After the Fiesta is over:

Foreign Language Attrition of Spanish in Dutch and German Erasmus students

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To Marc

Abstract

The present study explores the retention/attrition of Spanish as a foreign language in Dutch and German Erasmus students. Data from three different modes is analysed: oral, linguistic and psycholinguistic. In addition to cross sectional data, consisting of three attriting groups and a baseline group, it studies longitudinal data for 5 participants over the span of one year. The role of background and personal factors such as length of attrition, contact with the language, attitude and motivation and initial proficiency on the process of attrition is also investigated. Evidence for attrition is found at both linguistic (an increased number of disfluency markers, reduced lexical diversity and higher incidence of disfluency markers preceding lexical items in speech) and psycholinguistic level (slower reaction times and lower percent correct responses in a picture naming task). Although the results for the background variables are mixed, initial proficiency is established as the strongest predictor of retention/attrition.

Resum

Aquest estudi investiga la pèrdua (*attrition)* del castellà com a llengua estrangera en estudiants Erasmus holandesos i alemanys. S'investiguen tres tipus de dades: orals, lingüístiques i psicolingüístiques recollides de tres grups d'*attriters* i un grup de referència, a més de 5 persones de les quals s'han recollit dades longitudinals pel període d'un any. També s'ha explorat la importància de factors com el contacte amb la llengua, la longitud del període de pèrdua, l'actitud i la motivació i la competència inicial. Com a indicis de pèrdua de la llengua s'han trobat la reducció de la fluïdesa i de la diversitat lèxica i l'augment de les pauses plenes situades abans d'elements lèxics (substantius, verbs) en les dades orals; major temps de reacció i menor percentatge de respostes correctes en la tasca psicolingüística (*picture naming*). La competència inicial va ser la variable més important per a la predicció de retenció de llengua.

Prologue and acknowledgments

The journey leading to this dissertation began very inconspicuously some eight years ago on a bus. I very distinctly remember, after a 24-hour bus ride, looking through the bus window at the beautiful valley of Trieste and thinking: What am I doing here?! I don't speak the language, I don't know anybody and all I have are my two suitcases. Somehow, and mainly due to my quickly acquired Italian skills, I managed to survive my Erasmus year. Three years later, one new language and three suitcases, I found myself again staring through a window. This time I was on a plane looking ahead to a night on a bench at Madrid airport on my way to Barcelona. I couldn't speak the language and I didn't know anybody either. Four months later I could speak some Spanish and little did I know that in 8 more months the quest for my quickly escaping Italian would begin.

The proverb says 'Everything that happens twice, will happen a third time' and three and a half years later I found myself looking through yet another window. This time on a train (after a plane and a car ride): two new languages and one attrited; only one suitcase. This was the beginning of an on-going love affair between a dedicated skier and the Lowlands. After another two years and numerous trips between houses one (Barcelona), two (Sofia) and three (Groningen); after interviewing 60 of the most amazing Erasmus students and two incredible au-pairs; meeting a bunch of great new friends; a very successful house hunt that led to a very special person; two new languages and one attrited here we are at the beginning of this dissertation.

I did not find my Italian after all but I learned quite a few things about escaping languages and besides, my hope that one day I would go back to Italy and there, on a narrow cobbled street with shouting Italian housewives, I would be reunited with my Italian is still not dead. This has been an incredible journey for me: with lots of ups and downs (I hope the downs will soon start attriting), exhilarating moments and moments of pure stagnation (like in a real Dynamic System) and although you can only see the serious and 'boring' part here I hope you enjoy it and find it useful.

In order to realize this project I have counted with the financial support of AGAUR in the form of FI research grants for the duration of the PhD program at UPF and an additional BE grant for one of the periods spent in Groningen. The Department of Translation and Language Sciences at UPF also supported me with an EBES grant for the second visit to Groningen. In addition, without the generous leave of absence which my home institution, New Bulgarian University, granted me this PhD would have only remained a dream. I am immensely grateful to all three institutions for the opportunity given.

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At technical level, I never would have been able to record and transcribe the interviews without the help of the people from the Audio-visual Service at the Faculty of Arts, RUG, in particular Callista

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On academic level, I would like to thank my supervisor at UPF, Carmen Pérez-Vidal for her careful reading of the manuscript and her support with the never-ending formalities of the Double PhD contract. She has been an incredible teacher and an exceptional researcher, leading by example as much as by her actual teaching. It has been a privilege to be able to work with her. My sincere gratitude also to my promoter, Monika S. Schmid who is such an inspiration. Her knowledge and capacity never stop to surprise me. Thank you for teaching me so much about attrition and life in general. Finally, thanks as well to Kees de Bot who was initially my promoter. His kind support and attention go far beyond the duties of a promoter, for which I am immensely grateful. I never doubted that with such a team to supervise the process this would, after all, become a real dissertation.

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but made me, and still make me, feel very homesick every time I leave. Dear Agueda, Ani, Bregtje, Farah, Gülsen, Hanneke, Joyce, Sybrine, Tal, Xiaoyan and Yana, thank you for the incredible moments spent together at conferences, with the bikes, little dinners, *patat speciaal* and *kibbeling* at the market (and then in the gym trying to burn out all the extra calories). Many thanks to Ani and Joyce for providing me with a roof during some of the data collection visits; to Bregtje for translating the summary in Dutch and to Yana for her moral support. Gülsen, especially to you for your warm words when I most needed them and for your help with all thesis-related matter. To you and Hanneke, thanks as well for standing behind me on this special day as paranymphs. Thanks, too, to Chris McCully for his wise advice in a very delicate situation and in general for always making people feel so special.

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On personal level, I want to say thank you to my family and in the spirit of multilingualism the next lines will be in Catalan and Bulgarian as otherwise these would be just a few more lines in the 200 pages that my family would not be able to understand:

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Teodora H. Mehotcheva
Barcelona, August 2010

Contents

List of acronyms

AIO	Attitude and integrative orientation
AMQ	Attitude and motivation questionnaire
AMTB	Attitude and motivation test battery
AoA	Age of acquisition
ASP	Attitude towards Spanish people
ATH	Activation threshold hypothesis
CS	Cross sectional
DMM	Dynamic model of multilingualism
DS	Dynamic system
DSA	Duration stay abroad
DST	Dynamic systems theory
FL	Foreign language
IFL	Interest in foreign languages
HF	High frequency
IA	Image agreement
IO	Integrative orientation
LG	Longitudinal
LoA	Length of attrition
L1S	Use of L1 for social purposes
L1C	Use of L1 for communication
LF	Low frequency
LME	Language maintenance effort
MF	Medium frequency
NA	Name agreement
NTB	Neurolinguistic theory of bilingualism
PN	Picture naming
PNT	Picture naming task
PS	Pseudo (words)
RT	Reaction time
SA	Study abroad
SLA	Second language acquisition
SLQ	Sociolinguistic questionnaire
SPE	Spanish for entertainment
SPS	Spanish for social purposes

1
Introduction

"I speak two languages: English and rubbish."
Paul Taylor, *A Unicidade do Conhecimiento*

Learning foreign languages has become an integral part of our lives, yet how much of this (often) laboriously acquired knowledge is retained later in life is a question which was posed more than twenty years ago (Weltens, 1987:22) and which still has not been considered in detail. Only a handful of published investigations have addressed the problem of adult foreign language attrition so far (Bahrick, 1984a, 1984b; Grendel, 1993; Murtagh, 2003; Weltens, 1988) and the unanswered questions in the field far exceed the resolved ones. Moreover, no study has analysed language attrition in relation to mobility programmes, that is attrition in learners who have experienced both formal instruction at home and a study abroad context of acquisition of the language.

It is the aim of the present study to explore the processes of attrition/retention of such a language. A special focus is placed on lexical items and, in addition, the role of personal and background factors which might influence the process of attrition, in particular length of exposure to the languages and length of the attrition period, attitude and motivation, initial proficiency and contact with the language, is also investigated.

1.1 Outline of the dissertation

The dissertation consists of 7 Chapters. Chapter one provides a general introduction to the topic and the current project, as well as the context of the study. It presents the terminology used in the field and in the dissertation. It then introduces the field of foreign language attrition by providing a short review of its history and of four of the main studies in the field and their findings, which are used as a basis for the study. This is followed by a justification as to why more studies on foreign language attrition are needed. A discussion of some methodological problems and issues that research on foreign language

attrition faces are presented. The next section describes the context of the study, i.e. Study Abroad and exchange programs. Finally, the chapter ends with an outline of the challenges lying before the present study.

Chapter 2 provides a theoretical background to the study by presenting three theories, the Dynamic Model of Multilingualism, the Dynamic Systems Theory and the Neurolinguistic Theory of Bilingualism with its Activation Threshold Hypothesis. The next section is dedicated to language processing considering the implications of monolingual models for bilingual and multilingual speakers. The Picture Naming paradigm as a method for exploring lexical access is discussed next, followed by a number of factors which have been found to influence the attritional process. The general research questions, based on theoretical considerations, which are put forward conclude the chapter.

Chapter 3 presents the actual study. First, the recruitment procedures employed and the sociolinguistic characteristics of the participants are described. The data collection materials are then listed separately introducing the aim, construction, administration and scoring. The design of the study, a mixture of cross-sectional and longitudinal data, and the data collection organization and allocation in time are outlined next. This is followed by a description of the procedure which was followed during data collection and finally, the exact hypotheses and expectations that the study aims at answering with the materials employed close the chapter.

Chapters 4 and 5 are dedicated to the results of the study, longitudinal and cross-sectional respectively. In chapter 4, the results are discussed qualitatively and in the light of each participants' personal characteristics. In Chapter 5 a cross-sectional view of the data is presented, using statistical analyses. The chapters follow a similar pattern. Both begin by presenting the participants in each data set; the background data are analysed: first the sociolinguistic characteristics, then the attitude and motivation and language contact information; the results of each test follow in a separate section. Chapter 5 has two more additional sections presenting the correlation and regression analyses.

In Chapter 6, the main findings of each test are discussed in a separate section in relation to the research questions and hypothesis put forward in Chapters 2 and 3 and in the light of previous research. Finally, Chapter 7 summarises the work by mentioning the implications, theoretical, methodological and research, and the limitations of the study, which have to be considered in designing future studies on foreign language attrition.

1.2 The domain of language attrition

1.2.1 Terminology

Although being a relatively new field of research (as will be demonstrated in the following section), the use of definitions and terms in the field of language attrition has been far from unanimous. The terms *language attrition*, *language regression*, *language loss*, *language shift* and *language death,* among others, have all been used to refer to the phenomenon of losing a language. However, there are a number of differences among them that have to be borne in mind.

The last two terms, *language shift* and *language death*, are of interest to sociolinguists. Research on *language shift* focuses on loss of a language or a dialect across generations. Usually it is concerned with diglossia situations in migrant communities or bilingual communities where two languages co-exist and in the course of time one language takes the place of the other, i.e. it is an intergenerational process. *Language shift* is considered a normal phenomenon in language contact situations and its most extreme outcome is *language death*. *Language death,* however, also may be the result of failure to pass on a language to the following generations, without necessarily any qualitative changes taking place in the language itself. For a detailed discussion on the topic see Crystal (2000).

Language attrition or the decrease of linguistic skills in healthy individuals over time is an intragenerational phenomenon. Other terms such as *language regression* and *language loss* have also been used to refer to different types of decline in linguistic skills. *Language loss,* however, has a rather negative connotation of permanency and irreversibility that clashes with research on forgetting which claims that information represented in the brain cannot be entirely erased (for a review of theories of forgetting, see Ecke, 2004) – it just becomes

inaccessible. It was generally decided that *language loss* was to be used as a cover/general term for any type of decline in the linguistic skills, be it on individual or group level, encompassing both *language shift* and *language attrition* (de Bot & Weltens 1995:151; de Bot 1996:579; Hansen 2001:61).

In 1982 Andersen (p. 83) pointed out that just as Language Acquisition research had terms such as *acquisition*, *acquire*, *learn* and *learner*, Language Attrition research should have not only *attrition* as a term but also *attrite(v.)* and *attriter(subj.*) to complement it. Although Anderson himself did not use these terms in his paper because as he noted they were not recognized English words, *attrite* and *attriter* caught on and gradually became an integral part of the field present in the works of researchers such as de Bot & Weltens (1995), Gürel (2004), Hansen (1999), Köpke (2004), Montrul (2002), Schmid (2004a) and Weltens (1987) to name but a few.

The field of language attrition further distinguishes between *L1 attrition* or the attrition of a native language associated with immigrants as in de Bot & Clyne (1994), Gürel (2004), Hulsen (2000), Köpke, Schmid, Keijzer, and Dostert (2007), Opitz (2004), Seliger & Vago (1991), Schmid (2002), Schmid, Köpke, Keijzer, and Weilemar (2004), Yağmur, de Bot, and Kurzillus (1999) and *L2/foreign language (FL) attrition*, the attrition of languages acquired later in life. However, a foreign language learned at school can hardly be compared to a naturalistically acquired L2 as in the case of bilingual speakers and a further distinction needs to be made. In the present dissertation *L2 attrition* is understood to involve the attrition of a second language in bilingual individuals or in returnees who start using and relying more on their L1 as in Hansen (1999), Murtagh (2003), Starren (1998) and Taura (2008). *FL attrition* deals with a school acquired language or a language "picked up" in a naturalistic environment but usually lacking the status and level of proficiency of an L2 in a balanced bilingual, where the two languages are developed to a similar extent and used on a daily basis. Previous research on *FL attrition* includes works by Cohen (1989), Gardner (1985), Nakuma (1997), Weltens, van Els, and Schils (1989), Weltens & Grendel (1993). A clear distinction between these two is made in this dissertation, which deals with FL attrition.

Another pair of terms that has to be mentioned is *language maintenance* and *language retention*. These two terms are the counterparts of *language*

loss and *language attrition*, where the former refers to processes at intergenerational level and the latter at interpersonal level. Gardner (1982:24) claimed that even though the term *language attrition* lacked the negative connotation associated with *language loss*, it still referred to a negative phenomenon, i.e. the deterioration of linguistic skills. His suggestion was that instead the focus should be on *language retention*, i.e. what was retained rather than what had deteriorated, thus pointing to a more positive phenomenon. Although the term *retention* gradually gathered some popularity it still has not managed to displace *language attrition* as it is usually used in a combination with it as two complementing sides of one process.

Other terms that will come up and need to be clarified are *onset of attrition* – the moment when active use of and contact with a language stop and attrition is believed to commence; *initial proficiency, proficiency at onset* or *attained proficiency* is the language proficiency at the moment when attrition starts, which is expected to decline (the three terms are used interchangeably in this dissertation); *length of attrition* (LoA) is the period encompassed between the start of attrition and the moment when the competence in the language is evaluated again. The term *incubation* (Gardner, 1982) can also be used to refer to LoA. *Duration of SA* is the time spent studying abroad in a foreign country; *language use* is use of the target language before the onset of attrition while still on a SA and *language contact* or *rehearsal* is the use of the language after the onset of attrition.

1.2.2 Development of the field

Interest in the phenomenon of language loss can be traced back to as far as the 16th century (for a review see Berko-Gleason, 1982). However, it was mainly focused on two aspects of language attrition in particular: language shift and pathological language loss. The former, as has already been mentioned in the previous section, deals with the gradual decline of a language at intergenerational level and is usually associated with language contact situations. The latter explores language loss resulting form brain-damage situations as a consequence of an injury, illness, stroke, aneurysm, etc. in aphasic patients or from dementia in elderly people (see, e.g. Hyltenstam & Stroud, 1993).

It was not until the 1980s that the official beginning of research on "natural" language attrition, i.e. language deterioration within healthy

individuals, was proclaimed. The Conference on the Loss of Language Skills held at the University of Pennsylvania is usually pointed out as the formal "birthday" of the field. This conference produced a highly valuable volume comprising a selection of papers entitled *The Loss of Language Skills* (Lambert & Freed, 1982) dedicated to language loss and touching on several important issues for the newly born field: Theoretical Aspects, Measurement and Description, and Implications for Programs and Policy. The selection includes articles such as Anderson's blueprint for future research, Berko-Gleason's ideas from child language acquisition applicable to language attrition, Gardner's contribution on the importance of social factors, and Clark's chapter on measurements in attrition research.

Soon other books that dealt not only with theoretical or methodological issues but also reported on studies and research in progress followed (Weltens, de Bot, & van Els, 1986; Weltens, 1988; Seliger & Vago, 1991). Articles on language attrition began to appear regularly in international journals and several special issues were dedicated to the phenomenon: Applied Psycholinguistics (1986, Vol. 7:3), ITL Review of Applied Linguistics (1989) and Studies in Second Language Acquisition (1989, Vol. 11:2). In addition, the 1990s saw a surge in Doctoral dissertations dedicated to language attrition with the works of Ammeerlaan (1996), Grendel (1993), Kaufman (1992), Köpke (1999), Waas (1996) and Yağmur (1997).

The new century was especially prolific for the young field. It started with two *International Conferences on First Language Attrition*, Amsterdam 2002 and 2005; a Language Learning roundtable at *EUROSLA 17* 2007 in Newcastle and five graduate workshops dedicated to different issues in language attrition (Amsterdam 2003, 2003, 2005, 2006; Groningen 2009). In addition, a number of books were published: Hansen (1999), Köpke et al., (2007), Schmid (forthcoming), Schmid et al., (2004), the last being a selection of some of the papers presented at the *International Conference on First Language Attrition* 2002. This was complemented by a number of PhD dissertations such as Hulsen's (2000), Keijzer's (2007), Murtagh's (2003), Schmid's (2000), Taura's (2008) and special issues of journals such as the Journal of Neurolinguistics (2003, Vol. 17:1), the International Journal of Bilingualism (2004, Vol. 8:3) and Bilingualism: Language and Cognition (2010, Vol 13:1), International Journal of Bilingualism (forthcoming).

The majority of attrition research, however, was focused mainly on L1 attrition of people living in an L2 environment (Ammerlaan, 1996; Anderson, 2001; Bolonyai, 2000; Silva-Corvalán, 1991; Hulsen, 2000; Isurin, 2000; Jordens, de Bot & Trapmann, 1989; de Leeuw, Schmid & Mennen, 2010; Keijzer, 2007; Köpke, 1999; Köpke et al., 2007; Montrul, 2002; Nicoladis & Grabois 2002; Schmid et al., 2004; Seliger & Vago, 1991; Sharwood Smith & Van Buren, 1991; Tsimpli, 2007; Yağmur, 1997); or on the attrition of naturalistically acquired L2, often at native-like proficiency level (Cohen, 1989; Murtagh, 2003; Kuhberg 1992; Olshtain, 1986, 1989; Taura, 2008; Tomiyama, 1999; Weltens, de Bot & van Els, 1986; Yoshitomi, 1999). FL attrition research, although dating back to the 1920a, was, and still is, confined to a number of studies (Bahrik, 1984 a, b; Cohen, 1986; Cole, 1929; Gardner Lalonde, Moorcroft & Evers, 1987; Grendel, 1993; Nagasawa, 1999; Nakuma, 1997; Russel, 1999; Scherer, 1957; Starren, 1998; Weltens, 1988; Weltens & Grendel, 1993).

More than twenty years after the question which Weltens (1987:22) brought up, and which was mentioned earlier, we are still far from a conclusive answer. Some of the studies mentioned above were small case studies and/or dealt with children (Cohen, 1986; Cole, 1929; Gardner et al., 1987; Nagasawa, 1999; Starren, 1998). On the one hand and without undermining the explorative importance of such projects which provide insight into the phenomenon and outline further lines for research, small samples do not always allow for general conclusions to be made. On the other hand L1 and L2 attrition research has reported contrasting results regarding adults and children (for an overview see Bardovi-Harling & Stringer, 2010; Köpke & Schmid, 2004; Bylund 2009) thus pointing to the need to methodologically distinguish between adults and speakers whose linguistic system has not yet fully developed (Schmid, 2004 a: 9). The articles from Cole (1929), Gardner et al., (1987) and Scherer (1957) reported on the effect of summer vacation on the attrition of French (the first two) and German. Very little attrition was reported for all three studies which might be due, among other reasons, to the short LoA period that was investigated. Nakuma's article (1997) on the attrition of L3 Spanish in 13 Ghanaians actually presented a model for measuring attrition in communicative competence, which so far has not received much attention. Finally, Russel's chapter (1999) presented a project investigating the attrition of Japanese as a Second Language

in 20 missionaries that spent approximately 2 years in Japan where minimal evidence for attrition was found.

Adult FL attrition has only been dealt with so far in three large scale investigations: Bahrick's (1984a, 1984b) project on the attrition of school acquired Spanish by English L1 speakers and Weltens's (1988) and Grendel's (1993) work on the attrition of school acquired French by Dutch L1 speakers. Murtagh's investigation (2003) of the retention of Irish by high school leavers in Ireland is a mixed case of L2/FL attrition since it deals with a language that formally is an official language but in practice is used by a very small part of the population thus making school-acquired Irish look more like acquiring a foreign language. These four studies will be discussed in detail in the following subsection and it will be argued that there is a clear need for more research on the topic in order to be able to provide a reply to the question posited by Weltens.

1.2.3 Four studies on FL attrition

Bahrick

One of the most famous and influential studies not only in FL attrition but in language attrition research in general is Bahrick's (1984a), on the retention of Spanish by adult English L1 speakers. It is by far the largest project carried out on language attrition with a total of 773 participants. Of these, 146 were still learning the language in high school or university language courses at the time of the interview and 587 had studied the language one to fifty years prior to being interviewed. These 587 people were divided into eight groups according to the time elapsed since their last language course and were assigned to a training level, from 1 to 10, depending on the number of courses taken - one academic year at school or three courses of at college accounted for one training level. The remaining 40 participants had not received instruction in the target language. They were used to discriminate between Spanish learned in class and Spanish picked up incidentally, and between answers that were marked correctly and answers that were just guessed correctly.

The materials used to gather background data included a questionnaire that provided information for instruction, the grades obtained on courses taken and the opportunities to use Spanish and other

Romance languages during the period of attrition. The tests used to elicit language proficiency data consisted of reading comprehension; Spanish-English and English-Spanish recall vocabulary; Spanish-English and English-Spanish recognition vocabulary; grammar recognition; idiom recall and recognition, and word order.

The results from Bahrick's study showed that: (a) during the first three to six years there was an exponential drop in the retention followed by stabilization, (b) a large part of the knowledge was preserved for over 50 years, (c) the grades obtained were valid predictors of performance even several decades later; (d) the higher the number of courses taken, the greater the amount of retained knowledge, while (e) having completed only one course did not leave any permanent trace, (f) rehearsal during the period of attrition did not affect the retention process and (g) the amount of content forgotten during the first five years was equal for individuals across different training levels, but this represented a smaller proportion of the total knowledge with higher levels of training.

Bahrick explained the results obtained with the notion of a *permastore content* - a special part of knowledge where items that acquire a lifespan of over 25 years are kept. Acquiring such a lifespan was found to be dependent on the attained level of proficiency and the duration of the original language training but *not* influenced by rehearsal (i.e. watching TV, reading, writing or speaking in the language) during the attrition period. Bahrick's interpretation was criticised by Neisser (1984:33) who stated that the idea of a state of *permastore* was not the most adequate way to interpret the results obtained. Instead, he suggested that there might be a *critical threshold* of strength that some items must reach in order to be preserved. According to him, having reached such a threshold was what made high proficiency speakers of a language immune to substantial language attrition. In a similar vein, Schmid (2007:150) suggested a "saturation" threshold for adult L1 attriters, i.e. since a linguistic system acquired in monolingual environment until adulthood is rehearsed extensively, a point comes after which rehearsal no longer has an effect.

The idea of a critical threshold was also developed by Paradis (1985, 2004) on the basis of his work with aphasic patients. According to Paradis's Activation Threshold Hypothesis (ATH) the stimulation of all items and linguistic components has to exceed the activation

threshold level in order to be accessible for use. This model and its implications for language attrition will be discussed in detail in Chapter 2.

Weltens

Another seminal work in the field of FL attrition is Weltens's (1988) project on the retention of school-acquired French among 150 Dutch L1 learners for a period of four years and across two different training levels: four and six years of studying the language. Due to time restraints he used a combination of cross sectional and longitudinal measurements to investigate the retention of receptive skills. He noted several reasons for his choice: (1) if language attrition could be detected, it certainly would mean that the productive skills were also affected basing his assumption on research carried out by Snow, Padilla & Campbell, 1984; (2) testing the receptive skills could be done quite easily (3) due to the availability of standardized tests; and (4) the receptive skills were in practice the focus of school taught French in the Dutch system at the time.

The tests consisted of a cloze test and dictation tests as measures of general proficiency; general reading and listening comprehension skills. In addition, within each one of the previous components certain phonological, lexical and morpho-syntactic elements such as frequency of the elements and contrast with Dutch were examined. Additional information about the participants' linguistic background and their attitude towards French were gathered by means of a questionnaire in which they were also asked to self-rate their proficiency in French.

The results showed training effects for all the tests, with highly significant effects for the listening and reading sections. The scores obtained on the general proficiency tests, however, were unaffected by the length of the incubation period and the scores on the listening and reading sections and the phonological section correlated negatively with time. Cognates, as expected, were less prone to attrition as compared to non-cognates. Attrition was found only on the morpho-syntactic level with contrast items contributing more to the overall loss. There was no difference in the amount of language attrited between training levels - both groups lost 10-15% of their original knowledge. Lastly, no support was found for the rather negative self-reported assessment of the participants' language skills.

Welten's results were in line with Barick's (1984a) in indicating that attrition set in rapidly and then leveled off and that the amount of knowledge lost was independent of training level. His explanation of the results was that there might be other factors such as general maturation and cognitive development, continued academic training and continued learning of other foreign languages that might have contributed to the increase in listening, reading and phonological sections. He also pointed out that the participants were highly proficient speakers of the language and there also was no time limit when completing the tests. Had a time limit been introduced, Weltens argued, the picture might have been very different, especially when considering the results from a pilot study where a timed lexical decision task revealed loss of vocabulary after only two years of non-use.

Grendel

In a research project carried out a few years later, Grendel (as reported in Murtagh, 2003; and Weltens & Grendel, 1993) followed Weltens's design to explore the attrition of lexical knowledge. 200 participants from two training levels, four and six years of instruction of French, were tested at the end of their training, two and four years later. The main focus was on *1)* knowledge of the written form of words (orthographic knowledge) tested with an orthographic lexical decision task, and *2)* knowledge of word associations (semantic knowledge,) tested with a semantic priming task.

The orthographic lexical decision task consisted of pseudowords containing high and low-frequency clusters and nonwords. It was expected that pseudowords with low-frequency clusters would be rejected faster that pseudowords with high-frequency clusters due to the fact the latter were more similar to real words. Grendel expected that this frequency effect would disappear as the participants became less sensitive to the frequency of certain clusters as a result of orthographic attrition. This expectation, however, was not confirmed by the data since the frequency effect which was significantly larger for participants with 6 years of instruction remained the same two and four years later.

The semantic priming task consisted of words and pseudowords, half

of which were primed by semantically related words and half were primed by semantically unrelated words. It was expected that the words with semantically related primes would be recognized faster than those with semantically unrelated primes. This effect was expected to diminish over time as a result of semantic attrition. The result of this experiment did not give support to the expectations either. The priming effect which was significant for both training levels remained largely unchanged across the period of disuse.

Murtagh

Lelia Murtagh (2003) investigated the retention of school acquired Irish among high school leavers. As Murtagh explains, Irish, although an official language in Ireland (alongside English), is only used by 2.4% of the population and mainly by people living in the Irish speaking areas. Even though Irish is taught in all schools from primary education till the end of secondary education with the aim of promoting societal bilingualism, for many of the students it is difficult to find opportunities to practice the language once they finish their education due to limited use of the language in society. The aim of the study was to see how high school leavers managed to retain their Irish in this situation.

The sample consisted of secondary school leavers who came from three different learning environments: ordinary level Irish, advanced level Irish and immersion program students. The participants were interviewed twice: after completing their instruction of Irish (T1) and then again 18 months later (T2). Their proficiency in Irish was assessed by means of a C-test and a Communicative Test in Spoken Irish, both created for the purposes of the study. In addition, the participants had to fill in a student questionnaire that provided personal information, self-assessment rates on their ability to speak Irish, estimated language use outside the school and attitude/motivation ratings to learning Irish (based on the original AMTB by Gardener, 1985).

No evidence for language attrition during the first 18 months after leaving school was found. With a few individual exceptions, it was discovered that "time" alone was not a factor in the participants' proficiency. As reported earlier by Weltens, the participants' self-reported feeling of decreased performance contrasted with the results.

In addition, it was revealed that reduced number of opportunities to use the language existed, irrespective of the instructional level. However, those more likely to continue using the language (and who also used it more actively while still at school) were the students from the immersion program. The only two significant predictors of performance on the C-test at T2 that emerged were Initial Proficiency and reading in Irish after leaving school.

Murtagh suggested the results might be due to the relatively short period investigated, especially considering that Bahrick (1984a) had reported attrition to take place between 3 and 5 years after active use of the language stopped. She also pointed out that the tests used, despite their good reliability, might have failed to detect more subtle changes in the participants' performance.

1.2.4 More research on the topic needed

The need for more and more modern and "updated" studies on FL attrition becomes obvious if we first look at the existing body of research. On the one hand, previous studies were very beneficial in that they provided some important findings such as:

- the productive skills should be explored more extensively (Weltens, 1988; Weltens & Grendel, 1993) – the authors did not find signs of attrition in receptive lexical knowledge and concluded that recall is much more challenging than recognition and should be the focus of future studies;
- attrition seems to set in rapidly and then level off (Bahrick, 1984a; Weltens, 1988) – more attrition was found in initial periods of non-use than in ensuing ones;
- time alone is not enough for a language to attrite (Weltens, 1988) - attrition does not occur only as a function of time of attrition;
- initial proficiency (Weltens, 1988; Murtagh, 2003), course grades and number of courses taken (Bahrick, 1984a) might be predictors of attrition/retention – higher initial proficiency, higher course grades and higher number of courses were associated with better retention of the language.

On the other hand, research dealing with adult FL attrition is quite scarce. There is still a great deal of research to be done on the topic,

first to confirm the validity of the existing findings and second, to further establish what factor(s) and/or combination of factors influence the processes of attrition and how. It is also yet to be confirmed what the most vulnerable part of a language is, i.e. syntax, vocabulary or phonology.

In addition, a closer look at the projects reviewed in the previous section shows that, with the exception of Murtagh's project, these were carried out 16 to 25 years ago. Language teaching, learning and use, however, have changed considerably over the last two decades. As Weltens pointed out (1988:26), in the 1980s receptive skills were essentially the focus of FL teaching; little attention was paid to the communicative skills and/or the ability to talk. Although Weltens refers only to the Dutch school system, it can be assumed that this was more or less the situation in FL teaching in general. Languages used to be learned exclusively in formal settings, there was a very limited input (more often than not only from the teacher) and language learners had to go to special libraries or institutes, i.e. Cervantes, British Council, Goethe Institute, etc. to look for books, magazines and films in the target language. Speaking and use of the language was also confined to the classroom and the chances of real-life application of the language were limited to foreign travel.

This is quite different from FL learning and use nowadays when languages are not only formally learned at school but are also naturalistically acquired *in situ*. Languages can even be studied over the Internet without being in the same physical space with the teacher. Likewise, never before have so many opportunities existed, at least in some parts of the world, to get in direct contact with a foreign language. Globalization, the Internet, the technological developments and the easy and cheap access to travel also made languages very accessible. Authentic materials like films, music and exercises can be downloaded from the Internet and then played on a portable player while jogging or on the way to work. All kinds of on-line interactive activities can be accessed, which in a matter of minutes correct the responses and provide correct answers. A language can be practiced while on a weekend trip to Spain or with the next-door neighbours who are from Spain but have come to work in another country.

The new profile of the modern language learner is notably different from that of the learner 20 years ago. This is especially true in Europe

where FL attrition research can be particularly useful. The European Union (EU) is the largest area in the world where people from different cultures and languages can travel without any barriers and change their residence and/or job with few restrictions. Traditionally consisting of monolingual societies, it was not until the creation of the EU and the implementation of its policy of "freedom of movement" and "free circulation of workers" that Europe and its citizens in particular started interacting on an everyday basis and speaking foreign languages became a main issue on the agenda (for a detailed review of the topic, see Peréz-Vidal 2010).

One of the main linguistic goals of the EU, besides preserving the existing linguistic diversity by promoting local languages, is aiming "for a situation in which every EU citizen can speak at least two foreign languages in addition to their mother tongue" as stated in the EU Language Policy (http://ec.europa.eu/education/languages/eu-language-policy/index_en.htm). This suggests that all Europeans will sooner or later become multilinguals. The idea of multilingualism is supported by the EU through an array of programs, Erasmus, as will be seen in the next section, being the most popular one with approximately 2 million students who have already participated in it.

This, however, does not mean that language learning has become easier or effortless. On the contrary: it means that instead of spending time, money and effort on learning one language we do so on learning several. And as research on language attrition has showed, learning a language is not always for good. This new situation provides us with an opportunity but also poses a challenge: How to stay multilingual and not "forget" the language or languages that a person has learned in a lifetime.

Van Els and Weltens (1989) also put forward theoretical and practical reasons for the necessity and benefits of research on FL attrition. Among the theoretical reasons are contributing to the understanding of human memory and of the mechanisms that govern language. On a more applicable ground, FL attrition research can help better understand language change at the individual level and the relationship between acquisition and attrition. This in turn can have implications for language and curriculum planning, policy making and language teaching, for example by taking into account factors that are likely to make language learners less susceptible to attrition.

1.3 Methodological issues and constraints in FL attrition

Designing and carrying out a study on FL attrition, however, means facing a number of methodological issues and constraints which make the task quite demanding. These include *establishing a baseline* and using a suitable *methodology* to appropriately explore the phenomenon.

1.3.1 Establishing a baseline

A very frequently encountered problem and one which has been identified at the very first stages in research on language attrition is the problem of establishing a baseline. As Anderson noted "we need to know how normal LCs [*linguistically competent users*] use that feature" (1982:85) in the first place, in order to be able to say that it has suffered attrition. While in L1 research it might be fairly easy to find a group of L1 native speakers who live in the country of the target language, this is not the case of L2 or FL attrition. Research on FL attrition often deals with languages which have been acquired at different levels of competence not necessarily at native-like proficiency level (research carried out by Murtagh & Van der Slick, 2004; Reetz-Kurashige, 1999) or even close to high proficiency students. This makes a comparison to native control groups impossible since the experimental group would always be outperformed by the native speakers and instead of measuring attrition, the researcher will be measuring lack of acquisition. Also we have to make sure that the feature(s) that we are interested in have indeed be mastered by the target group in order to be able to claim that attrition has actually taken place.

The ideal solution to this problem would be to use longitudinal (LG) designs where the same subjects are interviewed over different periods of time. This approach would allow establishing a baseline from which the participants start and thus avoid the pitfalls of "*true attrition*" and "*failure to acquire*", to employ the words that Andersen (1982:85) used to refer to the problem. There are two major problems here, though. First, finding participants in general is a difficult enough task but convincing them to participate in a series of repeated experiments over the span of n-number of years, and every now and then subject them to tests, interview them or ask them to complete different experiments or questionnaires is not practicable. Second, even in the case of successful recruitment tactics, the researcher would have to

envisage participants dropping out due to purely life related circumstances – moving to another place; starting a family and unfortunately even death. Third, finding funding for an investigation which might take n-number of years to complete, then report and publish the results, can turn out to be too unrealistic.

A possible solution to this problem, as Weltens (1987:27) suggested, would be to use baseline data coming "from the same – or at least highly comparable - individuals as those whose attrition data are used" for whom the process of attrition has not started yet. This means that the baseline group should consists of individuals who share the characteristics of the experimental or attriting group(s) but who are not (yet) undergoing attrition. This strategy, as will be seen in Chapter 3, is adapted by the dissertation. In addition, LG data are provided for a subsample of the participants thus combining cross sectional (CS) and LG design.

1.3.2 The methodology problem

Another consistent problem in language attrition research in general is the inconsistency in the methodologies used across different studies. Only two research projects have followed the same methodology (Schmid, 2007 and Keijzer, 2007) and different kinds of materials have been employed to collect data. Among these are story telling based on a set of pictures (Cohen, 1989; Olshtain, 1989; Taura, 2008; Tomiyama 1999), recording of spontaneous speech (Tomiyama 1999), vocabulary recognition and recall (Bahrick, 1984a, 1984b), classical listening and reading tests (Weltens, 1988) and specially designed oral tests (Murtagh, 2003). In a similar fashion, some have focused on language reception (Bahrick, 1984a, 1984b; Weltens, 1988), others on the production (Tomiyama 1999, 2000; Murtagh, 2003) or on both (Taura 2008).

This lack of a common framework for research design and analysis was pointed out by Schmid (2004a) as a major drawback in research on attrition. In her closing article in the book combining papers presented at the *International Conference on First Language Attrition: Interdisciplinary Perspectives on Methodological Issue* she also draws attention to the fact that researchers usually rely on unimodal data. That is, data are gathered by only one means, for example story telling or vocabulary recognition but not the two together. Schmid suggests data

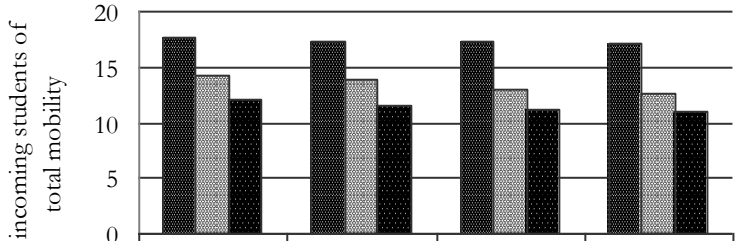
be elicited by using materials of three types: *Introspection and self-assessment* like for example a Sociolinguistic questionnaire, Can-Do Scales and Matched guise experiments; *Formal elicitation tasks* like C-tests, Verbal fluency tasks and Grammaticality judgment tasks; and *Spontaneous speech*, such as a film retelling task. This would provide the researcher with multimodal data that would allow to look at the phenomenon from different angles. Such standardization of the methodology would also make the results of different studies comparable and make future replications more meaningful. In a recent text Schmid (forthcoming) provided a number of standardized materials available for Dutch, German and English (both British and American). Her advice and materials were quickly put into practice in a number of L1 surveys (Opitz, 2004; Schmid, 2007; Yilmaz, Van der Kooi-Jamjam & Schmid, 2009) but to the knowledge of the researcher, the present dissertation is the first one to explore the phenomenon of FL attrition using multi-modal data. More details on the method and materials used can be found in Chapter 3.

1.4 The Study Abroad context

Studying abroad (SA), or spending some time at a university abroad, was first initiated by Prof. Kirkbride from the University of Delaware as early as 1921. Since then SA has become increasingly popular not only in the USA but all over the world, and not only for language majors but for students from all kinds of academic backgrounds.

Linguists noted the scientific possibilities that such programmes could offer and the first studies addressing the effects of SA on language acquisition appeared in the 1990s with the works of Brecht, Davidson, and Ginsberg (1993), DeKeyser (1990, 1991), Huebner (1998) and Freed (1995). More recent works (Collentine, 2004; Díaz-Campos, 2004; Du Fon & Churchill, 2006; Mora & Valls, 2007; Pérez-Vidal & Juan-Garau, 2009; Pérez-Vidal, 2010) focused on the effects of SA vs. classroom context, also known as At Home (AH) context (for a review on learning context see Collentine & Freed, 2004). Most SA studies focus on one specific phenomenon such as fluency (Valls & Mora, 2007), the development of phonology (Díaz-Campos, 2004), sociolinguistic competence (Mariott, 1995; Regan, 1995, 1998, 2009; Siegal, 1995) or vocabulary (Milton & Meara, 1995). However, multimodal methodologies have also been used to obtain data from

SA students. Within the European context[1], Pérez-Vidal, Juan-Garau, and Mora (forthcoming) report on a multimodal project. The Study Abroad and Language Acquisition (SALA) project employs both oral and written data collection procedures backed up by a Sociolinguistic questionnaire and Attitude and motivation questionnaire. It provides longitudinal data for the effects of both a SA period, and two terms of formal instruction AH that the participants experienced before going on the SA under the form of an Erasmus exchange.



	04/05	05/06	06/07	07/08
Spain	17,71	17,24	17,24	17,11
Germany	14,25	13,88	12,98	12,60
France	11,99	11,58	11,22	10,94

Figure 1.1 The three top-destination countries: Spain, Germany and France. Percentage incoming students of total mobility for academic years 2004-2008. Based on data published at http://ec.europa.eu/education/erasmus/doc920_en.htm

The European student exchange program, called Erasmus after the renowned Dutch humanist and theologian, only started in 1987 but it already boasts two million participants. The program has undergone several changes and has been integrated into different encompassing programs to finally become part of the Lifelong Learning Programme as of 2007. According to the EC website for Education and training[2], this is one of the most successful programs launched by the EU with about 90% of the universities in Europe participating in it. With a budget in excess of 440 million Euros the program provides funding for the participants in the form of a monthly grant for the duration of the SA and free language courses organized by the receiving institution *en situ* for minority languages (excluding German, English, French and Spanish). Spain is by far the most popular destination among Erasmus

[1] For an excellent review of early SA development in Europe, see Coleman (1989)
[2] The EC website for Education & training can be accessed at http://ec.europa.eu/education

students accounting for an average of 17,3% of the total student mobility for the period 2004 - 2008. France and Germany follow with 13,42% and 11,19%, respectively for the same period (see Figure 1.1 above). This means that during the last four years, an average of 26 857 Erasmus students chose Spain each year as their Erasmus destination.

Although the main influx of Erasmus students in Spain comes from Italy (23,2%) and France (18,9%), Spain is choice number one for German and Dutch students. Table 1.1 below shows that, for the last four years, 21,1% and 17,5% of all German and Dutch students have chosen to go to Spain. This made German and Dutch students a good target group for the survey. On the one hand there were lots of students who had been on SA to Spain, thus hopefully making the recruitment process easier and providing for more participants. On the other hand their L1 was a

Table 1.1 Percent for main groups of incoming students to Spain and percent of German and Dutch outgoing students to Spain.

Home country	Total outgoing/ home country	Incoming to Spain	% total outgoing/home country	% total incoming to Spain
IT	17562	6460	36,78	23,2
FR	22556	5281	23,41	18,9
DE	23559	4984	21,1	17,9
NL	4699	825	17,5	2,9
Total		27831		

Germanic language thus helping to avoid cross-linguistic maintenance which might be the case where the L1 is too similar to the attriting language, as in the case of Italian and French for example.

As already mentioned, Spanish is not one of the languages for which funding is provided by the EU. It is usually expected that the incoming students already have some (at least) basic knowledge of the language. Still, some of the universities in Spain provide language courses. This practice is not centrally organised or controlled for by any governing body and it depends strictly on the good will of the host institution and changes from university to university.

The Erasmus students coming to Spain have to face the fact that they cannot rely on English for communication. Even though a lot of effort is being put to teach the language and raise the general level of

English proficiency, Spaniards still remain predominantly English non-speaking[3] with the elder generation more familiar with French. While academic faculty are usually fluent in the language, administrative personnel not always are. Even staff working at the International Offices or Erasmus student organisations sometimes are not proficient in English. Although this might not be a very pleasant situation for a recently arrived Erasmus student, eager to enjoy the sunshine and fiestas, it has one very beneficial affect: it makes the students "espabilarse" roughly meaning, not waste time and immediately start learning the language since everything from finding accommodation, doing the shopping, ordering food in a restaurant, communicating with administrative staff at the university, to watching TV or movies (dubbing is the rule) is done in Spanish.

In her review of the effects of SA and AH contexts on Spanish SLA, Lafford (2006) points out that students in a SA context develop more their oral proficiency (Segalowitz & Freed, 2004; Segalowitz et al., 2004), fluency (Isabelli-Garcia, 2003; Segalowitz & Freed, 2004), pronunciation (Díaz-Campos, 2004; Simões, 1996; Stevens, 2001) and lexical development (Collentine, 2004; DeKeyser, 1986) in comparison to AH students who seem to be equal to or outperform SA students on pragmatic abilities (Rodriguez, 2001) and grammatical gains (Collentine, 2004; Torres, 2003). In addition, Milton & Meara (1995) found that SA students gain more in terms of vocabulary, which makes the topic of lexical attrition particularly appropriate for research.

In developing the hypothesis and research questions in Chapter 2 and Chapter 3, it is important to know which are the areas that SA students develop the most and it might be reasonable to look into. Also, this should be taken into account when choosing and/or designing the data collection materials and tasks, i.e. it would not make sense to use a written task when it is known that although written proficiency develops (even if indirectly)(Pérez-Vidal & Juan-Garau, 2009), oral capacity and the lexicon are most probably the ones expected to benefit the most from a SA period (Milton & Meara, 1995; Segalowitz et al., 2004). It also has to be taken into account that SA projects usually examine linguistic gain in language major students, whereas the participants involved in the current investigation were

[3] http://www.europapress.es

majoring in different areas and only studied the target language, i.e. the language of the SA country, as a foreign language.

1.5 Challenges for the present study

The major challenge is to provide a truthful outline of the attrition processes that the new language learner undergoes. In order to be able to effectively do so, two major points have to be taken into account. On the one hand the appropriate data collection materials should be used, which as suggested by Schmid (2004a) should ideally combine data from three different sets: Introspection and self-assessment, Formal elicitation tasks and Spontaneous speech. This would provide for a much more detailed and multidimensional grasp of the phenomenon. On the other hand the "baseline" problem should be effectively tackled with, making sure that the design employed allows for exploring attrition in the group concerned.

2
Theoretical background

The present chapter provides background to the field of FL attrition. Dynamic System Theory and the Dynamic Model of Multilingualism (Herdina & Jessner, 2002) are discussed together with their implications for research on attrition. Michel Paradis's (1985, 2004) Neurolinguistic Theory of Bilingualism and his Activation Threshold Hypothesis are examined for their possible contribution to FL attrition. Section 2.2 is dedicated to models of language processing. First a monolingual model is presented and then it is further developed for bilingual/multilingual use. Its possible implications for language processing in attriting speakers of a language are discussed. Section 2.3 outlines the basic concepts in Picture Naming, presents a number of factors that influence the naming process and discusses past studies that have used the same paradigm. Lastly, in Section 2.4, factors which have been demonstrated to influence the process of attrition are outlined, with a special focus on FL attrition. Finally, the chapter ends with the hypothesis that the study makes and the research question that it aims at answering.

2.1 Theoretical background to FL attrition

In this section two different models, the Dynamic Model of Multilingualism (DMM) by Herdina & Jessner (2002) and the Activation Threshold Hypothesis (ATH) by Paradis (1985, 2004) are presented and their implications for FL attrition research are discussed.

2.1.1 DST and DMM

Traditionally language and language acquisition, be it L1 or L2, were regarded as a linear system with a clear beginning and end, characterized by a steady upward movement, i.e. it starts at point *x* develops over time and stops at point *y* as in Figure 2.1a. Also, language learners, both in L1 and L2, were expected to go through analogous stages in acquiring a language. Although this might hold true for L1 acquisition, it is not so much the case in L2 or FL

acquisition.

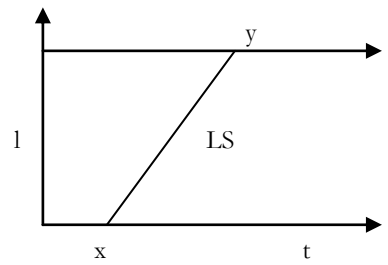


Fig 2.1a

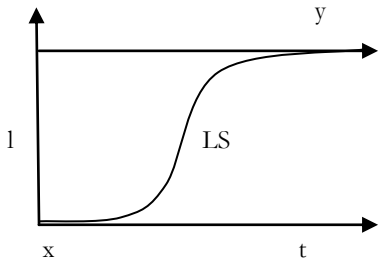


Fig 2.1b

Figure 2.1 Language as a linear system (a) and a dynamic system (b) LS – language system; t – time; l – language level. Adapted from Herdina & Jessner (2002:90).

As de Bot, Lowie, and Verspoor (2007) point out, several branches in linguistics such as Cognitive Linguistics and Functional Linguistics, and processing theories such as the Competition model by Bates & McWinney (1989) have found that a multitude of variables play a role in the language acquisition process. These include factors not only from within the linguistic system but also in the surrounding environment as well as individual characteristics pertaining to each person. The authors (de Bot et al.,:7) also explain that these variables interact on different levels: "in communication, in constructing meaning, in learning a language and among the languages in the multilingual mind" which makes it difficult to easily predict the final outcome with a simple linear function.

Dynamic Systems Theory (DST) gradually emerged as a better candidate to account for language and language development. At the core of DST is the notion of system as defined by Van Geert:

> A system…is more than just a collection of variables or observables we have isolated from the rest of the world. It is a system primarily because the variables mutually interact. That is, each variable affects all the other variables contained in that system and thus also affects itself. This is a property we may call *complete connectedness* and it is the default property of any system. The principal distinctive property – compared to a constant – is that it changes over time. Consequently, mutual interaction among variables implies that they influence and co-determine each other's changes over time. In this sense, a system is by definition, a dynamic system as a set of variables that mutually affect each other's changes over time.
>
> (1994:50, italics inserted by the author)

Besides being *completely connected,* that is all variables are interconnected and if one variables changes, this will affect all the other variables in the system, dynamic systems (DSs) are also "a nesting of larger and larger wholes" (Briggs & Peat, 1989:148), which means that every system is always a part of another one and that whatever changes occur in one, they will inevitably affect the other system(s).

The Dynamic Model of Multilingualism (DMM) developed by Herdina and Jessner (2002) draws not only on dynamic system research, but also on general biology and cognitive psychology and applies it to multilingual systems. Under DMM, language development in a multilingual system is characterized by *change of quality, reversibility, stability, complexity, non-linearity* and *interdependence* and is better represented by an s-curve as in Figure 2.1b.

Change of quality refers to the fact that proficiency in a given language may fluctuate – it may deteriorate or improve. This change in quality is a reversible process, i.e. a process of deterioration may be *reversed* by devoting more time and attention to the language and a process of improvement may slacken and turn into a process of deterioration if a language is neglected. The system may also remain *stable* as long as the time and effort devoted to maintain its elements remain constant. Accordingly, a multilingual language system is a very *complex* dynamic system which consists of other smaller, nested sub-systems - the different languages spoken by a multilingual. Each sub-system in turn consists of other subsystems such as morphology, syntax, phonology, etc. All these subsystems within the complex system *interact* between themselves and with the surrounding environment. They are in a process "of constant adjustment to the changing environment and internal conditions aiming at maintenance of a state of (dynamic) balance" (Herdina & Jessner, 2002:86).

One very interesting aspect of the DMM is the *positive* and *negative growth* envisioned by the model. *Positive growth* is when time and effort are invested into the language system and it develops. However, if instead of increase of effort there is a decrease in the time devoted to a language, the result is *negative growth*, which eventually leads to language attrition or gradual language loss. This process is considered to be "the mirrored process of language acquisition" (Herdina & Jessner, 2002:91) and is represented by an inverted s-curve as in Figure 2.2.

According to DMM, language attrition very often passes unnoticed, especially in the early stages, because it very often is demonstrated only by less frequent performance.

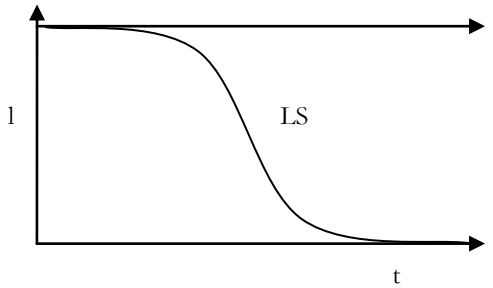


Figure 2.2 Gradual language loss under DMM. LS - language system; t – time; l – language level. Adapted from Herdina & Jessner (2002:91).

Rather than discussing language attrition, DMM considers the language maintenance effort (LME) that bilinguals and multilinguals have to exercise in order to keep their languages "alive". According to the authors, LME combines:

1) the use of the language for communication which leads to stimulation of parts of the subsystem,
2) the verification of hypotheses concerning the language system which again leads to the simulation of some parts of the speaker's linguistic subsystems (2002:99).

If there is no LME due to lack of use of a language this leads to the deterioration of competence in that particular language. Lack of deliberate LME does not necessarily mean that some parts of the language system are not activated by cross linguistic influence. Although this might not be enough to maintain the system fully functional, it might explain why absolute language loss is generally not observed after a certain age. LME becomes quite a demanding task in the case of multilinguals that have a number of languages, competing for a position in the "speaker's psycho-communicative system" (Herdina & Jessner, 2002:99) to care for.

Criticism of the DMM

Even though the authors build up quite a complex model to account for the intricate linguistic processes in multilinguals, there are several

weak points that have to be noted. First, although the authors make a special note to the fact that "language loss will affect different linguistic subsystems to an unequal degree" (Herdina & Jessner, 2002:97) they do not proceed to develop this idea further. No speculations are offered as to what the differences would be and which one or ones of the subsystems will be more or less affected, i.e. the lexical subsystem, the morpho-syntactic subsystem, the phonological subsystem, etc. Second, nothing is mentioned regarding the order in which the different subsystems will be affected: all systems at the same time but to a different degree or first one system and then another one, i.e. lexical followed by morphological, and each one to a different degree. Third, and due to the above mentioned problems, the model provides little for theoretical predictions and expectations but for the most general expectation that multilinguals can be very vulnerable to attrition due to the large number of languages that have to be maintained and compete for space in the "psycho-communicative system" (2002:99).

2.1.2 Neurolinguistic Theory of Bilingualism and Activation Threshold Hypothesis

The Neurolinguistic Theory of Bilingualism (NTB) developed by Paradis (2004), originated in pathological language loss but it can prove useful in research on attrition as well. The Activation Threshold Hypothesis (ATH), which is an integral part of the theory, has already been applied to L1 attrition research (Gürel, 2004; Köpke, 2002; Schmid, 2007; Schmitt, 2010) but its potential with respect to L2 and FL research still has to be explored.

A very important part of the NTB is the distinction between *implicit* and *explicit* linguistic competence. *Implicit* linguistic competence refers to the ability to use language knowledge subconsciously without being aware of the rules and procedures involved. For the native speaker of a language that would, for example, be the use of the subjunctive when required, making use of the correct word order or using the past tense in the appropriate context. This knowledge is acquired incidentally by focusing one's attention on other aspects of language and not the feature that is being acquired. Implicit knowledge is stored implicitly, that is a person is not aware of its existence. It is task specific and it is used automatically without conscious control.

Explicit knowledge, on the other hand, refers to knowledge that a person is aware of and that can be verbally represented. It is learned consciously by focusing one's attention on and learning a rule or an application of an item. It is stored explicitly, i.e. its contents can be recalled and verbalized, and it is consciously controlled when used. Paradis (2004:8) citing Cohen & Squire (1980) states that implicit knowledge is about *knowing how* and explicit knowledge about *knowing that*. E*xplicit* and *implicit* competence do no share information, do not exchange data and they do not interact.

Furthermore, implicit knowledge is sustained by *procedural* memory and explicit knowledge by *declarative* memory (Paradis, 2004:9). *Procedural* memory is used without consciously thinking about it and relates to internalized procedures and set patterns that lead to the automatic performance of a task. Examples of procedural memory are knowing how to ride a bike or play music, or phonology, morphology or syntax. *Declarative* memory sustains everything that can be consciously represented, retrieved and discussed. Our knowledge of biology and other sciences that has been learned consciously, knowing what happened a few days ago or what one had for dinner the night before all belong to *declarative* memory, as does the meaning of words. Generally, it is accepted that *procedural* memory is much more resistant to forgetting than *declarative* memory since it is task specific and interference is limited (Paradis, 2009). Still, it is not totally exempt from it: you may never forget how to ride a bike and yet, if you do not practice for some time, you do get a bit clumsy and insecure. *Declarative* memory, however, being not task specific, is open to interference from other sources.

Under the NTB, a language is a "system of systems" (Paradis, 2004:130). The different languages in a bilingual/multilingual are regarded as parametric variations of one and the same thing, i.e. language, and are considered to be subsystems rather than independent systems. Each language subsystem, meaning the implicit linguistic competence, on its turn consists of independent subsystems or modules, e.g. phonology, morphosyntax, semantics. Figure 2.3, which is based on Paradis (2004:131) exemplifies the language system (L) of a person who speaks four languages (Dutch, English, French and Spanish). There are four sets of language subsystems represented vertically, one for each language, and four sets of modules within each language subsystem, represented horizontally – phonology (P),

morphosyntax (S) and lexical semantics (Lx), one for each language.

The modules across the language subsystems are closer to each other than to the other modules within a language subsystem. For example, the phonology of different languages although having different final results, i.e. different vowels or onset time for consonants, deals with the way sounds function in the language and as a system is quite different from the morphosyntax system, which deals with the internal structure of words and the way the words are put into sentences.

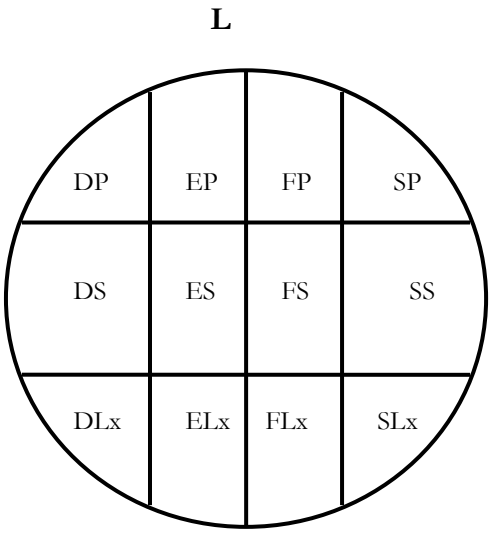


Figure 2.3 Language subsystems of a speaker of four languages, each one with its language specific modules (based on Paradis, 2004:131)

This division into modules provides for the possibility to have different levels of activation or inhibition for each separate module, both for the whole language subsystems and the modules with them. Thus, while one language subsystem is active, i.e. Spanish, the other language subsystems are inhibited to impede interaction. Similarly it allows for the inhibition of a module within the language subsystem, i.e. morphology, both across all language subsystems or only within one.

Another basic constituent of the NTB, and with direct implication for language attrition, is the Activation Threshold Hypothesis – ATH (Paradis, 1993, 2004). The hypothesis is based on an analogy with neuron action potentials where a critical threshold or level of activation must be reached for the cell to generate an action potential

(Paradis, 2004:29). In a similar vein, the ATH suggests that each linguistic item and subsystem has an activation threshold level which depends on the impulses that are necessary to activate it. An activation is achieved "when a sufficient amount of positive neural impulses have reached its neural substrate" (Paradis, 2004:28). A low activation threshold level requires less impulses to activate the item, while a higher threshold level requires more. Each activation lowers the threshold which then starts rising gradually until the next activation. If an item is not stimulated, i.e. activated, its threshold level rises and makes it more difficult to activate the item again. In order for an item to be selected, activation of the item in question is accompanied by inhibition of its possible competitors, i.e. their activation thresholds are raised (but not beyond a point where they would be no more recognised). The activation level of an item changes constantly and depends to a great extent on the frequency and recency of use.

Recognizing an item is based on stimulation from the outside, such as auditory or visual signals, whereas production of the same item requires an impulse from within the system thus making it a more difficult process. Accordingly, a person who is not able to produce a word might still be able to recognize and understand it. This is very much in line with findings from L2 attrition studies which demonstrate that the receptive skills remain generally intact while production is affected by attrition (Bahrick, 1984a; Weltens, 1989).

Under the ATH, total loss of a language in L1 speakers is not deemed possible. Rather, the language is considered to have become inaccessible to conscious retrieval due to its high activation level. Support for this has been found in studies using hypnosis to recover an attrited and seemingly totally lost language (Fromm 1970; Footnick 2007). An exception here are the studies by Pallier et al., (2003) and Ventureyra, Pallier, & Yoo (2004) which found no trace of the L1 in Korean adoptees across a number of tasks. These two studies however, dealt with very young immigrants whose language was not yet well established at the moment of emigration and was later never used.

One very important aspect of ATH is motivation. It is thought to play a special part in language retention, the same way that it boosts second language acquisition in that it may influence the activation threshold level. The emotional attitude towards a language might raise the

activation threshold or lower it depending on whether the attitude is negative or positive. This might explain the quick linguistic adaptation of immigrants or adoptees who connect their L1 with negative experiences and emotions which has been reported in a number of studies (Nicoladis & Grabois, 2002; Pallier et al., 2003; Pavlenko, 2005, 2006; Schmid, 2002; Ventureyra et al., 2004). Also, in natural language acquisition the utterances produced by a speaker derive from the genuine need or desire to transmit a message, while in SLA, classroom students are often placed in artificial situations where they have to practice a certain feature such as asking for directions while looking at a child-like map with the inevitable library, post office and bank pictures. Although motivated from the syllabus of the course the need to ask for directions does not come from within the learner. A very good example of how motivation, especially integrative motivation, i.e "attitudes toward learning the language, plus desire plus motivational intensity and a number of other attitude variables involving the other language community" (Gardner, 1985:54) boosts the language acquisition process is seen in partners with different linguistic backgrounds and especially during courtship. The influence of motivation for language retention is discussed later in the Chapter, in Section 2.4.2.

An implication of ATH for bilingual and multilingual speakers is that intensive use of or exposure to a language leads to lowering of the activation of that language thus making it easily available for use. However, at the same time the rest of the languages are inhibited. When an item is activated, all its competitors, not only from the same language but also all cross-linguistic translation candidates, are inhibited. Consequently, long-term disuse of a language leads to a raising of the level of activation, first for the declarative items, and then for the procedural ones as well, leading to a dynamic interference – where the procedures of another language may be used to generate utterances in the attriting one. Under ATH, lack of use is sufficient for a language to attrite as stated by Paradis (2007:125) "[…], attrition is a result of long-term lack of stimulation". Research on attrition so far has not found support for this claim, however. Bahrick (1984a) claimed that rehearsal during the attrition period did not play a role in the retention process. Similarly, Taura's study (2008) on the retention and attrition of English by Japanese returnee students showed that attrition was not a function of incubation, i.e. lack of use.

The modularity of the language subsystem in the NTB allows for and predicts different attrition rates for the different linguistic components. As morphosyntax and phonology are sustained by procedural memory and vocabulary by declarative memory, it is expected that vocabulary will be affected first. If attrition is to be detected in the early stages of the attrition process, it is going to be in the lexicon, even though (Paradis, p.c.) predicts that "the dominancy of vocabulary over grammar [in FL attrition] will be less salient to the extent that the grammar is also declarative".

As for total loss of a language in children, the lack of entrenchment of the language in young children might be seen to be similar to the not yet firmly established language in FL learners. This, on the one hand, can predict total loss of a foreign language: if the language is not fully developed and in addition it is rarely used, its activation threshold will rise quickly and the language will fall beyond "retrieval" and it could be totally erased. On the other hand, it might be expected that the more mature the language system is at the onset of attrition, the more resistant it would be to attrition. This would predict better retention rates for advanced FL speakers than for speakers at beginner level.

2.2 Language processing

Language is one of the distinctive features of human beings. It is effortlessly mastered by all healthy individuals and it is usually taken for granted: it is just something people do without thinking about it. The road from concept to speech, however, is quite complex. In normal conditions people manage to prepare and produce about two or three words per second (Levelt, 1993). In experimental conditions, when naming a picture stimulus, a word can be produced in as quickly as 600ms after the onset of the picture (Bates et al., 2003) That people manage to complete such a task in such a short time is an astonishing accomplishment. Bilinguals and multilinguals are further faced with the challenge of managing the different languages in their brain and still coming up with intelligible speech in one of their languages. It is the aim of this section to present a model of lexical access, namely Levelt's (1989) model and discuss its implications for bilingual and multilingual lexical access and FL attrition.

2.2.1 Monolingual language processing

A number of lexical access models have been put forward (Dell, Martin, & Schwartz, 2007; Levelt, 1989; Levelt, Roelofs, & Meyer,1999; Paivio, 1986) but one of the most widely used ones is Levelt's (1989, 1999) "Speaking" model. This model has also been applied to bilingual production (de Bot, 1992) and its implications for multilingual lexical access have been discussed (de Bot, 2004) and therefore it was deemed especially appropriate for the present study.

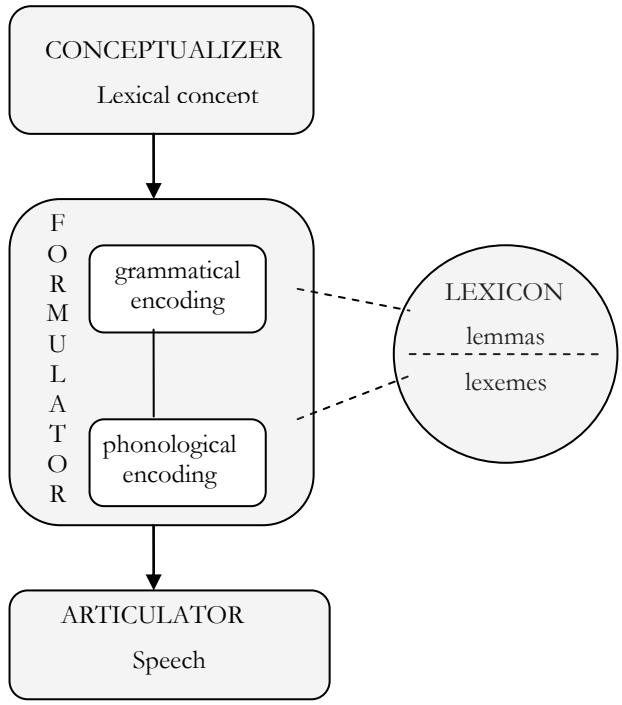


Figure 2.4 Lexical access stages (based on Levelt, 1989:9). See Levelt (1989) and Levelt et al., (1999) for a more detailed version of the model.

Levelt's (1989) model consists of three processing components: *conceptualizer*, *formulator* and *articulator*, Figure 2.4 shows a simplified version of the model. In the first component, the CONCEPTUALIZER, the concept that the speaker wants to convey is selected from an array of semantically related concepts. This generates a preverbal message which is used as input for the next component, the FORMULATOR. The formulator stage involves the selection of the most appropriate lexical unit for the concept intended for communication and it consists of two steps: the encoding of the

syntactic properties (grammatical encoding) and phonological properties (phonological encoding) of the selected lexical unit. The information necessary for the grammatical and phonological encoding is retrieved from the LEXICON.

The lexicon consists of *lemmas* and *lexemes*. A lemma incorporates the semantic and syntactic properties of an item, while the lexeme contains its morphological and phonological characteristics (Caramazza, 1997; Kempen & Huijbers, 1983). Lexical selection is generally considered a two-stage process involving (*1*) the selection of a semantic and syntactic lexical representation in accordance with the preverbal message, or *lemma*, which in turn (*2*) activates the corresponding morphological and phonological representation, or *lexeme,* for the utterance. The product of the formulator becomes the input for the last stage where the actual articulation of the intended message is produced (ARTICULATOR).

2.2.2 Language processing in bilinguals and multilinguals

Considering the model of language production just described and the fact that bilingual and multilingual speakers have lexical items in more than one language for the same concept, there are two main implications that have to be considered: *1)* how the bilingual/multilingual lexicon is organized and *2)* how lexical access in bilingual/multilingual production is achieved.

Originally, the discussion on the organization of the bilingual lexicon was on one (Grosjean, 1997) vs. more vocabulary sets (Tulving & Colotla, 1970). However, as de Bot (1992:9) points out, research on storage and retrieval by bilinguals has shown that representation and storage of "elements/knowledge of the two languages" might not be as straightforward and might be influenced by a number of factors, like the level of proficiency and the linguistic distance between the languages involved. This has shifted the focus of interest to trying to establish what conditioned the organization of the lexicon. Research by Chen and Leung (1989), Kroll & Curley (1988), Kroll, Michael, Tokowicz, and Dufour (2002) and Sunderman (2002) has demonstrated that there are indeed differences in the organization and processing of language between high and low proficiency bilingual speakers. As to the influence of linguistic proximity, de Bot (1992:9) following neurolinguistic research by Paradis (1987) claims that:

> …the speaker who speaks two closely related languages will for the most part use the same procedural and lexical knowledge when speaking either of the two languages, while in the case of languages which are not related, an appeal is made to much more language-specific knowledge

Although there is no empirical evidence as to the role of linguistic proximity, this might be especially relevant to FL attrition where language retention might be stimulated by the linguistic proximity of the L1 or other foreign languages spoken by the individual and still in active use. Alternatively, it might explain the quick erosion of a foreign language that is supervened by a closely related language which uses the structure and resources of the preceding language until it gradually replaces it.

Going back to the problems of language production in bilinguals and the issue of lexical access, Costa (2008:310) outlines two implications for bilingual and multilingual production. First, whether only items from the target language are activated (language specific activation) or items from the non-target language are activated as well (language non-specific activation). Second, assuming that items from both languages are activated, whether the selection process is affected by the levels of activation of the non-target items (language selective selection) or not (language non-selective activation).

In its strongest form the language-specific model states that during lexical access, only words from the target language are active for selection, thus making lexical access in bilinguals and multilinguals no different from that in monolingual speakers. This extreme view has taken a new direction claiming that both (all) languages are active to some degree but selection is restricted to the target language and there is some kind of a mental firewall between the languages which enables the selection of the target language (Kroll, Bobb, Misra, & Guo, 2008). In the language non-specific version, it is accepted that candidates of all languages, not only the target language, are activated and compete for selection while language selection is controlled through inhibition (Kroll, Bobb, & Wodniecka, 2006). Research on bilingual production has come to agree that lexical access is non-selective but there are different opinions as to the locus of selection, i.e. at the lemma level, at the phonology level, etc. This double (or even triple, etc. in the case of individuals speaking more than two languages) activation has one

important implication and that is speed of lexical access. It has been shown that bilinguals are slower than monolinguals in tasks involving lexical access like for example picture naming (Mägiste, 1979) even in their dominant language (Gollan, Montoya, Fennema-Notestine, & Morris, 2005; Ivanova & Costa, 2008).

In the bilingual production model that de Bot (1992) developed, which is an adaptation of Levelt's speaking model presented earlier, the choice of language is suggested to take place in the very early stages of the production, in the *conceptualizer*. In his attempt to adapt the model, de Bot tries to make as little changes as possible to the original model and introduces only two adjustments: a conceptualizer which is partly language non-specific and partly language specific and a formulator which is language specific. The lexicon as well as the articulator are language non-specific. The former contains the lexical items and the latter the sounds and patters from all languages.

In his later adaptation of the same model to multilingual production, de Bot (2004) postulates that there are "language specific subsets" (p. 28) for the conceptual, syntactic and form stores for each language. Language choice is controlled through a separate language node. The language node mediates the choice of language to the components that require language specific information and to the language subsets. One important aspect in both adaptations is the level of activation of the languages as subsets, based on Green's Activation model (1986). Green suggests that since bilinguals cannot completely switch one of their languages "off" instead there are three levels of activation which the languages spoken by a bilingual or a multilingual might have: *selected*, *active* and *dormant*. A *selected* language is the language which is intended for use and which directs the output. An *active* language is available simultaneously with the selected one but it is not chosen for the production of language. A *dormant* language is a language that has not been used for a long time, it is still preserved in long-term memory but it has no effect on the "ongoing processing" (Green, 1986:215).

De Bot (1992) notes that although there can be only one selected language, there may be several dormant or active languages. The active languages, however, will differ in level of activation depending on a number of factors, frequency of use and level of proficiency among others. The language used most often, usually the L1, will have a high level of activation, while a language that has been learned only for a

short time a long time ago would be activated to a very small extent or would even be dormant. In order to activate such a language, its level of activation will have to be raised and/or the other more active languages be inhibited to allow selection of items from the less active language.

Full inhibition, however, is difficult to achieve and de Bot (2004:26) uses a very original metaphor to refer to language inhibition. He compares it to trying to hold down ping-pong balls in a bucket full of water: no matter how careful you are, one or two will come to the surface. The interference that attriters sometimes get from their stronger and more active language, when required to use the weaker/attriting one, might be due to such breaks in the inhibitory system. The cost of inhibiting (an) active language(s) might be speed of lexical access and processing as has been shown in a number of studies (Ammerlaan, 1996; Hulsen, 2000; Soesman, 1997).

2.3 Picture naming

One very frequently used paradigm for testing lexical access is Picture Naming. A Picture Naming Task (PNT), in its simplest form, consists of presenting a participant with a picture stimulus and instructing them to name it as quickly as possible. Two measures are taken: *1)* the naming latency, known also as reaction time (RT), or the time it takes from the moment the picture is shown to the onset of the production of the word; and *2)* the number of correctly named items. PN is believed to include three operational phases (Paivio, Clark, Digdon, & Bo, 1989). The first phase is the identification of the picture that is presented to the person, which activates a non-verbal representation. This stage is also known as the *Höffding step* – "at which a stimulus contacts the appropriate representation for recognition among the myriad of stored memory representations" (Peterson & Gibson, 1991:199). This non-verbal representation in turn activates a number of verbal representations in a second processing phase. Finally, in the third and last stage, one of the competing verbal representations generates a response.

PN has been shown to be influenced by a number of factors. Some of these are properties of the word to be produced, or target name, such as f*requency*, *word length* and *age of acquisition*. Other factors include characteristics of the pictures used to present the stimuli such as *name*

agreement and *image agreement*. Since the latter two have no direct bearing on the research questions and hypothesis that the present study aims to answer, but are important for the proper design of the PNT, they are presented as controlled variables in the next Chapter, in Section 3.2.3.2 as part of the design of the PN task. The former three are discussed in short below.

As Oldfield and Wingfield (1965) have demonstrated, the *frequency* of a word affects naming. High frequency (HF) words (such as *dog*) are named faster and with less errors than low frequency (LF) words (such as *whale*). In terms of the ATH it might be said that due to their frequent use, high frequency words are maintained at a lower threshold of activation and are thus more easily accessed and more quickly produced. Support for the facilitatory role of frequency has been found in studies by Ivanova & Costa (2008), Jescheniak & Levelt (1994), Shatzman & Schiller (2004).

Another factor that has been reported to influence picture naming is *word length*. Longer words have been shown to elicit more errors and slower latencies in contrast to shorter words (D'Amico et al., 2001; Székely et al., 2003). However, due to the negative correlation between word frequency and word length, i.e. Zipf's law (Zipf, 1965) stating that the longer the word the less frequent it is, the effect of word length is somewhat confounding.

Age of acquisition (AoA), or the estimated age at which a word is acquired is another property that might be equally, if not more, influential in the naming process. It is generally agreed that frequency coincides with AoA to some extent, i.e. high frequency words are likely to be learned early in life (Iyer, Saccuman, Bates, & Wulfeck, 2003). Research in the field (Caroll & White, 1973; Snodgrass & Yuditsky, 1996) has confirmed that early acquired words lead to faster responses and less errors. Unfortunately, AoA ratings are only available for L1, making this factor inapplicable to FL research in its present form. It still remains to be seen if ratings for the order of foreign adult word acquisition can be made, based on textbooks syllabus or students' repertoire.

2.4 Factors affecting language attrition

Some of the factors that have been found to influence language attrition are, not surprisingly, the same as those influencing Second Language Acquisition (SLA). Two groups of factors can be distinguished: personal and external. Among the first ones are *age, age at the onset of attrition*, *gender*, *attained proficiency* and *attitude and motivation*; among the second: *time since onset of attrition, language contact and use* and/or *length of exposure to the language*.

Educational level is another important factor, in particular for L1 attrition, as it might influence the interviewee's performance on certain tasks. However, since all the participants in the study were university students their educational level is considered to be constant.

Age seems to be an important factor regarding cognitive processes in aging individuals, which might influence their performance (Schmid & Keijzer, 2009; Schmid & Dusseldorp, 2010). *Age at the onset of attrition* has been suggested to be of crucial importance with a "critical period" for attrition around puberty, i.e. 9-13 yeas of age (Bylund, 2009; Köpke & Schmid, 2004; Pallier, 2007). While studies investigating language attrition in children report considerable decrease in proficiency including a total wipe out of a language (see Nicoladis & Grabois, 2002; Pallier et al., 2003; Ventureyera & Palier, 2004; Ventureyera et al., 2004), research on adolescent and adult attriters has rarely found any drastic changes in proficiency. It is interesting to note that that this "cutoff" point (Schmid, 2006:77) coincides with the development of literacy, which has been suggested as a possible explanation for the resistance of language observed after puberty (Hansen, 2001; Köpke, 1999).

Where *gender* is concerned, despite allegations of differences in lateralization and use of memory in male and female individuals, which might theoretically result in differences in the process of attrition, no empirical support has been found for this claim (Köpke 1999, as cited in Schmid & Dusseldorp, 2010).

The rest of the factors: *attained proficiency*, *attitude and motivation, time since onset of attrition, language contact and use* and *length of exposure* will be discussed in detail in the following sections due to their particular reference to the present investigation. It must be noted, that in

addition to the factors mentioned earlier and those that are going to be reviewed next, there might be other factors such as aptitude, personal and learning style among others which influence the processes of attrition. However, measuring all these factors is quite a demanding task and outside the scope of the current project.

2.4.1 Attained proficiency

Attained proficiency is especially relevant to research in FL attrition, with higher initial proficiency entailing better retention of the language. In contrast to L1 attrition where it is accepted that the language has been fully acquired before the onset of attrition, in FL attrition this is hardly ever the case. One of the first studies to report a negative correlation between attrition and onset proficiency was Godsall-Myers's (1981). Then Bahrick (1984a, 1984b) published the results of his project on the retention of Spanish, which revealed that the amount of knowledge that was lost during the first years of attrition was equal for individuals across different training levels. This, however, meant that high proficiency speakers were left with a higher proportion of knowledge. Another important finding was that a large portion of knowledge survived for as long as fifty years. Neisser (1984:33) suggested that there was a *critical threshold* after which linguistic knowledge became "immune to interference or decay".

A number of studies have found attained proficiency to be a reliable indicator of attrition or retention in that higher proficiency led to better retention of the language: de Bot & Clyne (1989) on the attrition and retention of Dutch and English in Dutch immigrants in Australia; Gardner, Lalonde, and MacPherson (1985) on the attrition of school acquired French during the summer vacation; Nagasawa (1999) on the attrition and retention of Japanese in graduate students; Reetz-Kurashige (1999) on the retention of Japanese by elementary and secondary school returnees and Weltens (1989) on the retention of French by Dutch high-school students.

Hansen (1999) suggested that *length of exposure* rather than attained proficiency was what contributed to higher retention of a language. Schmid (2006:77), however, noted that it would not be unreasonable to expect these two factors to correlate as it would be expected a person who has been more time in contact with a language to have acquired higher proficiency. This idea has been corroborated by SA

research, which has found evidence that longer periods of SA led to higher linguistic gains (Llanes & Muños, 2009). Since this factor has not been thoroughly studied so far, it is the aim of the present investigation to explore its possible role in relation to the retention of a foreign language.

2.4.2 Attitude and motivation

Attitude and motivation have emerged as one of the central factors in successful SLA. Since attrition is the reverse process of acquisition one would expect, like Gardner (1982:31) that "since latitudinal/motivational characteristics are related to the level of second language proficiency, they will relate to second language retention". The role of attitudinal factors in attrition, however, has not been fully established yet. As Schmid (2006:76) points out, one reason for this might be that attrition studies extend over a period of time and attitude and motivation can change, and quite significantly, during this period. The author also notes that the only studies that have found a relation between attrition and attitude and motivation are those relying solely on self-evaluation reports as in Moorcroft & Gardner (1987), Gardner, Lalonde, Moorcroft, and Evers (1987) and Waas (1996). Weltens's study (1988), though, has demonstrated that self-evaluation is not always a valid measure in assessing attrition as participants tend to report greater linguistic loss than objectively found by linguistic tests. Still, it has to be noted that these studies dealt with L2 (Moorcroft & Gardner, 1987) or L1 (Waas, 1996) attrition.

2.4.3 Language contact

Contact with the language is intuitively expected to be especially important in maintaining a language once the speaker has been removed from the environment. Logically, it would be assumed that the more often a language is used, the better it would be retained and vice versa. This idea is also incorporated into ATH (Paradis, 2004, 2007), which is based on the level of accessibility of items and/or linguistic systems. *Recency* and *frequency of use*, to use the terms employed by Paradis, are crucial to maintaining a low activation threshold level. Each time an item is used, its activation threshold level is lowered and it then gradually starts rising again until the next activation occurs: the more often an item is used, the lower its activation threshold level is maintained.

Interestingly, however, research on attrition has not found unequivocal support for the importance of this factor. In a study by de Bot, Gommans, and Rossing (1991:91) proficiency in Dutch deteriorated over time for participants who reported little language use and Hulsen (2000) reported that the in-country network of L1 contacts correlated significantly with the retention of Dutch. On the other hand, Schmid (2007) applied Grosjean's Language Mode model to the influence of L1 use on the maintenance of a language but did not find any conclusive evidence as to the positive power of L1 use.

The fact that language use and contact depend, to a certain extent, on the person and their attitude and motivation (as noted by Köpke & Schmid, 2004; Schmid & de Bot, 2006), in the sense that it is up to the person to look for opportunities to use the language be it with other speakers of the language community or by finding reading or listening materials in the language, might complicate the matter. Another problem with this factor is its diversity, i.e. it is not clear what exactly language use and contact entail. It encompasses both receptive and productive activities in all kinds of contexts but which one(s) or which combination is most suitable to measure language use and contact is still to be established. Schmid & Dusseldorp (2010) note that as a result many studies tend to put everything together without any distinction.

Similarly, measures of language contact or rehearsal rely exclusively on subjective self-reports by participants. Leaving aside the problem of quantifying the amount of use, i.e. minutes/hours/etc. per day/week/over the last couple of days/etc., and the fact that perception of time may differ from person to person, personal expectations and believes of the participants also have to be taken into account. That is, sometimes participants unwittingly may not be reporting the correct amount of time of language contact due to the wide spread belief that a poor command of a previously "healthy" language is a result of disuse and lack of practice.

2.5 Research questions

After reviewing the state of the art in the field of FL attrition (Chapter 1) and discussing the theories, hypotheses and factors relevant to the phenomenon (this chapter), the research questions that the present

study aims at answering are the following:

1) Is mere lack of use of a language (i.e. lack of LME) enough for a foreign language to deteriorate, i.e. can FL attrition be a *function of disuse?*

2) Do language use and contact during the period of attrition have a positive effect on retention, i.e. will people who practice the language more frequently after the onset of attrition retain it better than people who do so less frequently?

3) Is length of exposure to the language, i.e. length of SA contributing to FL retention, i.e. longer stay in the country resulting in better retention of the language?

3
The study

As has been discussed in Chapter 1 above, research on language attrition so far has mainly focused on L1 attrition and very little has been done in the area of FL/L2 attrition. The few investigations dedicated to this less popular branch of the field have been targeted at either children (Cohen, 1989; Olshtain, 1986), young teenagers (Murtagh, 2003; Taura, 2008) or school acquired languages (Weltens, 1986; Grendel, 1993). It is the aim of the present study to explore FL attrition in adult speakers of a language that has not only been formally acquired but has also been used in real life and to explore the role that factors such as initial proficiency, attitude and motivation, duration of the SA and contact with the language might play in the process of retention/attrition. This chapter presents the design of the study. The first section introduces the participants and their sociolinguistic characteristics. This is followed by the materials used: the construction and scoring process are explained and reliability measures, where appropriate are outlined. The design and data collection process are described next. The section closes by outlining the research questions and hypothesis that the study aims at answering.

3.1 Participants

The sample consists of Dutch and German university students who have been on a SA program to a Spanish speaking country. Participating in a SA program meant that the participants had more or less similar experiences with the language and were exposed to similar conditions while in the country, i.e. they followed lectures at the university, had to find accommodation and communicate with their housemates in Spanish, etc. It also meant that the participants had a similar experience with the language before the SA, as university students are usually required to study the language of the destination country before leaving. Although language experiences can never be absolutely the same this ensured a certain level of homogeneity in terms of input, courses taken and materials used to learn the language.

3.1.1 Recruitment and data collection

Recruitment was targeted at university students, present or past, at Dutch and German universities with Dutch or German L1. They had to have participated in a SA program in a Spanish speaking country in the form of an exchange program, Erasmus or similar, or an internship. They could either be still on a SA and were then interviewed at location (interviewing at location was limited to Barcelona due to practical reasons) or they could have already gone back to their country of origin in which case they were interviewed there.

Possible participants were contacted through the international offices and the student advisers at their home universities in the Netherlands and in Germany. Fifteen different universities were contacted but the participants interviewed came only from five institutions: University of Groningen (RuG), Hanze Polytechnic Groningen (Hanze), Radboud University Nijmegen (RU), Technical University Berlin (TUB) and Free University Berlin (FUB). An email message presenting the study, prepared by the researcher, was sent to the international offices of different universities and those willing to collaborate with the project forwarded the message to all students, present or past, involved in a SA with a Spanish speaking country. Then it was up to the interested students to get back to the researcher. Unfortunately, this process was quite cumbersome and the response rate very low. Still, the initial group of participants who expressed the desire to participate in the study helped to recruit more people by word of mouth as they were asked, or offered themselves, to present the project to fellow students or friends of German or Dutch origin who had also spent some time in Spain or another Spanish speaking country. This resulted in a total number of 60 interviewees.

Data collection started in spring 2008 and continued until summer 2009 in three main data collection periods. In the first period, April – June 08, twenty people were interviewed. Five more were interviewed in the second period, November 08. The rest of the participants (35) were interviewed in the third and final period of data collection, April-June 09. These 60 participants were interviewed personally by the researcher at five different locations: Groningen, Nijmegen, Amsterdam, Berlin and Barcelona. As can be seen in Table 3.1 thirty participants were recruited from Dutch universities, seventeen from

Germany universities and thirteen people were recruited by word of mouth and help from friends.

Of the 60 people originally interviewed, nine had to be dropped from the final sample whose data were used in the present analysis. One participant was from Aruba and his mother tongue was Papiamento, a Creole language heavily influenced by Spanish. Three other participants had to be dropped because their L1 was not Dutch or German, but Lithuanian (1) and Bulgarian (2). Three participants had spent twice as much time on a SA as the rest of the participants (24 months). The last two participants did not participate in a SA but in an *au pair* program. Thus, the final sample consisted of 51 participants

Table 3.1 Recruitment of participants by institution; dropped participants and final sample

Origin	*N*
Hanze & RuG	6 & 15
RU	9
FUB & TUB	13 & 4
Other	13
Total recruited	60
Dropped out	9
Final sample	51

All participants in the study were either given a small present, i.e. a box of chocolates, or their name was entered in a lottery with several cash prizes in reimbursement for their participation in the study.

3.1.2 Sociolinguistic characteristics

This section presents the sociolinguistic characteristics such as age, gender and L1 distribution for the whole sample. The duration of the SA and attrition period as well as level of education are reported here. The linguistic background of the participants, i.e. the number of foreign languages that they have been in contact with and/or have studied and their exposure to Spanish at different educational levels is discussed last. In the next chapter, which deals with the CS analysis of the data, the participants are divided into a baseline group and three additional groups depending on length of attrition. Detailed descriptive sociolinguistic statistics, language experience and background information for each group can be found there.

Duration of SA and LoA

The participants in the study were almost equally distributed between the two sexes, with slightly more men (26) than women (25) (see Appendix A). The mean age was 23.45 (SD 1.8) and it varied between 21 and 29 yeas of age. There were 26 Dutch L1 speakers (51%) and 25 German L1 speakers (49%).

Table 3.2 Duration SA and Attrition

Duration SA	*N (51)*	*LoA*	*N (51)*
		= 0	12 (23.5%)
< 5 months	1 (2%)	1-3 months	9 (17.7%)
5-6 months	35 (68.6%)	3-6 months	2 (3.9%)
7-9 months	8 (15.7%)	7-10 months	17 (33.3%)
10-12 months	7 (13.7%)	11-96 months	11(21.6%)

The mean SA duration (Appendix A) was 6.58 months (SD 2.29) with a minimum duration of 4 months and a maximum 12. The LoA varied from 0 to 96 months, 9.9 months on average (SD 16.3). Table 3.2 shows that most of the participants spent between 5 and 6 months on a SA. For eight people the SA lasted between 7 and 9 months. Seven participants spent between 10 and 12 months. Only one person had been in Spain for less than 5 months (4 to be precise). Regarding LoA, 12 people were at zero months of attrition; 9 had finalized their SA between 1 and 3 months ago; 3 had done so 3 to 6 months ago; 17 had lost contact with Spanish between 7 and 10 months ago and finally, 11 participants had finalized their SA between 11 and 96 months ago.

Level of education

SA usually takes place during the second or third academic year. This automatically excluded first year university students from the sample and meant that the earliest moment participants could be interviewed was towards the end of their second year. Figure 3.1 shows that the majority of the participants were in their fourth year - 11 Dutch and 14 Germans amounting to 49%. Ten people (19.6%), eight Dutch and two Germans were doing a Master's degree; eight (15.7%) people, four Dutch and four Germans, were in their third year. There were 4 graduates and 4 second year students, (7,84% each) divided between one Dutch and three Germans, both.

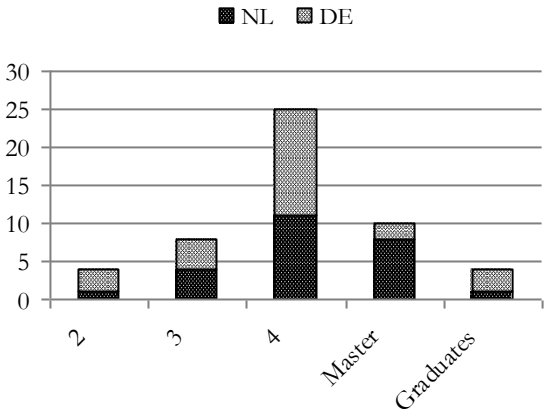


Figure 3.1 Year at university

Linguistic background

The participants in the study had studied a total of seventeen different foreign languages. Figure 3.2 presents the number of languages studied by the participants, depending on their L1. Twenty-two of the participants studied 4 foreign languages, with a slight advantage for the L1 Dutch participants (22 to 14). Two, six and seven languages were studied by two people each, with one L1 Dutch and one German L1 speaker for the first two and only Dutch L1 speakers for the last one. Nine German L1 speakers had studied three foreign languages and one Dutch L1 participant five.

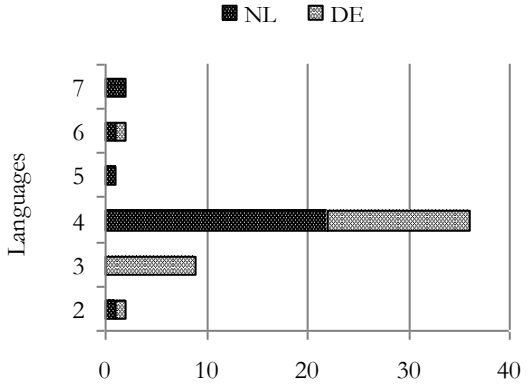


Fig 3.2 Number of foreign languages studied

Spanish was L5 for the majority of the participants – 69.3% including their L1; L4 for 17.3%; L3 for 3.84% and L6 for 9.61%. The majority of the participants had studied Spanish at University for approximately two years (84.2%); 13.5% started studying Spanish as early as secondary school and 69.2% had Spanish classes while on the SA. These consisted of the free language classes which were provided for participants in the Erasmus program and varied from 30, 40 to 60h classes. The estimate of ~40h is based on the median number of classes reported by the students, who were not always a hundred percent sure about the number of classes that they had attended. Only one person studied Spanish after the SA.

3.2 Materials

In an attempt to avoid the problem of differences in methodology which was discussed in the previous chapter, the present study followed the methodology and the language attrition test battery developed by Schmid (2005). The battery, suggesting various tests and measures, from oral interviews and film retelling to picture naming and grammaticality judgment tasks, has already been applied in a number of investigations (Altenberg & Vago, 2004; Keijzer, 2007; Ribbert & Kuiken, 2010; Schmid & Dusseldorp, 2010; Tsimpli, 2007).

Not all of the questionnaires and tests suggested by Schmid were considered appropriate for the present study and the ones used also had to be adapted for the needs of the investigation. Five different tasks were employed to collect data (see Figure 3.3).

There were three instruments to gather linguistic data: the sociolinguistic questionnaire (SLQ) which was used as a basis for the interview eliciting oral data in addition to the background sociolinguistic data and language contact and use information; a C-test with a focus on nouns and a picture naming task (PNT). Two other questionnaires, attitude and motivation questionnaire (AMQ), based on Gardner (1985), and can-do scales (following the Common European Framework of Reference for Languages - CEFR) were used to gain more insight into the participants' attitudes and motivation to learn foreign languages and Spanish in particular, and their initial level of proficiency, i.e. before losing active contact with the language.

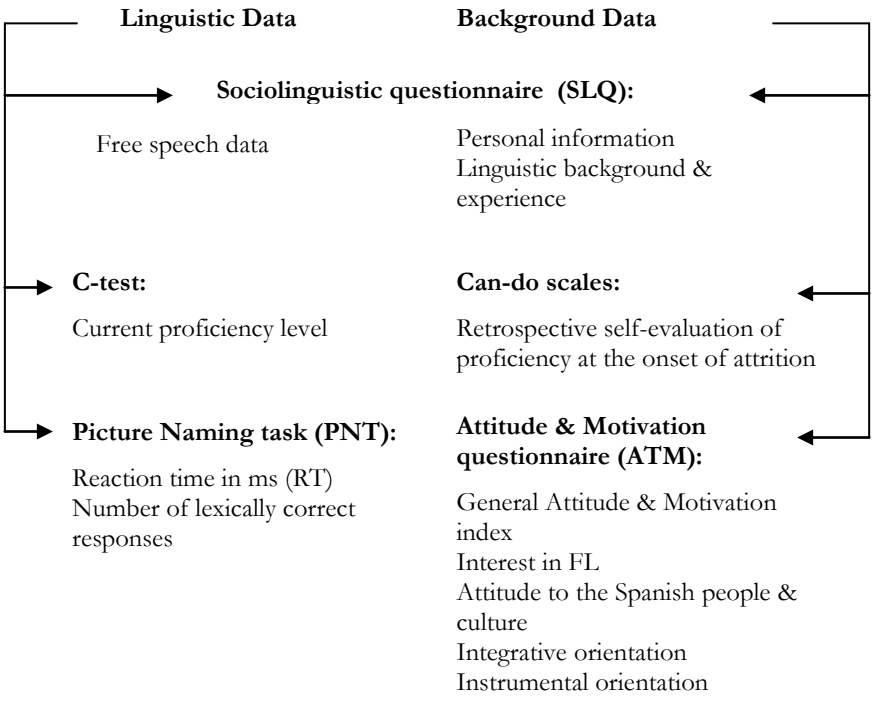


Figure 3. 3 Data collection materials

3.2.1 Sociolinguistic questionnaire

The Sociolinguistic questionnaire (SLQ) was designed to be used as a semi-structured interview. A semi-structured interview allows for the introduction of new questions in the course of the interview as a consequence of what the interviewee says. The advantage of a such an interview, in comparison to a retelling task, is that it allows the interviewer to direct the conversation to a topic that the participant finds more appealing and is familiar with, which gives the participants a chance to perform at their best. In a story or a film retelling task, people are limited to the vocabulary required by the task, which they might not be familiar with or not feel confident using. Also, it was felt that a free conversation was the closest to the way the people involved in the project used Spanish while on a SA, which, is characterised by a large amount of oral practice and input and lack of written practice.

Aim and previous use of oral data in attrition studies

The SLQ was used to provide both sociolinguistic and oral data as it was conducted as a semi-structured interview. The oral data were then used to access lexical diversity, hesitation and pause phenomenon. The measures that were adopted in the present study were based on previous research on attrition (Schmid & Beer Fägersten, 2010). They focused on the frequency and distribution of disfluency and hesitation phenomena (Table 3.3), namely: filled pauses, false starts, corrections, repetitions and reformulations.

Table 3.3 Oral data measures

Frequency disfluency markers:	*Distribution disfluency markers*	*Lexical Diversity*
• Filled Pauses	• Art	
• False Starts	• Adj	• D
• Corrections	• Adv	
• Repetitions	• Noun	
• Reformulations	• Etc.	

Besides evaluating their frequency, disfluency markers were examined for their distribution, i.e. whether they appeared predominantly in front of a particular part-of-speech element or were evenly distributed. If lexical access was compromised, it was expected that this might be manifested in an increase of hesitation and disfluency phenomena preceding lexical items. Another measure that was calculated on the basis of the oral data was lexical diversity. Lexical diversity measures the range or richness of vocabulary used by a person. A speaker who uses a limited selection of words has low lexical diversity in contrast to a person who uses lots of synonyms and diverse vocabulary to express herself. Previous research has found these measures to be especially relevant to the study of language attrition. A study by Schmid & Beers Fägersten (2010) has demonstrated that disfluency phenomena can change in the course of L1 attrition and that the position of disfluency markers may signal not only lexical retrieval difficulties but also point to problems with specific grammatical features.

Constructing the test

The SLQ was based on the Language Contact Profile developed by Freed, Dewey, Segalowitz & Halter (2004) and the language background questionnaire developed by Andonova[1] and used at the Central and East European Center for Cognitive Science, Sofia,

[1] Personal communication

Bulgaria. The questionnaire contained a total of 19 questions (see Appendix L) and consisted of three sections: Personal information and linguistic background, SA experience and current linguistic experience.

The first section, Personal information and linguistic background gathered information such as age, place of birth, education, languages used by the parents and within the family and languages that the participants had studied at different points in their lives. The participants also had to self-evaluate their abilities in each of these languages that they had studied and mark their contact with Spanish at different educational levels, i.e. pre-school, primary education, secondary education, etc. The questions were given as open ended questions (see example below) in the course of the talk and the researcher was in charge of noting down the answers.

5. ¿Qué lengua(s) hablas en casa?
Holandés ☐ *Alemán* ☐ *Otra* _____

What language do you speak at home?
Dutch☐ *German*☐ *Other* _____

Section two, SA experience, gathered information about the participants' experience and living arrangements during the SA as well as the frequency with which the participant used their languages to perform different activities while in Spain. The questions about the living arrangements were brought up during the conversation and the researcher marked the answers. Then the participant was in charge of filling in the table for language use and frequency (an excerpt can be seen bellow).

17. Por favor, utiliza la escala siguiente para marcar la frecuencia y la lengua que utilizabas ***durante tu estancia en España***:

1– muy raramente; 2 – raramente; 3 – a veces; 4 – con frecuencia; 5 – todo el tiempo

Cuando:	español	inglés	holandés/alemán	Otra
hablaba con amigos				
hablaba con mascotas				

Please use the following scale to note the frequency and language that you were using during your SA in Spain:
1 – almost never 2 – rarely 3 – sometimes 4 – frequently 5 – always

When:	*Spanish*	*English*	*Dutch/German*	*Other*
talking to friends				
talking to pets				

Section three, Current linguistic experience, was a repetition of the languages and frequency part of section two but this time the participant was instructed to answer it on the basis of the period *after* coming back from the SA. Again, it was filled in by the participant. This section was not administered to people who were still on a SA.

Administering the questionnaire

The questions from the SLQ were used as a basis for the interview, and although obligatory, they were not exclusive. Thus, depending on the interests and mood of the participant, the interview could go to one direction or another and cover additional topics to the ones included in the questionnaire. It was considered that allowing the participants to talk about things that they liked and were close to, rather than confining them to a certain picture story or a set topic, would help them relax, feel more confident and perform at their best.

Preparing the data for analysis

In order to analyze the data from the interview, all free speech samples were recorded on a digital recorder and then transcribed using the conventions of the Codes for the Human Analysis of Transcript (CHAT). CHAT together with CLAN (Computerized Language Analysis) are two basic components of the CHILDES project developed by MacWhinney (2000) which are used for the analysis of conversational interactions. Although the project was originally developed to analyze child language, hence the name CHILDES – Child Language Data Exchange System, CHAT and CLAN are increasingly used for the analysis or adult speech as well (Pérez-Vidal et al., forthcoming; Valls & Mora, 2009; Yilmaz, van der Kooi & Schmid, 2009). Transcribing and storing the data in CHAT format made it possible to use a number of programs from the CLAN package such as FREQ – providing frequencies of specific or all items in the corpus; MOR – performing a syntactic tagging of the transcribed text, and VOCD – calculating the type/token ratio. These programs will be discussed in more detail later on in the section.

To ensure the correct functioning of the CLAN programs, the data first had to be transcribed conforming to the CHILDES standards. An example of a transcribed interview can be found in Appendix N.

Besides transcribing the data in the necessary format, certain codes, i.e. for hesitation, repetition, reformulation were introduced. Part of the coding was done simultaneously with the transcription by introducing specific codes for the disfluency phenomena. For a full list of all symbols used in the transcriptions see Appendix M.

Filled pauses, irrespective of their pronunciation, i.e. um, ah, uh, were all coded with the *ahm@fp* symbol as in the following example:

1) um el febrero de uh dos mil siete um hasta ah junio /
ahm@fp el febrero de ahm@fp dos mil siete ahm@fp hasta ahm@fp junio

um February uh two thousand and seven um until ah June.

Repetitions of a part of a word were coded as *false starts* with the *&* symbol in front of the incomplete item as in Example 2 below.

2) pues en Málaga esta &ta también más difícil porque < tienen > [/] tienen un acento muy fuerte

well in Malaga it's &al also more difficult because they < (they) have> (they) have a very strong accent

Repeating linguistic material in the same way without any correction or change was coded with the symbol [/] following the repeated material in angled brackets. This could include single words, Examples 2, 4 & 5, or strings of two or three of words as in Example 3.

3) y mi barrio también, como bueno < no es muy > [/] no es muy, malo pero no esta bien, sabes?

and my neighbourhood, well, <it's not very> [/] it's not very, bad but it's not good, you know?

Corrections, or partial repetition of the preceding linguistic material with a correction, were coded with the symbol [//] following the retracted materials in angle brackets as in Examples 4.

4) sí, pero en Kenia y Tanzania es lo < mujer > [//] < mejor > [/] mejor, sí.

yes, but in Kenya and Tanzania it's the <bast> [//] <best> [/] best, yes.

Finally, *reformulations* of the preceding linguistic material were coded with the symbol [///] following the reformulated material in angle brackets.

5) algo así, < había > [///] pues era una casa < de > [///] < con > [/] con diferentes familias y todo

something like that, <there was> [///] well, it was a house <of> [//] with different families and all

Originally, it was intended to mark empty pauses as well and in the first stages of the coding process this was done manually by the researcher with the intention to later have native speakers independently mark silent pauses and compare the inter-rater agreement. However, it became clear that a lot of the pauses were caused not by linguistic problems and searching for the right word but by trying to remember when, where, why, etc. something was done. This was confirmed by the native speaker who started marking pauses independently of the researcher and claimed not to be able to clearly distinguish between linguistic-based pauses and other pauses.

Defining a pause in the speech of a FL speaker seems to be a very challenging task. How do we know when a pause is related to language processing problems or simply to trying to retrieve a memory? Especially so in the present study where the interview focused on a past experience. In pausological research a distinction is made between short and long pauses (see, for example, Kormos & Dénes, 2004). But how long is a long pause in the speech of a FL speaker? While "norms" as to the speed, rate and pausing patterns of native speakers and fluent L2 speakers can be easily obtained, how do we establish this for the FL speaker? Since exploring this problem is beyond the scope of the present study, it limits itself only to the analysis of filled pauses.

The files were then morphologically tagged by means of the MOR routine developed by Brian MacWhinney and Monica Sanz Torrent. After doing the MOR analysis, the output was disambiguated by means of the POST routine. The POST program uses a database file which contains information about syntactic order for the respective language and it is part of the grammar package. All further analyses such as counting frequencies, exploring the position of hesitation and disfluency markers or calculating lexical diversity were carried out on the files produced by the POST command. A complete transcription after the MOR and POST programs had been run can be found in Appendix O.

3.2.2 C-test

A C-test is a modified version of the Cloze test designed on the principle of reduced redundancy but avoiding some of the pitfalls that Cloze tests pose. In the C-test, instead of deleting whole words (as in the Cloze test) only the second half of every second word is deleted. This on the one hand allows for a much higher deletion rate (allowing for shorter texts to be used) and on the other hand (usually) leaves only one possibility for a correct answer making the task of both the tested and the scorer much easier. C-tests have been shown to be "the most economical and reliable procedure" (Klein-Braley, 1997:47) among the reduced redundancy tests and also to be "a reliable and valid procedure representative of the reduced redundancy principle" (Babaii & Ansay, 2001, p. 209).

Aim and previous uses of the C-test in attrition studies

The C-test was used as a means of assessing general language proficiency and it was designed with a special focus on nouns so that noun production could be compared with the PNT. C-tests have been used in a number of studies on L1 attrition (Keijzer, 2007; Köpke et al., 2007; Yagmur 1997) as well as in studies on L2 attrition (Murtagh, 2003) to establish the participants' level of proficiency.

Constructing the C-test

When creating a C-test, creators and investigators Raatz & Klein-Braley (1998, point 4.2.1) recommend using texts that:

- are written texts complete in themselves
- are appropriate in difficulty and content for the target group
- have no specialised vocabulary or content
- are not literary texts or contain verbal humour

Three different texts that met the above mentioned conditions, were taken from the materials for the official exam of Spanish as a foreign language (DELE) from the Cervantes Institute webpage[2]. They were put into C-test format with a deletion rate of every third word rather than every second word to avoid a disproportionally high percentage

[2] http://diplomas.cervantes.es/candidatos/recursos.jsp

of deleted articles and pronouns. This also allowed to put the stress on the production of nouns which were also investigated with a psycholinguistic task so that a comparison could be made in the performance under two different conditions. The first and the last sentences of each text were left intact. One-letter words such as "y" (*and*) were ignored as well as personal names and names of places. In words with uneven number of letters, one more letter was deleted than left standing. Each deleted letter was represented by a line.

The three texts were then pre-tested with 10 native speakers of Spanish and 5 fluent foreign speakers of Spanish currently living in Spain. As a result, two of the texts had to be discarded because they were two difficult[3]. The scores for the text that was left (see Appendix P) were 97% for the natives and 91% for the non-native speakers. Table 3.4 shows the distribution of parts-of-speech in the final text, which had 58 gaps.

Table 3.4 Percentage original and deleted words

Category	*% deleted words*	*% original words*
Nouns	25.86%	21.26%
Verbs	24.14%	18.55%
Adjectives	8.62%	5.88%
Adverbs	10.34%	6.78%
Prepositions	6.89%	10.85%
Conjunctions	6.89%	10.40%
Articles	10.34%	12.66%
Pronouns	5.17%	8.59%
Contractions	1.72%	1.35%

Administration

C-tests have been previously employed in a study on the attrition of Irish as a second language (Murtagh, 2000) and in a study on L1 attrition in Dutch immigrants in Anglophone countries (Keijzer, 2007). In both cases, however, the participants had a time limit of 5 mins per text, whereas in the present investigation no time limit was imposed. That was done on purpose as it was felt that it might be too frustrating for the FL attriters. Also, the participant was instructed to

[3] Native speakers should get at least 95% correct restorations (Raatz & Klein-Braley, 1998)

try and reconstruct as many words as possible but not to worry if something was left unfinished as it was almost impossible to reconstruct all words. If the participant had not finished after 10 mins, the researcher told them that that was enough and asked them to move on to the next questionnaire.

Scoring the C-test

Although Raatz & Klein-Braley (1981) advocate that, in order to avoid problems of subjectivity caused by the scorer's judgment of what is acceptable and what is not, only exact scoring should be used, it was felt that a group of attriters who were moving away from the linguistic norm were quite different from a group of second language learners who were aspiring to get closer to it. A misspelled attriter's answer can still be quite an achievement whereas in the case of a second language learner, it can be a mistake. In order to limit the possibility of personal interpretation of what constitutes a correct answer and still be able to explore the type of errors made by the participants, a 7 point scale similar to the one suggested by Schmid (2005) was used: *0* – if the gap was left empty; *1* – incorrect stem and incorrect word class; *2* – incorrect stem but correct word class; *3* – correct stem, incorrect word class; *4* – agreement error, be it number agreement, tense agreement, etc; *5* – all the previous are ok but still something is wrong; *6* – correct choice with a spelling mistake; and *7* - correct.

Table 3.5 Type and frequency of spelling mistakes

correct word	*spelling error*	*frequency*
además	ademas	13
canción	cancion	4
dolía	dolia	7
más	mas	14
niños	ninos	7
pequeño	pequeno	7
podía	podia	4
anécdota	anécdote, anéctoda	14, 1
llevaba	llevada, llemaba	1, 1
porque	porqua	1
privado	privada, privato	1, 2
quires	quiras, quienes	1, 1
tuvó	tubo	1

The score that was calculated for each participant (0-58) was based on codes 6 and 7 and the rest of the scale was used only for qualitative

analysis of errors. Table 3.5 lists the occurrences of misspelled words. As can be seen, the spelling mistakes, more often than not, consisted of omissions of diacritics and very rarely of misspelled words.

Reliability

Reliability measures for the C-test were obtained with Cronbach's α. Cronbach's α measures the internal consistency of the items within a questionnaire or whether the different items of a test measure the same thing. It is based on the principle of splitting the data in half and is essentially a correlation for all possible split combinations. Eight items (3, 9, 13, 19, 21, 30, 43 and 53) were excluded from the reliability analysis as they had zero variability. Table 3.6 shows that the overall reliability of the test was high, α=.89 Although it was not as high as the reliability reported in Murtagh (2003:80), i.e. α=.94, it was well within the "unofficially" accepted limit of .7 - .8 (Field, 2005).

Table 3.6 Reliability analysis of the C-test: Cronbach's α

N items	*N cases*	*min; max score obtained*	*Mean*	*SD*	*Alpha*
50	51	29;57	46.10	7.484	.889

Item difficulty

Table 3.7 shows descriptive item difficulty statistics for the gaps by parts-of speech category and for the total. Item difficulty was calculated on the basis of percent correct reconstructions per item, therefore a high percentage signaled low difficulty and vice versa. The average success rate was 79.4%, considerably closer to the higher end of the scale indicating that the test was not too difficult for the attriters. Verbs obtained the lowest percent correct restorations, while prepositions the highest.

It is not surprising that CONJ and PREP obtained a high success rate. They are two-letter words requiring only one letter for restoration (see Appendix Q for the number of letters to be restored in each gap). This applies to ART as well, as there was only one restoration that required three letters and 5 one-letter reconstructions, making the task relatively easy. It should be noted that, in terms of difficulty, nouns come in second, after verbs, but with considerably higher success rate.

Appendix Q shows individual item difficulty ratings for each word. Item difficulty rate varied from 0 to 100%.

Table 3.7 Percent correct responses for part-of-speech category and total.

	N	*Min*	*Max*	*Mean*	*SD*
N	15	0	100	79.6	26.9
V	14	29.4	94.1	66.7	17.7
ADJ	5	76.5	98.0	88.2	8.7
ADV	6	37.3	100	77.5	26.0
CONJ	4	80.4	100	94.1	9.1
PREP	4	88.2	100	94.1	5.7
ART	6	76.5	100	83.7	8.3
PRO	3	60.8	94.1	77.8	16.6
CONTR	1	88.2	88.2	88.2	-
Total	58	0	100	79.5	20.4

3.2.3 Picture naming

A picture naming task (PNT) with 75 stimuli was used to obtain reaction time measures and proportion of lexically correct responses for all participants.

Aim and a PNT as a measure in attrition

The aim of the PNT was to explore the processes of lexical access in FL attrition. The analysis of the PNT generated two measures: *1*) reaction time (RT) analysis, i.e. the time it took the participant to name the picture stimulus and *2*) proportion of correct responses, i.e. the percentage of correctly named pictures irrespective of reaction times. Although being a very popular tool in research on bilingualism, timed picture naming (PN) has been used only in a small number of language attrition projects like Ammerlaan's (1996), Hulsen's (2000) and Soesman's (1997) on L1 attrition. Although Schmid & Köpke (2009) note that not all of these studies used reliable reaction time measurement equipment, they maintain that PN is a valid measure for exploring problems with lexical retrieval in attriting populations. Recently, a PNT (alongside other measures) has also been adopted in a large scale investigation on L1 attrition in Moroccan and Turkish immigrants in the Netherlands (Van der Kooi, Yilmaz, & Schmid, 2009; Yilmaz, van der Kooi, & Schmid, 2008). To the knowledge of

the researcher, however, the present project would be the first one to employ a PNT in the study of FL attrition.

Constructing the PNT

The PNT consisted of 75 pictures, controlled for three levels of frequency, shown on a computer screen. Cognate words with Dutch and German were excluded. In addition there were 10 practice pictures. The criteria for choosing the stimuli, the apparatus used and the procedures followed are discussed in the following sections.

Stimuli

The stimuli for the experiment consisted of 75 black-and-white drawings taken from two different sources: 61 from Sanfeliu & Fernandez's (1996) set of "245 Snodgrass-Vanderwart pictures standardized for Spanish" and 14 from the *On-line Resource for Psycholinguistic Studies* (Szekely et al., 2004), developed and maintained by the University of California at San Diego. This was necessary since the on-line resource database, although allowing to browse for pictures using different parameters such as semantic category, percent name agreement and length of syllables, was standardized for Mexican Spanish. A comparison between the two sets showed that there were some differences as to the Name agreement and Image agreement ratings, maybe due to cultural bias and differences. Although these differences were not large, it was decided to follow the norms standardized for Spanish as far as possible and to use the Mexican norms only to fill in for any necessary items. A complete list of the stimuli with their origin can be found in Appendix R and pictures of the experimental stimuli are shown in Appendix T.

As can be seen from Table 3.8, the stimuli used represented different semantic categories such as people, animals, body parts, objects, foods, etc. Culturally biased drawings such as *a football helmet, a raccoon* or *a skunk* that are more common within North American culture; antiquated objects like *a spinning wheel*, *a thimble*, *a top* or technical vocabulary items like *a chisel*, *pliers*, *screw*, *screwdriver*, were excluded from the selection of the stimuli.

Table 3.8 Distribution of semantic categories across stimuli (excluding trial stimuli) based on the On-line Resource for Psycholinguistic Studies (Szekely et al., 2004).

Semantic categories	*N*
People	5
Animals	18
Body parts	7
Vehicles	3
Foods	7
Things to wear	4
Small artefacts	21
Large artefacts	6
Objects or nature phenomena	4
Total	*75*

- *Name agreement*

One of the conditions that the stimuli for the experiment had to meet was to have a minimum 80% name agreement. Name agreement (NA) is the degree to which participants agree on the name of a drawing. Drawings that generate several different names have lower name agreement than pictures generating only one. NA has been demonstrated to be a good predictor of naming speed (Barry, Morrison, & Ellis, 1997; Vitkovitch & Tyrell, 1995). Drawings that elicit only one name, i.e. *dog,* are named faster and more accurately than drawings that can elicit more than one response, i.e. *gun,* which can also be named *pistol* or *revolver:*

Table 3.9 Name agreement (NA) and image agreement (IA)

	Stimuli	*Min*	*Max*	*Mean*	*SD*
NA	75	80	100	95.71	5.127
IA	75	3	4.47	3.86	.422

NA is calculated as the percentage of people that produce the target name and the statistic *H* that was suggested by Snodgrass & Vanderwart (1980). Although at first sight it seems that these two factors measure the same thing, the statistic *H* provides more information as to the distribution of names across participants. For example, as Snodgrass & Vanderwart (1980, p.184) explain "if two concepts both are given their dominant name by 60% of the participants, but one is given a single other name and the second is given four other names, both concepts will have equal percentage

agreement scores, but the first will have a lower *H* value". The choice of the stimuli for the study was based on the % NA and the statistic *H* was only monitored in case of a low % (<85%) NA. The mean NA for the stimuli was 95.71 (SD= 5.127) (see Table 3.8).

- *Image agreement*

Image agreement (IA) refers to the degree to which the mental image that a participant forms when presented with a name corresponds to the actual picture. Barry et al., (1997) demonstrated that pictures with higher ratings of IA had shorter naming latencies than pictures with lower ratings. They suggested that IA has its influence at the level of object recognition, so that the closer a picture is to one's mental image of an object, the faster the naming for that item will be. IA ratings were taken from Sanfelui & Fernandez (1996). They were based on students' rating of the image they formed to a sound stimulus over 7secs (3 after hearing the word and 4 after seeing the picture) and rated on a 5 point Likert scale, 1 being low agreement and 5 high agreement. Only stimuli with minimum level 3 of IA were considered for the study. The mean IA for the stimuli was 3.86 (SD=.422) (see Table 3.8).

- *Frequency*

As was discussed in Section 2.3 above, word frequency influences naming latencies. In order to assess such frequency effects in naming latencies and in the number of correct responses, three levels of frequency were distinguished. The ratings were based on the International Picture Naming Project Database (Szekely et al., 2004). There were 25 pictures with high frequency – HF (word frequency 5.400, SD 1.1013), 25 pictures with medium frequency – MF (word frequency 3.473, SD 0.4342) and 25 pictures with low frequency – LF (word frequency 2.029, SD .6557). This frequency was also matched to the frequency given by Alameda & Cuetos (1995) in the "Diccionario de frecuencias de las unidades lingüísticas del castellano". The frequency values between the three sets of pictures were significant at $p<.000$ level for all three sets.

- *Other characteristics*

In the 75 stimuli there were four complex words (arco iris [rainbow], palomitas [popcorn], paraguas [unbrella] and tijeras [scissors]. The ratio between masculine/feminine words was 45.3% to 54.&% and the ratio of animate/unanimate, 33.3% to 66.7%.

Trial stimuli

The trial stimuli came from the same sources as the experimental stimuli in a 8/2 ratio: Spanish set and Mexican set (see Appendix R for the stimuli origin). To avoid priming, none of the stimuli included in the trial appeared later in the experiment script. The trial consisted of 10 drawings that were representative of the semantic categories present in the experiment and that always appeared in the same order: *star [estrella], banana [platano], church [iglesia], coat [abrigo], moon [luna], pencil [boligrafo], bridge [puente], boot [bota], boy [niño]* and *bear [oso]*.

Randomized lists

In order to diminish the tiredness effect, i.e. the fact that participants tend to become slower towards the end of an experiment because of fatigue, four different randomized versions were created. The order of appearance of the words was controlled for semantic category and initial sound of the word. That is, two consecutive words could not belong to the same category or begin with the same sound.

Apparatus

E-prime version 1.1.4 was used to create and run the script. All experiments were carried out on an ASUS X51R series portable computer. The screen was a 15,4" WXGA with a 1280x800 pixel resolution and a refresh rate 59.905 Hz. The black and white digitalized drawings (300x300 pixels) were shown in the middle of the screen. The participants had a hand-held microphone that was connected to a Serial Response Box which measured the reaction time (RT) with a voice key.

Administration

Before starting with the experiment the participants were instructed to name the picture they were going to see on the screen as quickly as possible, using only one word without an article and avoiding extra-linguistic sounds such as "hm", "ahh", etc. They were told to remain silent if they could not name the word (See Appendix S for the full instruction). In order to familiarize the participant with the task and the stimuli they could expect, a short trial version was run before the actual experiment. It could be repeated several times if the participant did not feel confident to start with the experiment. It also served to see whether the microphone was triggered correctly by the participant's voice or its sensitivity level had to be adjusted.

Once the trial session was over and the participants confirmed that they was ready to continue with the actual experiment, they could indicate this by means of pressing the space bar. On each trial, first there was a fixation cross "+" that appeared centered on the screen for 1000 ms. This was followed by the stimulus which disappeared as soon as the voice key was triggered (or for a maximum of 10.000ms[4]) and "*" appeared on the screen for 1000ms signaling voice-detection. The period between the offset of one trial and the onset of the next one was a random value of between 1200ms and 1500ms to prevent participants from falling into a pattern.

During the experiment the researcher used a score sheet (one for each of the 4 randomized versions) to follow the participant's progress. A six-point scale was used to mark problems with the RT (*1-target word with a valid RT; 2 – target word with a false start, hesitation, self correction; 3 – target words early RT; 4 – target word with late RT; 5 – target word and no RT; 6 – No Response, no RT).* In order not to make the participants nervous they were informed beforehand that the researcher might write down numbers and that these concerned only the way the microphone worked. Any names that did not match the target were noted down later on from the digital recording of the experiment, again in order not to make the participants anxious that they were not doing well.

[4] Pre-testing of the experiment started with 3000ms response time, that was increased to 4000ms and finally left to 10000ms as attriters tended to name the word when the stimulus was already gone and the next one was on.

Scoring

Two different scores were calculated on the basis of the PNT: mean reaction times (RT) in ms and percent correct responses. The RT analysis was based on a 6-point scale (shown in Table 3.10) which was also used by the researcher during testing to code reaction time related events for each item on the list.

Table 3.10 Reaction time codes

Code	*Description of the code*
1	the word produced matched the target word and RT was detected correctly
2	the word produced matched the target word but there was a false start, hesitation, self correction
3	the word produced matched the target word but RT was registered too early
4	the word produced matched the target word but RT was registered too late
5	the word produced matched the target word but the mic failed to register a response
6	no response was given and no RT was registered

There were 3 codes (codes 3, 4 and 5), which signaled malfunctioning of the microphone and 3 codes (codes 1, 2 and 6) which were related to the response given by the participant. The most frequent one was Code 1 – for a correct response with a valid reaction time measure. It accounted for 59.1% of all RT codes. The second most frequent code was Code 6 (no response given) with 30.2%. Failure of the microphone to trigger when there was a valid response (Code 5) added up to 5%. Early and late triggering of the microphone, code 3 and 4 respectively, contributed with 2% each and finally, words where the participant stuttered, hesitated or there was a false start amounted to 1.6%.

For the % correct responses another, lexical, code was introduced, which was independent of the RT code and which evaluated the lexical correctness of the response given, i.e. matching the target, synonym, hypernym, hyponym, etc. Table 3.11 lists the lexical codes used. These were based on the 7-point scale used by Bates al., (2003), i.e. codes 1 to 7, plus five additional codes (8-12), which were added to distinguish between the different types of errors. Items which did not get a response were coded with 0. Adding a lexical code allowed to analyze responses that were excluded from the RT analysis because of

problems with the microphone, i.e. responses marked with codes 2, 3, 4 and 5.

Table 3.11 Lexical codes, based on Bates et al., (2003)

Code	*Code description*	*target*	*response*
1	the response matches the target	gato (*cat*)	gato (*cat*)
2	morphological variation with phonological overlapping, the truth value is preserved	casa (*house*)	casita (*little house*)
3	synonyms	sombrero (*hat*)	gorro (*hat*)
4	hypernym	tiburon (*shark*)	pez (*fish*)
5	hyponym	araña (*spider*)	tarantula (*tarantula*)
6	word in a foreign language, the truth value is preserved	fresa *(strawberry – es*)	fragola (*strawberry-it*)
7	wrong answer	rana (*frog*)	gusano (*worm*)
8	morphological variation of gender, word incorrect	molin*o* (*windmill*)	molin*a*
9	morphological variation of number, word incorrect	paragua*s* (*umbrella*)	paragua
10	semantic association	avion (*airplane*)	vuelo (*flight*)
11	pseudo word based on the target	zapato (*shoe*)	zapatines
12	pronunciation error	calcetin /kalθetin/ (*sock*)	calceton/kalθeton/ (*sock*)

The responses were coded by the researcher and independently by another rater who was a native speaker and a teacher of Spanish using the lexical codes from Table 3.11. An inter-rater reliability analysis using Cohen's Kappa statistic (Cohen, 1960) was carried out to determine consistency between raters. Cohen's Kappa is a statistical measure of inter rater agreement which in addition to calculating the percent agreement calculates the amount of agreement that can result by pure chance. Although Kappa has been criticized for being too conservative and sometimes underestimating agreement, it is recommended over simple percent agreement, which can be misleading and too liberal (Lombard, 2004). Kappa ranges between 0 and 1 with larger values indicating better agreement. Generally a Kappa >.70 is considered to show substantial agreement. The inter rater agreement for T1 was found to be K = .71 and for T2 K = .86 showing satisfactory inter rater agreement for both data collection times.

3.2.4 Can-do scales

Can-do scales have been used in a number of L1 attrition studies (Hulsen, 2000; Van der Kooi, Yilmaz, & Schmid, 2008) to measure the self perceived proficiency of participants and have been demonstrated to be a good measure of second language proficiency.

In the present study they were used as a means of investigating the participants' language proficiency before the onset of attrition., i.e. as a retrospective pretest. The length of time elapsed since the participants' return from the SA (onset of attrition) varied across the sample (ranging from 0 to 8 years ago) and there was no objective way of establishing the participants' proficiency (with the exception of the baseline group) at that time. Instead, the participants from the AG were asked to self-rate their ability to perform different activities in Spanish before the end of their stay in Spain by means of can-do scales.

The use of retrospective pretests, or then-tests, was first suggested by Howard (1980) as a way to control for response-shift bias occurring in conventional pretest-posttest designs. The validity of the retrospective pretests has been investigated in a number of studies (Hoogstraten 1982, 1985; Howard, 1980) and retrospective pretests have been shown to be an accurate and valid measure.

Constructing the can-do scales

The can-do scales questionnaire was based on the ALTE Can Do project of the Common European Framework of Reference (see Appendix U). It consisted of 52 statements that referred to an array of different actions, performed in different contexts and varying in difficulty. The statements covered the reading, writing, listening and speaking skills from level A1 to level C2.

Scoring the can-do scales

The participants had to self-rate their ability to perform each of the actions mentioned using a five-point Likert scale. The response options varied from "*I cannot do this at all*" to "*I can do this without any difficulty at all*" and were represented by numbers from 1 to 5. The maximum score was 260 and the minimum 52. The mean over all

items was calculated and the closer it was to 5, the higher evaluation the participant had marked.

Reliability

Reliability of the can-do scales, measured again with Cronbach's α, showed that the questionnaire had a good total reliability of α = .96 (Table3.12). The highest reliability coefficient was measured in the Speaking Performance section. Writing performance obtained α=.92. Listening Comprehension reliability was a little bit lower, α=.85. The lowest reliability was found in the Reading Comprehension.

Table 3.12 Mean scores and reliability coefficients for the can-do-Scales.

	N	*Min; Max*	*M*	*SD*	*a*
Listening Comprehension	10	10; 50	38.8	4.92	.85
Reading Comprehension	9	9; 45	31.8	5.15	.83
Speaking Performance	21	21; 105	70.25	12.02	.94
Writing Performance	12	12; 60	39.15	9.29	.92
Total	52	52; 255	180.89	27.64	.96

No official reliability measures were found for the ALTE framework although according to the information on ALTE's webpage[5], validation work has been in progress for quite some time now.

3.2.5 Attitude and motivation questionnaire

Attitude towards Spanish speaking people and culture, and motivation to learn Spanish were studied with the help of an Attitude and motivation questionnaire (AMQ). The questionnaire was created using the Attitude Motivation Test Battery (AMTB) developed by Gardner (1985). Not all of the nineteen measures of the original AMTB were included in the AMQ since scales like "Parental Encouragement" and "Class Anxiety" were not relevant to the present study.

Constructing the AMQ

The AMQ consisted of 30 questions taken from four of the original AMTB sections: interest in foreign languages (11 questions), attitude towards the Spanish people – 9 questions; integrative orientation – 5

[5] http://www.alte.org/downloads/index.php?doctypeid=10

questions; instrumental orientation – 5 questions (See Appendix V for the questionnaire). These were translated into Spanish by the researcher and checked by a native speaker and teacher of Spanish. The participants were instructed to mark to what extent they agreed or disagreed with each statement referring to the Spanish language, culture or people, or language learning. The answers were marked by means of a seven point Likert scale where the response options varied from "Strongly Disagree" to "Strongly Agree" and were represented by numbers from 1 to 7.

Scoring the AMQ

A high score on the AMQ, maximum score 140 (70 interest in foreign languages and 70 attitude towards Spanish people and culture) indicated positive attitude and high motivation to learn the language. A high score on the instrumental orientation section, maximum score 35, showed that the participant had instrumental reasons (finding a job, better salary) for learning Spanish and a high score on the integrative orientation section showed that the participant was motivated by integrative reasons (interest in the culture and language studied). Before scoring the AMQ, the scores for the four inverted items (4, 9, 21 and 25) were reversed in SPSS using the formula: [(max value + 1) - the actual score]. Thus a person with a positive attitude who scored 1 on a negatively worded item would still score 7 and vice versa.

Reliability

Reliability was again tested with Cronbach's α. Table 3.13 shows that the lowest reliability coefficient in the AMQ was measured in the section "Attitude towards Spanish people", α=.74. The other three sections obtained similar coefficients. Integrative orientation had α value of .77; instrumental orientation α=.78 and the highest α value was found in interest in foreign languages, α=.79. These fall well within the ranges obtained by Gardner (1985) although not at the maximum end. It has to be noted that *1*) Garnder's study was conducted with Junior high school and High school students, aged 12 – 18; and *2*) the number of cases in the present study (n=51) is relatively small and it might be influencing negatively the reliability analysis.

Table 3.13 Mean scores and reliability coefficients (Cronbach α) for the A&M sections. IFL – interest in foreign languages; ASP – attitude towards Spanish people; IO – integrative orientation and InstO – instrumental orientation

AMQ	*Present Study*					*Alpha ranges Gardner (1985)*
	N items	*Min; Max*	*Mean*	*SD*	*Alpha*	
IFL	11	11; 77	66.80	.994	.79	.72 - .90
ASP	9	9; 63	45.44	.879	.74	.67 - .94
IO	5	5; 35	30.69	.496	.77	.62 - .88
InstO	5	5; 35	22.81	.692	.78	.13 - .77

3.3 Design of the study

It was argued earlier that the two major challenges for any study on FL language attrition were establishing a baseline against which to compare attriting individuals and using data collection materials that provide for a multi-dimensional look into the problem. It was seen in the previous section that the materials which were used were quite diverse and allowed for a multidimensional investigation. In this chapter, the design used to overcome the first problem is presented.

Using longitudinal (LG) designs to overcome the "baseline" problem faces several obstacles: mainly lack of time and the inability to go back and/or forth in time and interview the participants just before the onset of attrition and then a few years later without having to wait for a couple of years. Instead, Weltens (1987:27) suggested using informants as close to the profile of the attriting group as possible and for whom the attrition process has not yet started, i.e. a baseline group. Following his advice, the present study used a baseline group (n=14) of Erasmus participants who were interviewed shortly before the end of their SA (while still in Spain or within a month after going back to their country of origin) and an attriting group (n=37). In addition, as data collection continued for an year, it was decided to re-interview the participants who were interviewed in the first stages of the project (n=20) a year later in order to provide LG data for this subsample.

Figure 3.4 shows the three data collection times: T0, T1 and T2, the people interviewed and the tasks used at each data collection point. The first data collection time, Time 0 (T0), was not a "real" data collection time. It did not chronologically precede T1 and it consisted

only of the can-do scales: retrospective for the attriting group and at-the-time-of-interview for the baseline group. These questionnaires were actually administered together with all other materials at T1 but their data was used as T0 to compare the initial levels of proficiency.

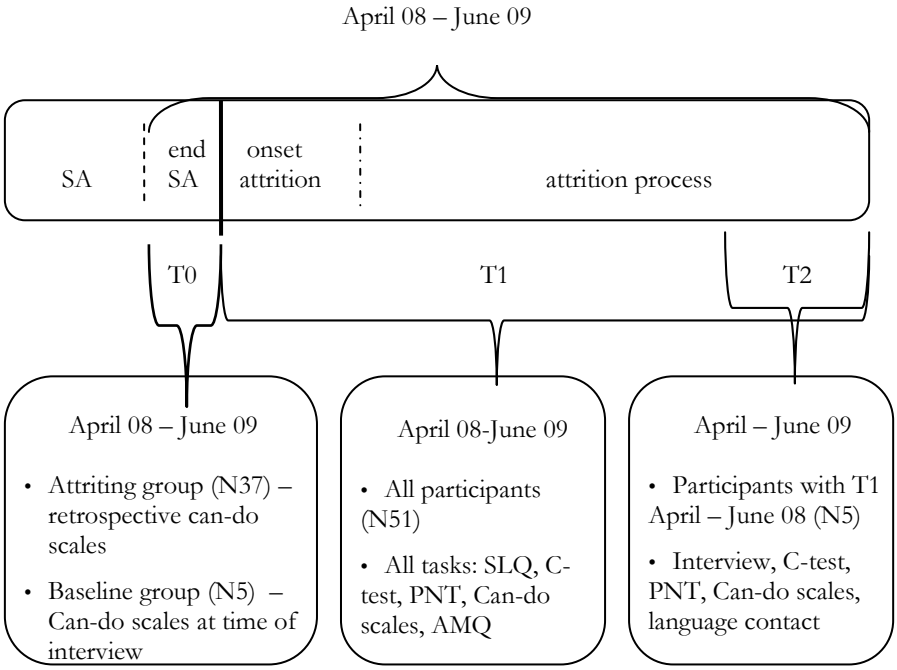


Figure 3.4 Data collection times

Time 1 (T1) data collection, in which participated all interviewees - attriters and baseline group, began in spring 2008 and continued through early summer 2009. All tasks were administered at this data collection time to a total of 51 people.

At Time 2 (T2), only a subsample of the participants who were interviewed in spring 2008 were re-interviewed approximately a year after their first interview. Originally, at T2 it was intended to re-interview all participants from the early stages of T1 data collection. Unfortunately, a year later the majority of these people had already finished their university education and were either very busy with their new job or where living outside the country. Thus, from the 20 people that were interviewed in spring 2008, only 5 could be retrieved for a

follow up interview a year later. T2 for the 5 participants who were re-interviewed continued from April until June 2009.

3.4 Procedure

All participants were interviewed individually by the researcher at the university premises (FUB, RU, RuG, VU and UPF), in an informal setting. Spanish was the language of communication and whenever the participants found difficulty they were encouraged to look for the Spanish words rather than change to English. A typical interview had the following sequence:

1. Consent form
2. SLQ (as an interview)
3. AMQ
4. Can-do scales
5. C-test
6. PNT

At a typical interview at T1 the participant was first asked to sign a consent form (Appendix W). This was the only document written in English to ensure its understanding by everybody irrespective of their level of proficiency in Spanish. The participants was then offered a cup of tea or coffee and the meeting began with an informal talk with the researcher in which she gradually introduced the questions from the SLQ.

The interview was then followed by the rest of the materials which the participants completed on their own, although the researcher was always available to answer questions and help with any doubts. The psycholinguistic task came last. The purpose of having the interview, the questionnaires and the tests, that were all done in Spanish, before the psycholinguistic task was to "warm up" the participants and activate their Spanish before the most demanding task – picture naming.

Usually, after the PNT the conversation would continue for a while discussing the participant's impressions of the task and how they felt while naming the pictures so that the interview did not end too abruptly. This also provided valuable insight as to how the participants felt during the task and the problems they encountered such as tip of

the tongue situations, confusion with other languages, etc. The whole meeting continued for approximately 1,5h to 2h and it was recorded from the moment the participant entered the room until they left. The interview was later transcribed using the conventions of CHAT (see Chapters 4 and 5 for the analysis of the data).

The materials used at T2 included the language use section from the SLQ, Can-do scales, C-test and the PNT. The interview was based on information from the first interview discussing what happened in the meantime and the future plans of the participant. This session was shorter, about 1h 15 min to 1h 30 min, and was again recorded and the interview transcribed for the analysis of free speech.

3.5 Hypotheses and expectations

In addition to the research questions brought up in the previous chapter, the study hopes to confirm a number of hypothesis and expectations not only based on the theories discussed in the previous chapter but also specific to the tasks and the design used in the study. These are presented separately for each task, while the hypotheses regarding the factors affecting attrition come last.

3.5.1 Oral data

1) In the LG data a decrease in lexical diversity within subjects over time will be observed. There will be a decrease across groups in the CS data; the baseline group will obtain the highest result and the group with the longest LoA the lowest.

2) In the LG data, there will be an increase in disfluency phenomena over time. In the CS data, hesitation and disfluency markers will increase across groups in comparison to the baseline group.

3) The increase in disfluency markers will be mostly visible in front of lexical items.

3.5.2 C-test

4) Scores on the C-test will decrease over time for the LG subsample and across groups for the CS data.

3.5.3 Picture naming

5) Individual naming latencies will increase and percent correctly named words will decrease over time for the LG group. In the CS data, reaction times will increase and percent correct responses will decrease across groups; the baseline group will perform best, i.e. attain a higher percentage of correct words and faster naming latencies, whereas the other groups will obtain lower scores and slower naming latencies; groups with longer attrition periods will have lower scores and slower naming latencies.

6) High frequency words will be retained better and retrieved quicker. There will be more correctly named HF words than MF and LF words. HF words will also be named faster than MF and LF words. This frequency effect will be present in both the CS and LG data.

3.5.4 Factors affecting the attrition process

7) High initial proficiency in the language fosters retention, i.e. people with high proficiency at the onset of attrition will retain the language better and will perform better at the test and tasks.

8) Motivation, especially integrative motivation, will have a positive effect on language retention, i.e. people with high motivation will retain the language better.

4
Longitudinal data

This chapter presents the results from the LG subsample. The five participants from whom LG data was obtained were all given fictitious Catalan names. First, sociolinguistic and background information about the sample is presented in Section 4.1 such as duration of SA, LoA, initial proficiency, attitude and motivation scores as well as language contact data after the onset of attrition. The analyses of the different tests are then presented and the results for each participant are discussed individually in the light of their personal characteristics. Data analyses start with the oral data (Section 4.2), the C-test (Section 4.3) and the PNT (Section 4.4), which is analyzed both for reaction time latencies and percent correct responses. Finally, the chapter ends with a summary of the results and some preliminary conclusions (Section 4.5).

4.1 Participants

This section presents the sociolinguistic characteristics of the participants such as age, gender, length of SA and attrition, initial proficiency. Also, information about the participants' attitude and motivation, as well as contact with and use of Spanish for the period between the two interviews is provided.

4.1.1 Sociolinguistic characteristics

As Table 4.1 shows, the five people in the LG subsample were quite a heterogeneous group. There were three female and two male participants. The mean age was 23.8 (*SD* = 0.8). Two participants had been on a SA for 5 months, and there was one person for 4, 6 and 7 months each. Thus the mean SA duration was 5.4 (*SD* 1.4). At T1 of the interview, two of the participants (Oriol and Núria) were interviewed while still on a SA. For them the attrition period was only of approximately a year at T2. There was one participant, Aleix, for whom the attrition period was only slightly longer – 14 months. The other two participants had spent 22 and 72 months without active

contact with the language. The mean length of attrition (LoA) was 26.4 (*SD* 25.8).

Table 4.1 Descriptive statistics of the LG subsample. LoA – length of attrition, InProf – Initial Proficiency

Participant	*Gender*	*Age*	*Duration SA*	*LoA T2*	*InProf*
Aleix	m	23	5	14	3.63
Clara	f	24	4	22	3.53
Oriol	m	24	7	12	3.34
Sonia	f	25	5	72	4.43
Núria	f	23	6	12	4.48
Mean (*SD*)	-	23.8 (0.8)	5.4 (1.4)	26.4 (25.8)	3.9 (0.5)

Initial proficiency, as measured by retrospective can-do scales, was above 3 on a scale out of five for all participants. Núria registered the highest score (4.48) and Oriol the lowest (3.34) but it can be said that the five participants had high to very high initial self-perceived proficiency. Due to the small number of participants at T2 and their heterogeneous nature regarding LoA and SA duration they could not be divided into groups. Each participant's results were explored individually in the light of their personal characteristics.

4.1.2 Attitude and motivation

Scores for the AMQ were calculated for the four sub sections: attitude, interest in FL, integrative orientation and instrumental orientation, as well as an overall score (Table 4.2). It can be seen that the person with the most positive attitude and with the highest motivation was Núria whose overall score exceeded 200 and was close to the maximum (217). For the rest of the participants the attitude and motivation score was situated around 160-174 also reflecting a considerably high motivation and positive attitude.

Table 4.2 Attitude and motivation scores; IFL – interest in foreign languages, IO – integrative orientation, InsO – instrumental orientation.

Participant	*Attitude*	*IFL*	*IO*	*InsO*	*Total*
Aleix	48	72	32	22	174
Clara	49	67	31	17	164
Oriol	42	73	31	14	160
Sonia	40	72	32	21	165
Núria	62	77	35	34	208

4.1.3 Language contact

At T2, participants were required to fill in a language contact questionnaire where they had to evaluate, on a scale from 1 to 5, the frequency with which they had been using Spanish, English and their L1 (and possibly another language). There were 18 different situations focusing on the time period between the two interviews. The maximum score that could be allocated to a language was 90.

Individual scores for the use of the three languages are given in Table 4.3. It can immediately be seen that for all participants the preferred language was the native language (L1), for which scores varied between 67 and 79. English came second with scores around 39-65 and Spanish was the one least used obtaining frequency scores between 18 and 44. The person who claimed to have been using Spanish the most was Núria (44) whose frequency score for Spanish stood out from the rest of the scores for that language. Clara was the person who marked the lowest frequency use of Spanish – 18, while for the rest of the participants the scores were around 23-26.

Table 4.3 Language contact and use between the two interviews

Participant	*Spanish*	*English*	*L1*
Aleix	25	52	79
Clara	18	39	75
Oriol	23	46	67
Sonia	26	43	71
Núria	44	65	77

4.2 Oral data

The oral data from the SLQ were analyzed for lexical diversity (the measure D, which is described in more detail in the following section), frequency and distribution of hesitation and disfluency markers. In addition, a word count (with the FREQ program in CHILDES) allowed for a comparison between the number of different parts-of-speech used by each participant at T1 and T2.

The words produced by each participant at both data collection times are listed in Table 4.4. In three cases, the participants were actually more eloquent at the second meeting than at the first one. Since at T2 the participants and the interviewer already knew each other they had

more things to discuss and this might have led to the increase in words. Although number of words was not taken as a measure of attrition, it is important to note that the participants felt confident and were able to speak freely a year after the first interview.

Table 4.4 Words produced at T1 and T2

Participant	*Words T1*	*Words T2*
Aleix	1401	1710
Clara	1329	1419
Oriol	1289	1364
Sonia	1441	1451
Núria	1375	1379
Total	6835	7323

After the initial count of words, the frequencies of different parts-of-speech at both data collections times were explored. It was discovered that at T2 there was an increase in the use of foreign (FL) and pseudo (PS) words. Since there was a difference in the total number of words produced by each participant at T1 and T2, occurrences of FL and PS words were calculated per 100 words per spoken speech.

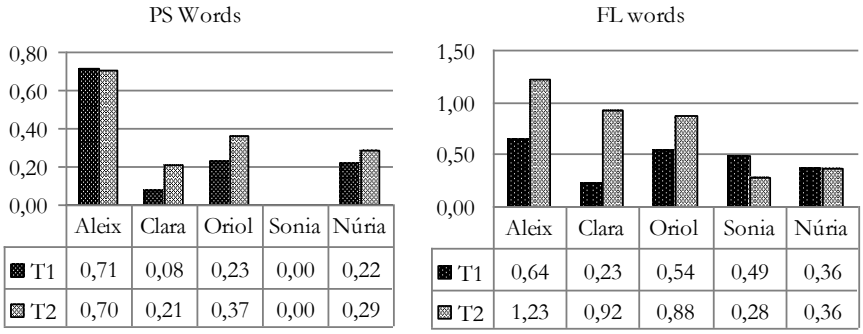


Figure 4.1 PS and FL words per 100 words at T1 and T2

It can be seen in Figure 4.1 that PS words in Aleix's speech were almost identical at T1 and T2. For Clara there was a clear increase as PS words tripled in her speech. An increase in PS words was also noted in Oriol's and Núria's speech, somewhat more noticeable in the speech of the first one. Sonia did not produce PS words at either data collection time. As for FL words, these had almost doubled and tripled in Aleix's and Clara's speech, respectively, over a year. There was a slight increase in the FL words used by Oriol while for Sonia,

there was actually a decrease. No change in the occurrences of FL words was observed in Núria's speech.

PS words were usually based on a Spanish word, which the participants could not recall entirely correctly, i.e. *restrictazo* (*restringido - restricted*) or mixed up with an English word as in *percento (porcentaje – percent)*. FL words at T1 were mainly specific vocabulary items such as business vocabulary and the occasional *yeah* and *ok*. At T2 though, participants reverted to FL words even for words like *journalist*, *learn* and *time*. This change of language, in this case with the aim of substituting for an unavailable word in the main language of conversation, should be distinguished from code-switching, i.e. the deliberate use of more than one language in conversation usually occurring in diglossia situations. Deliberate code-switching consists of a mixture of two languages, like Spanglish for example, and usually involves people who are fluent in both languages. Instead, the present increase in PS words and FL words reveals problems with the language and especially word accessibility and suggests that even an attrition period as short as one year can affect the availability and accessibility of vocabulary.

4.2.1 Lexical diversity

Lexical or vocabulary richness or diversity has traditionally been measured based on the ratio of different words (type) to the total number of words (tokens) used in a text, known as the type-token ratio (TTR). This ratio is automatically provided by the FREQ program in CLAN, which calculates the frequencies of different items in the text. This measure, however, is a function of the number of words in a language sample and therefore influenced by it, with long texts obtaining low levels of TTR and short texts high TTR.

The VOCD program, available in the CLAN package, was developed by McKee, Malvern & Richards (2000). It calculates D - a measure of lexical diversity, which is not sensitive to text length. D has been found to be a valid and reliable measure across a number of different contexts from children with SLI to adult learners of English as L2 (Richards & Malvern, 1997).

Since text length between speech samples for each participant differed, it was felt that D was a more appropriate measure than TTR, which

would have been influenced by the differences in text length. As Table 4.5 shows, a decrease in lexical diversity was registered for all participants. The biggest change was noted in Sonia's D score, where a decrease by as much as 25.2 points was registered. Clara's score was the second one most drastically decreased with 19.3. The change in score for Aleix and Oriol was 12.3 and 14.3, respectively. The smallest decrease was found in Núria's data, 1.6 points less at T2 than at T1.

Table 4.5 Lexical diversity scores, T1and T2 and difference

Participant	*D T1*	*D T2*	*Difference*
Aleix	87.35	75.09	12.3
Clara	80.72	61.44	19.3
Oriol	65.17	50.8	14.4
Sonia	85.26	60.06	25.2
Núria	65.04	63.49	1.6

4.2.2 Hesitations and disfluency markers: occurrences

The occurrences of disfluency and hesitation markers such as filled pauses (FPs), corrections (Corrs), repetitions (Reps), reformulations (Refs) and false starts (FStarts) were counted with the FREQ program. Table 4.6 lists the occurrences of these markers per 100 words at T1 and T2 for each category and participant. The marker which had increased the most was FPs with an overall change of 9.4. Reps followed with an increase by 5.1 points and FStarts by 3. The change in Corrs and Refs was less pronounced, an increase of 1.7 and 0.4 respectively.

Table 4.6 Hesitations and disfluency markers per 100 words, T1 & T2

	FStarts		*FPs*		*Reps*		*Corrs*		*Refs*		*All hes*	
	T1	*T2*	*T1*	*T2*	*T1*	*T2*	*T1*	*T2*	*T1*	*T2*	*T1*	*T2*
Aleix	0.7	1.1	4.2	5.0	4.2	5.4	1.3	1.2	0.9	1.1	10.6	12.7
Clara	1.1	1.3	3.5	8.5	2.4	3.0	0.5	1.1	0.5	0.6	6.6	13.2
Oriol	0.6	1.8	2.9	6.1	5.8	7.8	0.5	1.2	1.0	0.9	9.8	16.0
Sonia	0.9	1.3	0.8	1.1	2.0	4.0	0.6	1.1	0.5	0.6	3.9	6.8
Núria	0.6	1.4	0.4	0.5	5.2	4.5	0.4	0.4	0.9	1.0	6.4	6.4

An increase in the overall count of hesitations and disfluency markers was observed for all participants at T2 with the exception of Núria (Table 4.6). A detailed look at her use of the different hesitation and disfluency categories revealed that there were some minor fluctuations: an increase in her use of FStarts, which actually doubled; a decrease in

the number of Reps and a very slight increase in the occurrences of FPs and Refs.

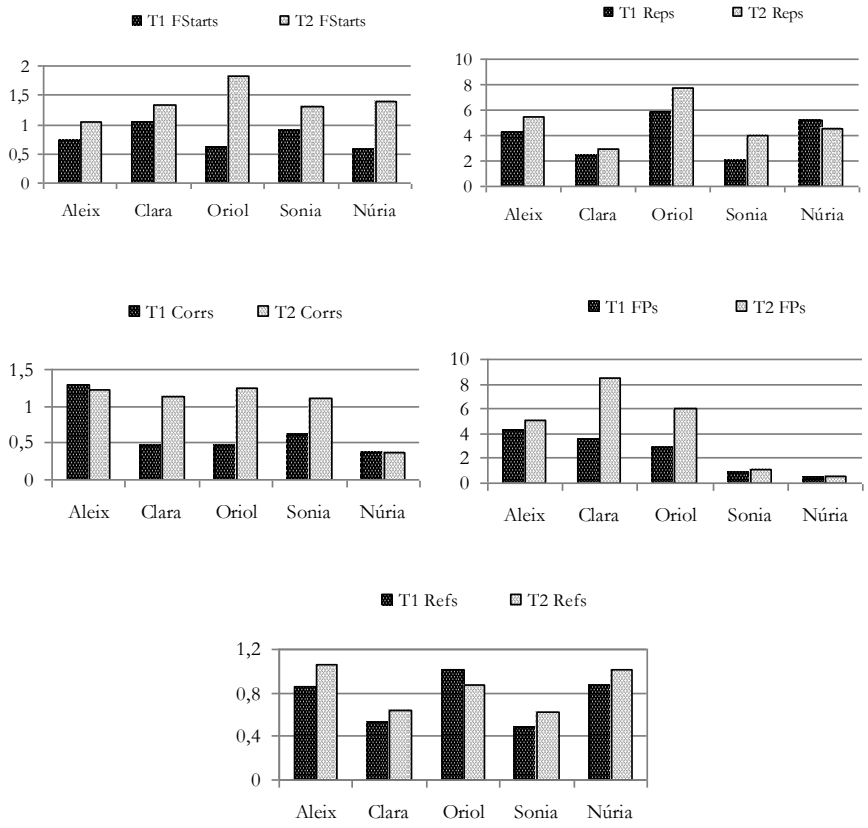


Figure 4.2 Hesitation and disfluency markers per 100 words at T1 and T2

For Aleix, the biggest increase was in the number of Reps (Figure 4.2). There was also an increase in the number of FStarts, Reps, FPs and Refs he used at T2. A slight decrease in the number of Corrs used by Aleix at T2 was noted. For Clara, Oriol and Sonia an increase across all categories over time was observed. The biggest change in Clara's and Oriol's speech was the increase in the number of FPs, which doubled at T2 in both cases. For Sonia the highest increase was in the occurrences of Reps which also doubled.

4.2.3 Hesitation and disfluency markers: distribution

Schmid & Beers Fägersten (2010) in a study on disfluency markers in L1 attrition found that the occurrences of empty pauses before lexical

items, articles and pronouns increased as well as FStarts before articles and Reps before PREPs, pointing to differences in the use of disfluency markers by the attriting population and the control groups. It is the aim of the present analysis to see if any such differences in the use of disfluency and hesitation phenomena can be found for FL attriters.

The position of FPs and Reps over 100 words with respect to the subsequent element was explored by means of the MOR program in CHILDES. These two categories were chosen because they were found to have increased the most in the previous section. Nine word classes were distinguished: adjectives (ADJ), adverbs (ADV), articles (ART), conjunctions (CONJ), interjections (ITJ) nouns (N), preposition (PREP), pronouns (PRO) and verbs (V) as well as PS words, FL words, FPs and Reps. All other successive words such as number, possessives, proper names, etc. were gathered under the common heading 'others' (OTH). Detailed information about the part-of-speech class preceded by FPs and Reps can be found in Appendix B.

For the two participants for whom the largest increase in FPs was registered – Clara and Oriol, it was found that there were four elements before which FPs increased: FPs, ITJ, N and V. As Figure 4.3 shows, the occurrences of FPs before other FPs tripled for both participants. That means that at T2 FPs were not only used individually but also in groups of two or more. This cumulative use of FPs seems to be a strategy to gain more time to plan and prepare the next part of the utterance when

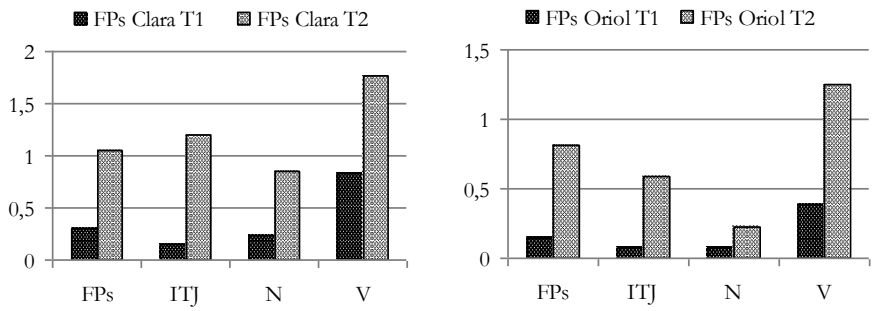


Figure 4.3 Type of element following FPs per 100 words, T1 and T2.

lexical access problems are encountered. In example (1) the participant was looking for a word of a specific activity and after two FPs, a short empty pause and then again a FP reconciled to using *fiestas* (parties) demonstrating her resignation to look any further with the word *bueno* (ok).

(1) pero es un poco # diferente también organiza ahm@fp ahm@fp # muchas ahm@fp bueno fiestas

but it is a bit # different it also organizes ahm@fp ahm@fp # lots of ahm@fp ok fiestas

Example (1) also illustrates the use of FPs in combination with interjections like *bueno* (ok) which also seem to complete the same purpose: gain time when encountering difficulties.

Although not as spectacular, an increase in FPs before N was also observed while the increase in FPs preceding Vs was more marked in both cases. Illustration of such situations is provided in the following examples.

(2) con ciencias naturales, ahm@fp puedes ahm@fp ser un profesor, en el ahm@fp escuela, la segunda escuela, se dice?

with natural sciences, ahm@fp you can ahm@fp be a teacher, in the (art. masc. sing) ahm@fp school (fem. sing), the second school, can you say?

(3) por el campo y todo y vamos a ahm@fp visitar muchos bares claro

through the countryside and all and we're going to ahm@fp visit lots of bars, of course

In example (2) the participant cannot find the appropriate word for secondary school and came up with an invention, i.e. the *second school*, while in example (3) after failing to find the desired word an improbable collocation, at least for Spanish, of *visit* and *bar* was made.

The increase in Reps was also not uniform (see Appendix B) but was more visible before three categories as demonstrated by the four graphs in Figure 4.4 illustrating the increase of Reps for Sonia, Oriol,

Aleix and Núria. The three categories were ITJs, PROs (personal) and PREPs. Since Reps are marked in the text before the repeated word, i.e. < *bueno* > *[/] bueno*, increased Reps before a certain element actually represent an increase in the number of Reps of that element, in this case interjections, PROs and PREPs.

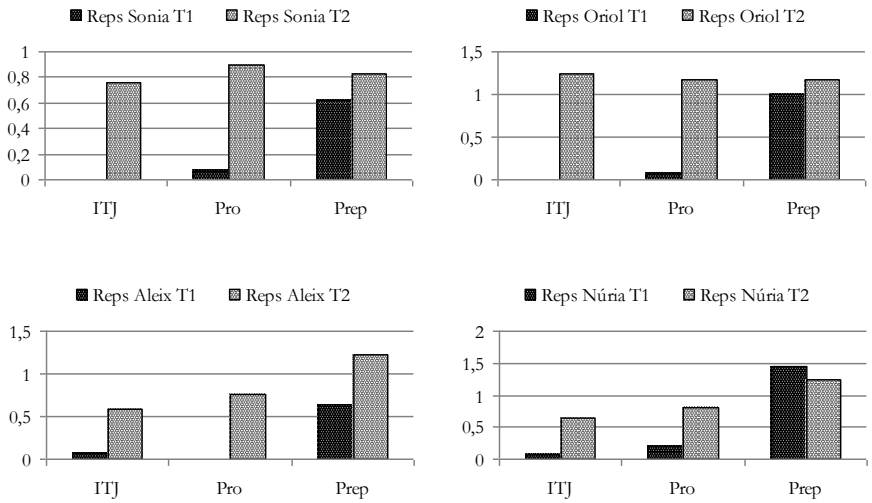


Figure 4.4 Distribution Reps per 100 words, T1 and T2

For Sonia and Oriol the increase of Reps of ITJs was quite marked since no repetition of this element was done at T1 and then at T2 they were as frequent as the Reps of PREPs and PROs.

This increase in the number of repetitions of ITJs points again to techniques for overcoming lexical access problems as in example (4). The participant started saying *they have* but then could not find the word he wanted to use and after a long pause started a new phrase where again he had difficulties accessing the right word so in the end he just abandoned the utterance.

(4) ahm@fp, tienen < bueno > [/] bueno ### hay algo < del > [//] < de > [/] de lecturas o notas en +...

ahm@fp they have <well> [/] well ### there is something <from> [//] <from> [/] or notes in +…

Overall, although the distribution of Reps is not as indicative as that of FPs, both leave the impression that this increase is prompted by problems linked to lexical access and retrieval and is used as a technique of gaining time.

4.3 C-Test

Individual scores on the C-test were calculated for both data collection times and are listed in Table 4.7 below. The scores were based on correct reconstructions including spelling mistakes. It can be seen that for 3 of the participants, Aleix, Oriol and Sonia, there was an increase in scores; for one person (Núria) there was a slight decrease and for another one there was no change (Clara).

Table 4.7 C-test scores, T1 and T2

Participant	*T1*	*T2*
Aleix	50	54
Clara	54	54
Oriol	44	51
Sonia	55	57
Núria	53	51

Individual percentages of correct scores were calculated for each part-of-speech category and are shown in Table 4.8. The results obtained at T1 were closer to the maximum end of the scale (with the exception of Oriol's score, which was the only one below 50) and demonstrated a high level of proficiency. Surprisingly, the scores at T2 were even better. For two part-of-speech categories in Aleix's scores, N and V, the percent correctly restored words increased at T2. Of the remaining 7 categories, which did not change over time, 6 got the maximum result.

Two categories changed in Clara's scores as well. One, N, increased, whereas the other one – V, decreased. Seven remained unchanged, of which there were five that obtained a 100% correct restoration rate. Oriol' scores, which seemed to be the ones that fluctuated the most, increased for N, V, ADJ and ART at T2. ART restorations though, decreased by half. There were three categories, PREP, ART and CONTR that were restored without a mistake at T2. Sonia's scores largely remained unchanged and at 100 percent success rate. Those that changed like ADJ and ADV also increased to the maximum at T2. Núria scored the maximum at 4 categories both at T1 and T2. The

remaining 5 categories, N, V, ADJ, ART and PRO, obtained a higher score at T2 than at T1, with ADJ getting a 100%.

Table 4.8 Percent correct scores by part-of-speech category

	Aleix		*Clara*		*Oriol*		*Sonia*		*Núria*	
	T1	*T2*	*T1*	*T2*	*T1*	*T2*	*T1*	*T2*	*T1*	*T2*
N	87	93	87	93	73	87	93	93	93	87
V	57	79	93	86	79	93	93	93	86	79
ADJ	100	100	100	100	80	100	80	100	80	100
ADV	100	100	83	83	67	67	83	100	100	100
CONJ	100	100	100	100	75	75	100	100	100	100
PREP	100	100	100	100	50	100	100	100	100	100
ART	100	100	100	100	83	100	100	100	83	67
PRO	67	67	67	67	67	33	100	100	33	67
CONTR	100	100	100	100	100	100	100	100	100	100

4.4 Picture naming

The PNT was used to calculate mean reaction times (RT) for each person in ms and the percent correct responses that were produced, irrespective of reaction time. As was explained in chapter three, two different coding systems were used to evaluate the validity of the responses in the two analyses.

4.4.1 Reaction times analysis

Individual mean reaction times were calculated for each person for both data collection times. Reaction times of less than 400 ms were eliminated (Levelt & Schriefers, 1987) and treated as missing data. Other missing data consisted of items that did not meet the RT code requirements, that is the microphone triggered off too early or too late, did not trigger at all (RT codes 3, 4 and 5) or the participant did not produce a word (code 6). Since big differences in the codes from T1 and T2 might indicate that data could not be compared, the use of different RT codes was explored and the results are listed in Table 4.9.

As can be seen, 67% of the codes at T1 were valid responses compared to 71% at T2. This difference was a result of more malfunctions of the microphone at T1 than at T2 as demonstrated by the higher percent for codes 3, 4 and 5 at T1. 20% of the items at T1

did not obtain a response, while at T2 the stimuli without a reply were 23%. These differences were not significant (p = .663 for Code 1 and p = .7131 for Code 6) and the results obtained at the two data collection times were compared.

Table 4.9 Percent RT codes at T1 and T2

Code	*T1*	*T2*
1	67	71
2	2	1
3	2	1
4	2	1
5	7	3
6	20	23

Mean RTs per person and frequency level are listed in Table 4.10. There was a frequency effect within subjects: the slowest reaction times, as expected, were registered in the LF condition and the fastest in the HF one. Interestingly, reaction times for the MF items were not always situated in between the other two. They were sometimes slower than LF items and sometimes faster than HF items.

Table 4.10 Mean RT for low frequency (LF), medium frequency (MF), high frequency (HF) items and average naming latencies (AV)

	LF		*MF*		*HF*		*AV*	
Participants	*T1*	*T2*	*T1*	*T2*	*T1*	*T2*	*T1*	*T2*
Aleix	1510	4336	1549	4651	1285	1661	1437	3549
Clara	1586	7198	1290	6452	1438	4733	1429	6128
Oriol	2522	6582	2534	5397	1996	2478	2338	4819
Sonia	4615	4911	2319	4303	1956	2026	2811	3747
Núria	1506	5501	1758	3818	1555	2772	1602	4030

Individual results are evaluated by means of Figure 4.5, which shows individual reaction times for T1 and T2 as well as average naming latencies for all participants. A considerable increase from T1 to T2 was observed in the naming latencies of all participants, with the slightest increase registered for Sonia. Her naming latencies increased with 936ms on average. For Aleix, Oriol and Núria the increase was of approximately 2000ms. The biggest difference was registered in Clara's reaction times for whom the increase was of 4699ms.

The analysis of individual reaction times showed a pattern visible across all participants. Naming latencies at T1 did not differ much

across frequency levels. At T2, however, MF and LF items visibly required more time. For three of the participants, Aleix, Oriol and Sonia, reaction times for HF items changed minimally to moderately: 376ms, 482ms and 70ms respectively. The change for Núria and Clara was much more pronounced: HF items were named twice as slower by the former and more than three times slower by the latter. It also has to be noted that naming latencies for MF items were not always situated at an equal distance from reaction times for HF and LF items but were much closer to LF items. Another interesting observation is that Aleix's reaction time for LF items was slightly faster than that of MF items both at T1 and T2. The same was noted in Oriol's and Núria's T1 naming latencies.

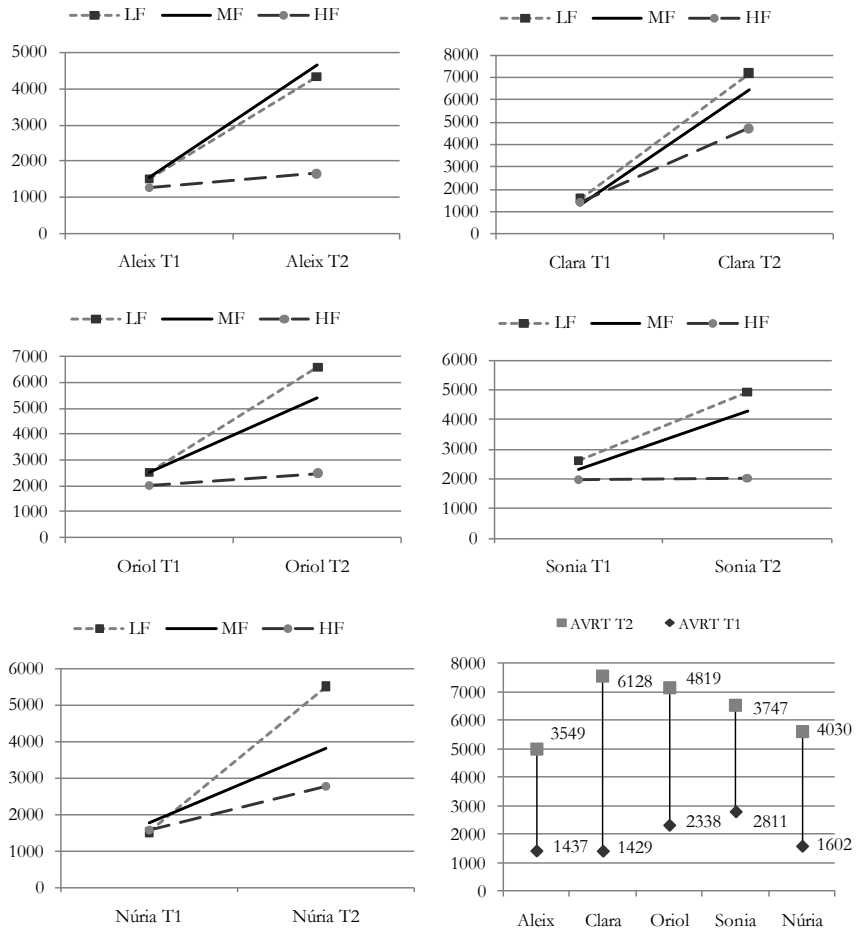


Figure 4.5 Individual reaction times across frequency levels and average in ms, T1

and T2. HF – high frequency, MF – medium frequency, LF – low frequency; AVRT – Average reaction time

Although the naming latencies at T1 could fall within the range of monolingual Spanish speaker reaction times (Bates et al., 2003:355), the increase at T2 was enormous clearly indicating lexical access difficulties. This is very different from the results obtained on the C-test. Clearly, when under time pressure, attriters could not perform so well. It has to be noted that the three participants for whom the increase was of approximately 2000ms (Aleix, Oriol and Núria) were all recent attriters, i.e. they had lost contact with the language approximately a year ago.

4.4.2 Percent correct responses analysis

Percent correct responses were calculated for the three frequency levels for each person on the basis of correct and mispronounced words (lexical codes 1 and 12). The results from this analysis, which were not as clear as those in the RT analysis, can be found in Table 4.11 below.

Table 4.11 Percent correct responses for HF, MF and LF items and average

	% LF		*% MF*		*% HF*		*% AV*	
Participant	*T1*	*T2*	*T1*	*T2*	*T1*	*T2*	*T1*	*T2*
Aleix	60	48	60	52	96	92	72	60
Clara	28	36	36	60	64	72	44	53
Oriol	60	32	56	48	92	84	68	52
Sonia	32	64	68	64	92	84	65	71
Núria	64	56	72	84	96	96	80	79

The results from the percent correct responses analysis are pictured in Figure 4.6. The overall results, as shown in the last graph, seem to be mixed. For two people, Aleix and Oriol, the average percent correct responses produced at T2 was less than the percent obtained at T1. For two people, however, Clara and Sonia, the reverse pattern was observed, that is, they obtained a higher percent correct scores at T2, against all expectations. Lastly, the correct responses Núria obtained at T2 decreased only by 1% from those obtained at T1.

The percent correct responses for the HF condition were very similar at T1 and T2 for all the participants, even coinciding for Núria. For Aleix and Oriol a slight decrease in the percent correct responses in all

frequency levels was registered at T2. Interestingly, although a decrease in the correct responses for HF and MF items at T2 was found also for Sonia, the percent correct responses she produced for the LF at T2 was actually higher than at T1. For Clara, all responses at T2 exceeded the percent correct responses she produced at T1. Finally for Núria, the correct responses for HF items she produced coincided at T1 and T2. Her percent correct responses for MF items at T2 slightly exceeded the percent at T1 and for LF items she named correctly less stimuli at T2 than at T1.

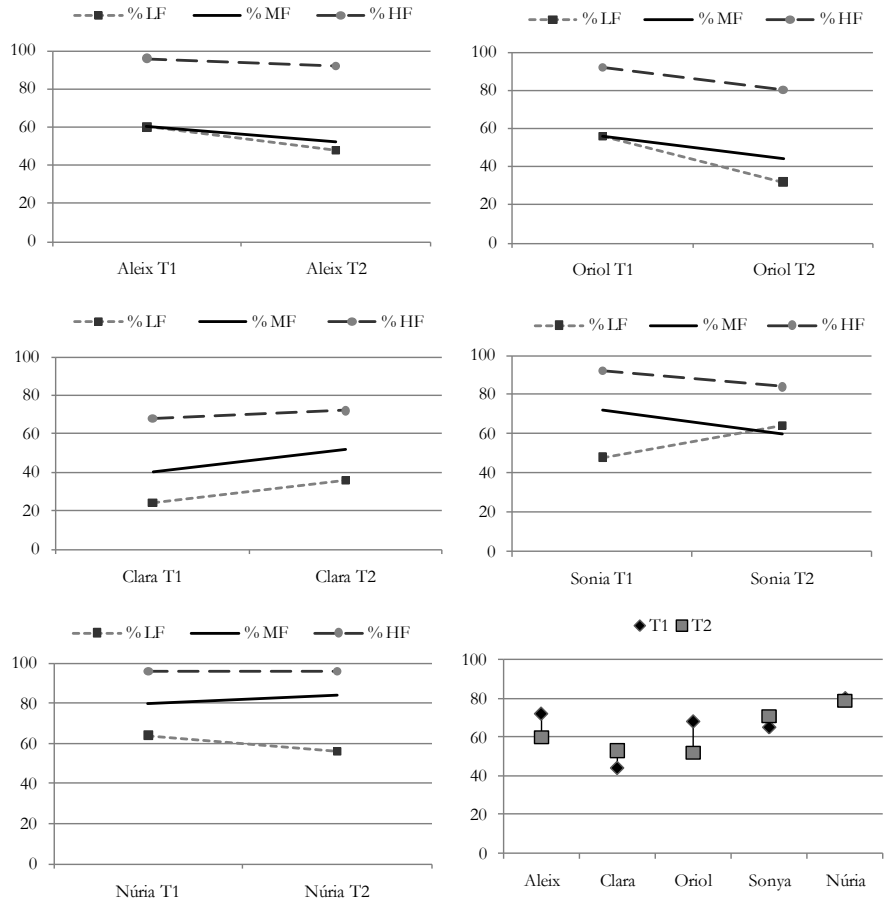


Figure 4.6 Percent correct responses across frequency level and average, T1 and T2. HF – high frequency, MF – medium frequency, LF – low frequency; AVRT – Average reaction time

Although these results may look controversial, they actually follow the pattern that was seen in the RT analysis. At T2 the people who had only recently lost contact with the language, Aleix, Oriol and Núria

obtained lower or very similar scores to the ones they got at T1. However, the participants for whom the attrition period has been going on for longer, Clara and Sonia, got better overall results at T2 than at T1. This might signal that initially, soon after contact with the language is lost there is a steeper decrease in the lexical proficiency that later stabilizes. This goes in line with previous research showing that attrition "sets in rapidly and then levels off" (Ebbinghause cited in Weltens, 1988).

4.5 Summary of results

This chapter examined the effect of a one-year attrition period on a small sample of 5 people. Quite a few of the measures used to analyze the data revealed results which were interpreted as manifestation of the attritional process that was taking place. These included increased use of PS and FL words in the attriters' speech at T2; a decrease in lexical diversity; an increase in the occurrences of disfluency markers, FPs and Reps in particular as well as a change in their distribution at T2; and finally, highly increased RTs at the PNT. One thing that all these changes have in common is that they are all directly or indirectly related to lexical access and are thus interpreted as an indication of reduced accessibility to lexical items.

5
Cross-sectional data

This chapter presents the CS analyses of the data. In the first section, the criteria for allocation to different groups and descriptive sociolinguistic statistics for each group are presented (Section 5.1). The analyses of the background data, i.e. proficiency at onset, attitude and motivation and language contact are outlined in Section 5.2. This is followed by the analysis of the oral data (Section 5.3) where the frequency and distribution of hesitation and disfluency markers, and lexical diversity is explored, as well as word distribution across groups. C-test scores, item difficulty and part-of-speech analysis of the C-test scores are presented next (Section 5.4). The subsequent section (5.5) discusses the results from the PNT. First, reaction time data is analyzed and then the percent correct responses are examined. The linguistic data and the background variables are then entered into regression analyses (Section 5.6) which are described in a separate section for each linguistic task. Finally, the chapter ends with a summary of the main results (Section 5.7).

5.1 Participants

After having examined the LG data (discussed in the previous chapter) and having observed signs of attrition over a period as short as one year, the investigation of the CS data was undertaken. The participants were divided in four groups depending on the LoA, i.e. the time elapsed since the end of their SA. The people who were interviewed while still on a SA or within a month after going back home were used as a baseline group – Group0 (N = 14). People with 1 to 7 months of attrition were included in Group1-7 (N = 12); those with 8 to 12 months to Group8-12 (N = 14) and the people with more than 12 months of attrition to Group>12 (N = 11).

5.1.1 Sociolinguistic characteristics

Table 5.1 below shows descriptive statistics for age, L1 and gender distribution for the four groups while Table 5.2 gives information about the SA duration and LoA. As can be seen, Group0 (N =14)

consisted of four Dutch L1 speakers (29%) and ten German L1 speakers (71%). Eight of these were men (57%) and six were women (43%) with a mean age of 23.6 (*SD* 2.17). They had been on a SA for 7.42 months on average (*SD* 3.39) and the attrition period was 0 months. This group was used as a baseline group against which the performance of the other groups was compared.

Table 5.1 Age, L1 and gender of the participants, across groups and total

	N	*Age*	*SD*	*L1*		*Gender*	
				nl	*de*	*m*	*f*
Group0	14	23.6 (21-29)	2.17	4 (29%)	10 (71%)	8 (57%)	6 (43%)
Group1-7	12	22.75 (21-27)	1.65	9 (75%)	3 (25%)	6 (50%)	6 (50%)
Group8-12	14	23.64 (22-26)	1.44	6 (43%)	8 (57%)	8 (57%)	6 (43%)
Group>12	11	23.73 (22-28)	2.14	7 (64%)	4 (36%)	3 (23%)	8 (72%)
Total	51	23.45 (21-29)	1.8	25 (49%)	26 (51%)	26 (51%)	25 (49%)

Group1-7 (*N* = 12) consisted of nine Dutch L1 speakers (75%) and three German L1 speakers (25%), who were equally distributed between men and women (50% each). The average age for this group was 22.75 (*SD* 1.65). Mean SA duration for Group1-7 was 7.42 months (*SD* 3.39) and the LoA 3.66 months (*SD* 2.2).

Group8-12 (*N* =14) consisted of six Dutch L1 speaker (43%) and eight German L1 speakers (57%) distributed between eight men (57%) and six women (43%), with an average age 23.73 (*SD* 2.14). The averaged SA duration for the group was 5.59 months (*SD*1.53) and the average LoA 8.7 months (*SD* .82).

Finally, Group>12 (*N* =11), consisted of seven Dutch L1 speakers (64%) and four German L1 speakers (36%) divided between three men (23%) and eight women (72%) with an average age 23.73 (*SD* 2.14). The average SA duration was 5.59 months (*SD* 1.53). This group was by far the most heterogeneous one regarding the LoA with an average of 30.7 months and an *SD* as high as 25.8.

Table 5.2 SA duration and length of attrition (LoA)

	N	*SA duration*	*SD*	*LoA*	*SD*
Group0	14	6.79 (5-10)	1.47	0	-
Group1-7	12	7.42 (5-12)	3.39	3.66 (1-5)	2.2
Group8-12	14	6.43 (4-12)	2.24	8.7 (8-10)	.82
Group>12	11	5.59 (5-10)	1.53	30.7 (12-96)	25.8
Total	51	6.58 (4-12)	2.29	9.9(0-96)	16.3

Shapiro-Wilk normality distribution tests showed that for two groups in Age and three groups in SA duration data were non-normally distributed (Appendix C). Lognormal transformation did not help normalize the data and a non-parametric test was used to compare the differences between groups. A Kruskal-Wallis test revealed that the differences in Age ($H(3) = 2.98$, $p = .395$) and SA duration ($H(3) = 6.10$, $p = .106$) were not significant across the four groups.

In addition, initial proficiency (InProf) ratings, which were obtained by means of retrospective can-do scales, were also compared. On a scale from 1 to 5, Group0 obtained a score of 3.50 (*SD* 0.61), Group1-7 – 3.48 (*SD* 0.25), Group8-12 -3.67 (*SD* 0.49) an Group>12 - 3.46 (*SD* 0.87). The average onset proficiency was 3.54 (*SD* 0.58). A one way ANOVA showed that there were no significant differences in initial proficiency across groups ($F(3,47) = .33$, $p = .749$).

5.2 Analyses of predictor variables

This section presents the analysis of the predictor variables, i.e. attained proficiency, attitude and motivation and contact with the language.

5.2.1 Attained proficiency

Attained proficiency was examined by means of retrospective can-do Scales where participants were instructed to think about the time before the end of their SA (that is before the onset of attrition) and mark on a five-point Likert scale to what degree they could or they could not complete the indicated activities in Spanish. Due to an initial error in the design, the first 13 participants were asked to think about their competence in Spanish at the time of the interview rather than at the end of the SA. However, after asking them to fill in an electronic version of the questionnaire, this time focusing on the period before

going back to their country of origin, this initial omission was used to compare the scores obtained at both occasions and verify if the participants really made a distinction between the at-time-of-interview and retrospective situation.

A dependent t-test was used to explore the differences in scores for the 6 participants who filled in both questionnaires (there were 7 people who failed to send back the questionnaire the second time). It was expected that scores for the retrospective condition would be higher than those for the at-time-of-interview, if the participants had followed the instructions. The test revealed that, indeed, on average participants had marked higher scores for the retrospective situation (M = 3.37, SE = 0.15), that at-the-time of interview (M = 3.18, SE = 0.43). Although the difference was not significant ($t(5) = .910$, *ns*, r = .38) it was accepted as a confirmation that the participants made a distinction between the two situations.

The scores from the at-time-of-interview condition were also used to deal with the missing values in the retrospective condition for the seven people who did not send back the questionnaire. A Missing Value Analysis (MVA) showed that missing data were missing completely at random (and they could not be predicted from other variables). Since onset proficiency was an important variable in the design of the study, deleting cases with missing values would have meant reducing and distorting the size of the sample. Another possibility of dealing with missing values is to replace them with the mean for the available data. This however, reduces the variance and consequently the correlation with other variables (Field, 2005). Since there were six people for whom there were data from both questionnaires, it was decided to take the mean increase in scores for these participants (0.19) and then add it to the at-time-of-interview score for the people who only completed this questionnaire. The resulting number was used to replace the missing values (see Appendix D for the replaced missing values).

Mean scores for initial proficiency and standard deviation are given in Table 5.3. Group8-12 was the one that self-rated themselves the highest and Group>12 the lowest. An omnibus ANOVA revealed that there the differences in initial proficiency were not significant ($F(3,47)=.33$, p =.749).

Table 5.3 Initial proficiency, mean scores and standard deviations

	N	*M*	*SD*
Group0	14	3.5229	.625
Group1-7	12	3.5192	.234
Group8-12	14	3.5953	.399
Group>12	11	3.1436	.639
Total	51	3.4601	.515

5.2.2 Attitude and motivation

Originally, the AMQ consisted of 30 questions from four different sections: attitude towards the Spanish people, interest in FLs, instrumental orientation and integrative orientation. Mean scores per section were calculated for each person (Table 5.4). The data were checked for multicollinearity and it was found that collinearity existed between attitude, interest in FL and integrative orientation.

Table 5.4 Attitude and motivation scores. IFL - interest in foreign language, InstO - instrumental orientation, IO - integrative orientation;

	N	*Min*	*Max*	*Mean*	*SD*
A&M	51	96	208	166.69	16.3
Attitude	51	26	62	45.78	6.3
IFL	51	40	77	67.33	7.3
InstO	51	13	35	30.76	3.9
IO	51	9	34	22.80	5.5

Following Bates, Burani, D'Amico & Barca (2001) and Janyan & Andonova (2006) a Principal Component Analysis with varimax rotation was performed on the four scales constituting the A&M score to correct this problem. The results of the PCA are given in Table 5.5 on the next page. The PCA analysis produced three components. Following Tabachnick & Fidell (2007) a loading of .55 (30% variance overlap between variable and factor) was used. The first component was the most heterogeneous one combining questions from three different categories: Interest in FL, Attitudinal questions and four Integrative orientation questions. It combined attitudinal and integrative intentions for learning a FL language; it explained 21.2% of the variance. The second factor consisted of four questions about Interest in FL and explained 12.8% of the variance. The third factor was a combination of four Instrumental orientation questions and one

Attitudinal question. It accounted for 12.4% of the variance. The exact questions, with their category and loading can be found in Table 5.5.

Table 5.5 Results of Principal Component Analysis of the AMQ (Varimax Normalized). IFL – interest in foreign languages, ASP – attitude Spanish people, IO – integrative orientation, InstO – instrumental orientation

Variable	*Components*		
	1	*2*	*3*
IFL4	**.856**	.186	-.021
ASP4	**.817**	.071	.191
ASP1	**.771**	-.157	-.068
IO4	**.748**	.153	.172
IO3	**.707**	-.147	.237
IO2	**.705**	.389	.041
IO1	**.674**	.166	.032
ASP2	**.578**	-.076	.305
IFL7	**.577**	.302	-.130
ASP3	**.572**	.288	.321
ASP6	**.563**	.306	.346
IFL6	**.552**	.279	.073
IFL Additional	-.033	**.862**	.089
IFL5	.265	**.822**	.094
IFL 9	.404	**.612**	.290
IFL1	.523	**.557**	.074
IFL10	-.153	.510	-.158
IFL2	.172	.494	.114
IFL8	.110	.465	-.261
IFL3	.187	.453	-.099
InstO Additional	-.127	-.187	**.772**
InstO1	.172	.161	**.772**
InstO3	.154	-.144	**.693**
InstO4	.068	.004	**.586**
ASP8	.017	-.101	**.572**
ASP7	.002	-.055	.514
InstO2	.165	.227	.480
ASP5	.112	.135	.311
IO Additional	.020	.166	.210
ASP Additional	.062	-.010	.193
Variance explained	21.2%	12.8%	12.4 %

Reliability ratings for the components were assessed and items were deleted if this led to an improvement in the reliability. The reliability in the first two components was of α = .904 and α = .849, respectively and no items were deleted. In the third component, the attitudinal

question (ASP8) was deleted and α improved to α= .811. Component scores were then calculated as the sum of the scores on the remaining items (Tabachnick & Fidell, 2007).

5.2.3 Language Contact

In the SLQ which gathered information about contact with the language, participants were asked to provide information for 17 different situations (using the language with friends, when reading or watching TV, etc.) for Spanish, their L1 and English. This meant that there were 51 questions on language use and contact only in addition to the questions about the linguistic background, experience with Spanish before the SA, after coming back, etc. After analyzing the correlations between the different variables, 17 items were kept for further exploration. A Principal Component Analysis (PCA) with varimax rotation was conducted on the 17 language contact variables. The results of the PCA are presented in Table 5.6.

The analysis outlined five component with eigenvalues greater than 1. Again a loading of .55 (30% variance overlap between variable and factor) was used. Thus, the first component was a combination of writing and reading emails, reading books, using the Internet, reading magazine and newspapers in English; this component accounted for 22.2% of the variance. Therefore the first component combined different aspects of using English. The second component accounted for 17.4% of the variance and consisted of using L1 for reading and writing emails as well as on the Internet. Thus it combined different uses of L1 for communication purposes. The third component accounted for 15.7% of the variance and united uses of L1 for social purposes: reading magazines, swearing and communication with friends. The forth component accounted for 11% of the variance and it consisted of Spanish for entertainment, i.e. Spanish when watching movies and television. Finally, the fifth component accounted for 9.7% of the variance and united use of Spanish for social purposes: Spanish used with friends and when ordering food.

Table 5.6 Results of Principal Component Analysis (Varimax Normalized)

	Components				
Variable	*1*	*2*	*3*	*4*	*5*
En writing mails	**.838**	-.060	-.263	-.298	-.137
En reading mails	**.830**	-.035	-.233	-.226	-.200
En reading books	**.775**	-.085	.040	.158	-.054
En Internet	**.727**	-.158	.002	-.028	.224
En reading newspaper	**.670**	-.008	.513	-.109	-.220
En reading magazines	**.634**	-.078	.505	.211	.266
L1 reading mails	-.107	**.932**	.192	.081	.052
L1 writing mails	-.113	**.930**	.155	.053	.064
L1 Internet	-.038	**.801**	.169	-.082	-.062
L1 reading magazines	.059	.256	**.794**	.010	-.146
L1 swearing	-.166	.304	**.717**	.011	.284
L1 with friends	-.234	.430	**.631**	-.067	-.119
Sp watching movies	-.025	-.045	.074	**.882**	-.014
Sp wathing TV	-.089	.066	-.119	**.808**	.176
Sp with friends	.036	-.018	.059	.054	**.893**
Sp ordering food	-.259	.102	-.472	.291	**.602**
Variance explained	22.2%	17.4%	15.7 %	11%	9.7%

A reliability analysis was carried out for the new scales, and it was also assessed whether the reliability of the scale would improve if an item was deleted. This, however, was not the case. Reliability for the first scale, Use of English, was .851 and the average correlation between items .49. The second scale, Use of L1 for communication, obtained an α = .905 and the average correlation coefficient was .75. L1 for social purposes, the third scale, got an α = .770 and average correlation between items .53. Cronbach α for the last two scales was .641 and .517, respectively for Spanish for entertainment and Spanish for social purposes. Although both scales were shown to have a relatively low reliability it has to be taken into account that they each consisted of only two items. Cortina (cited in Field, 2002) observes that caution has to be taken when interpreting reliability values since the value of α depends on the number of items: reliability tends to increase as number of items in a scale increase. Since correlation between the items in each variable was relatively good: r = .495 and r = .368 respectively it was considered that there was no reason for concern regarding reliability. Component scores were again calculated as the sum of the scores on the items constituting each component. These scores were then used in the regression analysis.

5.3 Oral data

In the same way as the LG data described in chapter 4, the oral data in the CS analyses were analyzed for lexical diversity (D) and frequency and distribution of hesitation and disfluency markers in addition to word count, which allowed for a comparison between the number of different part-of-speech items used by each group. The words in the oral data corpus were counted with the FREQ program. There were 65.099 words (M=1.276, SD=300.5), not counting hesitation and disfluency markers, i.e. FPs and FStarts, and Reps, Refs and Corrs. Words per group was not taken as a variable in the study since there was no time limit for the oral part and the free speech task. Although the researcher made sure that a minimum of 30 min of conversation was achieved, there was no upper limit besides general consideration of scheduled interviews, and the length of the speech samples varied from 40 to 60 min.

The total number of words produced by each group and the average number of words per participant are listed in Table 5.7. It shows that Group0 and Group>12 and Group1-7 and Group8-12, produced approximately the same number of words. A one-way ANOVA showed that the difference observed were not significant ($F(2.47) = 2.0, p = 126$).

Table 5.7 Words per group, average and total

	N	*Words*	*Mean*	*SD*
Group0	14	19 491	1392.21	212.42
Group1-7	12	14 069	1172.42	389.05
Group8-12	14	16 582	1184.43	254.69
Group>12	11	14 957	1359.73	301.32
Total	51	65 099	1276.45	300.50

A count of the different parts of speech present in the data and their distribution across the four groups was performed by means of the CLAN FREQ command (for complete descriptive statistics see Appendix E). The different parts of speech were approximately equally distributed across the four groups with the exception of pseudo (PS) words and foreign (FL) words, which are shown in Figure 5.1. These seemed to have increased for the group with the longest attrition period.

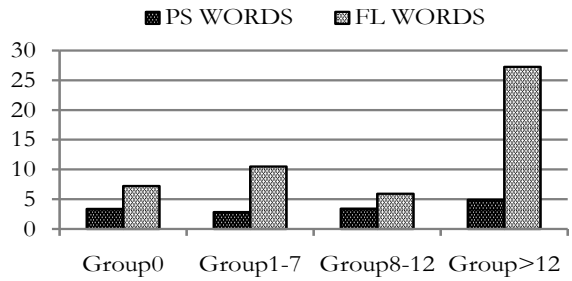


Figure 5.1 Distribution of parts-of-speech, per group and total, raw

To control for the possible effect of different word counts per group, the occurrences of PS and FL words were recalculated per 100 words. Reciprocal transformation was applied after reversing the scores to normalize the severe positive skeweness in the FL word data (see Appendix C for a comparison between normality and reciprocal normality statistics) and ANOVAs were used to explore the differences across groups in these two categories. The test showed that the increase in PS words was not significant ($F(3,47) = 1.29$, $p = .289$). The increase in FL words, however, was found to be significant ($F(3,47) = 3.215$, $p = .031$), although with a medium effect size, $r = .28$.

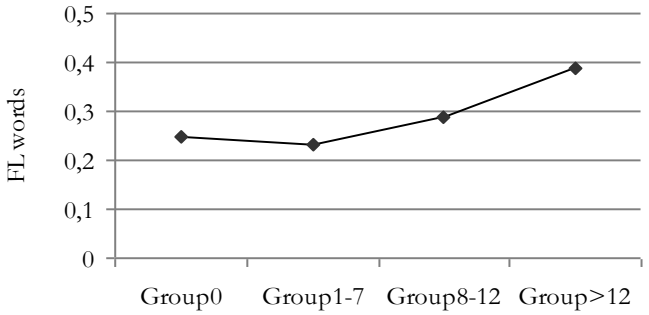


Figure 5.2 FL words across groups, reciprocally transformed data

Figure 5.2 shows that after an initial drop in the number of FL word in Group1-7, these increased for Group8-12 and particularly so for Group>12. Planned contrasts further revealed that Group>12 produced significantly more FL words than the baseline group - Group0, $t(47) = -2.862$, $p = .003$ (one-tailed), again with a medium size effect $r = .39$. Although there were no indications for a gradual linear increase in the number of borrowed words, it seemed that people with more than twelve months of attrition tended to use more FL words.

A qualitative analysis of the FLwords used showed that the majority were English borrowings - 80.2% of all FL words used. There were 16.7% German words, 1.47% French words and 1.63% Dutch words. A possible explanation for the dominance of English over the two L1s might be the fact that the participants were aware that the researcher did not speak German nor Dutch, but English, and therefore they resorted to it when they could not find the right word in Spanish. The high percentage of German words in comparison to Dutch words was due to the overuse of *ja* instead of the Spanish *sí* (yes). When these were removed, German words came down to 10.3% but the large difference of the number of FL words used by Group>12 remained.

Considering the fact that L1 distribution within the groups was not equal, a cross-language analysis was performed to ensure that the increase of FL words was not due to only one of the linguistic groups. An independent T-test on the transformed data showed that on average, L1 German speakers (M = 0.68, SE = 0.24) produced slightly more FL words than L1 Dutch speakers (M = .60, SE = .23). This difference, however, was not significant $t(49)$= -1.269, p =.210, r= .18.

5.3.1 Lexical diversity

As argued in Chapter 4, the measure D offered by the CLAN package is not influenced by text length and has been established as a valid and reliable measure in the investigation of lexical diversity and it was used, as in the LG data, to explore lexical diversity.

Table 5.8 Lexical diversity scores

	N	*Mean*	*SD*	*Max*	*Max*
Group0	14	69.53	14.6	48.95	101.6
Group1-7	12	66.81	11.2	50.77	87.4
Group8-12	14	65.49	14.9	45.73	92.4
Group>12	11	61.26	17.8	30.59	88.1
Total	51	65.99	14.6	30.59	101.6

Table 5.8 lists the results for the four groups and the total. It shows that Group0 obtained the highest lexical diversity result (M = 69.53, SD 16.6) and that the scores obtained by the attriting groups gradually decreased as months of attrition increased. Nonetheless, as the small differences in the results for the different groups suggest and a one way ANOVA confirmed, the differences were not significant F (3,47) = .664, p = .577, r = .20.

5.3.2 Hesitations and disfluency markers

This section reports on the results from the analyses of hesitations and disfluency markers. As in the LG analyses, data were first analyzed for the occurrences of disfluency markers and their distribution was then evaluated by exploring their position, i.e. whether they appeared in front of a N, V, ADJ, etc., and whether any changes in the pattern could be found as time of attrition increased.

Hesitations and Disfluency markers: occurrences

Frequency count, mean, standard deviation as well as % of total disfluencies for each hesitation marker are listed in Table 5.9. It can be noticed that the attriting groups used more FPs and less Refs than the baseline group. Disfluency markers, with the exception of Refs, were more represented especially in the speech of Group>12.

Table 5.9 Occurrences of hesitation markers across groups, raw data

		FStarts	Fps	Reps	Corrs	Refs	All
Group0	Mean	16.21	36.79	53.93	12.79	11.14	
	SD	8.39	30.49	34.01	8.93	6.13	
	N	227	515	755	179	156	1 832
	%	12.39	28.11	41.21	9.77	8.52	
Group1-7	Mean	11.58	47.33	47.17	8.50	7.00	
	SD	6.19	29.01	21.03	4.36	4.61	
	N	139	568	566	102	84	1 460
	%	9.52	38.90	38.77	6.99	5.75	
Group8-12	Mean	13.57	67.50	40.71	8.14	7.93	
	SD	7.25	36.56	17.02	6.49	4.73	
	N	190	945	570	114	111	1 931
	%	9.84	48.94	29.52	5.90	5.75	
Group>12	Mean	31.55	85.64	74.55	17.64	8.45	
	SD	18.84	44.01	38.41	10.92	5.03	
	N	347	942	820	194	93	2 397
	%	14.48	39.30	34.21	8.09	3.88	
	Total	903	2 970	2 711	589	444	7 620

Since these were raw data, the occurrences of hesitations and disfluency phenomena were calculated per 100 words in each group (Table 5.10). It can be noticed that there was an increase in the FPs used by the attriting groups and Group>12 in particular, which used more than 2 times as many FPs as the baseline group.

Table 5.10 Hesitation and disfluency markers per 100 words across groups

Group	*FStarts/100 words**		*Fps/100 words**		*Reps/100 words*		*Corrs/100 words*		*Refs/100 words*	
	M	SD	M	SD	M	SD	M	SD	M	SD
0	1.1	0.5	2.5	2.46	3.4	1.9	0.8	0.6	0.7	0.3
1-7	0.9	0.3	3.8	1.6	3.9	1.8	0.8	0.4	0.5	0.3
8-12	1.1	0.7	5.4	3.3	3.1	1.2	0.7	0.6	0.6	0.4
>12	2.1	1.2	5.9	3.7	4.9	2.6	1.1	0.5	0.5	0.2

* $p<.05$

In the speech of Group>12 in particular, there were 2 times as many FStarts as in the speech of Group0. A slight increase in the number of Reps and Corrs and a decrease in Refs was also observed for Group>12 (Figure 5.3). In the use of references there was actually a decrease rather than an increase.

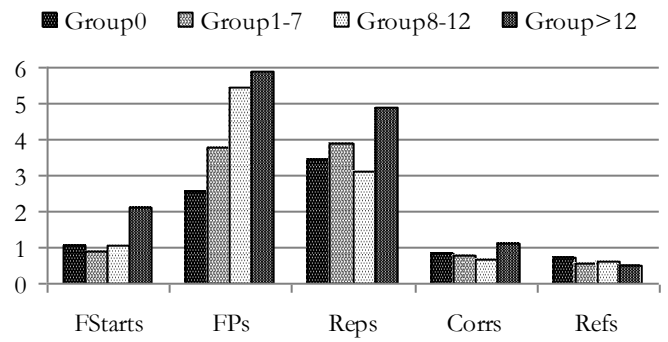


Figure 5.3 Distribution of hesitation markers per 100 words

To normalize the positively skewed data, log (Reps, FPs, Refs and FStarts) and log+1 (Corrs) transformations were applied (see Appendix F for data distribution before and after the transformations). ANOVAs revealed that the differences between groups were significant for FStarts ($F(3,47) = 4.683$, $p = .006$) and FPs ($F(3,47) = 4.748$, $p = .006$). For FPs, there was a significant linear

trend ($F(1,47) = 11.53$, $p < .01$), indicating that use of FPs increased proportionally across groups as months of attrition increased (Figure 5.4). Planned contrasts revealed a significant difference between the number of FPs used in Group0 and those in Group1-7 ($t(47) = 2.251$, $p = .015$, $r = .10$), Group8-12 ($t(47) = 3.224$, $p = .001$, $r = .18$) and Group>12 ($t(47) = 3.231$, $p = .015$, $r = .18$), all one-tailed.

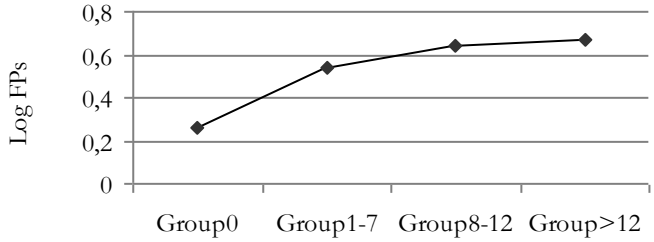


Figure 5.4 Occurrences of FP per 100 words, log transformed data

For FStarts there was a significant quadratic trend ($F(1,47) = 7.789$, $p < .01$) demonstrated by an initial decrease in the number of FStarts (Group1-7) and then a gradual increase for Group8-12 and Group>12 as shown in Figure 5.5. Planned contrasts revealed that the occurrences of FStarts increased significantly in the group with more than 12 months of attrition when compared to the baseline group ($t(47) = 3.100$, $p < .01$ (one-tailed), $r = .41$), while the difference between the other attriting groups and the baseline was not important.

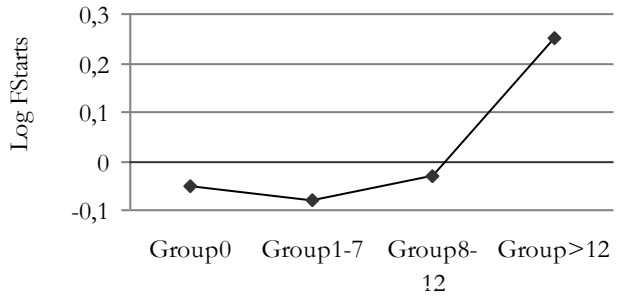


Figure 5.5 Occurrences of FStarts per 100 words, log transformed data

The differences among the occurrences of Corrs, Reps and Refs were not significant for any of the three variables: Corrs ($F(3,47) = 2.052$, $p > .05$), Reps ($F(3,47) = 1.852$, $p > .05$) and Refs ($F(3,47) = 1.224$, $p > .05$).

Hesitations and Disfluency markers: distribution

The next step in the analysis was to explore the distribution of disfluency and hesitation markers, i.e. whether they appeared predominantly before a certain part of speech, N, V, etc. or were equally distributed. Since the changes in the incidences of Corrs and Refs were not significant, and the placement of FStarts could not be calculated due to limitations in the MOR program, only the distribution of FPs and Reps per 100 words was explored.

As in the LG analysis, nine word classes were specified: adjectives (ADJ), adverbs (ADV), articles (ART), conjunctions (CONJ), interjections (ITJ), nouns (N), prepositions (PREP), pronouns (PRO) and verbs (V) and pseudo words (PS), FL words (FL), FPs and Reps. All other words such as numbers, proper names, etc. were gathered under the common heading 'others' (OTH). Table 5.11 lists the statistics: mean and standard deviation per group for each element following a FP per 100 words. It can be seen that the attriting groups used more FPs in front of every word class and element than the baseline group. The increase across different element was not different though. Another interesting observation was that Group8-12 sometimes used more FPs in front of a particular element than Group>12.

Table 5.11 Element following FPs per 100 word of spoken speech

	Group0		*Group1-7*		*Group8-12*		*Group>12*	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
ADJ*	0.053	0.068	0.082	0.094	0.156	0.129	0.137	0.093
ADV*	0.310	0.295	0.508	0.329	0.741	0.528	0.781	0.604
ART*	0.144	0.150	0.245	0.206	0.466	0.337	0.375	0.254
CONJ*	0.096	0.108	0.152	0.164	0.274	0.222	0.243	0.251
ITJ	0.148	0.153	0.149	0.153	0.208	0.172	0.132	0.122
N*	0.318	0.414	0.381	0.232	0.595	0.410	0.658	0.466
PREP	0.302	0.220	0.368	0.170	0.550	0.386	0.468	0.359
PRO	0.056	0.056	0.115	0.150	0.121	0.122	0.150	0.144
V*	0.438	0.546	0.670	0.411	1.126	0.619	1.081	0.681
OTH*	0.268	0.372	0.337	0.219	0.441	0.330	0.361	0.272
PSW	0.015	0.032	0.027	0.058	0.017	0.034	0.039	0.060
FLW*	0.032	0.087	0.109	0.129	0.066	0.107	0.205	0.273
FPs*	0.106	0.210	0.164	0.101	0.278	0.408	0.504	0.546
Reps*	0.056	0.059	0.165	0.130	0.146	0.134	0.284	0.323

*$p < .05$

The differences between groups were explored with a Jonckheere test. The Jonckheere test is a non-parametric statistic which tests whether the medians across groups come in an ordered pattern. In order to do so, the data should be coded in a meaningful way, that is in a decreasing or increasing order, according to the expectations and predictions made. As a consequence the Jonckheere test is always one-tailed. The Jonckheere test showed that the increase in the number of FPs in front of almost every word class was significant: ADJ (J = 645.5, z = 2.729, r = .38); ADV (J = 659.5, z = 2.921, r = .41); ART (J = 667.5, z = 3.056, r = .43); CONJ (J = 637.5, z = 2.564, r = .34); N (J = 650, z = 2.761, r = .38) and finally V (J = 7684.5, z = 3.342, r = .47); OTH (J = 587.5, z = 1.712, r = .24); FLW (J = 623, z = 2.748, r = .35); FPs (J = 646.5, z = 2.720, r = .38) and Reps (J = 624.5, z = 2.369, r = .33);

Table 5.12 Comparison of elements preceded by FPs by groups

	Group0vs. Group1-7	*Group0 vs. Group8-12*	*Group0 vs. Group>12*
ADJ	U = 67.5, *n.s.*, r = -.18	U = 47.5, p = .008, r = -.45	U = 33.5, p = . 007, r = -.48
ADV	U = 50.5, *n.s.*, r = -.34	U = 38, p = .003, r = -.52	U = 30, p = . 004, r = -.51
ART	U = 55 , *n.s.*, r = -.29	U =37 , p = .002, r = -.53	U = 30, p = .005, r = -.51
CONJ	U = 64.5 , *n.s.* , r = -.20	U = 44, p = .006, r = -.47	U = 42.5, *n.s.*, r = -.38
N	U = 54 , *n.s.,* r = -.30	U = 54, *n.s.*, r = -.38	U = 40, p = .015, r = -.41
V	U = 48, *n.s.*, r = -.36	U = 35, *n.s.*, r = -.55	U = 29, p = .004, r = -.53
OTH	U = 57, *n.s.*, r = -.27	U = 58, p = .033, r = -.36	U = 53, *n.s.*, r = -.26
FLW	U = 50.5, *n.s.*, r = -.39	U = 73, *n.s.*, r = -.26	U = 27, p = . 001, r = -.59
FPs	U = 37, p = .007, r = -.48	U = 62, *n.s.*, r = -.32	U = 34, p = .008, r = -.48
Reps	U = 441, p = .012, r = -.44	U = 59, *n.s.*, r = -.35	U = 43, *n.s.*, r = -.38

Mann-Whitney tests were then carried out to compare the occurrences across groups of FPs preceding the categories for which statistically significant increase was found. A Bonferroni correction[1] was applied

[1] Bonferroni correction ($\beta = \alpha / n$) was applied to all comparison between groups including the linguistic and psycholinguistic data

and data are reported at .01666 level of significance. The results are listed in Table 5.12.

As can be seen for the first comparison between Group0 and Group1-7, there was a significant difference only in the number of FPs proceeding FPs and Reps. For the second comparison, the number of pauses that Group 8-12 used in front of ADJ, ADV, ART and Conj had increased significantly in comparison to those used by the baseline group. In the third comparison, in the speech of Group>12 there were significantly more FPs in front of ADJ, ADV, ART, FPs, FL words, N and V than in the speech of Group0.

The distribution of Reps however, was not as affected as that of FPs. Descriptive statistics can be found in Appendix G. The only subsequent categories for which there was an increase in the number of Reps were FPs (J = 620, z = 2.318, r = -.38), Reps (J = 585, z = 1.667, r = .23) and FL words (J = 558.5, z = 2.044, r = .29). After applying a Bonferroni correction, the significance level was fixed at .01666 and Mann-Whitney tests revealed that none of the Reps preceding FPs (U = 43.5, *n.s.*, r = -.39), Reps (U = 43, *n.s.*, r = -.37) and FL words (U = 49, *n.s.*, r = -.41) in the speech of the attriting groups were significantly different in number form those in the control group.

5.4 C-test

This section presents the results from the C-test. Overall results, as well as results for the different parts of speech are provided. As mentioned in Chapter 3, the C-test was constructed with a focus on nouns and the parts-of-speech analysis, which is also reported here, provides for a comparison with the PNT (described in the next section), where participants were required to name objects, i.e. produce nouns, under time pressure and in response to a specific stimulus.

5.4.1 Scores analysis

An individual C-test score was calculated for each participant. This score was based on the words that were restored correctly (code 7) including spelling mistakes (code 6). Table 5.13 below shows descriptive statistics for the scores by groups and total. It shows that

Group0 achieved the highest score. Group1-7 got a lower score but was outperformed by Group8-12. Group>12 recorded the lowest result.

Table 5.13 C-test scores, descriptive statistics by group and total

Group	*N*	*Min*	*Max*	*Mean*	*SD*
Group0	14	39	57	51	5.3
Group1-7	12	32	58	44.7	7.4
Group8-12	14	30	57	47.5	7.2
Group>12	11	34	56	44.3	8.9
Total	51	30	58	47.1	7.5

Figure 5.6 shows that in all groups there was considerable variance. Group1-7 and Group8-12 were normally distributed, while Group0 and Group>12 were skewed. The former was skewed negatively, i.e. the frequent scores were clustered to the higher end of the scale, and the latter positively, showing that the scores were clustered closer to the lower end of the scale. Despite the great variance, the lower boundary of Group0, Group1-7 and Group>12 were situated at the lower end of 30, whereas Group0's lower boundary lay at the higher end, showing a higher threshold for the minimum scores. The maximum scores across all groups were close to maximum indicating a ceiling effect.

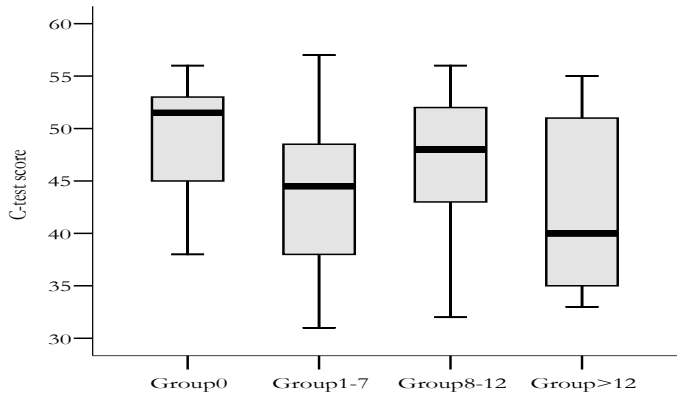


Figure 5.6 C-test scores by group, raw data

Since transformation did not help to normalize data distribution within groups, a Jonckheere test was used for analysis. The test revealed a significant decrease in scores across groups, $J = 380.5$, $z = -1.779$, $r = -0.24$. Two Man-Whitney tests were then used to compare

Group0 to Group1-7 and Group>12. A Bonferroni correction was applied and the results are reported at .025 level of significance. It appeared that the decrease in scores between Group0 and Group1-7 was significant (U = 37, p=.008, r = -.47), while the one between Group0 and Group>12 was only marginally significant (U = 45, p=.038, r = -.35).

5.4.2 Parts-of-speech analysis

The origin of the difference in scores across groups was then investigated, i.e. whether it was due to failure to correctly reconstruct one particular part-of-speech element or there was a decrease in the correct restoration across all part-of-speech categories and the results are listed in Table 5.14. It shows that for CONJ and PREP there was almost no difference across groups. There was a slight decrease in scores in ADJ, ADV, ART, PPO and CONTR. Finally, there was a slight variation in CONTR results: 1 for Group0 (since there was only one CONTR, this means that reconstruction of the item was at 100% success rate in this group), 0.9 for Group1-7 and Group8-12 and 0.7 for Group>12. The biggest change in item scores across groups was registered in N and V.

Table 5.14 Part-of-speech reconstruction across groups

	Group0 (n=14)		*Group1-7 (n=12)*		*Group8-12 (n=14)*		*Group>12 (n=11)*	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
N*	12.8	1.2	11.3	1.6	12.1	1.4	11.4	1.7
V*	11	3.2	8.1	3.4	9.9	2.6	7.9	4.0
ADJ	4.6	0.5	4.3	0.8	4.5	0.5	4.1	0.8
ADV	4.8	1.0	4.4	1.2	4.9	0.8	4.4	1.3
CONJ	3.9	0.4	3.6	0.7	3.8	0.4	3.8	0.4
PREP	3.7	0.6	3.9	0.3	3.7	0.6	3.7	0.5
ART	5.6	0.5	4.9	1.4	4.6	1.3	4.9	1.6
PRO	2.6	0.7	2.2	0.8	2.1	0.9	2.4	0.8
CONTR*	1	0	0.9	0.3	0.9	0.4	0.7	0.5

A Jonckheere test revealed the differences across groups for N, V and CONTR to be significant: J = 377.5, z = -1.866, r = -.26; J = 381.5, z = -1.770, r = -.24 and J = 416.5, z = -2.100, r = -.29, respectively. A Mann-Whitney test was employed to explore the differences between

Group0 and Group1-7 and Group>12 using a Bonferroni correction and reducing significance values to .025. The results obtained showed that for N and V, in both Group1-7 and Group>12 the correct restorations were significantly less than those in Group0. For nouns: U = 38.5, p=.009, r = -.47 and U = 37.5, p=.015, r = -.44, and for V: U = 42.5, p=.016, r = -.42 U = 41, p=.022, r = -.39, respectively for the two comparisons.

The restoration of CONTR in Group1-7 and Group>12 were found to be no statistically different from those in Group0 (U = 56, *ns*, r = -.40 and U = 56, *ns*, r = -.47, respectively).

5.5 Picture naming

This section presents the results of the PNT. First, the procedures followed to analyze the data are explained, then the scoring procedure and the measure calculated are described.

5.5.1 RT analyses

Reaction times which were coded with anything but Code 1 and/or were less than 400ms were again eliminated (Levelt & Schriefers, 1987) and were treated as missing data. The missing data in the RT analysis accounted for as much as 39.9%, so that almost half of the reaction times were not valid for RT analysis. The majority of the missing data was due to failures of the participants to provide a response (30.2% - Code 6) and malfunctioning of the microphone contributed with 9% (Codes 3, 4 and 5).

The data were analyzed considering the effect of frequency (low, medium and high) within (item analysis) and across groups (subject analysis). Reaction times and number of correct words were first explored taking frequency as a factor and then attrition group. It was expected that reaction times would increase and number of correct responses would decrease as frequency decreased (Hypothesis 5, Chapter 3). Also, if Hypothesis 4 was to be confirmed, the baseline group (Group0) was expected to record the fastest naming latencies and the highest number of correct responses, which would then increase/decrease for the other groups as months of attrition increased.

Item analysis

Mean reaction times for the three frequency levels were calculated for each group (Appendix H) and after applying log transformation to normalize the data (see Appendix I for normal and lognormal statistics), ANOVAs was used to explore the differences across the different frequency levels. The expected main effect of frequency was confirmed ($F(2,72) = 15.127$, $p < .001$, $r = .54$) and was present in all groups: $F(2,72) = 9.790$, $p < .001$, $r = .46$ for Group0; $F(2,72) = 3.677$, $p < .05$, $r = .31$ for Group1-7; $F(2,72) = 9.690$, $p < .001$, $r = .46$ for Group8-12 and $F(2,72) = 9.624$, $p < .001$, $r = .46$ for Group>12.

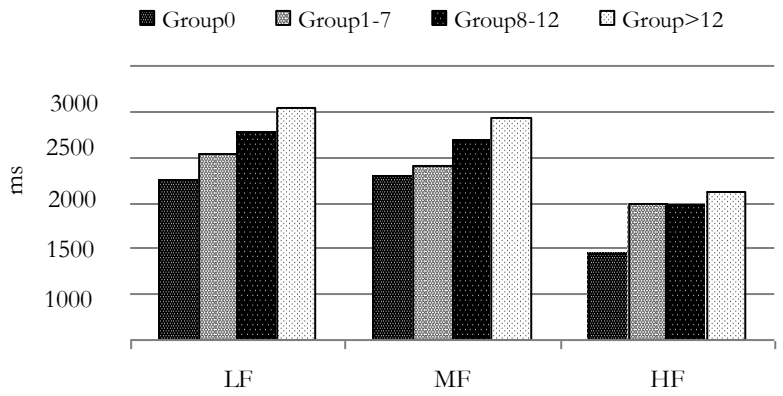


Figure 5.7 Lognormal RTs for the different frequency levels. LF – low frequency, MF – medium frequency, HF – high frequency

Following Hopkins (2000), Figure 5.7 shows the means of the log-transformed data with the values of the original raw data on the vertical axis. It can be seen that LF words took the longest to produce. MF naming latencies were quite close to those of LF items and HF words obtained the shortest reaction times in all groups, approximately 1000 ms faster, with the exception of Group1-7 where the difference was of 500ms.

Planned contrasts revealed that reaction times for HF items were significantly faster than latencies for LF ot MF items. For Group0 these differences were $t(72) = -3.738$, $p < .001$, $r = .40$ and $t(72) = -3.919$, $p < .001$, $r = .42$, low and medium frequency items respectively. For Group1-7 there was difference only between the LF and HF items: $t(72) = 2.779$, $p < .05$, $r = .31$. In Group8-12 and Group>12 both LF ($t(72) = -4.000$, $p < .001$, $r = -.43$ and $t(72) = -4.027$, $p <$

.001, r = -.43, respectively for the two groups) and MF (and $t(72)$ = -3.592, p = .001, r = .40 and $t(72)$ = - 3.506, p = .001, r = .38) differed from the HF condition. This showed that naming latencies increased as level of frequency decreased. This confirmed the expectation that HF words would be named faster (Hypothesis 4).

Subject analysis

Mean reaction times and standard deviations for the subject analysis are presented in Table 5.15.

Table 5.15 RTs for the different groups, in ms, raw data subject analysis. (SD in brackets). HF – high frequency, MF – medium frequency, LF – low frequency, AV - average

	Group0 (14)	*Group1-7 (12)*	*Group8-12 (14)*	*Group>12 (11)*	*Total (51)*
LF	2583 (1107)	2813 (762)	3230 (1287)	3335 (976)	2977 (1079)
MF	2479 (1225)	2691(997)	2734 (955)	3249 (756)	2765 (1018)
HF	1631 (479)	2051 (558)	1930 (429)	2200 (478)	1934 (516)
AV	2111 (636)	2440 (629)	2492 (679)	2797 (545)	2441 (657)

Distribution analysis by means of histograms and Shapiro-Wilk test showed that LF naming latencies were negatively skewed in one group and MF reaction times in two of the groups. Log transformation was applied to normalize the data in both variables (see Appendix I for normal and lognormal statistics). In order to be able to make comparisons, data in the other two frequency levels (HF and LF) were also log transformed.

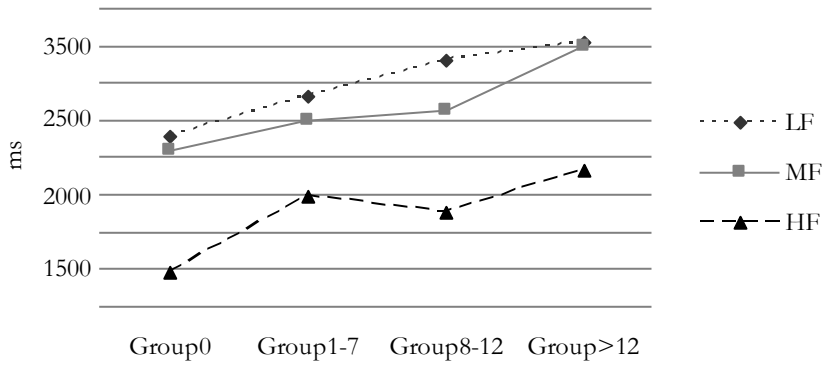


Figure 5.8 Lognormal RTs across groups. LF – low frequency, MF – medium frequency, HF – high frequency

Figure 5.8 illustrates the interaction of LoA and frequency (log transformed data with raw data values on the vertical axis). It can be seen that the baseline group (Group0) was the fastest to name the pictures in the three frequency conditions and Group>12, with the longest LoA, was the slowest. For LF and MF items the increase in reaction times was more or less gradual. For HF items though, Group8-12 not only was not slower than Group1-7 but was actually faster.

A main effect of LoA was found ($F(3,47) = 2.871$, $p < .05$, $r = .39$). Planned contrasts showed that for the HF condition, naming latencies for Group0 were significantly faster than reaction times of Group1-7 ($t(47) = 2.355$, $p < .05$, $r = .33$) and Group>12 ($t(47) = 3.125$, $p < .01$, $r = .42$). For the MF and LF conditions, Group0 again named the items significantly faster than Group>12: $t(47) = 2.342$, $p < .05$, $r = .32$ and $t(47) = 2.064$, $p < .05$, $r = .29$.

5.5.2 Percent correct responses analyses

The analysis of the percent correct responses was calculated on the basis of responses that matched the target (Code 1) and mispronounced words (Code 12) that were identifiable as the target. For the item analysis (with frequency as a factor) the percent correct scores for LF, MF and HF items, as well as an average for all items were calculated.For the group analysis (with group as a factor), individual percent correct scores for each participant were calculated for LF, MF and HF items as well as an average for the whole task.

Item analysis

Percent correct scores per frequency level were calculated for the four groups (see Appendix H). Distribution was explored and found to be non-normal but transformations did not help normalize it. Thus, non-parametric tests were used to explore the differences in the percent correct scores across the different frequency conditions.

Figure 5.9 shows that LF items obtained the lowest percent correct responses and HF items the highest. Correct responses for the MF condition seemed to have increased only slightly with respect to the LF condition. This trend for an increase in percent correct scores as frequency of items increased was confirmed by a Jonckheere test. This was observed in all groups: $J = 1462$, $z = 5.129$, $r = .59$, $J = 1415.5$, $z = 4.670$, $r = .54$, $J = 1456.5$, $z = 5.065$, $r = .58$, $J = 1495.5$, $z = 5.459$, $r = .63$, respectively for Group0, Group1-7, Group8-12 and Group>12. After applying a Bonferroni correction ($p = .05/3 = .0167$) three Mann-Whitney tests were used to follow up the analysis. As in the RT analyses, significant differences were found for the percent correct responses in the LF and HF condition on the one hand and the MF and HF conditions on the other.

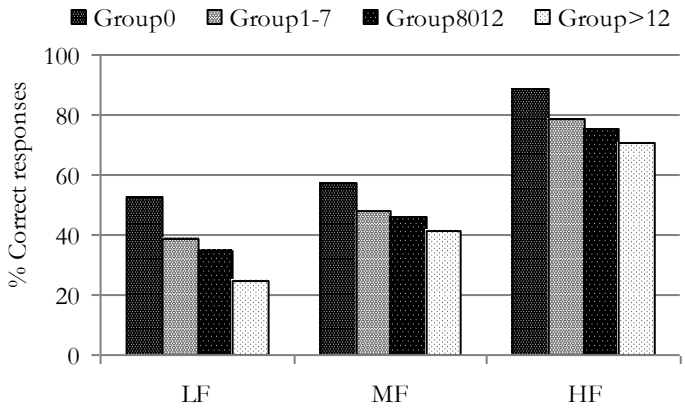


Figure 5.9 Percent correct responses for the different frequency levels. LF – low frequency, MF – medium frequency, HF – high frequency

For Group0, the difference in percent correct responses between the LW and HF condition was $U = 43.5$, $z = -5.257$, $r = -.74$ and for the MF and HF condition $U = 99$, $z = -4.186$, $r = -.59$. For Group1, there was also a significant difference in the percent correct responses for the LF and HF items ($U = 64.5$, $z = -4.835$, $r = -.68$) and the MF and HF items ($U = 133.5$, $z = -3.493$, $r = -.49$). The same pattern was found in Group8-12 ($U = 50$, $z = -5.109$, $r = -.72$ and $U = 129$, $z = -3.575$, $r = -.50$, respectively for the LF-HF and MF-HF conditions) and Group>12 ($U = 34$, $z = -5.432$, $r = -.77$ *and* $U = 132.5$, $z = -3.516$, $r = -.49$, respectively for the LF-HF and MF-HF conditions).

Subject analysis

Percent correct responses per group, minimum and maximum percent scores and standard deviations are listed in Table 5.16. ANOVAs revealed a significant main effect for LoA across groups ($F(3,47) = 4.51$, $p = .007$, $r = .47$). There was a significant linear trend indicating that percent correct responses decreased as months of attrition increased across groups. As the table shows, Group0 performed the best and obtained the highest percent correct responses across the three frequency levels. Group>12 was the one that got the least percentage of correct responses again for all frequency levels.

Table 5.16 Percent correct responses across groups. LF – low frequency, MF – medium frequency, HF – high frequency

Group	*N*	*LF (SD)* *Min-Max*	*MF (SD)* *Min-Max*	*HF (SD)* *Min-Max*	*Av (SD)* *Min-Max*
Group0	14	53 (21) 4-88	57 (15) 24-80	88 (8) 68-90	66 (13) 32-85
Group1-7	12	39 (20) 12-68	48 (18) 16-80	78 (13) 56-96	55 (16) 32-79
Group8-12	14	35 (18) 8-64	46 (17) 28-80	75 (12) 56-92	52 (14) 35-79
Group>12	11	25 (14) 4-48	41 (17) 16-68	71 (17) 40-92	45 (15) 21-65
Total	51	38 (21) 4-88	48 (17) 16-80	79 (14) 40-96	55 (16) 21-85

Planned contrasts showed that for the HF condition, the percent correct responses in Group0 differed significantly from those in the other three groups: Group1-7 ($t(47) = -2.157$, $p < .05$, $r = .09$); Group8-12 ($t(47) = -2.964$, $p < .01$, $r = .16$) and Group>12 ($t(47) = -3.426$, $p < .01$, $r = .20$). For MF items, Group0 produced significantly more correct responses than Group>12 ($t(47) = -2.412$, $p < .05$, $r = .10$). Finally, in the LF condition, Group0 again obtained significantly more correct responses than Group8-12 ($t(47) = -2.579$, $p < .05$, $r = .12$) and Group>12 ($t(47) = -3.721$, $p < .05$, $r = .23$).

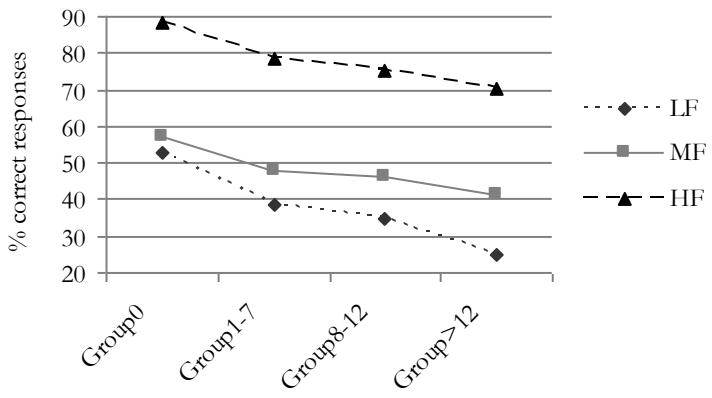


Figure 5.10 Percent correct responses, interaction of LoA by frequency level

Figure 5.10 shows the interaction of LoA and frequency level. This figure looks quite like the reversed Figure 5.10 with the naming latencies from the previous section. The percent correct scores for the LF and MF items were again clustered closer together and were situated at the lower end of the scale, while the scores for the HF items were separated by 30% more on average in all frequency levels. Also, while for HF and MF items the decrease in percent correct scores seemed to be more or less constant, the decrease in correct LF items was more accentuated.

5.6 Correlations

This section presents the results from the correlation analyses between the different linguistic measures and the background and predictor variables. The variables that were calculated on the basis of the oral data (Section 5.3) and the C-test (Section 5.4) included:

- C-test score
- Lexical diversity (D)
- Number of:
  - false starts (FStarts)
  - filled pauses (FPs)
  - repetitions (Reps)
  - corrections (Corrs)
  - reformulations (Refs)
  - FL words

The Psycholinguistic experiment – picture naming (Section 5.5), produced two measures:

- Reaction times (RTs)
- Percent correct responses

The variables from the background section in the Sociolinguistic questionnaire (Section 5.1) and the can-do-Scales (Section 5.2.1) that were included in the analyses were:

- Duration of SA (DSA)
- Length of Attrition (LoA)
- Initial Proficiency (InProf)

The attitudinal variables, calculated on the basis of the AMQ (Section 5.2.2), which were used in the analyses were:

- Attitude and integrative orientation (AIO)
- Interest in foreign languages (IFL)
- Instrumental orientation (InstO)

Finally, the amount of contact with the language after the onset of attrition based on the section on Linguistic experience in the Sociolinguistic questionnaire (Section 5.2.3) provided five measures:

- Spanish for entertainment (SPE)
- Spanish for social purposes (SPS)
- Use of English (EN)
- L1 for social purposes (L1S)
- L1 for communication (L1C)

The relationship between the experimental variables and the predictor and background variables was explored by means of Pearson correlations. In the following sections the results of the of the correlations with the different linguistic measures will be presented, first for the C-test, Lexical diversity and Oral data measures (Section 5.6.1) and then for the variables from the psycholinguistic task (Section 5.6.2). The complete correlation analyses for can be found in Appendix J.

5.6.1 Oral data and C-test

Background variables

Table 5.17 shows the bivariate correlations between the C-test, the Lexical diversity measure D, and the measures from the oral data. The correlations showed that duration of attrition did not correlate significantly with any of the linguistic measures, while duration of SA correlated significantly with the number of Corrs. Initial proficiency, on the other hand, correlated significantly with the C-test and the lexical diversity score, as well as with almost all measures from the oral data: FPs, FStarts, Corrs and FL words.

Table 5.17 Correlations of background variables with C-test score, lexical diversity (D) and oral data measures. DSA - Duration SA, LoA – Length of attrition; InProf - Initial Proficiency

	C-test	*D*	*Oral Data*					
			FStarts	*FPs*	*Reps*	*Corrs*	*Refs*	*FL words*
DSA	n.s.	n.s.	n.s.	n.s.	n.s.	-.290*	n.s.	n.s.
LoA	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
InProf	.424**	.394**	-.387**	-.464**	n.s.	-.320*	n.s.	-.383**

* p=<.05; ** p=<.01; n.s. – non significant

Partial correlations that were calculated to control for the possible role of initial proficiency did not differ from the correlations reported above. These results indicate that people with higher initial proficiency obtained a higher result on the C-test and a higher score on the lexical diversity measure. Participants with higher initial proficiency also produced less FPs, less FStarts, correlations and FL words.

Attitudinal variables

The correlations of the attitudinal variables, which were calculated on the basis of the AMQ, are listed in Table 5.18. Attitude and integrative orientation correlated positively with the lexical diversity measure and negatively with FPs and FLwords, suggesting that people with more positive attitude and higher integrative orientation got a better score on the lexical diversity measure and produced less FPs and less FL words. A significant positive correlation was found for interest in FL with the C-test results. Interest in FL was also negatively correlated with FPs, FStarts and FL words.

Table 5.18 Correlations of attitudinal variables with C-test score, lexical diversity (D) and oral data measures. AIO - attitude and integrative orientation; IFL - interest in foreign language; InstO - instrumental orientation

	C-test	*D*	*FStarts*	*FPs*	*Reps*	*Corrs*	*Refs*	*FL words*
AIO	n.s.	.309*	n.s.	-.439**	n.s.	n.s.	n.s.	-.288*
IFL	.312*	n.s.	-.325*	-.391**	n.s.	n.s.	n.s.	-.357*
InstO	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

* p=<.05; ** p=<.01; n.s. – non significant

These results imply that participants with a higher interest in FL performed better at the C-test and at the oral task by producing less disfluency phenomena.

Language contact variables

Finally, the five language contact variables were correlated with the C-test, the measure for lexical diversity and the different measures from the oral data (Table 5.19). Only two correlations were registered, one concerning use of English and the C-test result and another one for use of L1 for social purposes and the occurrences of Corrs in free speech, suggesting that more use of English was related to lower scores on the C-test and more use of the L1 for social purposes to higher incidence of Corrs.

Table 5.19 Correlations of Language use variables with C-test score, lexical diversity (D) and oral data measures. SPE – Spanish for Entertainment; SPS – Spanish for Social purposes; EN – use of English; L1S – Use of L1 for Social purposes; L1C – Use of L1 for Communication

	C-test	*D*	*FStarts*	*FPs*	*Reps*	*Corrs*	*Refs*	*FL words*
SPE	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
SPS	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
EN	-.283*	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
L1S	n.s.	n.s.	n.s.	n.s.	n.s.	.372**	n.s.	n.s.
L1C	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

* p=<.05; ** p=<.01; n.s. – non significant

5.6.2 Picture naming

Background variables

Correlations for the psycholinguistic measures and the background variables are presented in Table 5.20. Duration of SA was found to correlate with some of the measures in the percent correct responses.

Table 5.20 Correlations of background variables with psycholinguistic measures. DSA - Duration SA, LoA – Length of attrition, InProf - Initial Proficiency

	Reaction Times			*Percent correct*		
	LF	*MF*	*HF*	*LF*	*MF*	*HF*
DSA	n.s.	n.s.	n.s.	.328**	.461**	n.s.
LoA	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
InProf	n.s.	-.374**	-.300*	.425**	.535**	.475**

* p=<.05; ** p=<.01; n.s. – non significant

A positive correlation was registered with low and medium frequency items, signaling that longer stay in the country was related to higher percent of correctly named stimuli in the picture naming task. Duration of attrition did not correlate with any of the measures in the psycholinguistic task, while initial proficiency correlated both with the reaction naming latencies and the percent correct responses in the naming experiment. Apparently, higher initial proficiency implied faster reaction times in the medium and high frequency condition and higher percent correctly named words in all frequency conditions.

Attitudinal variables

Table 5.21 below, where the correlations of the attitudinal variables with the measures from the psycholinguistic task are listed, shows that there were just three significant correlations. A significant negative correlation was found for attitude and integrative orientation and the low and medium frequency levels of the reaction time measures. The third, positive, correlation was with the low frequency level of percent correct responses. The results signal that positive attitude and integrative orientation are related to faster naming latencies and higher percent correctly named words, at least in the low and medium frequency conditions.

Table 5.21 Correlations of attitudinal variables with psycholinguistic measures. AIO-attitude and integrative orientation; IFL-interest in foreign languages; InstO-instrumental orientation

	Reaction Times			*Percent correct*		
	LF	*MF*	*HF*	*LF*	*MF*	*HF*
AIO	-.313*	-.295*	n.s.	.278*	n.s.	n.s.
IFL	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
InstO	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

* p=<.05; ** p=<.01; n.s. – non significant

Language contact variables

Not many significant correlations were found for the language contact variables either (Table 5.22). Use of English was the only variable that correlated negatively with the low and medium frequency condition in the percent correct responses, indicating that more use of English suggested lower percent of correctly named words in the low and medium frequency conditions.

Table 5.22 Correlations of language contact variables with psycholinguistic measures. SPE – Spanish for Entertainment; SPS – Spanish for Social purposes; EN – use of English; L1S – Use of L1 for Social purposes; L1C – Use of L1 for Communication

	Reaction Times			*Percent correct*		
	LF	*MF*	*HF*	*LF*	*MF*	*HF*
SPE	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
SPS	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
EN	n.s.	n.s.	n.s.	-.331*	-.413*	n.s.
L1S	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
L1C	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

* p=<.05; ** p=<.01; n.s. – non significant

The analyses of correlations of the background and predictor variables with the linguistic measures provided a useful initial insight into the factors involved in the language attrition process. Initial proficiency was the variable that was found to correlate the most with the linguistic measures: it correlated with 11 of the 14 measures. Also, attitudinal and contact predictor variables seemed to correlate more with the measures from the oral data, that is the free speech data, than with the psycholinguistic data.

In order to investigate the extent to which language attrition can be predicted by the variables used, regression analyses were carried out and these are described in the next section.

5.7 Regression analyses

To investigate the influence of the predictor variables, i.e. initial proficiency, LoA, length of stay, attitude and motivation and language contact, and see to what extent they could explain the difference in scores reported in the previous section, hierarchical multiple regression analyses were done.

To keep the ratio of sample size to number of variables equal to 10 or 15 (Field, 2005), four hierarchical regression analyses were carried out for each dependent variable: Lexical diversity, C-test, RTs (HF, MF and LF items and mean RT), hesitation and disfluency markers (Reps, Refs, Corrs, FPs, FStarts and All hesitations) and percent correct responses (HF, MF and LF items and mean percentage). Predictor variables were entered each one in a separate step so that each variable's contribution to the model could be assessed. In the first regression analysis three predictor variables were entered: initial proficiency (InProf), length of attrition (LoA) and duration of SA (DSA). The second regression analysis consisted of the three attitude and motivation factors: attitude and integrative orientation (AIO), interest in foreign languages (IFL) and instrumental orientation (InstO). In the third regression the five factors focusing on language contact (Spanish for entertainment (SPE), Spanish for social purposes (SPS), Use of English (ENG), L1 for social purposes (L1S) and L1 for communication (L1C) were used as predictor variable. The fourth regression was the final model where the variables with the highest contribution to the previous analyses were employed in the building of the model. Detailed information about the regressions run for each dependent variable with R^2 change values for each step is available in Appendix K. The final model which was built for each variable will be discussed below.

5.7.1 Oral data and C-test

Table 5.23 summarises the regression models for the lexical diversity measure and the number of FL words. Only two variables were selected as predictors for the lexical diversity (D) score: initial proficiency (β = .354, p < .05) and duration of SA (β = .184, n.s.). This model explained 19% of the variance. Higher initial proficiency

and longer stay in the country were related to higher scores on the lexical diversity measure.

Table 5.23 Multiple linear regression, D and FL words. DSA - Duration SA, LoA – Length of attrition, InProf - Initial Proficiency, AIO, AIO-attitude and integrative orientation; IFL-interest in foreign languages; InstO-instrumental orientation

	D (β)	*FL words (β)*
DSA	-	-
LoA	.184 n.s.	.239 n.s.
InProf	.354*	-.297*
AIO	-	-
IFL	-	-.285*
InstO	-	-
	R^2 = .188	R^2 =.279
	$F(2,48)$ = 5.554 **	$F(3,47)$ = 6.073**

*p=<.05; ** p=<.01; n.s. – non significant

Reciprocal transformation was applied to the measure of FL words to correct for the moderate negative skewness. Three variables were then chosen for the final regression model: initial proficiency (β = -.297, p < .05), interest in foreign languages (β = -.285, p < .05) and LoA (β = .239, *n.s.*). This model accounted for 28% of the variance. Higher initial proficiency and interest in foreign languages were associated with less FL words, while a longer LoA was related to more FL words.

Log and log+1 transformations were applied to the hesitation and disfluency measures to reduce skewness and improve linearity. Results from the regression models are listed in Table 5.24. In the preliminary correlation analysis Reps did not correlate with any of the predictor variables and in the regression analyses no predictor variables produced a model that significantly predicted the dependent variable. Corrs were found to be significantly predicted by only one variable – use of L1 for social purposes (β =.342, p < .05) but the inclusion of initial proficiency in the final regression model (β = -.283, p < .05) helped improve it. This model explained 22% of the variance. More frequent use of L1 for social purposes and lower initial proficiency were related to higher incidence of Corrs.

Table 5.24 Multiple linear regression, Corrs, FPs, Refs and FStarts. DSA - Duration SA; LoA – Length of attrition; InProf - Initial Proficiency; AIO-attitude and integrative orientation; IFL-interest in foreign languages; InstO-instrumental orientation SPE – Spanish for Entertainment; SPS – Spanish for Social purposes; EN – use of English; L1S – Use of L1 for Social purposes; L1C – Use of L1 for Communication

	Corrs (β)	*Refs (β)*	*FStarts (β)*	*FPs (β)*
DSA	-	.205 n.s.	-	-
LoA	-	-.258 n.s.	-	-
InProf	-.283*	-	-.387**	-.339*
AIO	-	-	-	-.296*
IFL	-	-	-	-
InstO	-	-	-	-
SPE	-	.258 n.s.	-	-
SPS	-	.330*	-	-
EN	-	-	-	-
L1S	.342*	-	-	-
L1C	-	-	-	-
	R^2 = .218	R^2 = .199	R^2 = .150	R^2 = .287
	F(2,48)=6.678**	*F*(4,46) = 2.865*	*F*(1,49) =8.625**	*F*(2,48)=9.683***

* p=<.05; ** p=<.01; *** p=<.001; n.s. – non significant

Although after the first regression analyses the use of Spanish for social purposes (β = .330, p < .05) came up as the only significant predictor of Refs, the final regression model was improved by the inclusion of Spanish for entertainment (β = .258, *n.s.*), LoA (β = -.258, *n.s.*) and duration of SA (β = .205, *n.s.*). This model explained 20% of the variance in Refs (F(2, 48) = 6.678, p < .01). Frequent use of Spanish for social purposes and entertainment and longer SA duration led to more frequent use of Refs. Longer periods of attrition and were associated with less Refs. Initial proficiency (β = -.387, p < .01) explained 15% of the variance in with FStarts. Lower initial proficiency was related to more FStarts.

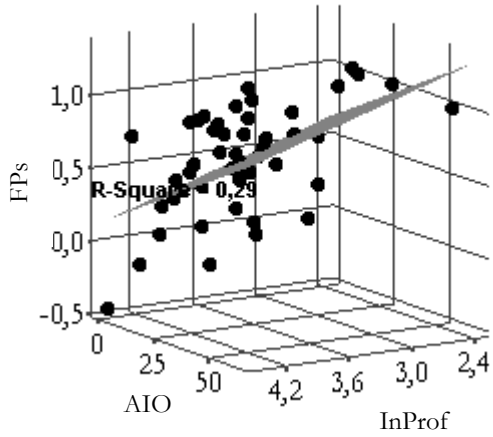


Figure 5.11 Regression model, FPs

Two predictor variables were chosen for the final model of FPs. These included initial proficiency (β = -.339, p < .05) and attitude and integrative orientation (β = -.296, p < .05). 29% of the variance was explained with this model where lower initial proficiency and lower attitude and integrative orientation were associated with more pauses as shown on Figure 5.11.

The C-test

For the C-test score two variables, initial proficiency (β = .492, p < .001) and InstO (β = .313, p < .05) were chosen as predictors. A regression model with these variables explained 29% of the variance (F(2, 48) = 10.008, p<.001). Higher initial proficiency and stronger instrumental orientation were associated with higher C-test scores.

5.7.2 Picture naming

Evaluation of assumptions resulted in transformation of some of the variables to reduce skewedness and improve normality of residuals. A log transformation was applied to the three conditions (HF, MF and LF) in the RT data. In the percent correct responses measures, the HF condition variable had a high negative kurtosis and transformations did not help improve it; it was not transformed.

RT measures

Table 5.25 Multiple linear regression models, HF, MF and LF RTs. DSA - Duration SA; LoA – Length of attrition; InProf - Initial Proficiency; AIO-attitude and integrative orientation; IFL-interest in foreign languages; InstO-instrumental orientation SPE – Spanish for Entertainment; SPS – Spanish for Social purposes; EN – use of English; L1S – Use of L1 for Social purposes; L1C – Use of L1 for Communication

	HF RT (β)	*MF RT (β)*	*LF RT (β)*
DSA	-	-	-
LoA	-	-	-
InProf	-.300*	-.347**	-.151 n.s.
AIO	-	-	-.250 n.s.
IFL	-	-	-
InstO	-	-	-
SPE	-	-	-
SPS	-	-	-
EN	-	-	-
L1S	-	-	-
L1C	-	-	-
	R^2 = .090	R^2 = .140	R^2 = .117
	F(1,49)=4.836*	*F*(1,49) =7.965**	*F*(2,48) =3.182*

* p=<.05; ** p=<.01; *** p=<.001; n.s. – non significant

For the HF condition in the reaction time part of the PNT no factors came out as significant predictors of variance with the first three regression analysis. The final model was built with one predictor variable: initial proficiency (β = -.300, p < .05), which explained 10% of the variance (Table 5.25). Lower initial proficiency were associated with longer naming latencies. The language contact factors did not seem to play a role for the variance in HF reaction times, as neither did the motivational factors.

Initial proficiency made a significant contribution to the MF condition and the regression model created with it (β = -.374, p < .01) accounted for 14% of the variance. Thus low initial proficiency was related to higher reaction times for the MF items. For the LF condition, the attitude and integrative orientation factor came out as a significant predictor. A regression model with it (β = -.250, *n.s.*) and initial proficiency (β = -.151, *n.s.*) explained 12% of the variance in the mean reaction times for the LF condition. Positive attitude and high integrative orientation and high initial proficiency were associated with faster reaction times in the LF variable.

Percent correct responses

In the percent correct responses part (Table 5.26), there was only one significant predictor variables in the HF condition. A regression model including initial proficiency (β = .515, p < .001) explained 27% of the variance in the percent HF correct answers. Higher initial proficiency was related to higher percent correct naming of HF items.

Table 5.26 Multiple linear regression models, HF, MF and LF percent correct responses. DSA - Duration SA; LoA – Length of attrition; InProf - Initial Proficiency; AIO-attitude and integrative orientation; IFL-interest in foreign languages; InstO-instrumental orientation SPE – Spanish for Entertainment; SPS – Spanish for Social purposes; EN – use of English; L1S – Use of L1 for Social purposes; L1C – Use of L1 for Communication

	HF % (β)	*MF % (β)*	*LF % (β)*
DSA	-	.261*	-
LoA	-	-	-
InProf	.515***	.460***	.374*
AIO	-	-	.121, n.s.
IFL	-	-	-
InstO	-	-	-
SPE	-	-	-
SPS	-	-	-
EN	-	-.297*	-
L1S	-	-	-
L1C	-	-	-
	R^2 = .266	R^2 = .489	R^2 = .193
	F(1,49)=17.714***	F(3,47) =14.977***	F(2,48) =5.731**

* p=<.05; ** p=<.01; *** p=<.001; n.s. – non significant

Three variables made a significant contribution to the variance in the MF condition: initial proficiency, duration of SA and use of English. A regression model including initial proficiency (β = .460, p < .000), SA duration (β = .261, p < .05) and use of English (β = -.297, p < .05) explained 49% of the variance (Table 5.26). Higher initial proficiency and longer SA were associated with higher percent correctly named MF items. Use of English led to a lower percentage in the correctly named word. Finally, for the LF condition initial proficiency (β = .374, p < .05) and AIO (β = .121, *n.s.*) explained 19% of the variance. Higher initial proficiency and positive attitude were related to higher percentage correct responses in the LF condition.

5.8 Summary of results

This chapter focused on the CS analyses of the data. In the oral data an increased use of FL words, FPs and FStarts was found as LoA increased. Also, the distribution of FPs changed across groups: an overuse of FPs preceding lexical elements and articles was observed for the group with the longest LoA. Although not significant, a tendency for lower lexical diversity was registered. The scores on the C-test also got lower as months of attrition increased. Finally, in the PNT, a main effect of LoA was found in the reaction time section and in the percent correct responses. This effect was visible across the three frequency levels.

The regression analysis showed that Attitude and instrumental orientation and Initial proficiency in particular were the two strongest predictors of attrition. They contributed to 4 and 11 regression analyses respectively. Duration of SA was involved in 3 models. Instrumental orientation was included in one regression model (C-test), while the language contact factors, were used once each with the exception of L1 for communication which was not included in any model. It is interesting to note that LoA was included in three models but not as a significant predictor.

6
Summary of results and discussion

This chapter summarises and discusses the results of the study (presented in more detail in chapters 4 and 5). In particular, it examines the results of each test in relation to the hypotheses made in chapter 3 and aims at providing an explanation for the patterns and phenomena observed. Both the LG (5 people over the span of one year) and CS data (three attriting groups with increasing LoA and a baseline group) are considered. The chapter follows the structure of the results chapters. It first looks into the results of the linguistic tasks – interview (section 6.1) and C-test (section 6.2) and then moves on to the psycholinguistic task (section 6.3). An interesting pattern found in the LG data is discussed before moving on to the factors influencing the process of attrition. The role of predictor variables is investigated in section 6.5. The research questions which were listed in Chapter 2 are discussed last since they consider questions for which no exact predictions were made and are of more general nature.

6.1 Oral data

The oral data were analysed for lexical diversity, frequency of hesitation and disfluency markers and their distribution within the sentence. In addition, word counts of the different classes of words produced at each data collection time (for the LG subsample) and by each group (for the CS analyses) were explored. It was expected, based on previous research on L1 and L2 attrition, that if attritional process were taking place and lexical access was compromised these would be manifested in oral production in a number of ways:

1) In the LG data a decrease in lexical diversity within subjects over time will be observed. There will be a decrease across groups in the CS data; the baseline group will obtain the highest result and the group with the longest LoA the lowest.

2) In the LG data, there will be an increase in disfluency phenomena over time. In the CS data, hesitation and disfluency markers will increase across groups in comparison to the baseline group.

3) The increase in disfluency markers will be mostly visible in front of lexical items.

The results from the analyses, both LG and CS, found evidence for the presence of attritional processes in all the measures that were explored. In the LG analyses, indications of attrition were found in the performance of almost all participants. In the CS analyses, the attriting groups systematically underperformed in comparison to the baseline group, especially so the group with the longest LoA, Group>12. In addition, word count showed an increased use of PS and FL words at T2 for three of the participants in the LG subsample (two at LoA approximately 12 months). In the CS data, although higher incidence of PS words was noted, it was not found to be significant. Regarding FL words, though, the group with the longest LoA produced significantly more FL items per 100 words in comparison to the baseline group. This increase in PS words and FL words can be explained with reduced lexical availability of the target language which forced the participants to revert to English when they could not access the necessary word in Spanish.

6.1.1 Lexical diversity

In relation to lexical diversity, the study found that, in line with hypothesis (1), there was evidence for a decrease in both the LG and CS data. In the LG data, lexical diversity decreased for all participants although to a different degree. What stands out is that for two of the people with approximately 12 months LoA, the decrease observed was very similar. On the whole, diversity decreased proportionally to LoA. Thus, the person with the longest LoA registered the largest decrease, the person with a medium LoA showed a medium decrease and the people with the shortest LoA had the slightest and very similar change in their score (with the exception of Núria, whose result hardly changed at all). This linear trend was also observed in the CS analysis where the baseline group registered the highest score and a gradual decrease across groups with increasing LoA was observed. Even though the difference in scores between the best and worst performing group was not very large and it was not found to be statistically significant, this decrease might be regarded as an indication of attritional processes affecting the availability of lexical items in oral production.

These results are in line with previous research which has found that lexical diversity in the speech of attriters can become compromised as a result of attrition (Olshtain & Barzilay, 1991; Schmid, 2002). What is interesting is the apparently linear trend observed, both in the LG and CS data. That is, attriters with longer periods of attrition seemed to experience a higher decrease in lexical diversity. However, further analyses showed that there was no correlation between length of attrition and lexical diversity, suggesting that this result might be due to the influence of other factors.

6.1.2 Hesitations and disfluency markers: occurrences

Manifestation of attrition was also found in the occurrences of hesitation and disfluency markers. An increase in these phenomena was observed for all participants in the LG subsample (except for Núria) and for the majority of markers in the speech of the attriting groups, thus providing support for hypothesis (2).

Filled pauses

FPs were affected the most both in the LG and CS data, followed by FStarts. In the LG data, a considerable increase in FPs was registered for three participants (two at LoA approximately 12 months), while the attriting groups in the CS analyses all used significantly more FPs than the control group.

This finding is especially interesting in view of Clark & Fox Tree's (2002) suggestion that FPs are actually used as conventional words, which have a specific communicative purpose. According to the authors, FPs are used by speakers to signal that they are looking for a word or deciding what to say next; accordingly, they can choose to prolong the filled pause if the upcoming delay is expected to be longer. The higher incidence of FPs which was found can thus be attributed to increasing difficulties with word access and retrieval that attriters face as attrition sets it. As attrition develops, attriters are more frequently faced with an inability to find the intended word and try to gain time by using FPs.

False starts

What was also found was that FStarts, which were the second most affected hesitation phenomenon, increased considerably in the speech of two participants in the LG sample, while moderate increase was registered for the other four attriters. In the CS data, the attriters with the longest LoA employed significantly more FStarts that the baseline group but there was no noticeable increase for the other two attriting groups. While the LG data seem difficult to interpret and are more likely to be a result of personal characteristics, the CS data might be indicative of deepening problems with lexical access. While in the first stages of attrition, difficulties to retrieve the word are mainly characterized by delayed lexical access as shown by the increased number of FPs, towards later stages attrition might be affecting the vocabulary register. In other words, in addition to problems with lexical access and retrieval, attriters may have problems in distinguishing the words, uttering an incorrect word which is then truncated to correct it for the required item.

In order to confirm this hypothesis however, further analyses will have to be carried out to establish whether FStarts consisted of *emerging* or *recycling* repair (Edmundus, 2006:204). The former refers to the replacement of an emerging word with a different one and the latter to the recycling of the emerging word either entirely or with some modification or replacement of some of its parts.

Repetitions, corrections and reformulations

A considerable increase in Reps (doubling) was found only in the speech of one attriter from the LG group; the results from the CS analysis were ambiguous, too: a quadratic trend was observed with a higher incidence of Reps, not significant, for the group with longest LoA. These results are hard to explain as they do not point to any pattern in particular. The results of the analysis of Corrs were also unclear. However, Corrs count consisted of all instances of Corrs made by the speaker, not necessarily 'correct' correction. Had such a distinction been made, the results of the analyses might have been different.

Finally, Refs was the category which underwent the smallest change in both data sets. For some participants in the LG data there was an

increase and for others a decrease. In the CS data the attriting groups employed less Refs than the controls. A possible explanation for this, at first sight bewildering finding, may be the fact that the ability to make Refs could be related to higher levels of proficiency. That is, in order to make an adequate and quick reformulation, the speakers first need to have a good command of the language, both lexically and syntactically. The avoidance of Refs might be indicating the attriters' diminishing ability to quickly and effectively find the appropriate synonyms and alternative structures, which match the context lexically and grammatically and allow for a reformulation to be made, thus pointing to attritional processes.

6.1.3 Hesitations and disfluency markers: distribution

Since the placement of FStarts could not be tracked and the changes in occurrences of Corrs and Refs was not significant, the analyses of distributions focused on FPs and Reps only. Even so, several interesting observations were made regarding the distribution of FPs and Reps which confirmed hypothesis (3).

Filled Pauses

For the LG sample it was found that for two attriters at T2, FPs increased considerably in front of four items: FPs, interjections, nouns and verbs. There was no change in the distribution for the other participants. In the CS data it was discovered that as LoA increased across groups, so did the number of part-of speech categories preceded by FPs. While at 1 to 7 months FPs preceded mainly other FPs and Reps, at 8-12 months they had increased significantly also in front of ADJ, ADV, ART and CONJ. Finally, for participants with LoA more than 12 months, there were significantly more FPs preceding ADJ, ADV, ART, FPs, PS words, N and V.

This increase in FPs preceding lexical items is likely to result from lexical access problems, where the participant tries to gain more time while searching for the right words, as suggested earlier in this chapter. This is especially visible in cases where the attriter failed to produce the desired word and ended up using a generic term (as exemplified in chapter 4) or used a FL or PS word. This build-up of FPs preceding an increasing number of word classes across groups points to deepening lexical access problems. While at the beginning these were

manifested mainly before other hesitation markers, the problems later spread to include all lexical word classes.

Moreover, the significant increase of FPs in front of ART that was found for the group with the longest LoA might be an indication that lexical access problems were not limited only to lexical items but possibly affected the whole NP (see Schmid & Beers Fägersten, 2010). In Spanish the article precedes the noun, which means that the speaker has to know in advance the gender and number of the noun that is going to be used later and plan the speech accordingly. Thus, language attrition might be affecting the ability to plan speech in advance.

Repetitions

The distribution of Reps, which did not change as dramatically as that of FPs, also provided for some interesting observations. An increase of Reps preceding ITJ, PRO and PREP was found in the speech of four participants from the LG sample. For the CS data, a higher incidence of Reps preceding FPs, Reps and FL words was observed in the attriting groups but it was not significant.

As was remarked earlier (see Chapter 4), the increase of Reps preceding PRO and PREP is not surprising and this is in line with previous research (Maclay & Osgood, 1959 cited in Edmunds, 2006), which has demonstrated that single word Reps are the most frequent in speakers of Spanish. However, the increase noted in the CS data is more likely to stem from reduced lexical access with Reps being used as a technique to gain time while searching for the right word. This is exemplified in the increased numbers of Reps followed by FL words. In other words, the attriter first used Reps in an attempt to gain more time while trying to retrieve a word but since this did not help, reverted to using a FL word.

6.2 C-test

Individual scores on the C-test were calculated on the basis of correct restoration of a gap (regardless of spelling errors). Only one hypothesis was made regarding the C-test, namely that language attrition could be detected though a decrease in C-test scores:

4) Scores on the C-test will decrease over time for the LG subsample and across groups for the CS data.

In this respect, some quite unexpected results were observed in the LG sample. Instead of the expected decrease, 3 out of 5 people actually obtained better results at T2. Clara's score did not change and interestingly Núria's score, for whom no signs of attrition were found in the oral data, was the only one that decreased, albeit very slightly. The results in the CS analysis were also quite surprising. The scores obtained by the group with LoA 1 to 7 months were significantly lower than those in the baseline group. This group was outperformed by the group with LoA 8 to 12 months and finally group>12 registered the lowest score which, however, did not turn out to be significantly different from the baseline group's results.

These results are interesting since a decrease in scores over time, rather than an increase, was expected for the attriting participants. It has to be noted, however, that there was no time limit to the task and obviously the participants performed very well when not under time pressure. Had a time component been added, the results might have been quite different. Also, the C-test consisted of one text of 50 gaps whereas the use of several texts with less gaps in each text might have been more appropriate.

Further analyses into the percent correct restorations per different word class, i.e. adjectives, verbs and nouns, and per group revealed that Group1-7 and Group>12 were able to restore correctly significantly less nouns, verbs and contractions than the baseline group. Since there was only one contraction this is not taken as an indication of reduced proficiency. Verbs and nouns, however constituted 24% and 26% respectively of all items in the text. Although the task was untimed and the participants could think about the required information at their leisure, they had problems filling in the gaps correctly. This is interpreted as an indication of reduced lexical access and in the case of verbs, limited morphological information. Spanish is an inflected language which requires different conjugation of the verb according to tense, mood, aspect and number and the speaker has to take into account the information provided. These results point to the fact that morphological information may also be vulnerable to attrition.

6.3 Picture naming

The picture naming task was employed to explore language processing in FL language attriters. Picture naming has been previously used in a number of studies on L1 attrition (Ammerlaan, 1996; Hulsen, 2000; Soesman, 1997) but so far it had not been applied to the study of FL attrition. The focus of the task was the lexicon, which under the Neurolinguistic Theory of Bilingualism (Paradis, 2004), discussed in Chapter 2, is assumed to be most susceptible to attrition. It was expected that, as attrition progressed, lexical access would become compromised, which would be demonstrated by an increasing inability to quickly and correctly name the stimuli in the Picture Naming task. Also, the effect of word frequency, which has been proven to be an important factor in psycholinguistic tasks, was explored.

The hypotheses that were put forward focused on the progress of lexical retrieval with respect to LoA and the effect of frequency:

5) Individual naming latencies will increase and percent correctly named words will decrease over time for the LG group. In the CS data, reaction times will increase and percent correct responses will decrease across groups; the baseline group will perform best, i.e. attain a higher percentage of correct words and faster naming latencies, whereas the other groups will obtain lower scores and slower naming latencies; groups with longer attrition periods will have lower scores and slower naming latencies.

6) High frequency words will be retained better and retrieved quicker. There will be more correctly named HF words than MF and LF words. HF words will also be named faster than MF and LF words. This frequency effect will be present in both the CS and LG data.

Mean reaction times in ms and percent correct responses were calculated for each participant and each data collection time. Two analyses, for subject and item, were carried out for each measure. The differences in reaction times and percent correct responses with respect to frequency level were analysed only qualitatively in the LG data (the sample consisted of only 5 people and was very heterogeneous), while the CS data were analysed by means of

ANOVAs (see Chapters 4 and 5 for the detailed analyses of the data, respectively).

The stimuli were divided into three frequency categories: low, medium and high. For the reaction time analyses, naming latencies faster than 400ms were excluded from the analyses as well as all other instances where problems with the microphone were registered, i.e. failure to trigger in time, triggering too early/late or not registering the reply at all. The percent correct responses consisted of all responses produced matching the target, including mispronounced words and irrespective of any problems with the registration of the reaction time.

The results from the reaction time and percent correct responses analyses of the LG sample supported hypothesis (5) only partially since only the expectations regarding naming latencies were upheld. As expected, a considerable increase in the naming latencies over time was found for all participants in the LG subsample. Interestingly, the participants at LoA approximately 12 months, including Núria, obtained similar results again. On the other hand, the person with the longest LoA (Sonia) registered the smallest increase in reaction time and the participant with medium LoA (Clara) obtained the highest increase. This might be a result of the fact that the participants did not name the same stimuli at the two data collection times and/or that the number of valid responses was different at each data collection point. However, a detailed look into Sonia's and Clara's data showed that this was not the case: the ratio of missing-valid data did not change drastically between the two data collection times - 40 to 34 % and 22 to 15% for T1 and T2 for Clara and Sonia respectively. It can also be assumed that these might be the result of an intricate relationship among personal and background factors. Sonia's background variables revealed that she continued using Spanish after the end of the SA - her language contact and use score was the second highest. Clara, on the other hand, was the one who had the most limited contact and use of Spanish. Another difference in the background characteristics was their proficiency level at the onset of attrition – Sonia's score was a full point higher than Clara's. There was hardly any difference between the participants' attitude and motivation.

However, the results from the percent correct responses analysis in the LG data were not as straightforward. The expected decrease was registered only for the participants with LoA approximately 12

months, while an increase was noted in the scores of the other two participants. These results are perplexing and difficult to account for. Although very unlikely, they might be a result of a test effect and individual memorizing ability. In other words, the increase in percent correct responses might be due to the fact that some of the participants remembered, maybe subconsciously, the stimuli from the first interview and although they could not produce faster responses they could name more items.

Statistical analyses of the CS data showed that, as expected in the second part of hypothesis (5), reaction times increased and percent correct responses decreased across groups. The baseline group performed best, while naming latencies increased and percent correct responses decreased across groups with increasing LoA. Interestingly, for both reaction times and percent correct responses the results for medium frequency items were not situated between high and low frequency items. They were actually closer to the low frequency stimuli. This increase in reaction times and decrease in the percent correct responses is seen as a result of compromised lexical access which leads to a slowing down of the retrieval and production.

It has to be noted that the reaction times that were registered in the PNT were considerably higher than the ones normally reported in naming experiments. Cuetos, Ellis and Alvarez (1999) reported mean naming latency for the Snodgrass and Vanderwart pictures in Spanish of 829 ms. These results, however, were obtained from native L1 Spanish monolingual speakers. Bilinguals, on the other hand, have been shown to be systematically slower when naming pictures (Gollan et al., 2005; Mägiste, 1979) even in their dominant language as demonstrated by Ivanova and Costa (2008). The authors explained this 'lexical access disadvantage' (2008: 287) with the effect of frequency of use: bilinguals do not use items with the same frequency as monolinguals do due to the fact that they use two languages. Similarly, naming latencies for second generation Dutch L1 attriters in New Zealand who were studied by Hulsen (2000) were in the range between 1,650 ms and 2,142 ms with mean of 1,910 ms. It therefore should come as no surprise that multilingual FL language attriters need considerably more time in order to access and retrieve words from a weaker and seldom used language.

Regarding hypothesis (6), the expected frequency effect was found in all frequency conditions across all groups in the CS data. In other words, high frequency words were named faster and more correctly than medium and low frequency words. This is in line with previous research (Ivanova & Costa, 2008, Jescheniak & Levelt, 1994, Shatzman & Schiller, 2004) where frequency has been found to facilitate lexical access. Not too many studies have used three levels of frequency, as usually only high and low frequency items are distinguished as in all the studies cited above. One interesting finding in this respect is that medium frequency naming latencies and percent correct responses were not situated between those of high and low items. Instead, they were much closer to the reaction times and percent correct responses of low frequency words.

In addition, at T1 in the LG data the participants of LoA approximately 12 months (Aleix, Oriol and Núria) were slower to name medium frequency words than low frequency items. This was repeated also at T2 in Alex's data. This result is quite intriguing. On the one hand, it might be due to the fact that the number of stimuli the participants were able to name for each frequency level differed and thus biased the results. Since the average is based on the number of items produced, if a higher number of medium frequency words is named, that might increase the mean RT, while having rapidly named only a few of the low frequency items might result in a faster RT. Further analyses however, showed that this was not the case. Another explanation might be that this was an effect of the properties of the stimuli, i.e. visual complexity, concept familiarity, etc. involved in the initial stages of picture naming. However, research on the locus of frequency has demonstrated that the frequency effect is independent of variables influencing the input stages (Almeida, Knobel, Finkebeiner & Caramazza, 2007). Also, if that were the case, these results should have also been observed across all groups in the results from the CS data

A third possibility is that the distinction between medium and low frequency becomes evident and starts gaining significance as attrition progresses but is not yet noticeable at such early stages. This idea is further supported by the fact that the baseline group in the CS analyses also named low frequency items slightly faster (127ms) than medium frequency items (See appendix S).

6.4 A note on LG data

Before proceeding to the discussion of the effect of the background variables on the linguistic and psycholinguistic measures and its implication for the hypothesis and research questions made, this section concerns itself with an interesting point which was noticed in the findings from the LG data, namely the pattern found for participants with LoA approximately a year.

In the oral data, similar results were registered in the lexical diversity measure, occurrences of FPs, Reps and FL words for two of the participants at 12 months LoA, Aleix and Oriol. Interestingly, no change in the oral performance of the third participant with a similar attrition period, Núria, was found. At T2 of the data collection she seemed to be as fluent as at T1: her lexical richness decreased hardly at all and no increase in hesitation and disfluency markers was noted in her speech. In the psycholinguistic data, however, the reaction times increased and percent correct responses decreased to a similar extent for the three participants, including Núria.

There are two points to be considered here. The first one is what might have caused this difference in oral performance and the second one, why this 'advantage' disappeared in the psycholinguistic task.

On the one hand, the personal characteristics of the participants might be playing a role here. A closer look into Núria's background information revealed that she had the highest initial proficiency score, the highest attitude and motivation score, as well as the most frequent ongoing contact with Spanish after the end of the SA. All these factors, individually or in a combination, might be contributing to her apparent lack of attrition in comparison to the other two participants in the oral task. In other words, background factors might be contributing to the retention of oral performance skills. On the other hand, a psycholinguistic task is much more demanding than free speech, requiring a quick response within a certain window of time and to a specific stimulus. Therefore, it might be a more sensitive measure of even initial processes of attrition, which cannot be detected by a free speech task, where the participant can control the choice of words and use compensatory strategies. The information gathered by the present study is not enough to form a conclusive

answer and it is a matter of further research to establish what exactly has caused this pattern.

6.5 Predictor variables

In accordance with previous research and theoretical assumptions which were discussed in Chapter 2 it was expected that factors such as motivation and initial proficiency would influence the processes of attrition. Two hypotheses in particular were made:

7) High initial proficiency in the language fosters retention, i.e. people with high proficiency at the onset of attrition will retain the language better and will perform better at the test and tasks.

8) Motivation, especially integrative motivation, will have a positive effect on language retention, i.e. people with high motivation will retain the language better.

6.5.1 Initial proficiency

Initial proficiency was measured with retrospective can-do Scales (see chapter 3 for details). In order to assess its effect on the linguistic (scores from the oral data, C-test) and psycholinguistic variables (reaction time and percent correct responses from the picture naming task), multiple linear regression analyses were carried out.

The results from the regression analyses showed that initial proficiency was a valid predictor of language retention: higher initial proficiency led to higher lexical diversity, higher percent correct responses on the PNT and fewer FPs, FStarts Corrs and FL words, as well as faster naming latencies in the picture naming task. This data gave support to hypothesis (7) and the Activation Threshold hypothesis which maintains that initial proficiency is a valid predictor for the successful performance and completion of linguistic and psycholinguistic tasks. These results are also in line with previous research showing the importance of attained proficiency like Bahrick's (1984), Weltens's (1989) and de Bot & Clyne (1989).

6.5.2 Attitude and motivation

The AMQ used was based on Gardner's AMBT (1985). Details for the construction, administration and scoring of the test can be found in Chapter 3. The final attitudinal factors, after carrying out a principle component analysis, consisted of three composite variables: attitude and integrative orientation, interest in foreign languages and instrumental orientation.

Contrary to expectations, no firm support for the role of attitude and motivation was found. Although attitude and integrative orientation and interest in foreign languages correlated significantly with a number of outcome variables (positive correlation with lexical diversity, C-test scores and percent correct responses for low frequency items; negative correlation with naming latencies for high and medium frequency items for the former and a positive correlation with the C-test scores and negative with FPs, FStarts and FL words for the latter) they each were included in only one regression model. Positive attitude and higher integrative orientation were found to lead to less FPs, while interest in foreign languages resulted in less FL words. Interestingly, instrumental orientation, which did not correlate with any of the measures, was found to be a significant predictor for the C-test results.

A possible explanation for these findings might be the fact that the questionnaire used to measure attitude and motivation was not sensitive enough or it was not the adequate instrument. The multicollinearity problem reported earlier in Chapter 5 points to the fact that the questions from the different sections were not totally independent as they seemed to overlap. Schmid and Dusseldorp (2010), who used Gardner's AMTB on a study on the multivariate nature of language attrition, also encountered a perplexing finding (positive attitude towards speakers of the target language was linked to lower lexical diversity), that they could not account for. Regarding integrative motivation, it has to be noted, that its effect has been called into question by several researchers (Au, 1988; Crookes & Schmidt, 1991; Dörnyei, 1990; Schmidt, Boraie, and Kassabgy, 1996, Strong, 1984) due to the contradictory results obtained in a number of studies (see Au, 1988 for a review).

Also, as noted by Dörnyei & Otto (1998) and Schmid (2006) and demonstrated in research by Nikitina & Furuoka (2005), attitudinal

and motivational variables develop dynamically and are subject to change. Although they might truthfully reflect the current attitude and motivation of the participants, these may not be valid for the period when the language was studied and/or used while on a SA.

6.6 Research questions

In addition to the two hypothesis which were discussed above, three general research questions were put forward in Chapter 2. These concerned the role of three other background variables: disuse of the language or the time spent without putting a language to practice; the extent to which language contact after the onset of attrition could contribute to language retention and whether length of exposure to the language, i.e. time spent in the country, could also be an important factor in predicting language attrition/retention. The research questions were:

9) Is mere lack of use of a language (i.e. lack of LME) enough for a foreign language to deteriorate, i.e. can FL attrition be a *function of disuse?*

10) Do language use and contact during the period of attrition have a positive effect on retention, i.e. will people who practice the language more frequently after the onset of attrition retain it better than people who do so less frequently?

11) Is length of exposure to the language, i.e. length of SA contributing to FL retention, i.e. longer stay in the country resulting in better retention of the language?

6.6.1 Disuse

Disuse or length of attrition was measured as the time after the end of SA when active use of the language ceased until the time of the interview. Interestingly, and contrary to what might be expected intuitively, no evidence for the influence of disuse was found. LoA did not correlate with any of the linguistic or psycholinguistic measures. Even though partial correlations were also conducted, controlling for the effect of initial proficiency, they did not yield different results. Neither did disuse contribute significantly to any of the regression models that were built.

On the one hand these results might be due to deficiencies in the design and its inability to effectively detect and measure attrition. However, keeping in mind previous research which also failed to find corroborating evidence for the role of disuse (Murtagh, 2003; Taura, 2008, a more probable explanation is that disuse alone is not sufficient for attrition to take place. It might be the case that in combination with other factors LoA becomes an important factor, which contributes to the attrition of linguistic competence. So far, however, this study has not confirmed the idea put forward by the Activation Threshold Hypothesis: that language attrition is a result of "long-term lack of stimulation" (Paradis, 2007:125) due to a raise in its level of activation.

6.6.2 Language contact

Contact with the language, during and after the SA, was measured by a self-completed questionnaire as part of the Sociolinguistic questionnaire (see chapter 3 for details on administration and scoring). After carrying out a principle component analysis the original 16 measures were combined in 5 composite variables: Spanish for entertainment, Spanish for social purposes, Use of English, L1 for social purposes and L1 for communication.

Again, no firm evidence for the beneficial role of contact with the language, or language rehearsal, after the onset of attrition was found. Only in the case of two participants from the LG sample, Clara and Sonia with 22 and 72 LoA respectively, might it be speculated that the lack and respectively use of the language led to unexpected naming latencies: slow for the former and fast for the latter, while the opposite pattern was expected on the basis of LoA. A previous investigation which found no support for the idea that language rehearsal led to higher language retention is Bahrick's (1984) study on the retention of school acquired Spanish.

One interesting suggestion regarding the role of rehearsal is Schmid's (2007) proposal of a 'saturation' threshold which was presented in Chapter 2. Although she proposed that the extensive rehearsal of an L1 that was acquired in a monolingual environment led to a 'saturation' threshold, which made later rehearsal superfluous, this idea can be easily transferred to L2/ FL attrition. High proficiency speakers

who have studied the language for a substantial period of time and have used it, and therefore rehearsed it, abundantly can be seen to resemble L1 speakers who no longer need to practice the language in order to maintain it. In this sense, language use during the active use of the language rather than language contact after the onset of attrition might be an important factor.

6.6.3 Length of exposure

Hansen's idea (1999) that length of exposure to the language, here measured as duration of SA, might be a predictor variable for language attrition (expecting longer periods of exposure to result in better retention of the language), did not receive support.

Duration of SA correlated only with three of the linguistic and psycholinguistic measures. Although it might be reasonable to expect that a longer SA leads to higher linguistic achievement, and therefore to better retention of the language, no corroboration for this was found either: length of SA did not correlate with initial proficiency, which is actually the proficiency at the end of the stay.

6.7 Summary

This chapter has presented a summary of the results of the study and has tried to offer an explanation for the findings which were reported. It has shown that language skills have been affected by attrition at both the linguistic and the psycholinguistic level in the two data sets: participants in the LG sample tended to obtain lower scores at T2 and attriting groups in the CS data typically underperformed in comparison to the baseline group. Initial proficiency emerged as the most salient predictor of language retention, with high proficiency at onset leading to better retention of the language.

7
Conclusions

This chapter provides some concluding remarks to the study which investigated FL attrition of Spanish in two samples: longitudinal (5 people over the span of one year) and cross sectional (3 attriting groups with different LoA and a baseline group) consisting of Dutch and German Erasmus students. It first discusses the implications, theoretical, methodological and research that surge from the result of this dissertation. Some limitations that should be considered when planning future research on FL attrition are then outlined and the chapter ends with a general summary of the whole dissertation

7.1 Implications of the study

This dissertation presented a study on FL attrition: one of the first after a prolonged period of inactivity in the field. The need for more research on the topic, both theoretical and practical, was defended in Chapter 1. In addition to exploring the attrition of a FL that was first formally acquired and then used in real life, the study attempted to investigate the role of background factors such as initial proficiency, attitude and motivation and external factors such as LoA, contact with the language and length of exposure to the language. Its findings have both methodological and research implications, as well as some theoretical importance.

7.1.1 Theoretical

Although the study does not result in any explicit theoretical advance such as a theory or a model of FL attrition, it nevertheless has an implicit theoretical importance in that it is one of the first studies in the field to be theoretically driven. As discussed earlier in Chapter 1, the majority of the preceding studies were predominantly empirical and exploratory in nature. However, the development of Paradis's (1993, 2004) Activation Threshold Hypothesis and Herdina and Jessner's (2002) Dynamic Model of Multilingualism, which was the first one to provide for FL attrition explicitly, made it possible to adopt a more theoretical approach and to formulate precise research

questions (Chapter 2). Also, specific predictions could be made regarding the performance on the different tasks (Section 3.5 on hypotheses and expectations).

It is important to test the assumptions made by different theories and models and confirm that they are suited to reality especially in a field which borrows heavily from its fraternal areas, i.e. L1 and L2 attrition. Although seemingly very similar, FL attrition might be governed by slightly or even totally different principles than the ones involved in the aforementioned domains. Likewise, some of the factors that are usually considered to affect FL attrition, like for example attitude and motivation, have been adopted from L1 and L2 attrition research but they may not be valid predictors for FL attrition and retention.

7.1.2 Methodological

In contrast to previous studies, this project is one of the first to use multimodal data for the investigation of FL attrition. Traditionally, research on language attrition has used only one method of data collection, i.e. an interview or linguistic tests (Cohen, 1989; Olshtain, 1989, Weltens, 1989 to name but a few) but not a combination of the two. The combination of various types of data, i.e. free spoken, linguistic and psycholinguistic, provides for a more comprehensive and detailed view of the phenomenon than the one-sided approaches used before. Recently, several studies on L1 attrition (Keijzer, 2007; Van der Kooi-Jamyam, Yilmaz & Schmid, 2008; Yilmaz, Van der Kooi-Jamjam & Schmid, 2009) have used the multimodal approach thus exploring the phenomenon in much more depth.

Also, the study employed data collection materials and instruments from the ones suggested by Schmid (forthcoming), who criticized the lack of a common research framework and methodology as a major drawback of the field, which impedes the interpretation and comparability of results. The use of such standardized materials and common methodology makes the findings from different studies comparable as well as future replications more coherent. The present study has shown that such a combination provides a valuable diversity in findings and that different tests complement each other, allowing to create a more comprehensive picture of the phenomenon investigated.

Finally, to the knowledge of the researcher, this is the first study on FL attrition which has employed a timed psycholinguistic task. Although the importance of the materials used traditionally in attrition research such as interviews, film-retelling tasks and classic linguistic tests is unquestionable, the implementation of modern techniques may bring new insights into the phenomenon and allow to investigate aspects of attrition which so far could not be explored. Although psycholinguistic tasks are not without limitations - they have been criticized as being out of context and artificial - they allow targeting specific items, components and processes that otherwise cannot be investigated. In the present study, the PNT was found to be a very sensitive instrument, capable of detecting the early stages of attrition, which may still have not been manifested in oral production or other linguistic skills.

7.1.3 Research

The present study found evidence of attrition in the performance of both naturalistic and experimental tasks in the two data sets analysed: longitudinal and cross sectional. The only exception was the C-test for which confusing results were found: in the LG data some scores actually increased and in the CS data, there was some fluctuation of scores across groups and only the group with the shortest LoA obtained scores which were significantly lower than those of the baseline group. A possible explanation for this finding might be the fact that the test was untimed which allowed the participants to prepare the responses without any pressure. Although care was taken to carefully choose the materials used, the test might have been to easy, leading to a ceiling effect as pointed out in Chapter 5. Also, the introduction of a time limit might have made the test more demanding.

All other measures showed lower scores at T2 for the participants in the LG sample and for the attriting groups in the CS sample in comparison to the baseline group. First, in the oral data, a decrease in lexical diversity over time and across groups was registered, as well as an increase in FPs, Reps and FL words. This showed evidence of attrition and confirmed hypotheses 1, 2 and 3. Second, in the psycholinguistic data, the expected increase in naming latencies was registered for all participants in the LG data and for the attriting groups in the cross-sectional sample. Although the results from the

percent correct responses were not as straightforward (for two participants in the LG data the expected decrease was not observed), the attriting groups obtained significantly less correct responses in comparison to the baseline group. Also, the excepted frequency effect was observed, with high frequency items being named faster and more correctly than medium and low frequency items. An interesting finding is that reaction times and percent correct responses for medium frequency items were not situated in the middle of the continuum between high and low frequency naming latencies; rather they were closer to low frequency items. These data confirm hypotheses 5 (partially) and 6 and suggest that foreign language skills are, indeed, affected by attrition.

Third, the effect of various background and personal variables was explored. Although many factors have been proposed as possible variables affecting the processes of attrition, no firm confirmation for their validity has been found so far. Besides, most of the suggested factors are based in L1 and L2 attrition research or even SLA studies. However, if these are also applicable to FL attrition is still to be confirmed. The variables explored consisted of three composite variables on attitude and motivation and five composite variables on language use and contact. In addition, initial proficiency, LoA and length of exposure to the language were explored. Initial proficiency emerged as the most valid predictor of the outcome variables, both linguistic and psycholinguistic. This finding provides further support for the long held idea of a "critical threshold" (Neisser, 1984:33), "the critical mass of language, that once acquired, makes loss unlikely" (Pan & Berko Gleason (1986:204) or "saturation threshold" (Schmid, 2007:150).

Interestingly, and contrary to what might be expected intuitively, no unequivocal evidence for the effect of attitude and motivation was found. Instrumental orientation did not appear to play a role at all, while participants with positive attitude and higher motivation and higher interest in foreign languages produced less FPs and less FL words respectively. Although the results from the LG analyses give food for speculation about the possible facilitatory role of these variables for language retention, these were not confirmed in the CS data. Since the LG sample was quite small and the possible attitudinal effect was observed only in two of the participants, further research is needed to clarify the role of attitude and motivation. On the one hand,

this lack of effect might be a result of the properties of the questionnaire used, based on Gardner's AMTB (Gardner, 1985), which might not be sensitive enough. The multicollinearity problem reported in Chapter 5 also points to problems of the test construct. On the other hand, supporting evidence for the importance of attitudinal variables comes mainly from L1 attrition studies where bilinguals have been suggested to attach different emotional functions to their languages (see research by Pavlenko, 2002, 2005, 2006; Pallier et al., 2003) and it might be the case that attitudinal factors are not of such importance in FL attrition especially considering the changing nature of attitude and motivation as claimed by Schmid (2007): although they might truthfully reflect the current attitude and motivation of the participants, attitude and motivation ratings may not be valid for the period when the language was actually studied.

Similarly, although rehearsal of the language (i.e. watching TV, reading books or writing letters/emails) during the attrition period is naturally expected to contribute to language retention the "use it or lose it" motto, to use Schmid's words (2004b), may not actually hold true for FL attrition. The five composite language use variables were not found to have any impact on the psycholinguistic measures and only some limited effect on the linguistic measures: use of Spanish for social purposes and for entertainment led to higher incidence of Refs. Although this finding might look controversial, it may actually make sense if we consider the idea that reformulations might be related to higher proficiency and good command of the language (as suggested in Chapter 6). The other variable that was related to higher incidence of Corrs was use of the L1 for social purposes. Research by Schmid and Dusseldorp (2010), on the relationship of sociolinguistic and background variables and L1 attrition in migrants, also found puzzling results regarding the influence of the language use variables. There are three possible explanations here: either language use is of no such importance as is usually attached to it (and in order to confirm this there is need for more research); the questionnaire used and its later quantification failed to measure the contact with the language, or the participants themselves were not capable to truthfully estimate the amount of contact with the language.

7.2 Limitations of the study

The present study is not without its limitations, which consequently may influence the generalizability of its findings. Therefore, it is important to consider its drawbacks: methodological and statistical.

7.2.1 Methodological

The sample

One of the nightmares of every researcher is recruiting participants for a study. This especially applies to research on attrition where LG designs are often used. The present study is a clear example of the inconsistent nature of participants: out of a group of 20 people, only 5 could be retrieved a year later for a follow up interview. The five people for whom LG data was gathered presented different background characteristics and could not be easily grouped. Therefore, their results were considered individually and although they provided some very important insights into the processes of attrition, their generalizability is limited to only speculating for the possible effect in larger populations. Although it is very difficult to maintain subjects over prolonger periods of time, it is definitely worth trying to follow a LG design whenever possible.

The materials

Although the materials for the study were prepared with great caution and were carefully pretested to ensure their suitability, it is very difficult to ensure that the processes measured are indeed the only ones involved. Tests like the C-test depend to some extent on the interviewees' familiarity with the format and although all participants were of similar educational background and had all participated in formal language courses where similar tests are frequently used, their performance might depend on learning and personal styles. Moreover, the text used might have been too easy as indicated by the ceiling effect seen in several groups in the CS data. Although reliability measures showed that the test had good overall reliability, the reliability rating might have been inflated due to the large number of items in the test (58) since Cronbach's α gets higher with increasing number of items.

The psycholinguistic task, picture naming, is also quite artificial and not even remotely related to the way people use a language naturally. Although participants first had to complete a short practice session, maybe for some people that was not enough, putting them at a disadvantage. Additionally, the time window of 10 000 ms, which was allowed for a response, far exceeds the response time given in picture naming studies and criticisms might be expected that the task does not really measure lexical access. In a norming study for Spanish by Cuetos, Ellis & Alvarez (1993) the total window within which a response could be given was 6,000ms, while in Bates et al. (2003) for Mexican Spanish the window was 4,000ms. These studies however, were carried out with monolingual speakers. The participants in the present study were all multilinguals, and bilingual and multilingual speakers have been shown to be slower in picture naming when compared to monolinguals speakers (Gollan et al., 2005; Ivanova & Costa, 2008). In addition, these were attriting speakers who were expected to have problems with lexical access and word retrieval and the long response window is justifiable. In conclusion, it can be said that the PNT is a useful tool for the investigation of attrition which can contribute valuable information.

Finally, the use of an interview made it impossible to calculate the speech rate, mean length of run, and other measures of fluency like error-free clauses (Kormos & Dénes, 2004) due to overlapping with the interviewer's voice. Still, this method is considered much more natural than a film retelling task and the closest one to the natural environment in which the participant had practiced the language during their SA. The use of materials should be considered carefully since each one has its advantages and disadvantages and it depends on the aims of the study and the profile of the participants, namely their experience with the language.

7.2.2 Statistical

As was claimed earlier in Chapter 2, under the DMM (Herdina & Jessner, 2002) and DST (de Bot, Lowie, and Verspoor, 2007), language acquisition is a non-linear phenomenon characterized by periods of acceleration, slowing down and stagnation where multiple components interact and are nested in other systems. In a similar vein, it might be expected that language attrition is a dynamic process, in which case applying linear statistical methods to analyze the manifestation and

nature of a phenomenon which is non-linear in nature, may not be especially suitable. Due to time limitations, the present study made use of only classical multilevel statistics, but it is suggested that future studies make use of more advanced statistical methods.

Also, the present study attempted to explore the effect of quite a few background and predictor variables which resulted in 40 correlations. It can be expected that for such a high number of correlations some of them would be significant by mistake. One way to deal with such a problem would be to plan studies with a lower number of variables and probably focus on only one set of predictor variables, i.e. attitudinal or background.

7.3 Summary

This study has shown that language attrition affects foreign language skills, both linguistically and psycholinguistically. Initial proficiency was found to be the most reliable factor in predicting results on outcome variables but no firm conclusions for the other variables could be made. In two further case studies which were not presented in this dissertation (because they did not meet the conditions for Erasmus exchange) the competence of two female attriters was explored. One of them went to Spain as an au pair and lived with a Spanish family for 10 months. 7 years later she had difficulty completing a simple phrase in Spanish. The other one went to live with a Spanish family and learn the language for 10 months. When she was interviewed 18 years later, it was difficult for the researcher to believe that she had not left the country a week ago. What makes these two attriters so different in their retention of the language is not yet clear. It is a matter of further research to establish what other factor(s) or combination of factors might be involved in the processes of FL attrition besides initial proficiency. Futures studies should also consider carefully the methodological and statistical limitations which were outlined above and which might influence the results of the study.

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List of Appendices

Appendices A to K are presented in the text of the dissertation. Appendices L to W can be found on the accompanying CD.

Appendix A: Sociolinguistic characteristics of the participants

Age, DSA – duration study abroad; LoA – length of attrition

N	*Age*	*SD*	*DSA*	*SD*	*LoA*	*SD*
51	23.45 (21-29)	1.8	6.58 (4-12)	2.29	9.9(0-96)	16.3

L1 and gender distribution

N	*L1*		*Gender*	
	nl	*de*	*m*	*f*
51	25 (49%)	26 (51%)	26 (51%)	25 (49%)

Appendix B. LG data: distribution of filled pauses and repetitions

Part-of-speech preceded by FPs

	ADJ	*ADV*	*PS.W*	*FPs*	*Refs*	*Reps*	*Corr*	*Cos*	*CONJ*	*ART*	*L2*	*N*	*Num*	*PREP*	*PRO*	*V*	*Oth*
Aleix T1	1	6	3	3	2	5	4	3	3	2	2	4	3	5	1	9	4
Aleix T2	2	11	1	4	2	3	2	9	6	6	4	6	3	6	5	8	6
Clara T1	2	7	1	4	1	0	0	2	1	3	0	3	2	4	0	11	6
Clara T2	3	5	0	15	0	2	2	17	1	12	3	8	1	8	3	25	14
Oriol T1	3	9	0	2	0	2	0	1	0	1	0	2	1	10	0	5	1
Oriol T2	0	8	2	11	1	7	2	8	3	3	1	4	1	5	6	17	4
Sonia T1	0	3	0	0	1	0	0	1	0	1	1	2	0	1	0	2	0
Sonia T2	0	2	0	0	0	2	0	3	0	1	0	2	1	1	0	3	1
Núria T1	0	0	0	0	0	2	0	0	0	2	1	0	0	0	0	1	0
Núria T2	0	2	0	0	0	0	0	2	1	0	0	0	0	1	0	0	1

Part-of-speech proceeded by Reps

	ADJ	*ADV*	*PS.W*	*FPs*	*Refs*	*Reps*	*Corr*	*Cos*	*CONJ*	*ART*	*L2*	*N*	*Num*	*PREP*	*PRO*	*V*	*Oth*
Aleix T1	1	9	1	4	2	9	1	1	5	4	1	1	1	9	0	7	3
Aleix T2	0	7	1	1	0	13	3	10	4	6		3	1	21	13	7	8
Clara T1	1	11	0	0	0	1	0	0	2	6	0	1	0	4	0	3	3
Clara T2	0	7	0	2	0	10	1	5	0	8	0	0	0	5	1	6	0
Oriol T1	1	19	0	0	3	8	0	0	1	14	0	0	2	13	1	1	12
Oriol T2	0	5	0	2	1	9	1	17	3	11	0	1	1	16	16	22	4
Sonia T1	0	9	0	0	0	2	2	0	1	2	0	0	0	9	1	2	1
Sonia T2	0	5	0	0	0	5	1	11	5	3	0	0	0	12	13	5	3
Núria T1	0	11	0	0	0	7	0	1	6	4	0	2	1	20	3	7	9
Núria T2	0	6	0	0	0	8	0	9	6	2	0	1	0	17	11	6	3

Appendix B. LG data: distribution of filled pauses and repetitions

Appendix C. CS data: distribution and normality tests for Age, duration SA, LoA and FL words

Tests of normality: Age, DSA – duration stay abroad; LoA – length of attrition

	Age		*DSA*		*LoA*	
	W	*p*	*W*	*p*	*W*	*p*
Group0 (14)	.876	.052	.882	.063	.982	.983
Group1-7 (12)	.827	.019*	.639	.000*	.933	.413
Group8-12 (14)	.892	.086	.808	.006*	.902	.119
Group>12 (11)	.811	.013*	.565	.000*	.880	.103

*p < .05

Tests of normality: FL words

	Normal distribution		*Reciprocal distribution*	
	W	*p*	*W*	*p*
Group0 (14)	.721	.001*	.898	.105
Group1-7 (12)	.751	.003*	.881	.089
Group8-12 (14)	.902	.120	.953	.602
Group>12 (11)	.511	.000*	.883	.113

*p < .05

Appendix D. Initial proficiency compensation of missing values

	Retrospecitve	*At-time of intreview*	*Difference*	*Corrected retrospective scores*
1	3.63	3.68	-0.05	-
2	3.9	3.41	0.49	-
3	3.53	3.39	0.14	-
4	N/A	3.59	-	3.78
5	N/A	2.37	-	2.56
6	N/A	3.69	-	3.88
7	2.84	2.42	0.42	-
8	N/A	3.42	-	3.61
9	3.36	3.1	0.26	-
10	N/A	2.46	-	2.65
11	3.34	3.44	-0.1	-
12	N/A	2.73	-	2.92
13	N/A	4.3	-	4.49
Mean			**0.19**	

Appendix E. CS data: part-of-speech distribution across groups

	Group0 (14)		*Group1-7 (12)*		*Group8-12 (14)*		*Group>12 (11)*	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
ADV	53.4	16.8	49.6	19.6	48.4	19.5	54.6	19.5
ADJ	205.4	50.4	174.4	66.7	165.1	56.6	205.9	56.8
ART	152.4	24.4	134.1	48.6	142.1	31.6	149.6	36.2
CONJ	135.4	34.2	109.1	33.2	117.7	33.4	136.1	36.6
N	200.0	24.3	170.6	64.1	180.1	37.4	184.5	45.8
PREP	147.4	28.9	125.3	46.4	136.7	26.5	137.0	31.4
PRO	73.9	22.0	49.2	22.4	53.9	24.7	72.0	20.4
V	238.8	48.1	189.1	66.8	196.4	50.7	227.0	75.5
INV.WORDS	3.4	2.0	2.8	2.8	3.4	2.9	4.9	3.0
L2_WORDS	7.2	8.7	10.5	13.8	5.9	4.7	27.3	40.6
OTHER	174.9	39.4	157.8	67.7	134.6	29.6	160.8	35.3

Appendix F. CS data: distribution and normality tests for disfluency and hesitation markers

Normality distribution: disfluency and hesitation markers over 100 words

	Reps		*FPs*		*Refs*		*FStarts*		*Corrs*	
	W	*p*	*W*	*p*	*W*	*p*	*W*	*p*	*W*	*p*
Group0	.923	.242	.733	.001*	.917	.200	.949	.543	.760	.002*
Group1-7	.787	.007*	.965	.853	.951	.647	.964	.840	.917	.261
Group8-12	.951	.579	.933	.333	.781	.003*	.733	.001*	.805	.006*
Group>12	.872	.082	.957	.733	.868	.073	.926	.368	.902	.193

*p < .05

Log and Log+1 distribution: disfluency and hesitation markers over 100 words

	Reps lg		*FPs lg*		*Refs lg*		*FStarts lg*		*Corrs lg+1*	
	W	*p*	*W*	*p*	*W*	*p*	*W*	*p*	*W*	*p*
Group0	.943	.461	.988	.998	.938	.394	.893	.088	.841	.017
Group1-7	.872	.069	.959	.770	.920	.289	.931	.391	.909	.207
Group8-12	.961	.744	.945	.482	.939	.410	.940	.423	.870	.041
Group>12	.962	.800	.930	.416	.965	.827	.937	.487	.940	.518

*p < .05

Appendix G. CS data: parts-of-speech preceding repetitions

	Group0 (14)		*Group1-7 (12)*		*Group8-12 (14)*		*Group>12 (11)*	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
ADJ	0.022	0.036	0.005	0.019	0.035	0.051	0.033	0.059
ADV	0.714	0.364	0.864	0.390	0.683	0.390	1.175	0.560
ART	0.304	0.283	0.318	0.263	0.235	0.142	0.486	0.360
CONJ	0.209	0.262	0.186	0.181	0.138	0.133	0.232	0.164
ITJ	0.073	0.058	0.259	0.201	0.119	0.138	0.159	0.137
N	0.053	0.057	0.058	0.064	0.052	0.057	0.033	0.059
PREP	0.849	0.621	0.794	0.594	0.588	0.513	0.878	0.569
PRO	0.122	0.093	0.085	0.106	0.072	0.070	0.175	0.190
V	0.319	0.207	0.357	0.214	0.253	0.199	0.421	0.354
OTH	0.276	0.290	0.246	0.188	0.277	0.229	0.289	0.200
PSW	0.000	0.000	0.005	0.019	0.000	0.000	0.000	0.000
FLW*	0.005	0.020	0.005	0.019	0.000	0.000	0.063	0.137
FPs*	0.048	0.059	0.081	0.079	0.118	0.120	0.155	0.154
Reps*	0.280	0.280	0.417	0.209	0.434	0.502	0.602	0.595

*$p < .05$

Appendix H. CS data, item analyses: reaction times and percent correct responses

Appendix H. CS data, item analyses: reaction times and percent correct responses

RTs for the different groups, in ms, item analysis. (SD in brackets). HF – high frequency, MF – medium frequency, LF – low frequency, AV - average

	Group0 (14)	*Group1-7 (12)*	*Group8-12 (14)*	*Group>12 (11)*	*Total (51)*
HF	1631 (479)	2051 (558)	1930 (429)	2200 (478)	1934 (516)
MF	2479 (1225)	2691(997)	2734 (955)	3249 (756)	2765 (1018)
LF	2583 (1107)	2813 (762)	3230 (1287)	3335 (976)	2977 (1079)
AV	2111 (636)	2440 (629)	2492 (679)	2797 (545)	2441 (657)

Percent correct responses, item analyses (SD in brackets). HF – high frequency, MF – medium frequency, LF – low frequency, AV - average

	LF	*MF*	*HF*	*AV*
Group0 (14)	53 (23) [1]*U* = 43.5, p< .001	57 (31) [2]*U* = 99, p< .001	88 (18)[1,2]	66 (29)
Group1-7 (12)	39 (22) [3]*U* = 64.5, p< .001	48 (30) [4]*U* = 133.5, p< .001	78 (21)[3,4]	55 (30)
Group8-12 (14)	35 (18) [5]*U* = 50, p< .001	46 (28) [6]*U* = 129, p< .001	75 (22)[5,6]	52 (28)
Group>12 (11)	25 (16) [7]*U* = 34, p< .001	41 (29) [8]*U* = 132.5, p< .001	71 (21)[7,8]	45 (29)
Average (51)	20 (9) [9]*U* = 37.5, p< .001	25 (14) [10]*U* = 112.5, p< .001	40 (9)[9,10]	28 (14)

Appendix I. CS data, subject and item analyses: normal and lognormal distribution of reaction times

Appendix I. CS data, subject and item analyses: normal and lognormal distribution of reaction times

Subject analyses. Normal and lognormal distribution of low frequency (LF), medium frequency (MF) and high frequency (HF) items

	LF normal		*LF lognormal*		*MF normal*		*MF lognormal*		*HF normal*		*HF lognormal*	
	W	*p*	*W*	*p*	*W*	*p*	*W*	*p*	*W*	*p*	*W*	*p*
Group0 (14)	.175	.200	.115	.200	.237	.033*	.141	.200	.151	.910	.143	.200
Group1-7 (12)	.171	.200	.221	.110	.235	.066	.199	.200	.114	.963	.090	.200
Group8-12 (14)	.232	.039*	.162	.200	.238	.030*	.175	.200	.162	.960	.156	.200
Group>12 (11)	.167	.200	.167	.200	.123	.200	.141	.200	.185	.880	.149	.200

*p < .05

Subject analyses. Normal and lognormal distribution of average naming latencies (AV)

	AV normal		*AV lognormal*	
	W	*p*	*W*	*p*
Group0 (14)	.197	.146	.152	.200
Group1-7 (12)	.190	.200	.190	.200
Group8-12 (14)	.216	.075	.167	.200
Group>12 (11)	.154	.200	.124	.200

*p < .05

Appendix I. CS data, subject and item analyses: normal and lognormal distribution of reaction times

Item analyses. Normal and lognormal distribution of low frequency (LF) . medium frequency (MF) and high frequency (HF) items

	LF normal		*LF lognormal*		*MF normal*		*MF lognormal*		*HF normal*		*HF lognormal*	
	W	*p*	*W*	*p*	*W*	*p*	*W*	*p*	*W*	*p*	*W*	*p*
Group0 (14)	.806	.008*	.954	.618	.984	.994	.917	.196	.927	.309	.965	.800
Group1-7 (12)	.970	.912	.936	.450	.890	.117	.871	.067	.934	.430	.975	.956
Group8-12 (14)	.877	.065	.980	.973	.960	.757	.940	.416	.885	.085	.950	.560
Group>12 (11)	.856	.051	.909	.237	.933	.445	.959	.761	.836	.028*	.907	.222

*p < .05

Item analyses. Normal and lognormal distribution of average naming latencies (AV)

	AV normal		*AV lognormal*	
	W	*p*	*W*	*p*
Group0 (14)	.851	.023*	.928	.286
Group1-7 (12)	.886	.104	.872	.068
Group8-12 (14)	.915	.186	.963	.768
Group>12 (11)	.952	.672	.965	.834

*p < .05

Appendix J. Correlations between background and predictor variables and outcome variables

Correlations between background and predictor variables and oral data and C-test. DSA - Duration SA; LoA – Length of attrition; InProf - Initial Proficiency; InstO-instrumental orientation SPE – Spanish for Entertainment; SPS – Spanish for Social purposes; EN – use of English; L1S – Use of L1 for Social purposes; L1C – Use of L1 for Communication; AIO-attitude and integrative orientation; IFL-interest in foreign languages.

	DSA	*LoA*	*InProf*	*SPE*	*SPS*	*EN*	*L1S*	*L1C*	*AIO*	*IFL*
DSA	-									
LoA	n.s.	-								
InProf	n.s.	n.s.	-							
SPE	n.s.	n.s.	n.s.	-	-					
SPS	n.s.	n.s.	n.s.	.289*	-					
EN	.344*	n.s.	n.s.	n.s.	n.s.	-				
L1S	-.443**	n.s.	n.s.	n.s.	n.s.	n.s.	-			
L1C	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	.532**	-		
AIO	n.s.	n.s.	.420**	-.319*	n.s.	n.s.	n.s.	n.s.	-	
IFL	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	.521**	-
InstO	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	-.331*	n.s.	n.s.	n.s.
C_Test	n.s.	n.s.	.424**	n.s.	n.s.	-.283*	n.s.	n.s.	n.s.	.312*
VOCD	n.s.	n.s.	.394**	n.s.	n.s.	n.s.	n.s.	n.s.	.309*	n.s.
Reps	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Corrs	-.290*	n.s.	-.320*	n.s.	n.s.	n.s.	.372**	n.s.	n.s.	n.s.
FPs	n.s.	n.s.	-.464**	n.s.	n.s.	n.s.	n.s.	n.s.	-.439**	-.391**
Refs	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
FStarts	n.s.	n.s.	-.387**	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	-.325*
FL word	n.s.	n.s.	-.383**	n.s.	n.s.	n.s.	n.s.	n.s.	.288*	-.357*

	InstO	*C-test*	*VOCD*	*Reps*	*Corrs*	*FPs*	*Refs*	*FStarts*
DSA								
LoA								
InProf								
SPE								
SPS								
EN								
L1S								
L1C								
AIO								
IFL								
InstO	-							
C_Test	n.s.	-						
VOCD	n.s.	.485**	-					
Reps	n.s.	n.s.	-.486**	-				
Corrs	n.s.	n.s.	-.324*	.383**	-			
FPs	n.s.	-.430**	-.528**	n.s.	.301*	-		
Refs	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	-	
FStarts	n.s.	-.509**	-.491**	.294*	.449**	.313*	n.s.	-
FL word	n.s.	-.542**	n.s.	n.s.	n.s.	n.s.	n.s.	-.381**

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Correlations between background and predictor variables and the psycholinguistic measures. DSA - Duration SA; LoA – Length of attrition; InProf - Initial Proficiency; SPE – Spanish for Entertainment; SPS – Spanish for Social purposes; EN – use of English; L1S – Use of L1 for Social purposes; L1C – Use of L1 for Communication; AIO-attitude and integrative orientation; IFL-interest in foreign languages; InstO-instrumental orientation.

	DSA	*LoA*	*InProf*	*SPE*	*SPS*	*EN*	*L1S*	*L1C*
DSA	-							
LoA	n.s.	-						
InProf	n.s.	n.s.	-					
SPE	n.s.	n.s.	n.s.	-				
SPS	n.s.	n.s.	n.s.	.289*	-			
EN	.339*	n.s.	n.s.	n.s.	n.s.	-		
L1S	-.438**	n.s.	n.s.	n.s.	n.s.	n.s.	-	
L1C	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	.532**	-
AIO	n.s.	n.s.	.420**	.319*	n.s.	n.s.	n.s.	n.s.
IFL	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
InstO	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	-.331*	n.s.
RT HF	n.s.	n.s.	-.300*	n.s.	n.s.	n.s.	n.s.	n.s.
RT MF	n.s.	n.s.	-.374**	n.s.	n.s.	n.s.	n.s.	n.s.
RT LF	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
% HF	n.s.	n.s.	.475**	n.s.	n.s.	n.s.	n.s.	n.s.
% MF	.461**	n.s.	.535**	n.s.	n.s.	-.413*	n.s.	n.s.
% LF	.328*	n.s.	.425**	n.s.	n.s.	-.331*	n.s.	n.s.

	AIO	*IFL*	*IO*	*RT HF*	*RT MF*	*RT LF*	*% HF*	*% MF*
DSA								
LoA								
InProf								
SPE								
SPS								
EN								
L1S								
L1C								
AIO	-							
IFL	,521**	-						
InstO	n.s.	n.s.	-					
RT HF	n.s.	n.s.	n.s.	-				
RT MF	-,295*	n.s.	n.s.	,722**	-			
RT LF	-,313*	n.s.	n.s.	,656**	,631**	-		
% HF	n.s.	n.s.	n.s.	-,489**	-,422**	-,382**	-	
% MF	n.s.	n.s.	n.s.	-,553**	-,498**	-,432**	,718**	-
% LF	,278*	n.s.	n.s.	-,677**	-,488**	-,566**	,792**	,820**

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Appendix K. Regressions

Multiple hierarchical regression analysis, C-test and Lexical diversity (D). DSA - Duration SA; LoA – Length of attrition; InProf - Initial Proficiency; AIO-attitude and integrative orientation; IFL-interest in foreign languages; InstO-instrumental orientation SPE – Spanish for Entertainment; SPS – Spanish for Social purposes; EN – use of English; L1S – Use of L1 for Social purposes; L1C – Use of L1 for Communication

	C-test (Sq.root)			*D (lexical diversity)*		
	B	*SE*	*β*	*B*	*SE*	*β*
DSA	-.006	.066	-.011	1.267	.855	.200
LoA	-.008	.009	-.123	.104	.118	.116
InProf	-.940	.293	-.431**	10.195	3.788	.360**
		R^2 = .180 step 1; ΔR^2 = .015 step 2; ΔR^2 = .000 step 3				R^2 =.155 step 1; ΔR^2 = .008 step 2; ΔR^2 = .037 step 3
AIO	-.026	.018	-.220	.457	.252	.293
IFL	-.086	.053	-.243	.493	.734	.107
InstO	.078	.030	.349**	-.530	.407	-.181
		R^2 = .073 step 1; ΔR^2 = .040 step 2; ΔR^2 = .116 step 3				R^2 = .095 step 1; ΔR^2 = .008 step 2; ΔR^2 = .031 step 3
SPE	.004	.071	.009	-.188	.938	-.030
SPS	.007	.128	.009	-1.178	1.687	-.108
EN	-.052	.026	-.294	.393	.347	.170
L1S	.011	.053	.037	-.426	.702	-.106
L1C	-.035	.062	-.095	.391	.824	.083
		R^2 = .002 step ; ΔR^2 = .001 step 2; ΔR^2 = .076 step 3; ΔR^2 = .000 step 4; ΔR^2 = .006 step5				R^2 = .006 step 1; ΔR^2 = .012 step 2; ΔR^2 = .027 step 3; ΔR^2 = .004 step 4; ΔR^2 = .005 step5

p< .05; ** p < .01;

Appendix K. Regressions

Multiple hierarchical regression analysis. AV – average reaction time, HF – high frequency, MF – medium frequency; LF – low frequency. DSA - Duration SA; LoA – Length of attrition; InProf - Initial Proficiency; AIO-attitude and integrative orientation; IFL-interest in foreign languages; InstO-instrumental orientation SPE – Spanish for Entertainment; SPS – Spanish for Social purposes; EN – use of English; L1S – Use of L1 for Social purposes; L1C – Use of L1 for Communication

	Av (log)			*HF (log)*			*MF (log)*			*LF (log)*		
	B	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*
DSA	-.005	.007	-.092	-.006	.007	-.117	-.010	.009	-.157	.002	.010	.023
LoA	.001	.001	.204	.001	.001	.124	.001	.001	.110	.002	.001	.257
In.Prof	-.066	.031	-.288*	-.060	.032	-.264	-.098	.040	-.331*	-.073	.042	-.240
	R^2 = .104 step 1;			R^2 = .090 step 1;			R^2 = .140 step 1;			R^2 = .066 step 1;		
	Δ R^2 = .046 step 2;			Δ R^2 = .019 step 2;			Δ R^2 = .017 step 2;			Δ R^2 = .064 step 2;		
	Δ R^2 = .008 step 3			Δ R^2 = .013 step 3			Δ R^2 = .023 step 3			Δ R^2 = .001 step 3		
AIO	-.004	.002	-.318	-.003	.002	-.218	-.004	.003	-.262	-.007	.003	-.399*
IFL	.000	.006	.002	-.002	.006	-.057	-.003	.008	-.065	.006	.008	.132
InstO	.001	.003	.027	-.001	.003	-.022	.000	.004	.003	.002	.004	.076
	R^2 = .097 step 1;			R^2 = .064 step 1;			R^2 = .087 step 1;			R^2 = .098 step 1;		
	Δ R^2 = .000 step 2;			Δ R^2 = .002 step 2;			Δ R^2 = .003 step 2;			Δ R^2 = .013 step 2;		
	Δ R^2 = .001 step 3			Δ R^2 = .000 step 3			Δ R^2 = .000 step 3			Δ R^2 = .006 step 3		
SPE	.010	.008	.201	.006	.008	.116	.010	.010	.150	.016	.010	.245
SPS	-.015	.014	-.170	-.007	.014	-.076	-.015	.018	-.134	-.012	.018	-.106
EN	-.001	.003	-.067	-.003	.003	-.166	.001	.004	.042	-.002	.004	-.090
L1S	.003	.006	.080	.001	.006	.035	.008	.007	.180	-.002	.007	-.045
L1C	-.002	.007	-.052	-.002	.007	-.056	-.003	.009	-.055	-.002	.009	-.038
	R^2 = .024 step 1;			R^2 = .013 step 1;			R^2 = .009 step 1;			R^2 = .051 step 1;		
	Δ R^2 = .027 step 2;			Δ R^2 = .003 step 2;			Δ R^2 = .025 step 2;			Δ R^2 = .007 step 2;		
	Δ R^2 = .004 step 3;			Δ R^2 = .025 step 3;			Δ R^2 = .001 step 3;			Δ R^2 = .006 step 3;		
	Δ R^2 = .003 step 4;			Δ R^2 = .000 step 4;			Δ R^2 = .022 step 4;			Δ R^2 = .004 step 4;		
	Δ R^2 = .002 step5			Δ R^2 = .002 step5			Δ R^2 = .002 step5			Δ R^2 = .001 step5		

* p< .05; ** p < .01;

Multiple hierarchical regression analysis, hesitation markers and disfluencies. Reps – repetitions, Corrs – corrections, Refs – reformulations, FPs – filled pauses, FStarts – flase starts. DSA - Duration SA; LoA – Length of attrition; InProf - Initial Proficiency; AIO-attitude and integrative orientation; IFL-interest in foreign languages; InstO-instrumental orientation SPE – Spanish for Entertainment; SPS – Spanish for Social purposes; EN – use of English; L1S – Use of L1 for Social purposes; L1C – Use of L1 for Communication

	Reps (log)			*Corrs. (log+1)*			*Refs (log)*			*FPs (log)*			*FStarts (log)*		
	B	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*
D SA	-.003	.014	-.027	-.013	.007	-.239	-.019	.015	-.189	-.012	.020	-.079	-.011	.016	-.090
LoA	.000	.002	.009	.000	.001	-.058	-.003	.002	-.224	.000	.003	-.015	.003	.002	.202
InProf	-.098	.061	-.233	-.065	.033	-.273	-.005	.064	-.012	-.302	.089	-.448**	-.182	.069	-.351*
	R^2 = .057 step 1;			R^2 = .102 step 1;			R^2 = .001 step 1;			R^2 = .22 step 1;			R^2 = .15 step1;		
	Δ R^2 = .000 step 2;			Δ R^2 = .001 step 2;			Δ R^2 = .04 step 2;			Δ R^2 = .00 step 2;			Δ R^2 = .05 step 2;		
	Δ R^2 = .001 step 3			Δ R^2 = .054 step 3			Δ R^2 = .034 step 3			Δ R^2 = .01 step 3			Δ R^2 = .01 step 3		
AIO	-.003	.002	-.218	-.002	.002	-.128	-.003	.004	-.106	-.012	.006	-.315*	-.004	.005	-.135
IFL	-.002	.006	-.057	-.002	.006	-.050	.007	.012	.093	-.024	.016	-.223	-.023	.014	-.267
InstO	-.001	.003	-.022	-.005	.004	-.209	.002	.007	.044	-.003	.009	-.038	.005	.007	.092
	R^2 = .064 step 1;			R^2 = .04 step 1;			R^2 = .002 step1;			R^2 = .19 step 1;			R^2 = .07 step1;		
	Δ R^2 = .002 step 2;			Δ R^2 = .002 step 2;			Δ R^2 = .006 step 2;			Δ R^2 = .04 step 2;			Δ R^2 = .05step 2;		
	Δ R^2 = .000 step 3			Δ R^2 = .042 step 3			Δ R^2 = .002 step 3			Δ R^2 = .00 step 3			Δ R^2 = .01 step 3		
SPE	.005	.014	.054	.000	.007	.002	.022	.014	.229	.010	.022	.070	.013	.017	.114
SPS	-.004	.025	-.024	.014	.013	.159	-.052	.026	-.304*	-.020	.040	-.075	-.007	.030	-.037
EN	-.006	.005	-.179	.002	.003	.100	.002	.005	.044	-.006	.008	-.105	-.001	.006	-.020
L1S	.003	.011	.053	.012	.005	.351*	.001	.011	.014	.024	.017	.245	.023	.013	.310
L1C	.001	.012	.010	.004	.006	.095	-.005	.013	-.062	-.017	.020	-.155	-.020	.015	-.233
	R^2 = .005 step 1;			R^2 = .001 step 1;			R^2 = .017 step 1;			R^2 = .002 step 1;			R^2 = .007 step 1;		
	Δ R^2 = .000 step 2;			Δ R^2 = .009 step 2;			Δ R^2 = .090 step 2;			Δ R^2 = .009 step 2;			Δ R^2 = .006 step 2;		
	Δ R^2 = .033 step 3;			Δ R^2 = .002 step 3;			Δ R^2 = .003 step 3;			Δ R^2 = .010 step 3;			Δ R^2 = .000 step 3;		
	Δ R^2 = .003 step 4;			Δ R^2 = .157 step 4;			Δ R^2 = .000 step 4;			Δ R^2 = .026 step 4;			Δ R^2 = .034 step 4;		
	Δ R^2 = .000 step5			Δ R^2 = .006 step5			Δ R^2 = .003 step5			Δ R^2 = .017 step5			Δ R^2 = .037 step5		

* p< .05; ** p < .01;

Appendix K. Regressions

Multiple hierarchical regression analysis, % correct responses. AV – average percent correct responses, HF – high frequency, MF – medium frequency; LF – low frequency. DSA - Duration SA; LoA – Length of attrition; InProf – Initial Proficiency; AIO-attitude and integrative orientation; IFL-interest in foreign languages; InstO-instrumental orientation SPE – Spanish for Entertainment; SPS – Spanish for Social purposes; EN – use of English; L1S – Use of L1 for Social purposes; L1C – Use of L1 for Communication

	% correct Av			*% correct HF*			*% correct MF*			*% correct LF*		
	B	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*
DSA	1.984	.845	.286*	.982	.734	.174	2.757	.855	.371**	2.114	1.183	.233
LoA	-.023	.117	-.023	.024	.101	.030	.074	.118	.071	-.142	.163	-.111
InProf	13.953	3.742	.451**	11.059	3.253	.439**	15.223	3.785	.460***	14.782	5.238	.365**
	R^2 = .266 step 1;			R^2 =.225 step 1;			R^2 = .286 step 1;			R^2 = .181 step 1;		
	Δ R^2 = .004 step 2;			Δ R^2 = .000 step 2;			Δ R^2 = .001 step 2;			Δ R^2 = .020 step 2;		
	Δ R^2 = .077 step 3			Δ R^2 = .028 step 3			Δ R^2 = .129 step 3			Δ R^2 = .051 step 3		
AIO	.495	.275	.291	.263	.229	.190	.498	.295	.273	.741	.361	.333*
IFL	.384	.800	.076	.516	.668	.126	.512	.859	.095	-.038	1.051	-.006
InstO	-.771	.443	-.241	-.503	.370	-.194	-.800	.476	-.234	-.987	.582	-.236
	R^2 = .077 step 1;			R^2 = .046 step 1;			R^2 = .074 step 1;			R^2 = .077 step 1;		
	Δ R^2 = .004 step 2;			Δ R^2 = .011 step 2;			Δ R^2 = .006 step 2;			Δ R^2 = .000 step 2;		
	Δ R^2 = .055 step 3			Δ R^2 = .036 step 3			Δ R^2 = .052 step 3			Δ R^2 = .053 step 3		
SPE	.042	.952	.006	.252	.788	.046	-.221	1.013	-.031	-.196	1.251	-.022
SPS	-.045	1.711	-.004	.634	1.416	.065	-.184	1.821	-.014	-.322	2.250	-.021
EN	1.001	.352	.396**	.572	.291	.278	1.141	.374	.422**	1.226	.463	.371
L1S	-.658	.713	-.149	-.755	.590	-.211	-.735	.758	-.156	-.328	.937	-.057
L1C	1.449	.836	.281	1.566	.692	.373*	.852	.889	.154	1.920	1.099	.285
	R^2 = .001 step1;			R^2 = .002 step1;			R^2 = .007 step 1;			R^2 = .041 step 1;		
	Δ R^2 = .001 step 2;			Δ R^2 = .004 step 2;			Δ R^2 = .002 step 2;			Δ R^2 = .003 step 2;		
	Δ R^2 = .126 step 3;			Δ R^2 = .053 step 3;			Δ R^2 = .163 Step 3;			Δ R^2 = .103 step 3;		
	Δ R^2 = .000 step 4;			Δ R^2 = .000 step 4;			Δ R^2 = .005 step 4;			Δ R^2 = .009 step 4;		
	Δ R^2 = .055 step 5			Δ R^2 = .096 step 5			Δ R^2 = .016 step 5			Δ R^2 = .056 step 5		

* p< .05; ** p < .01;

Appendix L. Sociolinguistic Questionnaire

_____

Nombre: _____ **Fecha**: _____

Part I: Información Personal y Lingüística

1. Sexo: Hombre ____ Mujer____

2. Edad: _____

3. ¿Dónde has nacido?

Población _____ Región_____ País _____

4. ¿Cuál es tu lengua materna? Holandés ____ Inglés ____ Otra _____

5. ¿Qué lengua(s) hablas en casa? Holandés ____ Inglés ____ Otra _____

5a. ¿Si hablas mas de una, con quién hablas cada lengua?

_____

6. ¿En qué lengua(s) realizaste la mayoría de tus estudios pre-universitarios?

Holandés ____ Inglés ____ Otra _____

6a. En caso de más de una, por favor marca aproximadamente el número de años por cada lengua.

_____

7. ¿Has estado alguna vez en una región de habla Española ***con el fin de aprender español***?

No ____ Sí ____

7a. En caso de que "Sí", ¿Cuándo? ____ 7b. ¿Dónde? _____

7c. ¿Cuánto tiempo? 1 semestre o menos ____; 2 semestres ____ ; más de 2 semestres ____

8. ¿Aparte de la experiencia mencionada en la pregunta 7, has vivido alguna vez en una situación donde estuvieras expuesto/a a una lengua que **NO** fuera tu lengua(s) materna o el español?

No ____ Sí ____

Si la respuesta es "Sí", por favor, pon los detalles en la taula de abajo.

	Experiencia 1	Experiencia 2	Experiencia 3
País/región			
Lengua			
Propósito			
Duración			

9. Por favor, utiliza la tabla abajo para auto-evaluar tu nivel de conocimiento de cada una de las habilidades de cada lengua que hablas, utilizando la siguiente escala:

1 – Malo, 2 – Bueno, 3 – Muy bueno, 4 – Nativo/casi-nativo

En la última columna escribe cuantos años has ***estudiado*** esta lengua en un entorno ***formal***.

Lengua	Comprensión auditiva	Expresión oral	Comprensión de lectura	Expresión escrita	Años
Holandés					
Inglés					
Español					

10 ¿Has estudiado español en cada uno de los niveles siguientes? En que nivel:

a. Primaria: __ No __ Sí: __ menos de un año; __1-2 años; __más de 2 años

b. Secundaria: __ No __ Sí: __ menos de un año; __1-2 años; __más de 2 años

d. Universidad: __ No __ Sí: __ menos de un año; __1-2 años; __más de 2 años

e. Otro (por favor especifica)
_____

__ menos de un año; __1-2 años; __más de 2 años

11. ¿En qué año de universidad estás? 1º __ 2º__ 3º__ 4º__ Postgrado__ Otro__

12. ¿Que carrera haces?
_____

Part II. Información de la estancia en el extranjero.

13. Universidad de intercambio:
_____

15. Duración: desde _____ hasta
_____

16. ¿Cuál de las siguientes situaciones describe mejor tu alojamiento en España??

___ a. Vivía en la casa de una familia hispano hablante.

¿La familia hablaba holandés? No___ Sí___

¿La familia hablaba inglés? No___Sí___

¿Había otros hablantes de español no nativos que vivían con tu familia huésped? No___Sí___

___ b. Vivía en una residencia.

___ Tenía habitación individual.

___ Compartía la habitación con un hispano hablante nativo.

___ Vivía con otros que NO eran hablantes nativos o muy fluidos en español.

___ c. Vivía solo en un apartamento o casa.

___ d. Vivía en un apartamento o casa con hablante(s) nativos o muy fluidos.

___ e. Vivía en un apartamento o casa con otros que NO eran hablantes nativos o muy fluidos en español.

___ f. Otro, por favoriespecífica:

_____

17. Por favor, utiliza la escala siguiente para marcar la frecuencia y la lengua que utilizabas ***durante tu estancia en España*** cuando:

1 –*muy raramente* **2** –*raramente* **3** – *a veces* **4** – *con frecuencia* **5** – *todo el tiempo*

	español	inglés	holandés	Otra, especifica.
hablaba con amigos				
hablaba on mascotas				
hacía cálculos				
decía palabrotas				
soñaba				
hacía la compra				
pedía comida en restaurantes				
miraba páginas por Internet				
leía libros				
leía periódicos				
leía revistas				
leía emails				
Escribía emails				
Escribía cartas				
miraba la tele				
miraba películas				
escuchaba la radio				

Part III: Experiencia Lingüística Actual

18. Por favor, marca todas las asignaturas que has hecho en español desde que has vuelto de España. Esto incluye asignaturas de lengua española así como otras signaturas que se han hecho en español.

Asigntura desde - hasta

_____ _____

_____ _____

_____ _____

19. Por favor, utiliza la escala siguiente para marcar la frecuencia y la lengua que utiliza ***desde que has vuelto de España/después de volver de España*** cuando:

1 –*muy raramente* **2** –*raramente* **3** – *a veces* **4** – *con frecuencia* **5** – *todo el tiempo*

	español	inglés	holandés	Otra, especifica.
hablas con amigos				
hablas on mascotas				
haces calculos				
dices palabrotas				
sueñas				
haces la compra				
Pides comida en restaurantes				
miras páginas por Internet				
lees libros				
lees periódicos				
lees revistas				
lees emails				
escribes emails				
escribes cartas				
miras la tele				
miras películas				
escuchas la radio				

Appendix M. Transcription symbols

Symbols used	*Description of Standards*
#, ##, ###	Unfilled short, medium and long pause.
.	Period. End of an unmarked (declarative) utterance.
?	Question Mark. End of a question.
!	Exclamation Point. End of an imperative or emphatic utterance.
+...	Trailing Off. Incomplete, but not interrupted, utterance.
+,	Self-Completion. Completion of an utterance after an interruption.
+/.	Interrupted speech.
+"/.	Direct speech of a third person follows on next line.
+"	Direct speech.
je@s:fr	Speech in foreign language: s:fr, s:en, s:nl, s:de.
sumarar@e	Pronunciation error or invented word.
xxx	Unintelligible speech.
&	False start: retraction within a word.
&=	Simple Events. Sounds produced by the speaker not being words such as laughs, munching, etc.
<fragment>	String of words modified by the following symbol.
ahm@fp	Filled pause.
[/] rp@fp	Retracing Without Correction. Repetition of early material without change.
[//] rt@fp	Retracing With Correction. Repetition of the basic phrase, changing the syntax but maintaining the same idea.
[///]rf@fp	Retracing With Reformulation. Full and complete reformulations of the message without specific corrections.

Appendix N. A transcribed interview

@UTF8
@Begin
@Languages: es
@Participants: XYZ Participant_1
@Filename: Subj_01_T1.cha
@Age of XYZ: 22;
@Sex of XYZ: male
@Date: 14-APR-2008
@Test type: Interview
@Session: I
@Location: Groningen
@Transcriber: Teodora
@Coder: Teodora
@ID:sp|thesis|XYZ|22;|||Participant||.
@Font: Courier New
*XYZ: veinte dos.
*XYZ: aquí en Holanda, cual lugar ?
*XYZ: ahm@fp se llama Harlingen h@l a@l +/.
*XYZ: tu ya lo conoces?
*XYZ: muy guay no?
*XYZ: pequeño al mar +...
*XYZ: me gusta mucho durante el verano pero < a > [/] rp@fp < a > [//] rt@fp en el invierno es aburrido.
*XYZ: sí creo que sí.
*XYZ: pero &mts # pues < es > [/] rp@fp <es > [/] rp@fp <es > [/] rp@fp es bonito # es xxx Harlingen.
*XYZ: < porque pues > [//] rt@fp # porque es # primero < es > [/] rp@fp ## es que todos mis amigos o < muchas > [//] rt@fp muchos a venían por aquí ## y supongo porque es más cerca # más cerca que Ámsterdam que Utrecht que Rotterdam ## entonces por esto y me gusta la ciudad.
*XYZ: desde cuando estas aquí?
*XYZ: dos meses?
*XYZ: vale.
*XYZ: claro.
*XYZ: sí.
*XYZ: frisón.
*XYZ: pero solo con la familia de mi padre.
*XYZ: holandés siempre.
*XYZ: sí.
*XYZ: pues # más y más con palabras de inglés pero # con mis amigos nunca frisón # no solo con mi familia porque con los viejos del lado de mi padre.
*XYZ: frisón pues ahm@fp # en la escuela # en la primaria # sí tienen en < todo > [/] rp@fp todo Frisia # tienen cursos # como ahm@fp creo que son dos horas # cada semana +...
*XYZ: +, para los niños entre # &=munch siete y &pr doce años.
*XYZ: +, en Frisia tienen que aprender el frisón.

*XYZ: no < nunca > [/] rp@fp nunca solo para bromar@e < solo > [/] rp@fp solo para imitar a los frisones porque soy frisón claro pero # los que hablan frisón ahm@fp como lengua primera # ahm@fp # decimos que somos <los ganadores> [//] rt@fp los ganadores # como los del campo que no saben mucho del mundo sabes?
*XYZ: entonces solo para bromar@e < pero > [/] rp@fp # pero ahm@fp < para > [///] rf@fp por mi abuelo era importantísimo que hablaba frisón porque +...
*XYZ: +, pues soy ahm@fp primero hijo del primero hijo del primer hijo por eso tuve que hablarlo # importantísimo &=laugh pero +/.
*XYZ: sí lo he visitado en noviembre y en # enero otra vez Barcelona # no con navidad de siempre # sí # he nadado por allá # hieladisima@e pero vale # después tuve frío pero es me gusta mucho y el país vasco también.
*XYZ: y en ahm@fp ahm@fp # un parte de Aragón muy pequeño no?
*XYZ: como se llama &=knocking ?
*XYZ: pero algo como romano # no?
*XYZ: vale # es muy pequeño # como cinco mil personas.
*XYZ: a mi <me encanta> [//] rt@fp me encantan las lenguas.
*XYZ: no nunca < siempre > [/] rp@fp siempre vivía aquí # pues en Holanda Harlingen o Groningen # hace cuatro años.
*XYZ: sí.
*XYZ: sí.
*XYZ: sí # por el Internet hablando con mis amigos por xxx.
*XYZ: ahm@fp ahm@fp clase número siete como se dice en español?
*XYZ: clase número siete como cuando tienes como diez años # en Holanda tienes que aprender o empiezas con aprender ahm@fp (l)inglés@e .
*XYZ: y dos años después # ahm@fp ahm@fp primer clase de secundaria empiezas con francés y alemán.
*XYZ: entonces tienes # yo estuve en la escuela # ahm@fp durante # &=whistling la secundaria durante nueve años # entonces ahm@fp sí nueve no siete años xxx pero entonces tuve inglés por nueve años # y tuve clases de francés y alemán por # ahm@fp siete años.
*XYZ: en inglés cuatro.
*XYZ: cuatro.
*XYZ: todos las partes # leer, escribir.
*XYZ: francés xxx muy # malísimo de # pues después < de > [/] rp@fp # de aprender español mi francés era una mierda de verdad # porque +/.
*XYZ: +, porque de xxx cuando quiero hablar < español > [//] rt@fp ahm@fp francés digo como # ahm@fp < je@s:fr > [/] rp@fp <je@s:fr > [/] rp@fp je@s:fr también hablo español con el acento francés sabes?
*XYZ: es increíble # entonces <no es> [/] rp@fp # no es bueno como antes # creo que hablo +...
*XYZ: dos.
*XYZ: escribir uno.
*XYZ: alemán tres creo # escribir dos.
*XYZ: siete sí.
*XYZ: poco # he hecho un curso de treinta y dos horas # aquí # en mayo ## < eran > [//] rt@fp # # < fueron > [/] rp@fp ## fueron dieciséis semanas # un clase cada semana.

*XYZ: &=snort al final he dicho a mi mismo pues <esta seran poco> [///] rf@fp eran poco &=laugh porque < cuando > [/] rp@fp cuando llegué a España ## ahm@fp cuando era # fin de agosto este agosto, el agosto pasado +/.
*XYZ: +, hablé casi nada # no conocía el pretérito imperfecto el pasado # &=inhale no conocía nada.
*XYZ: Gracias porque xxx España y en particular cuando viajas un poco y vives en Madrid y +...
*XYZ: no e(s) pa tanto, ma(s) o meno(s) # yo fui a < cadi@e > [/] rp@fp < cadi@e > [/] rp@fp < cadi@e > [/] rp@fp # cadi@e # y conocí a < una > [/] rp@fp <una> [/] rp@fp una amiga mía <era de> [/] rp@fp era de entre Cádiz y Sevilla y siempre # tuve que preguntar <que dices> [/] rp@fp que dices puedes repetirlo pero what@s:en porque no lo entiendo mucho &=laugh # es que ## hablan todo a dentro # y no [///] rf@fp como # vaya oí # es como papa viene por aquí # puedes pronunciar # es que pero vale # vale.
*XYZ: tercero curso # cuarto año # mi cuarto año, sí.
*XYZ: ahm@fp <en dos> [/] rp@fp <en dos > [///] rf@fp pues ahm@fp &des después de este año # voy a hacer un máster # para dos años # eso es.
*XYZ: yo voy a hacer el máster educativo # de historia.
*XYZ: quiero ser profesor < quizás > [/] rp@fp ## pero < quizá > [//] rt@fp quizás &=laugh estoy hablando andaluz pero ahm@fp pues < no > [/] rp@fp no estoy < cierto > [//] rt@fp ahm@fp seguro # pero ahm@fp # < todos > [//] rt@fp de todos modos < quiero > [/] rp@fp ahm@fp quiero el poder # < de > [/] rp@fp de como se dice # # ahm@fp (d)estar@e profesor.
*XYZ: sí, de enseñar # eso es desde luego.
*XYZ: no, creo que no # pues # hace algunos años # ahm@fp # # habrá más atención # < por > [/] rp@fp # ahm@fp # por ahm@fp este < ocupación > [/] rp@fp ocupación se dice no.
*XYZ: sí # por # sí, esta profesión # porque hay < un > [//] rt@fp ahm@fp o # habrá # una falta # de profesores y &necesit necesitamos más # pero es que # < cuando > [///] rf@fp pues # si vas a estar profesor # no vas a ahm@fp # como se dice # no vas a # earn@s:en &=laugh ?
*XYZ: a ganar # es ganar, no?
*XYZ: < he > [/] rp@fp he pensado que ganar solo era como fútbol ganar pero # no vas a ganar mucho # y < tampoco > [/] rp@fp &=munch ahm@fp tampoco vas a tener mucho respecto o status.
*XYZ: es de xxx.
*XYZ: pues.
*XYZ: es verdad es verdad.
*XYZ: sí.
*XYZ: es verdad.
*XYZ: sí.
*XYZ: pues < es > [/] rp@fp es que en Holanda en general esta bien # todos partes # pues están educados < buenos > [//] rt@fp # ahm@fp buenos educados pero # # ahm@fp # # &=sign xxx es que ahm@fp # &=munch < gente > [///] rf@fp creo que no quieren estar profesor # porque no puedes # ahm@fp # hacer una carrera # sabes # si vas a estar profesor es como a # # vale # y cuanto ganas y ahm@fp no lo saben pero < a > [/] rp@fp a mi me encanta trabajar < con > [/] rp@fp con jóvenes en particular # y con historia también # y por esto &m me gusta creo.

*XYZ: secundaria: < los > [/] rp@fp <los clases> [/] rp@fp los clases más altas # ahm@fp de secundaria.
*XYZ: < pues > [/] rp@fp < pues > [/] rp@fp pues < pero > [/] rp@fp pero tengo amigos # tengo un amigo que quiere # ser # profesor # aquí en la universidad # a mi no me gusta porque < no quiero > [/] rp@fp # no quiero ahm@fp < dedicar > [//] rt@fp < dediquir > [//] rt@fp dedicar mi vida # a estudiar todo el tiempo y xxx escribir libros y pues xxx creo que en una secundaria # con los jóvenes en particular # entre quince y las dieciocho ahm@fp # < son > [/] rp@fp son difíciles # &=laugh pero &=laugh estuve difícil mi mismo # pero <a mi me gusta> [/] rp@fp a mi me gusta y también tengo que decir que soy de una familia # de profesores # mi madre # ahm@fp # mi hermana # sí # mucha gente # pues < tengo > [///] rf@fp, como se dice en holandés ahm@fp # tengo # lo tengo en mi sangre &=laugh .
*XYZ: historia sí.
*XYZ: <tuve duros> [//] rt@fp tuve dudas # antes de elegir # ahm@fp sociología me intereso # ahm@fp # otras cosas como aquí también tienes # ahm@fp < relaciones # internacionales > [//] rt@fp <relaciones y organisones > [//] rt@fp organiciones@e internacionales # pero al final historia porque # < no > [/] rp@fp no pude decidir &=laugh tuve que elegir.
*XYZ: < no > [/] # no # hay que elegir # pues en general # ahm@fp hay tres masters@s:en y # otros espelizaciones@e como # ahm@fp < estudia > [//] rt@fp estudios ánticos@e o estudios de Japón o algo de historia # pero ahm@fp en historia # el main@s:en stream@s:en # como se dice # tiene el máster educativo # el máster científico y el máster # normal por un año # con que vas a trabajar < a > [//] en un empresa o algo # pero el educativo no se, son dos años # y soy joven sabes por eso he dicho a mi mismo vale # voy a hacer dos años mas.
*XYZ: sin máster educativo?
*XYZ: pues # los # # creo que la mayoría de los históricos # # &his &his < historiano > [/] rp@fp históricos no?
*XYZ: históricos, sí # van a trabajar con empresas # o < con > [/] rp@fp ahm@fp <con el estado> [/] rp@fp # con el estado # solo hay como # un cuarto o < veinte > [/] rp@fp veinte &per por ciento que # va a ser profesor.
*XYZ: la mayoría va a trabajar como &=munch &=gasp # algo # que es muy difícil < para > [/] rp@fp para traducir # (d)holandés@e a español # ahm@fp # &=munch &=gasp xxx@s:nl &=laugh .
*XYZ: tu no sabes nada # eso < es > [/] # es como alguien # que es como ahm@fp pues en inglés # no?
*XYZ: algo ahm@fp &=laugh # en inglés es difícil también &=inhale ahm@fp &=munch policy@s:en cooperator@s:en.
*XYZ: vale es que ahm@fp estas trabajando < como > [///] rf@fp porque los teóricos # saben escribir y leer y ahm@fp sumarar@e # y todo muy bueno # y tienen su ## &=noise su [/] rp@fp < su vistas> [//] rt@fp sus vistas históricos porque pues # no se # con que puedas algo no lo se.
*XYZ: Alcalá de Henares en Madrid.
*XYZ: cuidad más # bonita.
*XYZ: depende?
*XYZ: o si vas con el coche Alcalá es < muy > [/] rp@fp < muy> [/] rp@fp muy feo.
*XYZ: Alcalá < parece > [///] rf@fp me parece < muy > [/] rp@fp muy fea si vayas con el coche porque hay mucha industria # es como # conectado con Madrid

con un # &=inhale < con > [/] rp@fp con solo industria pero # el casco antiguo # es < como > [///] rf@fp # me gusta mucho, es más viejo que Madrid.
*XYZ: sí, agosto.
*XYZ: tres de febrero dos mil ocho.
*XYZ: en un piso compartido # con dos francesas.
*XYZ: español.
*XYZ: español pude entender el Frances # pero mi mejor amiga ya # ahm@fp < la > [/] rp@fp < la > [///] rf@fp < una > [/] rp@fp una francesa me ha dicho +"/.
*XYZ: +" yo no estoy en España para hablar francés.
*XYZ: y tuve razones # eh y ahm@fp # la otra no estaba mucho # entonces no +...
*XYZ: siempre hemos hablado español # con todos hablé español pero solo con los americanos o con los ingleses # hable inglés.
*XYZ: no # < pero > [/] rp@fp pero empecé con # ahm@fp &=munch escribir < mi > [/] rp@fp mi ensayo final # por mi bachelor@s:en sobre < un > [/] rp@fp un tema español # sobre la transición &es en España.
*XYZ: no < a > [//] <in@s:en > [//] en holandés pero leo mucho por eso en # ahm@fp inglés # y un poco en español.
*XYZ: lo veo como ## más como una generación en general que # gente de este piso gente de este país a mi me parece que # pues los franceses, los ingleses, los frisones < tienen > [///] rf@fp todos tienen algún particular como los alemanes que se llevan tan muy pronto por la # madrugada y van a trabajar y los ingleses que están borrachos por la calle # franceses que son un poco arrogantes, los españoles que quieren hacer la fiesta todo el tiempo pero ## vale +...
@End

Appendix O. A transcription after MOR and POST programs

@UTF8
@Begin
@Languages: es
@Participants: XYZ Participant 1
@Filename: Subj_01.cha
@Age of XYZ: 22;
@Sex of XYZ: male
@Date: 14-APR-2008
@Test type: Interview
@Session: I
@Location: Groningen
@Transcriber: Teodora
@Coder: Teodora
@ID:sp|thesis|XYZ|22;||||Participant||.
@Font: Courier New
*XYZ: veinte dos .
%mor: num|veinte=twenty num|dos=two .
*XYZ: aquí en Holanda, cual lugar ?
%mor: adv|aquí=here prep|en=in n:prop|Holanda rel|cual=which |lugar&MASC=place ?
*XYZ: ahm@fp se llama Harlingen h@l a@l +/.
%mor: chi|ahm pro:refl|se=itself vpres|llama-3S&PRES=call n:prop|Harlingen n:let|h n:let|a +/.
*XYZ: tu ya lo conoces ?
%mor: det:pos|tu=your adv|ya=already pro:per:1|lo&MASC=him vpres|conoce-2S&PRES=know ?
*XYZ: muy guay no ?
%mor: adv|muy=very co|guay=cool adv|no=no ?
*XYZ: pequeño al mar +...
%mor: adj|pequeño-MASC=small prep|a~det|el&MASC=to n|mar&FEM=sea +...
*XYZ: me gusta mucho durante el verano pero < a > [/] rp@fp a en el invierno es aburrido .
%mor: pro:per|me=me vpres|gusta-3S&PRES=like adv|mucho=much adv|durante=during det:art|el&MASC&SG=the n|verano&MASC=summer conj|pero=but chi|rp prep|a=to prep|en=in det:art|el&MASC&SG=the n|invierno&MASC=winter vpres|se-3S&PRES=be n|aburrido&MASC=boredom .
*XYZ: sí, creo que sí .
%mor: adv|sí=yes vpres|cree-1S&PRES=believe rel|que=that co|sí=yes .
*XYZ: pero &mts # pues < es > [/] rp@fp <es > [/] rp@fp <es > [/] rp@fp es bonito # es xxx Harlingen .
%mor: conj|pero=but co|pues=well chi|rp chi|rp chi|rp vpres|se-3S&PRES=be adj|bonito-MASC=pretty vpres|se-3S&PRES=be unk|xxx n:prop|Harlingen .
*XYZ: < porque pues > [//] rt@fp # porque es # primero < es > [/] rp@fp ## es que todos mis amigos o < muchas > [//] rt@fp muchos a venían por aquí ## y

supongo porque es más cerca # más cerca que Ámsterdam que Utrecht que Rotterdam ## entonces por esto y me gusta la ciudad .
%mor: chi|rt conj|porque=because vpres|se-3S&PRES=be num:adj|primero-MASC=first chi|rp vpres|se-3S&PRES=be rel|que=that det:indef|todo-MASC-PL=all det:pos|mi-PL=my n|amigo-MASC-PL=friend^n|amigo-PL&FEM=friend conj|o=or chi|rt det:indef|mucho-MASC-PL=many prep|a=to vpas|veni-3P&PAS=come prep|por=for adv|aquí=here conj|y=and vpres|supone-1S&PRES=suspose conj|porque=because vpres|se-3S&PRES=be adv|más=more adv|cerca=near adv|más=more adv|cerca=near rel|que=that n:prop|Ámsterdam rel|que=that n:prop|Utrecht rel|que=that n:prop|Rotterdam adv|entonces=then prep|por=for pro:dem|esto=this_one conj|y=and pro:per|me=me vpres|gusta-3S&PRES=like det:art|el&FEM&SG=the n|ciudad&FEM=town .
*XYZ: desde cuando estas aquí ?
%mor: prep|desde=from conj|cuando=when det:dem|este-FEM-PL=this adv|aquí=here ?
*XYZ: dos meses ?
%mor: num|dos=two n|mes-PL&MASC=month ?
*XYZ: vale .
%mor: co|okay .
*XYZ: claro .
%mor: co|claro=obvious .
*XYZ: sí.
%mor: conj|si=if .
*XYZ: frisón .
%mor: adj|frisón=Frisian .
*XYZ: pero solo con la familia de mi padre .
%mor: conj|pero=but adv|solo=just prep|con=with det:art|el&FEM&SG=the n|familia&FEM=family prep|de=of det:pos|mi=my n|padre&MASC=father .
*XYZ: holandés siempre .
%mor: n|holandés&MASC=Dutch adv|siempre=always .
*XYZ: sí.
%mor: co|sí=yes .
*XYZ: pues # más y más con palabras de inglés pero # con mis amigos nunca frisón # no solo con mi familia porque con los viejos del lado de mi padre .
%mor: co|pues=well adv|más=more conj|y=and adv|más=more prep|con=with n|palabra-PL&FEM=word prep|de=of n|inglés&MASC=English conj|pero=but prep|con=with det:pos|mi-PL=my n|amigo-MASC-PL=friend^n|amigo-PL&FEM=friend adv|nunca=never adj|frisón=Frisian adv|no=no adv|solo=just prep|con=with det:pos|mi=my n|familia&FEM=family conj|porque=because prep|con=with det:art|el&MASC-PL=the adj|viejo-MASC-PL=old prep|de~det|el&MASC=of n|lado&MASC=side prep|de=of det:pos|mi=my n|padre&MASC=father .
*XYZ: frisón pues ahm@fp # en la escuela # en la primaria # sí tienen en < todo > [/] rp@fp todo Frisia # tienen cursos # como ahm@fp creo que son dos horas # cada semana +...
%mor: n|frisón&MASC=Frisian co|pues=well chi|ahm prep|en=in det:art|el&FEM&SG=the n|escuela&FEM=school prep|en=in det:art|el&FEM&SG=the n|primaria&FEM=primary adv|sí=yes vpres|tene-3P&PRES=have prep|en=in chi|rp det:indef|todo-MASC=all n:prop|Frisia vpres|tene-3P&PRES=have n|curso-PL&MASC=course adv|como=like chi|ahm

vpres|cree-1S&PRES=believe rel|que=that vpres|se-3P&PRES=be num|dos=two n|hora-PL&FEM=hour det:indef|cada=each n|semana&FEM=week +...
*XYZ: +, para los niños entre # &=munch siete y &pr doce años .
%mor: prep|para=for det:art|el&MASC-PL=the n|niño-MASC-PL=child prep|entre=between num|siete=seven conj|y=and num|doce=twelve n|año-PL&MASC=year .
*XYZ: +, en Frisia tienen que aprender el frisón .
%mor: prep|en=in n:prop|Frisia vpres|tene-3P&PRES=have rel|que=that vinf|aprende-INF=learn det:art|el&MASC&SG=the n|frisón&MASC=Frisian .
*XYZ: no < nunca > [/] rp@fp nunca solo para bromar@e < solo > [/] rp@fp solo para imitar a los frisones porque soy frisón claro pero # los que hablan frisón ahm@fp como lengua primera # ahm@fp # decimos que somos <los ganadores> [//] rt@fp los ganadores # como los del campo que no saben mucho del mundo sabes ?
%mor: adv|no=no chi|rp adv|nunca=never adv|solo=just prep|para=for bab|bromar chi|rp adv|solo=just prep|para=for vinf|imita-INF=imitate prep|a=to det:art|el&MASC-PL=the n|frisón-PL&FEM=Frisian^n|frisón-PL=Frisian conj|porque=because vpres|se-1S&PRES=be n|frisón&MASC=Frisian co|claro=obvious conj|pero=but det:art|el&MASC-PL=the rel|que=that vpres|habla-3P&PRES=speak n|frisón&MASC=Frisian chi|ahm adv|como=like n|lengua&FEM=tongue num:adj|primero-FEM=first chi|ahm vpres|deci-1P&PRES=say rel|que=that vpres|se-1P&PRES=be chi|rt det:art|el&MASC-PL=the n|ganador-PL&FEM=winner^n|ganador-PL&MASC=winner adv|como=like det:art|el&MASC-PL=the prep|de~det|el&MASC=of n|campo&MASC=countryside rel|que=that adv|no=no vpres|sabe-3P&PRES=know adv|mucho=much prep|de~det|el&MASC=of n|mundo&MASC=world co|sabes=know ?
*XYZ: entonces solo para bromar@e < pero > [/] rp@fp # pero ahm@fp < para > [///] rf@fp por mi abuelo era importantísimo que hablaba frisón porque +...
%mor: adv|entonces=then adv|solo=just prep|para=for bab|bromar chi|rp conj|pero=but chi|ahm chi|rf prep|por=for det:pos|mi=my n|abuelo-MASC=grandparent vpas|se-13S&PAS=be adj|importante-SUPER-MASC=important rel|que=that vpas|habla-13S&PAS=speak adj|frisón=Frisian conj|porque=because +...
*XYZ: +, pues soy ahm@fp primero hijo del primero hijo del primer hijo por eso tuve que hablarlo # importantísimo &=laugh pero +/.
%mor: conj|pues=well vpres|se-1S&PRES=be chi|ahm num:adj|primero-MASC=first n|hijo-MASC=child prep|de~det|el&MASC=of num:adj|primero-MASC=first n|hijo-MASC=child prep|de~det|el&MASC=of num|primer=first n|hijo-MASC=child prep|por=for pro:dem|eso=that_one vpret|tene-1S&PRET=have rel|que=that vinf|habla-INF~pro:clit|OBJ&MASC=speak adj|importante-SUPER-MASC=important conj|pero=but +/.
*XYZ: sí, lo he visitado en noviembre y en # enero otra vez Barcelona # no con navidad de siempre # sí # he nadado por allá # hieladisima@e pero vale # después tuve frío pero es me gusta mucho y el país vasco también .
%mor: adv|sí=yes pro:per:1|lo&MASC=him v:aux|habe-1S&PRES=have vpart|visita-PPART&MASC=visit prep|en=in n|noviembre&MASC=November conj|y=and prep|en=in n|enero&MASC=January det:indef|otro-FEM=other n|vez&FEM=turn n:prop|Barcelona adv|no=no prep|con=with n|navidad&FEM=christmas prep|de=of adv|siempre=always co|sí=yes

v:aux|habe-1S&PRES=have vpart|nada-PPART&MASC=swim prep|por=for adv|allá=there bab|hieladisima conj|pero=but co|okay adv|después=after vpret|tene-1S&PRET=have adj|frío-MASC=cold conj|pero=but vpres|se-3S&PRES=be pro:per|me=me vpres|gusta-3S&PRES=like adv|mucho=much conj|y=and det:art|el&MASC&SG=the n|país&MASC=country^n|país&MASC=nation n|vasco-MASC=basque adv|también=also .
*XYZ: y en ahm@fp ahm@fp # un parte de Aragón muy pequeño no ?
%mor: conj|y=and prep|en=in chi|ahm chi|ahm det:art|un&MASC=one n|parte&FEM=part prep|de=of n:prop|Aragón adv|muy=very adj|pequeño-MASC=small co|no=no ?
*XYZ: como se llama &=knocking ?
%mor: adv|como=like pro:refl|se=itself vpres|llama-3S&PRES=call ?
*XYZ: pero algo como romano # no ?
%mor: conj|pero=but pro:dem|algo=something adv|como=like adj|romano-MASC=roman co|no=no ?
*XYZ: vale # es muy pequeño # como cinco mil personas .
%mor: co|okay vpres|se-3S&PRES=be adv|muy=very adj|pequeño-MASC=small adv|como=like num|cinco=five n|mil&MASC=thousand n|persona-PL&FEM=person .
*XYZ: a mi <me encanta> [//] rt@fp me encantan las lenguas .
%mor: prep|a=to det:pos|mi=my chi|rt pro:per|me=me vpres|encanta-3P&PRES=enchant det:art|el&FEM-PL=the n|lengua-PL&FEM=tongue .
*XYZ: no nunca < siempre > [/] rp@fp siempre vivía aquí # pues en Holanda Harlingen o Groningen # hace cuatro años .
%mor: adv|no=no adv|nunca=never chi|rp adv|siempre=always vpas|vivi-13S&PAS=live adv|aquí=here co|pues=well prep|en=in n:prop|Holanda n:prop|Harlingen conj|o=or n:prop|Groningen vpres|hace-3S&PRES=do num|cuatro=four n|año-PL&MASC=year .
*XYZ: sí .
%mor: adv|sí=yes .
*XYZ: sí .
%mor: adv|sí=yes.
*XYZ: sí # por el Internet hablando con mis amigos por xxx .
%mor: adv|sí=yes prep|por=for det:art|el&MASC&SG=the n:prop|Internet vger|habla-PROG=speak prep|con=with det:pos|mi-PL=my n|amigo-MASC-PL=friend^n|amigo-PL&FEM=friend prep|por=for unk|xxx .
*XYZ: ahm@fp ahm@fp clase número siete como se dice en español ?
%mor: chi|ahm chi|ahm n|clase&FEM=rank n|número&MASC=number num|siete=seven adv|como=like pro:refl|se=itself vpres|deci-3S&PRES=say prep|en=in n|español&MASC=Spanish ?
*XYZ: clase número siete como cuando tienes como diez años # en Holanda tienes que aprender o empiezas con aprender ahm@fp (l)inglés@e .
%mor: n|clase&FEM=rank n|número&MASC=number num|siete=seven adv|como=like conj|cuando=when vpres|tene-2S&PRES=have adv|como=like num|diez=ten n|año-PL&MASC=year prep|en=in n:prop|Holanda vpres|tene-2S&PRES=have rel|que=that vinf|aprende-INF=learn conj|o=or vpres|empeza-2S&PRES=begin prep|con=with vinf|aprende-INF=learn chi|ahm bab|linglés .
*XYZ: y dos años después # ahm@fp ahm@fp primer clase de secundaria empiezas con francés y alemán .

%mor: conj|y=and num|dos=two n|año-PL&MASC=year adv|después=after chi|ahm chi|ahm num|primer=first n|clase&FEM=rank prep|de=of n|secundaria&FEM=secondary vpres|empeza-2S&PRES=begin prep|con=with n|francés&MASC=French^n|francés&MASC=Frenchfranela conj|y=and adj|alemán=German .
*XYZ: entonces tienes # yo estuve en la escuela # ahm@fp durante # &=whistling la secundaria durante nueve años # entonces ahm@fp sí nueve no siete años xxx pero entonces tuve inglés por nueve años # y tuve clases de francés y alemán por # ahm@fp siete años .
%mor: adv|entonces=then vpres|tene-2S&PRES=have pro:per|yo=I vpret|esta-1S&PRET=be prep|en=in det:art|el&FEM&SG=the n|escuela&FEM=school chi|ahm adv|durante=during det:art|el&FEM&SG=the n|secundaria&FEM=secondary adv|durante=during num|nueve=nine n|año-PL&MASC=year adv|entonces=then chi|ahm adv|sí=yes num|nueve=nine adv|no=no num|siete=seven n|año-PL&MASC=year unk|xxx conj|pero=but adv|entonces=then vpret|tene-1S&PRET=have n|inglés&MASC=English prep|por=for num|nueve=nine n|año-PL&MASC=year conj|y=and vpret|tene-1S&PRET=have n|clase-PL&FEM=rank prep|de=of n|francés&MASC=French^n|francés&MASC=Frenchfranela conj|y=and adj|alemán=German prep|por=for chi|ahm num|siete=seven n|año-PL&MASC=year .
*XYZ: en inglés cuatro .
%mor: prep|en=in n|inglés&MASC=English num|cuatro=four .
*XYZ: cuatro .
%mor: num|cuatro=four .
*XYZ: todos las partes # leer escribir .
%mor: det:indef|todo-MASC-PL=all det:art|el&FEM-PL=the vpres|parti-2S&PRES=divide vinf|lee-INF=read vinf|escribi-INF=write .
*XYZ: francés xxx muy # malísimo de # pues después < de > [/] rp@fp # de aprender español mi francés era una mierda de verdad # porque +/.
%mor: n|francés&MASC=French^n|francés&MASC=Frenchfranela unk|xxx adv|muy=very adj|malo-SUPER-MASC=bad prep|de=of co|pues=well adv|después=after chi|rp prep|de=of vinf|aprende-INF=learn n|español&MASC=Spanish det:pos|mi=my n|francés&MASC=French^n|francés&MASC=Frenchfranela vpas|se-13S&PAS=be det:art|un-FEM=one n|mierda&FEM=shit prep|de=of n|verdad&FEM=truth conj|porque=because +/.
*XYZ: +, porque de xxx cuando quiero hablar < español > [//] rt@fp ahm@fp francés digo como # ahm@fp < je@s:fr > [/] rp@fp <je@s:fr > [/] rp@fp je@s:fr también hablo español con el acento francés sabes ?
%mor: conj|porque=because prep|de=of unk|xxx conj|cuando=when vpres|quere-1S&PRES=want vinf|habla-INF=speak chi|rt chi|ahm n|francés&MASC=French^n|francés&MASC=Frenchfranela vpres|deci-1S&PRES=say adv|como=like chi|ahm chi|rp chi|rp L2|je adv|también=also vpres|habla-1S&PRES=speak n|español&MASC=Spanish prep|con=with det:art|el&MASC&SG=the n|acento&MASC=accent n|francés&MASC=French^n|francés&MASC=Frenchfranela co|sabes=know ?
*XYZ: es increíble # entonces <no es> [/] rp@fp # no es bueno como antes # creo que hablo: +...

%mor: vpres|se-3S&PRES=be adj|increíble=incredible adv|entonces=then chi|rp adv|no=no vpres|se-3S&PRES=be adj|buen-MASC=good adv|como=like adv|antes=before vpres|cree-1S&PRES=believe rel|que=that vpres|habla-1S&PRES=speak +...
*XYZ: dos .
%mor: num|dos=two .
*XYZ: escribir uno .
%mor: vinf|escribi-INF=write det:art|un-MASC=one .
*XYZ: alemán tres creo # escribir dos .
%mor: adj|alemán=German num|tres=three vpres|cree-1S&PRES=believe vinf|escribi-INF=write num|dos=two .
*XYZ: siete, sí .
%mor: num|siete=seven adv|sí=yes .
*XYZ: poco # he hecho un curso de treinta y dos horas # aquí # en mayo ## < eran > [//] rt@fp # # < fueron > [/] rp@fp ## fueron dieciséis semanas # un clase cada semana .
%mor: adv|poco=few v:aux|habe-1S&PRES=have vpres|hecha-1S&PRES=give det:art|un&MASC=one n|curso&MASC=course prep|de=of num|treinta=thirty conj|y=and num|dos=two n|hora-PL&FEM=hour adv|aquí=here prep|en=in n|mayo&MASC=May chi|rt chi|rp vpret|i-3P&PRET=go^vpret|oí-3P&PRET=went^vpret|se-3P&PRET=be num|dieciséis=sixteen n|semana-PL&FEM=week det:art|un&MASC=one n|clase&FEM=rank det:indef|cada=each n|semana&FEM=week .
*XYZ: &=snort al final he dicho a mi mismo pues <esta seran poco> [///] rf@fp eran poco &=laugh porque < cuando > [/] rp@fp cuando llegue a España ## ahm@fp cuando era # fin de agosto este agosto el agosto pasado +/.
%mor: prep|a~det|el&MASC=to adj|final=final v:aux|habe-1S&PRES=have vpart|deci-PPART&MASC=say prep|a=to det:pos|mi=my adj|mismo-MASC=same co|pues=well chi|rf vpas|se-3P&PAS=be adv|poco=few conj|porque=because chi|rp conj|cuando=when vsub|llega-13S&SUB&PRES=arrive prep|a=to n:prop|España chi|ahm conj|cuando=when vpas|se-13S&PAS=be n|fin&MASC=end prep|de=of n|agosto&MASC=August det:dem|este=this n|agosto&MASC=August det:art|el&MASC&SG=the n|agosto&MASC=August vpart|pasa-PPART&MASC=pass +/.
*XYZ: +, hable casi nada # no conocía el pretérito imperfecto el pasado # &=inhale no conocía nada .
%mor: vimp|habla-3S&IMP=speak adv|casi=almost pro:indef|nada=nothing adv|no=no vpas|conoce-13S&PAS=know det:art|el&MASC&SG=the n|pretérito&MASC=preterit n|imperfecto&MASC=imperfect det:art|el&MASC&SG=the vpart|pasa-PPART&MASC=pass adv|no=no vpas|conoce-13S&PAS=know vpres|nada-3S&PRES=swim .
*XYZ: Gracias porque xxx España y en particular cuando viajas un poco y vives en Madrid y +...
%mor: n:prop|Gracias conj|porque=because unk|xxx n:prop|España conj|y=and prep|en=in adj|particular=particular conj|cuando=when vpres|viaja-2S&PRES=travel det:art|un&MASC=one adv|poco=few conj|y=and vpres|vivi-2S&PRES=live prep|en=in n:prop|Madrid conj|y=and +...
*XYZ: no e(s) pa tanto, ma(s) o meno(s) # yo fui a < cadi@e > [/] rp@fp < cadi@e > [/] rp@fp < cadi@e > [/] rp@fp # cadi@e # y conocí a < una > [/] rp@fp <una> [/] rp@fp una amiga mía <era de> [/] rp@fp era de entre Cádiz y

Sevilla y siempre # tuve que preguntar <que dices> [/] rp@fp que dices puedes repetirlo pero what@s:eng porque no lo entiendo mucho &=laugh # es que ## hablan todo a dentro # y no [///] rf@fp como # vaya oí # es como papa viene por aquí # puedes pronunciar # es que pero vale # vale .
%mor: adv|no=no vpres|se-3S&PRES=be co|pa adj|tanto-MASC=so_much conj|mas=moreover conj|o=or adv|menos=less pro:per|yo=I vpret|fui-1S&PRET=went prep|a=to chi|rp chi|rp chi|rp bab|cadi conj|y=and vpret|conoce-1S&PRET=know prep|a=to chi|rp chi|rp det:art|un-FEM=one n|amigo-FEM=friend pro:pos|mío-FEM=my chi|rp vpas|se-13S&PAS=be prep|de=of prep|entre=between n:prop|Cádiz conj|y=and n:prop|Sevilla conj|y=and adv|siempre=always vpret|tene-1S&PRET=have rel|que=that vinf|pregunta-INF=ask chi|rp rel|que=that vpres|deci-2S&PRES=say vpres|pode-2S&PRES=can vinf|repeti-INF~pro:clit|OBJ&MASC=repeat conj|pero=but L2|what conj|porque=because adv|no=no pro:per:1|lo&MASC=him vpres|entende-1S&PRES=understand adv|mucho=much vpres|se-3S&PRES=be rel|que=that vpres|habla-3P&PRES=speak det:indef|todo-MASC=all prep|a=to adv|dentro=inside conj|y=and chi|rf adv|como=like co|come_on vpret|oí-1S&PRET=hear vpres|se-3S&PRES=be adv|como=like n|papa&MASC=pope vpres|veni-3S&PRES=come prep|por=for adv|aquí=here vpres|pode-2S&PRES=can vinf|pronuncia-INF vpres|se-3S&PRES=be rel|que=that conj|pero=but co|okay co|okay .
*XYZ: tercero curso # cuarto año # mi cuarto año sí .
%mor: num:adj|tercero-MASC=third n|curso&MASC=course n|cuarto&MASC=quarter n|año&MASC=year det:pos|mi=my n|cuarto&MASC=quarter n|año&MASC=year co|sí=yes .
*XYZ: ahm@fp <en dos> [/] rp@fp <en dos > [///] rf@fp pues ahm@fp &des después de este año # voy a hacer un máster # para dos años # eso es .
%mor: chi|ahm chi|rp chi|rf co|pues=well chi|ahm adv|después=after prep|de=of det:dem|este=this n|año&MASC=year vpres|i-1S&PRES=go prep|a=to vinf|hace-INF=do det:art|un&MASC=one n|máster&MASC=MA^n|máster&MASC=master prep|para=for num|dos=two n|año-PL&MASC=year pro:dem|eso=that_one vpres|se-3S&PRES=be .
*XYZ: yo voy a hacer el máster educativo # de historia .
%mor: pro:per|yo=I vpres|i-1S&PRES=go prep|a=to vinf|hace-INF=do det:art|el&MASC&SG=the n|máster&MASC=MA^n|máster&MASC=master adj|educativo-MASC=educational prep|de=of n|historia&FEM=story .
*XYZ: quiero ser profesor < quizás > [/] rp@fp ## pero < quizá > [//] rt@fp quizás &=laugh estoy hablando andaluz pero ahm@fp pues < no > [/] rp@fp no estoy < cierto > [//] rt@fp ahm@fp seguro # pero ahm@fp # < todos > [//] rt@fp de todos modos < quiero > [/] rp@fp ahm@fp quiero el poder # < de > [/] rp@fp de como se dice # # ahm@fp (d)estar@e profesor .
%mor: vpres|quere-1S&PRES=want vinf|se-INF=be n|profesor&MASC=professor chi|rp conj|pero=but chi|rt adv|quizás=maybe^adv|quizás=perhaps vpres|esta-1S&PRES=be vger|habla-PROG=speak n|andaluz&MASC=Andalusian conj|pero=but chi|ahm co|pues=well chi|rp adv|no=no vpres|esta-1S&PRES=be chi|rt chi|ahm co|seguro=sure conj|pero=but chi|ahm chi|rt prep|de=of det:indef|todo-MASC-PL=all n|modo-PL&MASC=mode chi|rp chi|ahm vpres|quere-1S&PRES=want det:art|el&MASC&SG=the vinf|pode-INF=can chi|rp

prep|de=of adv|como=like pro:refl|se=itself vpres|deci-3S&PRES=say chi|ahm bab|destar n|profesor&MASC=professor .
*XYZ: sí de enseñar # eso es desde luego .
%mor: adv|sí=yes prep|de=of vinf|enseña-INF=teach pro:dem|eso=that_one vpres|se-3S&PRES=be prep|desde=from adv|luego=afterwards .
*XYZ: no creo que no # pues # hace algunos años # ahm@fp # # habrá más atención # < por > [/] rp@fp # ahm@fp # por ahm@fp este < ocupación > [/] rp@fp ocupación se dice no .
%mor: adv|no=no vpres|cree-1S&PRES=believe rel|que=that co|no=no co|pues=well vpres|hace-3S&PRES=do det:indef|alguno-MASC-PL=some n|año-PL&MASC=year chi|ahm vfut|habe-3S&FUT=have adv|más=more n|atención&FEM=attention chi|rp chi|ahm prep|por=for chi|ahm vsub|esta-13S&SUB&PRES=be chi|rp n|ocupación&FEM=ocupation pro:refl|se=itself vpres|deci-3S&PRES=say adv|no=no .
*XYZ: sí # por # sí esta profesión # porque hay < un > [//] rt@fp ahm@fp o # habrá # una falta # de profesores y &necesit necesitamos más # pero es que # < cuando > [///] rf@fp pues # si vas a estar profesor # no vas a ahm@fp # como se dice # no vas a # earn@s:eng &=laugh ?
%mor: adv|sí=yes prep|por=for adv|sí=yes det:dem|este-FEM=this n|profesión&FEM=profession conj|porque=because vpres|habe-3S&PRES&SPEC=have chi|rt chi|ahm conj|o=or vfut|habe-3S&FUT=have det:art|un-FEM=one vpres|falta-3S&PRES=be_lacking prep|de=of n|profesor-PL&MASC=professor conj|y=and vpres|necesita-1P&PRES=need adv|más=more conj|pero=but vpres|se-3S&PRES=be rel|que=that chi|rf co|pues=well conj|si=if vpres|i-2S&PRES=go prep|a=to vinf|esta-INF=be n|profesor&MASC=professor adv|no=no vpres|i-2S&PRES=go prep|a=to chi|ahm adv|como=like pro:refl|se=itself vpres|deci-3S&PRES=say adv|no=no vpres|i-2S&PRES=go prep|a=to L2|earn ?
*XYZ: a ganar # es ganar no ?
%mor: prep|a=to vinf|gana-INF=win vpres|se-3S&PRES=be vinf|gana-INF=win co|no=no ?
*XYZ: < he > [/] rp@fp he pensado que ganar solo era como fútbol ganar pero # no vas a ganar mucho # y < tampoco > [/] rp@fp &=munch ahm@fp tampoco vas a tener mucho respecto o status .
%mor: chi|rp v:aux|habe-1S&PRES=have vpart|pensa-PPART&MASC=think rel|que=that vinf|gana-INF=win adv|solo=just vpas|se-13S&PAS=be adv|como=like n|fútbol&MASC=football vinf|gana-INF=win conj|pero=but adv|no=no vpres|i-2S&PRES=go prep|a=to vinf|gana-INF=win adv|mucho=much conj|y=and chi|rp chi|ahm adv|tampoco=neither vpres|i-2S&PRES=go prep|a=to vinf|tene-INF=have det:indef|mucho-MASC=many n|respecto&MASC=respect conj|o=or n|status&MASC=status .
*XYZ: es de xxx .
%mor: vpres|se-3S&PRES=be prep|de=of unk|xxx .
*XYZ: pues .
%mor: co|pues=well .
*XYZ: es verdad es verdad .
%mor: vpres|se-3S&PRES=be n|verdad&FEM=truth vpres|se-3S&PRES=be n|verdad&FEM=truth .
*XYZ: sí.
%mor: adv|sí=yes.

*XYZ: es verdad .
%mor: vpres|se-3S&PRES=be co|verdad=right .
*XYZ: sí.
%mor: adv|sí=yes .
*XYZ: pues < es > [/] rp@fp es que en Holanda en general esta bien # todos partes # pues están educados < buenos > [//] rt@fp # ahm@fp buenos educados pero # # ahm@fp # # &=sign xxx es que ahm@fp # &=munch < gente > [///] rf@fp creo que no quieren estar profesor # porque no puedes # ahm@fp # hacer una carrera # sabes # si vas a estar profesor es como a # # vale # y cuanto ganas y ahm@fp no lo saben pero < a > [/] rp@fp a mi me encanta trabajar < con > [/] rp@fp con jóvenes en particular # y con historia también # y por esto &m me gusta creo .
%mor: co|pues=well chi|rp vpres|se-3S&PRES=be rel|que=that prep|en=in n:prop|Holanda prep|en=in adj|general=general det:dem|este-FEM=this adv|bien=well det:indef|todo-MASC-PL=all n|parte-PL&FEM=part conj|pues=since vpres|esta-3P&PRES=be vpart|educa-PPART&MASC-PL=educate chi|rt chi|ahm adj|buen-MASC-PL=good vpart|educa-PPART&MASC-PL=educate conj|pero=but chi|ahm unk|xxx vpres|se-3S&PRES=be rel|que=that chi|ahm chi|rf vpres|cree-1S&PRES=believe rel|que=that adv|no=no vpres|quere-3P&PRES=want vinf|esta-INF=be n|profesor&MASC=professor conj|porque=because adv|no=no vpres|pode-2S&PRES=can chi|ahm vinf|hace-INF=do det:art|un-FEM=one n|carrera&FEM=degree^n|carrera&FEM=race co|sabes=know conj|si=if vpres|i-2S&PRES=go prep|a=to vinf|esta-INF=be n|profesor&MASC=professor vpres|se-3S&PRES=be adv|como=like prep|a=to co|okay conj|y=and det:indef|cuanto-MASC=how_much vpres|gana-2S&PRES=win conj|y=and chi|ahm adv|no=no pro:per:1|lo&MASC=him vpres|sabe-3P&PRES=know conj|pero=but chi|rp prep|a=to det:pos|mi=my pro:per|me=me vpres|encanta-3S&PRES=enchant vinf|trabaja-INF=work chi|rp prep|con=with n|jóven-PL&MASC=young_person prep|en=in adj|particular=particular conj|y=and prep|con=with n|historia&FEM=story adv|también=also conj|y=and prep|por=for pro:dem|esto=this_one pro:per|me=me vpres|gusta-3S&PRES=like vpres|cree-1S&PRES=believe .
*XYZ: secundaria: < los > [/] rp@fp <los clases> [/] rp@fp los clases más altas # ahm@fp de secundaria .
%mor: adj|secundario-FEM=secondary chi|rp chi|rp det:art|el&MASC-PL=the n|clase-PL&FEM=rank adv|más=more adj|alto-FEM-PL=tall chi|ahm prep|de=of n|secundaria&FEM=secondary .
*XYZ: < pues > [/] rp@fp < pues > [/] rp@fp pues < pero > [/] rp@fp pero tengo amigos # tengo un amigo que quiere # ser # profesor # aquí en la universidad # a mi no me gusta porque no < quiero > [/] rp@fp # no quiero ahm@fp < dedicar > [//] rt@fp < dediquir > [//] rt@fp dedicar mi vida # a estudiar todo el tiempo y xxx escribir libros y pues xxx creo que en una secundaria # con los jóvenes en particular # entras quince y las dieciocho ahm@fp # < son > [/] rp@fp son difíciles # &=laugh pero &=laugh estuve difícil mi mismo # pero <a mi me gusta> [/] rp@fp a mi me gusta y también tengo que decir que soy de una familia # de profesores # mi madre # ahm@fp # mi hermana # sí # mucha gente # pues < tengo > [///] rf@fp, como se dice en holandés ahm@fp # tengo # lo tengo en mi sangre &=laugh .

%mor: chi|rp chi|rp co|pues=well chi|rp conj|pero=but vpres|tene-1S&PRES=have n|amigo-MASC-PL=friend^n|amigo-PL&FEM=friend vpres|tene-1S&PRES=have det:art|un&MASC=one n|amigo&FEM=friend^n|amigo-MASC=friend rel|que=that vpres|quere-3S&PRES=want vinf|se-INF=be n|profesor&MASC=professor adv|aquí=here prep|en=in det:art|el&FEM&SG=the n|universidad&FEM=university prep|a=to det:pos|mi=my adv|no=no pro:per|me=me vpres|gusta-3S&PRES=like conj|porque=because adv|no=no chi|rp adv|no=no vpres|quere-1S&PRES=want chi|ahm chi|rt chi|rt vinf|dedica-INF=dedicate det:pos|mi=my n|vida&FEM=life prep|a=to vinf|estudia-INF=study det:indef|todo-MASC=all det:art|el&MASC&SG=the n|tiempo&MASC=season conj|y=and unk|xxx vinf|escribi-INF=write adj|libre-MASC-PL=free conj|y=and co|pues=well unk|xxx vpres|cree-1S&PRES=believe rel|que=that prep|en=in det:art|un-FEM=one n|secundaria&FEM=secondary prep|con=with det:art|el&MASC-PL=the n|jóven-PL&MASC=young_person prep|en=in adj|particular=particular vpres|entra-2S&PRES=come_in num|quince=fifteen conj|y=and det:art|el&FEM-PL=the num|dieciocho=eighteen chi|ahm chi|rp vpres|se-3P&PRES=be adj|difícil-PL=difficult conj|pero=but vpret|esta-1S&PRET=be adj|difícil=difficult det:pos|mi=my adj|mismo-MASC=same conj|pero=but chi|rp prep|a=to det:pos|mi=my pro:per|me=me vpres|gusta-3S&PRES=like conj|y=and adv|también=also vpres|tene-1S&PRES=have rel|que=that vinf|deci-INF=say rel|que=that vpres|se-1S&PRES=be prep|de=of det:art|un-FEM=one n|familia&FEM=family prep|de=of n|profesor-PL&MASC=professor det:pos|mi=my n|madre&FEM=mother chi|ahm det:pos|mi=my n|hermano-FEM=sibling co|sí=yes det:indef|mucho-FEM=many n|gente&FEM=folk co|pues=well chi|rf adv|como=like pro:refl|se=itself vpres|deci-3S&PRES=say prep|en=in adj|holandés=Dutch chi|ahm vpres|tene-1S&PRES=have pro:per:1|lo&MASC=him vpres|tene-1S&PRES=have prep|en=in det:pos|mi=my n|sangre&FEM=blood .

*XYZ: historia sí .

%mor: n|historia&FEM=story co|sí=yes .

*XYZ: <tuve duros> [//] rt@fp tuve dudas # antes de elegir # ahm@fp sociología me intereso # ahm@fp # otras cosas como aquí también tienes # ahm@fp < relaciones # internacionales > [//] rt@fp <relaciones y organisones > [//] rt@fp organiciones@e internacionales # pero al final historia porque # < no > [/] rp@fp no pude decidir &=laugh tuve que elegir .

%mor: chi|rt vpret|tene-1S&PRET=have vpres|duda-2S&PRES=disbelieve adv|antes=before prep|de=of vinf|elegi-INF=elect chi|ahm n|sociología&FEM=sociology pro:per|me=me vpres|interesa-1S&PRES chi|ahm det:indef|otro-FEM-PL=other n|cosa-PL&FEM=thing adv|como=like adv|aquí=here adv|también=also vpres|tene-2S&PRES=have chi|ahm chi|rt chi|rt bab|organiciones adj|internacional-PL=international conj|pero=but prep|a~det|el&MASC=to adj|final=final n|historia&FEM=story conj|porque=because chi|rp adv|no=no vpret|pode-1S&PRET=can vinf|decidi-INF=decide vpret|tene-1S&PRET=have rel|que=that vinf|elegi-INF=elect .

*XYZ: no # no # hay que elegir # pues en general # ahm@fp hay tres masters@s:en y # otros espelizaciones@e como # ahm@fp < estudia > [//] rt@fp estudios ánticos o estudios de Japón o algo de historia # pero ahm@fp en historia # el main@s:eng stream@s:eng # como se dice # tiene el máster educativo # el máster científico y el máster # normal por un año # con que vas a trabajar a en u

empresa o algo # pero el educativo no se son dos años # y soy joven sabes por eso he dicho a mi mismo vale # voy a hacer dos años mas .
%mor: adv|no=no adv|no=no vpres|habe-3S&PRES&SPEC=have rel|que=that vinf|elegi-INF=elect co|pues=well prep|en=in adj|general=general chi|ahm vpres|habe-3S&PRES&SPEC=have num|tres=three L2|masters conj|y=and det:indef|otro-MASC-PL=other bab|espelizaciones adv|como=like chi|ahm chi|rt n|estudio-PL&MASC=study adj|ántico-MASC-PL=antique conj|o=or n|estudio-PL&MASC=study prep|de=of n:prop|Japón conj|o=or pro:dem|algo=something prep|de=of n|historia&FEM=story conj|pero=but chi|ahm prep|en=in n|historia&FEM=story det:art|el&MASC&SG=the L2|main L2|stream adv|como=like pro:refl|se=itself vpres|deci-3S&PRES=say vpres|tene-3S&PRES=have det:art|el&MASC&SG=the n|máster&MASC=MA^n|máster&MASC=master adj|educativo-MASC=educational det:art|el&MASC&SG=the n|máster&MASC=MA^n|máster&MASC=master n|científico&MASC=scientific^n|científico&MASC=scientist conj|y=and det:art|el&MASC&SG=the n|máster&MASC=MA^n|máster&MASC=master adj|normal=normal prep|por=for det:art|un&MASC=one n|año&MASC=year prep|con=with rel|que=that vpres|i-2S&PRES=go prep|a=to vinf|trabaja-INF=work prep|a=to prep|en=in conj|u=or n|empresa&FEM=task conj|o=or pro:dem|algo=something conj|pero=but det:art|el&MASC&SG=the adj|educativo-MASC=educational adv|no=no pro:refl|se=itself vpres|se-3P&PRES=be num|dos=two n|año-PL&MASC=year conj|y=and vpres|se-1S&PRES=be adj|joven=young vpres|sabe-2S&PRES=know prep|por=for pro:dem|eso=that_one v:aux|habe-1S&PRES=have vpart|deci-PPART&MASC=say prep|a=to det:pos|mi=my adj|mismo-MASC=same co|okay vpres|i-1S&PRES=go prep|a=to vinf|hace-INF=do num|dos=two n|año-PL&MASC=year conj|mas=moreover .
*XYZ: sin máster educativo ?
%mor: prep|sin=without n|máster&MASC=MA^n|máster&MASC=master adj|educativo-MASC=educational ?
*XYZ: pues # los # # creo que la mayoría de los históricos # # &his &his < historiano > [/] rp@fp históricos no ?
%mor: co|pues=well det:art|el&MASC-PL=the vpres|cree-1S&PRES=believe rel|que=that det:art|el&FEM&SG=the n|mayoría&FEM=majority prep|de=of det:art|el&MASC-PL=the adj|histórico-MASC-PL=historical chi|rp adj|histórico-MASC-PL=historical co|no=no ?
*XYZ: históricos sí # van a trabajar con empresas # o < con > [/] rp@fp ahm@fp <con el estado> [/] rp@fp # con el estado # solo hay como: # un cuarto o < veinte > [/] rp@fp veinte &per por ciento que # va a ser profesor .
%mor: adj|histórico-MASC-PL=historical adv|sí=yes vpres|i-3P&PRES=go prep|a=to vinf|trabaja-INF=work prep|con=with n|empresa-PL&FEM=task conj|o=or chi|rp chi|ahm chi|rp prep|con=with det:art|el&MASC&SG=the vpart|esta-PPART&MASC=be adv|solo=just vpres|habe-3S&PRES&SPEC=have adv|como=like det:art|un&MASC=one n|cuarto&MASC=quarter conj|o=or chi|rp num|veinte=twenty prep|por=for num:adj|ciento-MASC=hundred rel|que=that vpres|i-3S&PRES=go prep|a=to vinf|se-INF=be n|profesor&MASC=professor .

*XYZ: la mayoría va a trabajar como: &=munch &=gasp # algo # que es muy difícil < para > [/] rp@fp para traducir # (d)holandés@e a español # ahm@fp # &=munch &=gasp xxx@s:nl &=laugh .
%mor: det:art|el&FEM&SG=the n|mayoría&FEM=majority vpres|i-3S&PRES=go prep|a=to vinf|trabaja-INF=work adv|como=like pro:dem|algo=something rel|que=that vpres|se-3S&PRES=be adv|muy=very adj|difícil=difficult chi|rp prep|para=for vinf|traduci-INF=translate bab|dholandés prep|a=to n|español&MASC=Spanish chi|ahm L2|xxx .
*XYZ: tu no sabes nada # eso es # es como alguien # que es como ahm@fp pues en inglés # no ?
%mor: det:pos|tu=your adv|no=no vpres|sabe-2S&PRES=know pro:indef|nada=nothing pro:dem|eso=that_one vpres|se-3S&PRES=be vpres|se-3S&PRES=be adv|como=like pro:indef|alguien=someone rel|que=that vpres|se-3S&PRES=be adv|como=like chi|ahm co|pues=well prep|en=in n|inglés&MASC=English co|no=no ?
*XYZ: algo ahm@fp &=laugh # en inglés es difícil también &=inhale ahm@fp &=munch policy@s:eng cooperator@s:eng .
%mor: pro:dem|algo=something chi|ahm prep|en=in n|inglés&MASC=English vpres|se-3S&PRES=be adj|difícil=difficult adv|también=also chi|ahm L2|policy L2|cooperator .
*XYZ: vale es que ahm@fp estas trabajando < como > [///] rf@fp porque los teóricos # saben escribir y leer y ahm@fp sumarar@e # y todo muy bueno # y tienen su ## &=noise su [/] rp@fp < su vistas> [//] rt@fp sus vistas históricos porque pues # no se # con que puedas algo no lo se .
%mor: co|okay vpres|se-3S&PRES=be rel|que=that chi|ahm det:dem|este-FEM-PL=this vger|trabaja-PROG=work chi|rf conj|porque=because det:art|el&MASC-PL=the adj|teórico-MASC-PL=theoretical vpres|sabe-3P&PRES=know vinf|escribi-INF=write conj|y=and vinf|lee-INF=read conj|y=and chi|ahm bab|sumarar conj|y=and det:indef|todo-MASC=all adv|muy=very co|bueno conj|y=and vpres|tene-3P&PRES=have det:pos|su&3S=his chi|rp chi|rt det:pos|su&3S-PL=his vpart|ve-PPART&FEM-PL=see adj|histórico-MASC-PL=historical conj|porque=because co|pues=well adv|no=no pro:refl|se=itself prep|con=with rel|que=that vsub|pode-2S&SUB&PRES=can pro:dem|algo=something adv|no=no pro:per:1|lo&MASC=him pro:refl|se=itself .
*XYZ: Alcalá de Henares en Madrid .
%mor: n:prop|Alcalá prep|de=of n:prop|Henares prep|en=in n:prop|Madrid .
*XYZ: cuidad más # bonita .
%mor: vimp|cuida-2P&IMP=take_care adv|más=more adj|bonito-FEM=pretty .
*XYZ: depende ?
%mor: vimp|depende-2S&IMP=depend ?
*XYZ: o si vas con el coche Alcalá es < muy > [/] rp@fp < muy> [/] rp@fp muy feo .
%mor: conj|o=or conj|si=if vpres|i-2S&PRES=go prep|con=with det:art|el&MASC&SG=the n|coche&MASC=car n:prop|Alcalá vpres|se-3S&PRES=be chi|rp chi|rp adv|muy=very adj|feo-MASC=ugly .
*XYZ: Alcalá < parece > [///] rf@fp me parece < muy > [/] rp@fp muy fea si vayas con el coche porque hay mucha industria # es como # conectado con Madrid con un # &=inhale < con > [/] rp@fp con solo industria pero # el casco antiguo # es < como > [///] rf@fp # me gusta mucho, es más viejo que Madrid .

%mor: n:prop|Alcalá chi|rf pro:per|me=me vpres|parece-3S&PRES=seem chi|rp adv|muy=very adj|feo-FEM=ugly conj|si=if vsub|i-2S&SUB&PRES=go prep|con=with det:art|el&MASC&SG=the n|coche&MASC=car conj|porque=because vpres|habe-3S&PRES&SPEC=have det:indef|mucho-FEM=many n|industria&FEM=industry vpres|se-3S&PRES=be adv|como=like vpart|conecta-PPART&MASC=connect prep|con=with n:prop|Madrid prep|con=with det:art|un&MASC=one chi|rp prep|con=with adv|solo=just n|industria&FEM=industry conj|pero=but det:art|el&MASC&SG=the n|casco&MASC=cask adj|antiguo-MASC=ancient vpres|se-3S&PRES=be chi|rf pro:per|me=me vpres|gusta-3S&PRES=like adv|mucho=much vpres|se-3S&PRES=be adv|más=more adj|viejo-MASC=old rel|que=that n:prop|Madrid .
*XYZ: sí agosto .
%mor: co|sí=yes n|agosto&MASC=August .
*XYZ: tres de febrero dos mil ocho .
%mor: num|tres=three prep|de=of n|febrero&MASC=February num|dos=two num|mil=thousand num|ocho=eight .
*XYZ: en un piso compartido # con dos francesas .
%mor: prep|en=in det:art|un&MASC=one n|piso&MASC=floor vpart|comparti-PPART&MASC=share prep|con=with num|dos=two n|francés-FEM-PL=French .
*XYZ: español .
%mor: adj|español=Spanish .
*XYZ: español pude entender el Frances # pero mi mejor amiga ya # ahm@fp < la > [/] rp@fp < la > [///] rf@fp < una > [/] rp@fp una francesa me ha dicho +"/.
%mor: adj|español=Spanish vpret|pode-1S&PRET=can vinf|entende-INF=understand det:art|el&MASC&SG=the n:prop|Frances conj|pero=but det:pos|mi=my adj|mejor=better n|amigo-FEM=friend adv|ya=already chi|ahm chi|rp chi|rf chi|rp det:art|un-FEM=one n|francés-FEM=French pro:per|me=me v:aux|habe-3S&PRES=have vpart|deci-PPART&MASC=say +"/.
*XYZ: +" yo no estoy en España para hablar francés .
%mor: pro:per|yo=I adv|no=no vpres|esta-1S&PRES=be prep|en=in n:prop|España prep|para=for vinf|habla-INF=speak n|francés&MASC=French^n|francés&MASC=Frenchfranela .
*XYZ: y tuve razones # eh y ahm@fp # la otra no estaba mucho # entonces no +...
%mor: conj|y=and vpret|tene-1S&PRET=have n|razón-PL&FEM=reason co|eh conj|y=and chi|ahm det:art|el&FEM&SG=the det:indef|otro-FEM=other adv|no=no vpas|esta-13S&PAS=be adv|mucho=much adv|entonces=then adv|no=no +...
*XYZ: siempre hemos hablado español # con todos hablé español pero solo con los americanos o con los ingleses # hable inglés .
%mor: adv|siempre=always v:aux|habe-1P&PRES=have vpart|habla-PPART&MASC=speak adj|español=Spanish prep|con=with det:indef|todo-MASC-PL=all vpret|habla-1S&PRET=speak n|español&MASC=Spanish conj|pero=but adv|solo=just prep|con=with det:art|el&MASC-PL=the n|americano-MASC-PL=American conj|o=or prep|con=with det:art|el&MASC-PL=the n|inglés-PL&FEM=English^n|inglés-PL&MASC=English vimp|habla-3S&IMP=speak n|inglés&MASC=English .

*XYZ: no # < pero > [/] rp@fp pero empecé con # ahm@fp &=munch escribir < mi > [/] rp@fp mi ensayo final # por mi bachelor@s:eng sobre < un > [/] rp@fp un tema español # sobre: la transición &es en España .
%mor: adv|no=no chi|rp conj|pero=but vpret|empeza-1S&PRET=begin prep|con=with chi|ahm vinf|escribi-INF=write chi|rp det:pos|mi=my n|ensayo&MASC=rehearsal adj|final=final prep|por=for det:pos|mi=my L2|bachelor vimp|sobra-3S&IMP=remain chi|rp det:art|un&MASC=one n|tema&FEM=theme n|español&MASC=Spanish prep|sobre=above det:art|el&FEM&SG=the n|transición&FEM=transition prep|en=in n:prop|España .
*XYZ: no a &in en holandés pero leo mucho por eso en # ahm@fp inglés # y un poco en español .
%mor: adv|no=no prep|a=to prep|en=in n|holandés&MASC=Dutch conj|pero=but vpres|lee-1S&PRES=read adv|mucho=much prep|por=for pro:dem|eso=that_one prep|en=in chi|ahm n|inglés&MASC=English conj|y=and det:art|un&MASC=one adv|poco=few prep|en=in n|español&MASC=Spanish .
*XYZ: lo veo como ## más como una generación en general que # gente de este piso gente de este país a mi me parece que # pues los franceses los ingleses los frisones < tienen > [///] rf@fp todos tienen algún particular como los alemanes que se llevan tan muy pronto por la # madrugada y van a trabajar y los ingleses que están borrachos por la calle # franceses que son un poco arrogantes, los españoles que quieren hacer la fiesta todo el tiempo pero: ## vale +...
%mor: pro:per:1|lo&MASC=him vpres|ve-1S&PRES=see adv|como=like adv|más=more adv|como=like det:art|un-FEM=one n|generación&FEM=generation prep|en=in adj|general=general rel|que=that n|gente&FEM=folk prep|de=of det:dem|este=this n|piso&MASC=floor n|gente&FEM=folk prep|de=of det:dem|este=this n|país&MASC=country^n|país&MASC=nation prep|a=to det:pos|mi=my pro:per|me=me vpres|parece-3S&PRES=seem rel|que=that co|pues=well det:art|el&MASC-PL=the n|francés-PL&FEM=French^n|francés-PL&MASC=Frenchfranela det:art|el&MASC-PL=the n|inglés-PL&FEM=English^n|inglés-PL&MASC=English det:art|el&MASC-PL=the n|frisón-PL&FEM=Frisian^n|frisón-PL=Frisian chi|rf det:indef|todo-MASC-PL=all vpres|tene-3P&PRES=have det:indef|alguno&MASC=some adj|particular=particular adv|como=like det:art|el&MASC-PL=the n|alemanes&MASC=German rel|que=that pro:refl|se=itself vpres|lleva-3P&PRES=carry adv|tan=such adv|muy=very adv|pronto=soon prep|por=for det:art|el&FEM&SG=the vpart|madruga-PPART&FEM=keep_up_late conj|y=and vpres|i-3P&PRES=go prep|a=to vinf|trabaja-INF=work conj|y=and det:art|el&MASC-PL=the n|inglés-PL&FEM=English^n|inglés-PL&MASC=English rel|que=that vpres|esta-3P&PRES=be n|borracho-MASC-PL=drunk prep|por=for det:art|el&FEM&SG=the n|calle&FEM=street n|francés-PL&FEM=French^n|francés-PL&MASC=Frenchfranela rel|que=that vpres|se-3P&PRES=be det:art|un&MASC=one adv|poco=few adj|arrogante-PL=arrogant det:art|el&MASC-PL=the n|español-PL&FEM=Spanish^n|español-PL&MASC=Spanish rel|que=that vpres|quere-3P&PRES=want vinf|hace-INF=do det:art|el&FEM&SG=the n|fiesta&FEM=festival det:indef|todo-MASC=all det:art|el&MASC&SG=the n|tiempo&MASC=season conj|pero=but co|okay +...

@End

Appendix P. C-test

El texto siguiente va sobre Mozart pero la segunda parte cada tres palabras está borrada. Por favor, completa las palabras: los guiones corresponden al número de letras que faltan.

¿Quién era Mozart?

Wolfgang Amadeus Mozart fue uno de los compositores más brillantes de la historia y sus sonatas, óperas, sinfonías y conciertos fueron apreciados en todo el mundo. De pequeño, y gra _ _ _ _ a su pa _ _ _ , que era u _ gran violinista, y_ dominaba la téc _ _ _ _ del piano y po _ _ _ componer obras e _ las que most _ _ _ _ una precocidad d _ gran compositor. E _ _ un genio. ¿Qui _ _ _ _ conocer una anéc _ _ _ _ de su vi _ _ ?

Mozart y su her _ _ _ _ Nancy eran los ni _ _ _ músicos más conoc _ _ _ _ de Europa. S_ padre los lle _ _ _ _ de una ciu _ _ _ a otra d _ _ continente para q _ _ todo el mu _ _ _ pudiese oírlos to _ _ _. El primer vi _ _ _ de Mozart emp _ _ _ cuando él te _ _ _ 7 años ¡y ter _ _ _ _ cuando tenía ca _ _ 11!

Cuando lleg _ _ _ _ a una ciu _ _ _ realizaban conciertos priv _ _ _ _ para los nob_ _ _ y, si alg _ _ _ _ les encargaba ot _ _ concierto o l _ _ pedía una can _ _ _ _, se quedaban un _ _ días más. E _ un viaje a Munich e _ camino estaba ll _ _ _ de baches y e _ carro no par _ _ _ de dar botes . A_ llegar, Mozart tu _ _ que tocar e _ piano de p _ _ porque no po _ _ _ sentarse de l _ que le do _ _ _ el trasero…

Pe _ _ , en vez d _ disgustarse, la ge _ _ _ le aplaudió m _ _ que nunca, por _ _ _ les encantó q _ _ un niño tan peq _ _ _ _ tocase tan bi _ _ el piano… ¡y ade _ _ _ de pie!

¡Si es que este chico era un genio!

Appendix Q. C-test, item difficulty

0 – the gap was left empty;
1 – incorrect stem and incorrect word class;
2 – incorrect stem but correct word class;
3 – correct stem, incorrect word class;
4 – agreement error, be it number agreement, tense agreement, etc;
5 – all the previous are ok but still something is wrong;
6 – correct choice with a spelling mistake;
and *7* – correct

Coding and % correct reconstructions per item

Item (letters missing)	*Part of speech*	*Coding*								*% correct*
		0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	
1. gra-cias (4)	ADV	33.3	13.7	0.0	0.0	0.0	0.0	2.0	51.0	53
2. pa-dre (3)	N	5.9	3.9	3.9	0.0	0.0	0.0	2.0	84.3	86
3. u-n (1)	IND.ART	0.0	0.0	0.0	0.0	0.0	0.0	2.0	98.0	100
4. y-a (1)	ADV	60.8	2.0	0.0	0.0	0.0	0.0	0.0	37.3	37
5. téc-nica (4)	N	19.6	2.0	9.8	0.0	3.9	0.0	0.0	64.7	65
6. po-día (3)	V	7.8	2.0	9.8	0.0	7.8	0.0	7.8	64.7	73
7. e-n (1)	PREP	9.8	0.0	0.0	0.0	0.0	0.0	0.0	90.2	90
8. most-raba (4)	V	25.5	2.0	2.0	0.0	0.0	0.0	0.0	70.6	71
9. d-e (1)	PREP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100	100
10. e-ra(2)	V	2.0	2.0	0.0	0.0	2.0	0.0	0.0	94.1	94
11. qui-eres (4)	V	7.8	9.8	3.9	0.0	2.0	0.0	5.9	70.6	76
12. anéc-dota (4)	N	5.9	0.0	7.8	0.0	2.0	0.0	3.9	80.4	84
13. vi-da (2)	N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100	100
14. her-mana (4)	N	0.0	0.0	0.0	0.0	2.0	2.0	0.0	96.1	96
15. ni-ños (3)	N	3.9	0.0	0.0	0.0	0.0	0.0	11.8	84.3	96
16. cono-cidos (4)	ADJ	0.0	7.8	2.0	0.0	7.8	0.0	2.0	80.4	82
17. s-u (1)	PRON	0.0	3.9	0.0	0.0	2.0	0.0	0.0	94.1	94
18. lle-vaba (4)	V	3.9	3.9	11.8	0.0	9.8	0.0	3.9	66.7	71
19. ciu-dad (3)	N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100	100
20. d-el (2)	CONTR	3.9	7.8	0.0	0.0	0.0	0.0	0.0	88.2	88
21. q-ue (2)	CONJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100	100
22. mu-ndo (3)	N	3.9	3.9	0.0	0.0	0.0	0.0	0.0	92.2	92
23. to-car (3)	V	11.8	27.5	0.0	0.0	5.9	0.0	0.0	54.9	55
24. vi-aje (3)	N	35.3	9.8	7.8	0.0	2.0	0.0	2.0	43.1	45
25. emp-ezó (3)	V	3.9	0.0	5.9	0.0	17.6	0.0	2.0	70.6	73
26. te-nía (3)	V	0.0	0.0	2.0	0.0	5.9	0.0	5.9	86.3	92
27. ter-minó (4)	V	3.9	9.8	5.9	0.0	17.6	0.0	2.0	60.8	63
28. ca-si (2)	ADV	2.0	3.9	0.0	0.0	0.0	0.0	3.9	90.2	94
29. lleg-aban (4)	V	0.0	7.8	2.0	0.0	37.3	0.0	0.0	52.9	53
30. ciu-dad (3)	N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100	100
31. priv-ados (4)	ADJ	0.0	0.0	0.0	0.0	5.9	0.0	2.0	92.2	94
32. no-bles (4)	N	15.7	2.0	2.0	0.0	0.0	0.0	0.0	80.4	80
33. alg-uien (4)	PRON	2.0	2.0	15.7	0.0	2.0	0.0	0.0	78.4	78
34.ot-ro (2)	ADJ	3.9	0.0	0.0	0.0	5.9	0.0	0.0	90.2	90
35. l-es (2)	PRON	2.0	11.8	21.6	0.0	3.9	0.0	0.0	60.8	61
36. can-ción (4)	N	11.8	2.0	0.0	0.0	0.0	0.0	7.8	78.4	86
37. un-os (2)	IND.ART	2.0	0.0	3.9	0.0	13.7	0.0	0.0	80.4	80
38. e-n (1)	PREP	3.9	5.9	0.0	0.0	2.0	0.0	0.0	88.2	88
39. e-l (1)	DEF.ART	3.9	9.8	3.9	0.0	2.0	0.0	0.0	80.4	80
40. ll-eno (3)	ADJ	13.7	3.9	0.0	0.0	5.9	0.0	0.0	76.5	76
41. e-l (1)	DEF.ART	3.9	11.8	2.0	0.0	2.0	0.0	0.0	80.4	80
Item (letters missing)	*Part of speech*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*% correct*
42. par-aba (3)	V	47.1	2.0	3.9	0.0	3.9	0.0	0.0	43.1	43

43. bo-tes (3)	N	98.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0
44. tu-vo (2)	V	7.8	2.0	0.0	0.0	29.4	0.0	2.0	58.8	61
45. e-l (1)	DEF.ART	2.0	7.8	3.9	0.0	2.0	0.0	0.0	84.3	84
46. p-ie (2)	N	25.5	3.9	0.0	0.0	2.0	0.0	0.0	68.6	69
47. po-día (3)	V	5.9	0.0	2.0	0.0	11.8	0.0	13.7	66.7	80
48. l-o (1)	ART	15.7	0.0	5.9	0.0	2.0	0.0	0.0	76.5	76
49. do-lía (3)	V	64.7	0.0	2.0	2.0	2.0	0.0	2.0	27.5	29
50. pe-ro (2)	CONJ	15.7	3.9	0.0	0.0	0.0	0.0	0.0	80.4	80
51. d-e (1)	PREP	2.0	0.0	0.0	0.0	0.0	0.0	0.0	98.0	98
52. ge-nte (3)	N	5.9	0.0	0.0	0.0	0.0	0.0	0.0	94.1	94
53. m-ás (2)	ADV	0.0	0.0	0.0	0.0	0.0	0.0	27.5	72.5	100
54. por-que (3)	CONJ	2.0	0.0	0.0	0.0	0.0	0.0	2.0	96.1	98
55. q-ue (2)	CONJ	2.0	0.0	0.0	0.0	0.0	0.0	0.0	98.0	98
56. peq-ueño (4)	ADJ	0.0	0.0	2.0	0.0	0.0	0.0	13.7	84.3	98
57. bi-en (2)	ADV	3.9	0.0	0.0	0.0	0.0	0.0	0.0	96.1	96
58. ade-más (3)	ADV	11.8	3.9	0.0	0.0	0.0	0.0	25.5	58.8	84
% total codes		*10.8*	*3.4*	*2.5*	*0.0*	*3.8*	*0.0*	*2.6*	*76.8*	

Appendix R. PNT stimuli origin

Spanish name	*English name*	*Origin*
Trial pictures		
estrella	star	Sanfeliu & Fernandez (1996)
plátano	banana	Sanfeliu & Fernandez (1996)
iglesia	church	Sanfeliu & Fernandez (1996)
abrigo	coat	Sanfeliu & Fernandez (1996)
luna	moon	Sanfeliu & Fernandez (1996)
bolígrafo	pencil	Sanfeliu & Fernandez (1996)
puente	bridge	Szekely et al. (2004)
bota	boot	Sanfeliu & Fernandez (1996)
niño	boy	Szekely et al. (2004)
oso	bear	Sanfeliu & Fernandez (1996)
Experiment pictures (in alphabetical order)		
avión	airplane	Sanfeliu & Fernandez (1996)
manzana	apple	Sanfeliu & Fernandez (1996)
libro	book	Sanfeliu & Fernandez (1996)
novia	bride	Szekely et al. (2004)
mariposa	butterfly	Sanfeliu & Fernandez (1996)
gorra	hat	Sanfeliu & Fernandez (1996)
coche	car	Sanfeliu & Fernandez (1996)
gato	cat	Sanfeliu & Fernandez (1996)
silla	chair	Sanfeliu & Fernandez (1996)
gallina	chicken	Sanfeliu & Fernandez (1996)
peine	comb	Sanfeliu & Fernandez (1996)
vaca	cow	Sanfeliu & Fernandez (1996)
taza	cup	Sanfeliu & Fernandez (1996)
oreja	ear	Sanfeliu & Fernandez (1996)
sobre	envelope	Sanfeliu & Fernandez (1996)
ojo	eye	Sanfeliu & Fernandez (1996)
bombero	fireman	Szekely et al. (2004)
pez	fish	Sanfeliu & Fernandez (1996)
pie	foot	Sanfeliu & Fernandez (1996)
tenedor	fork	Sanfeliu & Fernandez (1996)
rana	frog	Sanfeliu & Fernandez (1996)
niña	girl	Szekely et al. (2004)
pistola	gun	Szekely et al. (2004)
mano	hand	Sanfeliu & Fernandez (1996)
corazón	heart	Sanfeliu & Fernandez (1996)
caballo	horse	Sanfeliu & Fernandez (1996)
casa	house	Sanfeliu & Fernandez (1996)
llave	key	Sanfeliu & Fernandez (1996)
cuchillo	knife	Sanfeliu & Fernandez (1996)
hoja	leaf	Sanfeliu & Fernandez (1996)
pierna	leg	Sanfeliu & Fernandez (1996)

espejo	mirror	Szekely et al. (2004)
ratón	mouse	Sanfeliu & Fernandez (1996)
seta	mushroom	Sanfeliu & Fernandez (1996)
collar	necklace	Sanfeliu & Fernandez (1996)
naríz	nose	Sanfeliu & Fernandez (1996)
cebolla	onion	Sanfeliu & Fernandez (1996)
sartén	pan	Sanfeliu & Fernandez (1996)
cerdo	pig	Sanfeliu & Fernandez (1996)
piña	pineapple	Sanfeliu & Fernandez (1996)
palomitas	popcorn	Szekely et al. (2004)
calabaza	pumpkin	Sanfeliu & Fernandez (1996)
bolsa	purse	Szekely et al. (2004)
reina	queen	Szekely et al. (2004)
conejo	rabbit	Sanfeliu & Fernandez (1996)
arco iris	rainbow	Szekely et al. (2004)
anillo	ring	Sanfeliu & Fernandez (1996)
gallo	rooster	Sanfeliu & Fernandez (1996)
bufanda	scarf	Szekely et al. (2004)
tijeras	scissors	Sanfeliu & Fernandez (1996)
tiburón	shark	Szekely et al. (2004)
oveja	sheep	Sanfeliu & Fernandez (1996)
zapato	shoe	Sanfeliu & Fernandez (1996)
caracol	snail	Sanfeliu & Fernandez (1996)
serpiente	snake	Sanfeliu & Fernandez (1996)
calcetín	sock	Sanfeliu & Fernandez (1996)
araña	spider	Sanfeliu & Fernandez (1996)
cuchara	spoon	Sanfeliu & Fernandez (1996)
fresa	strawberry	Sanfeliu & Fernandez (1996)
maleta	suitcase	Sanfeliu & Fernandez (1996)
sol	sun	Sanfeliu & Fernandez (1996)
mesa	table	Sanfeliu & Fernandez (1996)
corbata	tie	Sanfeliu & Fernandez (1996)
semáforo	stoplight	Sanfeliu & Fernandez (1996)
árbol	tree	Sanfeliu & Fernandez (1996)
camión	truck	Sanfeliu & Fernandez (1996)
tortuga	turtle	Sanfeliu & Fernandez (1996)
paraguas	umbrella	Sanfeliu & Fernandez (1996)
aspiradora	vacuum	Szekely et al. (2004)
ballena	whale	Szekely et al. (2004)
rueda	wheel	Sanfeliu & Fernandez (1996)
molino	windmill	Sanfeliu & Fernandez (1996)
ventana	window	Sanfeliu & Fernandez (1996)
vaso	glass	Sanfeliu & Fernandez (1996)
bruja	witch	Szekely et al. (2004)

Appendix S. PNT instruction

"Tendrás que indicar el nombre que crees que es el más apropiado para cada dibujo que ves a la pantalla. Tienes que responder lo más rápidamente posible, intentando evitar sonidos no lingüísticos como HHHM, EEEHHH, etc.

Intenta producir SOLAMENTE el nombre del dibujo sin artículos como "el", "la", etc.!

Si no te recuerdas la palabra, no digas nada por favor."

Appendix T. PNT stimuli pictures

I. LOW FREQUENCY

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

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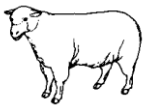

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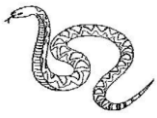

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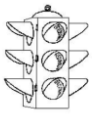
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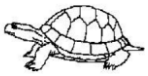
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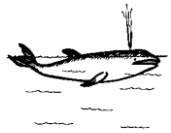
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II. MEDIUM FREQUENCY


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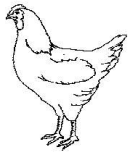
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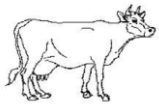
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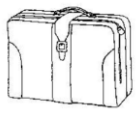
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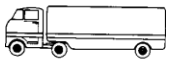
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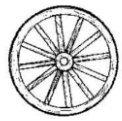
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II. HIGH FREQUENCY


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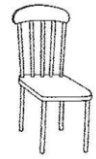
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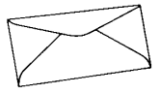
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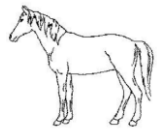
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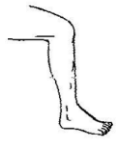
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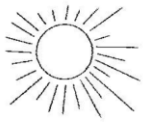
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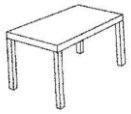
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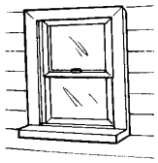
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TRIAL PICTURES


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Appendix U. Can-do scales

Conocimiento de español

A continuación siguen varias declaraciones sobre tu conocimiento de español al **FINAL** de tu estancia en España. Por favor, lee atentamente cada frase y marca si podías hacer cada una de las tareas **al FINAL de tu estancia en España**. Puedes marcar solo una casilla por frase. Por favor, utiliza la siguiente escala:

1 – no lo podía hacer
2 – podía hacerlo pero con muchas dificultades
3 – podía hacerlo pero con dificultad
4 – podía hacerlo relativamente fácilmente
5 – podía hacerlo sin ninguna dificultad

Por ejemplo:
Cuando estaba en un sitio ruidoso, como por ejemplo un bar o discoteca, podía entender y participar en una conversación.
1 ② 3 4 5

	Comprensión auditiva	**Español**
1.	Comprendía casi todas las noticias de la televisión y los programas sobre temas actuales.	1 2 3 4 5
2.	Comprendía la idea principal de muchos programas de radio o televisión que trataban temas actuales o asuntos de interés personal o profesional, cuando la articulación era relativamente lenta y clara.	1 2 3 4 5
3.	No tenía ninguna dificultad para comprender cualquier tipo de lengua hablada, tanto en conversaciones en vivo como en discursos retransmitidos, aunque se producieron a una velocidad de hablante nativo, siempre que tuviera tiempo para familiarizarme con el acento.	1 2 3 4 5
4.	Comprendía discursos extensos incluso cuando no estaban estructurados con claridad y cuando las relaciones estaban sólo implícitas y no se señalaban explícitamente.	1 2 3 4 5
5.	Comprendía las ideas principales cuando el discurso era claro y normal y se trataban asuntos cotidianos que tenían lugar en el trabajo, en la escuela, durante el tiempo de ocio, etc.	1 2 3 4 5
6.	Comprendía discursos y conferencias extensos e	

	incluso seguía líneas argumentales complejas siempre que el tema fuera relativamente conocido.	1 2 3 4 5
7.	Comprendía la mayoría de las películas en las que se hablaba en un nivel de lengua estándar.	1 2 3 4 5
8.	Era capaz de captar la idea principal de avisos y mensajes breves, claros y sencillos.	1 2 3 4 5
9.	Comprendía sin mucho esfuerzo los programas de televisión y las películas.	1 2 3 4 5
10.	Comprendía frases y el vocabulario más habitual sobre temas de interés personal (información personal y familiar muy básica, compras, lugar de residencia, empleo).	1 2 3 4 5
	Comprensión de lectura	
11.	Comprendía textos largos y complejos de carácter literario o basados en hechos, apreciando distinciones de estilo.	1 2 3 4 5
12.	Era capaz de leer artículos e informes relativos a problemas contemporáneos en los que los autores adoptaban posturas o puntos de vista concretos.	1 2 3 4 5
13.	Era capaz de leer textos muy breves y sencillos.	1 2 3 4 5
14.	Era capaz de leer con facilidad prácticamente todas las formas de lengua escrita, incluyendo textos abstractos estructural o lingüísticamente complejos como, por ejemplo, manuales, artículos especializados y obras literarias.	1 2 3 4 5
15.	Comprendía la descripción de acontecimientos, sentimientos y deseos en cartas personales.	1 2 3 4 5
16.	Sabía encontrar información específica y predecible en escritos sencillos y cotidianos como anuncios publicitarios, prospectos, menús y horarios y comprendía cartas personales breves y sencillas.	1 2 3 4 5
17.	Comprendía textos redactados en una lengua de uso habitual y cotidiano o relacionada con el trabajo.	1 2 3 4 5
18.	Comprendía artículos especializados e instrucciones técnicas largas, aunque no se relacionaron con mi especialidad.	1 2 3 4 5
19.	Comprendía la prosa literaria contemporánea.	1 2 3 4 5

	Expresión y Interacción Oral	
20.	Podía participar en una conversación con cierta fluidez y espontaneidad, lo que posibilitaba la comunicación normal con hablantes nativos.	1 2 3 4 5
21.	Presentaba descripciones o argumentos de forma clara y fluida y con un estilo que es adecuado al contexto y con una estructura lógica y eficaz que ayudaba al oyente a fijarse en las ideas importantes y a recordarlas.	1 2 3 4 5
22.	Podía comunicarme en tareas sencillas y habituales que requierían un intercambio simple y directo de información sobre actividades y asuntos cotidianos	1 2 3 4 5
23.	Era capaz de realizar intercambios sociales muy breves, aunque, por lo general, no podía comprender lo suficiente como para mantener la conversación por mí mismo.	1 2 3 4 5
24.	Podía participar espontáneamente en una conversación que tratara temas cotidianos de interés personal o que fueran pertinentes para la vida diaria (por ejemplo, familia, aficiones, trabajo, viajes y acontecimientos actuales).	1 2 3 4 5
25.	Tomaba parte sin esfuerzo en cualquier conversación o debate y conocía bien modismos, frases hechas y expresiones coloquiales.	1 2 3 4 5
26.	Sabía narrar una historia o relato, la trama de un libro o película y podía describir mis reacciones.	1 2 3 4 5
27.	Sabía desenvolverme en casi todas las situaciones que se me presentan cuando viajaba donde se habla esa lengua.	1 2 3 4 5
28.	Utilizaba el lenguaje con flexibilidad y eficacia para fines sociales y profesionales.	1 2 3 4 5
29.	Podía tomar parte activa en debates desarrollados en situaciones cotidianas explicando y defendiendo mis puntos de vista.	1 2 3 4 5
30.	Me expresaba con fluidez y espontaneidad sin tener que buscar de forma muy evidente las expresiones adecuadas.	1 2 3 4 5
31.	Si tenía un problema, sorteaba la dificultad con tanta discreción que los demás apenas se daban cuenta.	1 2 3 4 5

32.	Sabía enlazar frases de forma sencilla con el fin de describir experiencias y hechos, mis sueños, esperanzas y ambiciones.	1 2 3 4 5
33.	Presentaba descripciones claras y detalladas de una amplia serie de temas relacionados con mi especialidad.	1 2 3 4 5
34.	Utilizaba una serie de expresiones y frases para describir con términos sencillos a mi familia y otras personas, mis condiciones de vida, mi origen educativo y mi trabajo actual o el último que tuve.	1 2 3 4 5
35.	Me expresaba con fluidez y transmitía matices sutiles de sentido con precisión.	1 2 3 4 5
36.	Sabía explicar un punto de vista sobre un tema exponiendo las ventajas y los inconvenientes de varias opciones.	1 2 3 4 5
37.	Podía explicar y justificar brevemente mis opiniones y proyectos.	1 2 3 4 5
38.	Presentaba descripciones claras y detalladas sobre temas complejos que incluían otros temas, desarrollando ideas concretas y terminando con una conclusión apropiada.	1 2 3 4 5
39.	Formulaba ideas y opiniones con precisión y relacionaba mis intervenciones hábilmente con las de otros hablantes.	1 2 3 4 5
	Expresión escrita	
40.	Seleccionaba el estilo apropiado para los lectores a los que iban dirigidos mis escritos.	1 2 3 4 5
41.	Era capaz de escribir textos sencillos y bien enlazados sobre temas que me eran conocidos o de interés personal.	1 2 3 4 5
42.	Podía escribir cartas, informes o artículos complejos que presentaban argumentos con una estructura lógica y eficaz que ayudaba al oyente a fijarse en las ideas importantes y a recordarlas.	1 2 3 4 5
43.	Podía escribir cartas personales muy sencillas, por ejemplo agradeciendo algo a alguien.	1 2 3 4 5
44.	Podía escribir redacciones o informes transmitiendo información o proponiendo motivos que apoyaban o refutaban un punto de vista concreto.	1 2 3 4 5

45.	Podía escribir cartas personales que describían experiencias e impresiones.	1 2 3 4 5
46.	Era capaz de expresarme en textos claros y bien estructurados exponiendo puntos de vista con cierta extensión.	1 2 3 4 5
47.	Era capaz de escribir textos claros y detallados sobre una amplia serie de temas relacionados con mis intereses.	1 2 3 4 5
48.	Era capaz de escribir textos claros y fluidos en un estilo apropiado.	1 2 3 4 5
49.	Podía escribir sobre temas complejos en cartas, redacciones o informes resaltando lo que consideraba que eran aspectos importantes.	1 2 3 4 5
50.	Era capaz de escribir notas y mensajes breves y sencillos relativos a mis necesidades inmediatas.	1 2 3 4 5
51.	Sabía escribir cartas que destacaban la importancia que le daba a determinados hechos y experiencias.	1 2 3 4 5

52. Si te acuerdas tu nota del final del curso de español que hiciste en Holanda antes de ir a España, y no te importa, puedes marcarla aquí por favor?

_____

Appendix V. Attitude and Motivation Questionnaire

A continuación tenemos un grupo de enunciados con los cuales alguna gente está de acuerdo y otra no. No hay respuestas correctas o incorrectas ya que la mayoría de la gente tiene diferentes opiniones. Nos gustaría que indicaras tu opinión sobre cada enunciado utilizando la siguiente escala:

1 Totalmente en desacuerdo
2 Moderadamente desacuerdo
3 Ligeramente en desacuerdo
4 Neutro
5 Ligeramente de acuerdo
6 Moderadamente de acuerdo
7 Totalmente de acuerdo

	Anunciado	*Evaluación*
1.	Me gustaría hablar muchas lenguas extranjeras perfectamente.	1 2 3 4 5 6 7
2.	Los españoles son simpáticos y hospitalarios	1 2 3 4 5 6 7
3.	Aprender español es importante porque me permitirá estar más cómodo con gente que habla español.	1 2 3 4 5 6 7
4.	Aprender lenguas extranjeras no es agradable.	1 2 3 4 5 6 7
5.	Estudiar español es importante para mí porque lo necesito para mi carrera profesional.	1 2 3 4 5 6 7
6.	Me gustaría poder leer periódicos y revistas en muchas lenguas extranjeras.	1 2 3 4 5 6 7
7.	La mayoría de los españoles son tan simpáticos y es tan fácil llevarse bien con ellos, que nos sentimos afortunados de tenerlos como amigos.	1 2 3 4 5 6 7
8.	Estudiar español es importante porque me permitirá conocer y hablar con más gente y más variada.	1 2 3 4 5 6 7
9.	No tengo ningún interés en lenguas extranjeras.	1 2 3 4 5 6 7
10.	Estudiar español es importante porque me hará más educado.	1 2 3 4 5 6 7
11.	Me gustaría tener muchos amigos españoles.	1 2 3 4 5 6 7
12.	De verdad me gustaría aprender muchas lenguas extranjeras.	1 2 3 4 5 6 7
13.	Los españoles son muy sociables y amables.	1 2 3 4 5 6 7
14.	Estudiar español es importante porque me ayudará a aprender mejor y apreciar la manera de vivir española.	1 2 3 4 5 6 7
15.	Los españoles tienen mucho con lo que estar orgullosos porque han contribuido mucho al mundo.	1 2 3 4 5 6 7

16.	Es importante para nosotros aprender lenguas extrajeras.	1 2 3 4 5 6 7
17.	Es importante estudiar español porque será útil para encontrar un buen trabajo.	1 2 3 4 5 6 7
18.	Si planeara pasar tiempo en otro país, intentaría aprender su lengua.	1 2 3 4 5 6 7
19.	Me gustaría conocer más españoles.	1 2 3 4 5 6 7
20.	Aprender español es importante para mí porque así podré comunicarme más fácilmente con gente española.	1 2 3 4 5 6 7
21.	La mayoría de las lenguas extranjeras suenan ordinarias y ásperas.	1 2 3 4 5 6 7
22.	Estudiar español es importante para mí porque la gente me respectará más si sé español.	1 2 3 4 5 6 7
23.	Me gusta conocer gente que habla lenguas extranjeras.	1 2 3 4 5 6 7
24.	Cuanto más conozco a hablantes de español, más me gustan.	1 2 3 4 5 6 7
25.	Preferiría ver un programa televisivo doblado en mi lengua, que en otra lengua con subtítulos.	1 2 3 4 5 6 7
26.	Siempre puedes confiar con los hablantes de español.	1 2 3 4 5 6 7

El propósito de la siguiente parte del cuestionario es determinar sus sentimientos sobre algunos aspectos. Por favor, evalúa en cada uno de los siguientes enunciados como te sientas respecto a cada uno de ellos. Cada enunciado va seguido de una escala con un valor en la izquierda y otro en la derecha y con los números del 1 al 7 entre los dos valores. Para cada enunciado, marca el número entre 1 y 7 que mejor le describa.

1. Mi motivación de aprender español para poder comunicarme con hispanohablantes es:

BAJA ___1:___2:___3:___4:___5:___6:___7 ALTA

2. Mi actitud hacia los españoles/hispanohablantes es:

DESFAVORABLE ___1:___2:___3:___4:___5:___6:___7 FAVORABLE

3. Mi interés en aprender lenguas extranjeras es:

MUY BAJO ___1:___2:___3:___4:___5:___6:___7 MUY ALTO

4. Mi motivación de aprender español por razones prácticas (por ejemplo para encontrar buen trabajo) es/era:

DEBIL ___1:___2:___3:___4:___5:___6:___7 FUERTE

Appendix W. Consent form

UNIVERSITAT POMPEU FABRA

university of groningen

CONSENT FORM

1. This is to certify that I, _____,

agree voluntarily to take part in the study of the linguistic post effects of exchange periods.
I have had the project explained to me and I understand that agreeing to take part means that I am willing to:

- be interviewed by the researcher
- allow the interview to be audiotaped
- complete questionnaires asking me about my linguistic background and present use of languages
- complete the linguistic and non-linguistic tasks that comprise the study.

I understand that any information I provide will be kept confidential and will be used only for scientific purposes. The raw data will be available only to the research team at RUG. Any information gathered in the research that could lead to the identification of an individual will not be disclosed in any reports on the project, or to any other party. For the purposes of presentations, publications, etc., names will be changed or coded so that no identification with a person is possible.

Please put a tick if you:
☐ Want to receive a summary of the project results by e-mail/mail.
☐ Agree to make yourself available for a further interview should that be required

Signature: .....
Date: .....