Towards a Characterization of Agrammatism in Ibero-Romance

Silvia Martínez Ferreiro

Doctoral Dissertation

Supervisor:

Prof. Anna Gavarró Algueró

To my grandfather,
To his universe of silences,
To his life with just two words.

This dissertation has been prepared at the Universitat Autònoma de Barcelona (UAB) under the supervision of Prof. Anna Gavarró Algueró (Departament de Filologia Catalana, Àrea de Lingüística General) and is submitted in partial fulfillment of the requirements for the degree of Doctor as established by the UAB's Escola de Doctorat i de Formació Continuada.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS
_____

on several of my conference presentations over these years. Equally valuable has been the patience exhibited by Susagna Tubau and Elisabet Pladevall, who were always ready to pick up the phone to answer whatever administrative or theoretical question I might have. The Servei d'Estadística at the UAB also deserves some words of acknowledgment, and special thanks go to Anna Espinal for reviewing the statistical analysis cited throughout this volume.

I also have more than pleasant memories of the time I spent with all the subjects involved in the research described in this dissertation. The experimental tasks could not have been carried out without their help. Needless to say, I will always be indebted to them for their good humor and hard work. I would also like to express my deepest gratitude to the individuals and institutions who allowed me access to these subjects. I am deeply thankful to the Associació Sant Pau de Trastorns de la Comunicació (speech disorders), the Hospital Provincial (CHOP) and Hospital de la Merced in Pontevedra and the Hospital Meixoeiro (CHUVI) and Xeral-Cíes in Vigo. Special gratitude goes to José Luis Cardona, Dr. Vendrell, Dr. Muñoz and Dr. Calderón as well as all the speech therapy staff I had the good fortune to meet. Special thanks go to Liliana for her inexhaustible energy in the face of diverse difficulties over the years. I also wish to thank the 15 control subjects in Barcelona and Pontevedra who generously allowed me to take up their spare time.

In addition, I had the opportunity to present some of the material discussed here at various congresses: The Science of Aphasia 7, 8, 9 and 10 (Sardinia 2006, Monopoli 2007, Thessalonika 2008, Antalya 2009), I and II International Congresses on Clinical Linguistics (Valencia 2006, Madrid 2009), V Workshop on Syntax and Semantics (Barcelona 2007), IV and V Encuentros de Gramática Generativa (Argentina 2007, 2009), Poznań Linguistics Meeting (Poland 2008), Going Romance 23 (Nice 2009) and several seminars at the UAB, CISCL, École Normale de Paris and UNCOMA. The valuable comments I received from members of the audiences on these occasions have certainly left their imprint on this dissertation.

My family, friends and colleges have also played an undeniably important role. With the utmost patience for my lack of time, they have always stood by me. Some have been translators or informants for me (J. L. Martínez Chamadoira and Mª Àngels Tuneu), others have collaborated in the preparation of my experimental

None of the people acknowledged here should be held responsible for any mistake herein.

ABSTRACT (English version)

_____

The linguistic study of Broca's aphasia and agrammatism is relatively recent in the history of linguistics and, despite the large number of experiments run and proposals formulated in the last few decades, it is almost inexistent for many languages. This dissertation aims to partly address that gap by examining whether grammatical errors produced by Broca's aphasics are a consequence of a selective impairment of functional categories in three closely related Ibero-Romance languages, Catalan, Galician and Spanish. The topic under examination is considered to be of scientific interest since the characterization of agrammatic symptoms not only has the potential to lead to a better understanding of this pathology and to help future creation of better diagnostic and therapeutic methods, but should also provide clues about the structure of non-pathological Ibero-Romance.

The formal description of the results is construed within the framework of generative grammar, including both the Minimalist Program (Chomsky 1995 and other work) and Cartographical proposals (Belletti 2002, Cinque 1999, 2002, Rizzi 1997, 2004). In fact, one purpose of this dissertation is to attempt a theoretical reinterpretation under cartographical terms of previous structural neurolinguistic models of agrammatic aphasia, more specifically the truncation model known as the Tree-Pruning Hypothesis (Friedmann 1994 and other work; Friedmann and Grodzinsky 1997 and other work). According to this hypothesis, an element is more or less susceptible to impairment depending on its position in the tree structure with lower nodes more likely to be preserved and the pruning site subject to variation according to the degree of severity of the agrammatic syndrome.

Eight experimental tasks are especially designed to observe the behavior of certain functional categories located at different points in the syntactic structure in both production and comprehension, though we concentrate mainly on production deficits. This design provides us with data for the IP-field, in terms of tense, agreement, negation, auxiliaries and clitics, with the CP-field also covered by questions (yes/no and wh-) and subject embeddings. The results obtained from our own experiments are then compared and contrasted with those from similar studies described elsewhere in the literature.

We conclude that the relative order of functional categories is indeed central since, in line with the TPH, the higher an element is located in the tree-structure, the more susceptible it is to being impaired, as indicated in our results by error rates in the production of agrammatic subjects as low as 2.53% for negation and 2.46% for agreement vs. 47.69% for wh-questions and 37.33% for subject embeddings. Our data yield clearly parallel results in this respect for all three of the Ibero-Romance varieties under examination. Nevertheless, structural position alone is shown to be insufficient to account for the full array of data presented, as in the case of the contrasts between wh- and yes/no questions, 3rd person object clitics and reflexive forms or modals and aspectuals. Far from being a purely structural matter, the analysis of the results shows therefore that a combination of factors is necessary to properly account for our Ibero-Romance data.

RESUM (versió catalana)

_____

Malgrat l'elevat nombre d'experiments duts a terme en el camp de l'afàsia de Broca i l'agramatisme i de les propostes formulades durant les últimes dècades, l'estudi específicament lingüístic d'aquest camp és relativament recent i quasi inexistent en moltes llengües. Aquesta tesi pretén examinar si els errors gramaticals produïts pels afàsics de Broca són una conseqüència del dany selectiu de les categories funcionals en un d'aquests grups de llengües pràcticament inexplorats, les llengües iberoromàniques. El tema d'estudi es considera d'interès científic ja que la caracterització dels símptomes de l'agramatisme no només condueix a una comprensió més elevada de la patologia en qüestió i a la creació de mètodes tant de diagnòstic com de tipus terapèutic més eficaços, sinó que també proporciona pistes sobre l'estructura de les varietats iberoromàniques en adults sense dèficit adquirit.

La descripció formal dels resultats de producció i comprensió en parla agramàtica està construïda en el marc de la gramàtica generativa, inclosos el Programa Minimista (Chomsky 1995ss) i les propostes recents del marc cartogràfic (Belletti 2002, Cinque 1999, 2002, Rizzi 1997, 2004). Un dels propòsits d'aquesta tesi és fer una reinterpretació en termes cartogràfics de models neurolingüístics estructurals previs, més específicament, del model de truncament conegut com *Tree-Pruning Hypothesis* (TPH), 'hipòtesi de la poda de l'arbre sintàctic' (Friedmann 1994ss; Friedmann i Grodzinsky 1997ss).

En concordança amb aquesta hipòtesi, un element és més o menys susceptible d'aparèixer danyat en funció de la posició que ocupa en l'estructura sintàctica, de manera que les projeccions més baixes són més propenses a mantenir-se preservades, mentre que el lloc específic del truncament es troba subjecte a variació en funció de la severitat del dèficit agramàtic. Les prediccions d'aquesta hipòtesi són contrastades amb dades del castellà, el català i el gallec. Així doncs, s'ha dissenyat específicament un total de 8 tasques per tal d'observar el comportament d'una selecció de categories funcionals localitzades en punts diferents de l'estructura sintàctica en producció, sobretot, i també en comprensió. El temps, la concordança, la negació, els auxiliars i els clítics són els temes de discussió en el camp del SFlexió, mentre que les

interrogatives (absolutes i parcials) i les oracions relatives de subjecte proporcionen evidència sobre el camp del SComplementador. Aquestes tasques experimentals, realitzades a un grup experimental i a un grup control, apareixen contrastades en aquest treball amb els resultats obtinguts en altres llengüens en un examen retrospectiu de la bibliografia especialitzada.

L'ordre relatiu de les categories funcionals apareix com un element determinant en la preservació ja que, en la línia de la TPH, es mostra que com més elevada és la posició que ocupa un element dins de l'estructura sintàctica, més susceptible és d'aparèixer danyat, com il·lustren taxes d'error tan baixes com ara el 2.53% pel que fa a la negació i el 2.46% quant a la concordança, en contraposició amb el 47.69% de les interrogatives parcials i el 37.33% de les oracions relatives de subjecte. A més, aquests resultats són molt uniformes en les tres varietats iberoromàniques estudiades. Tot i això, la posició estructural per si sola es demostra insuficient a l'hora de donar compte de totes les dades presentades, com en el cas del contrast entre les interrogatives absolutes i parcials, els clítics d'objecte de 3a persona i els reflexius o els elements de mode i d'aspecte. Lluny d'ésser una qüestió exclusivament estructural, l'anàlisi dels resultats indica que es fa necessària una combinació de factors per tal de donar compte d'una manera apropiada les dades provinents de les varietats iberoromàniques.

RESUMEN (versión galega)

_____

Mal e ó grande número de experimentos levados a termo no campo da afasia de Broca e do agramatismo e ás propostas formuladas nas últimas décadas, o estudo especificamente lingüístico deste campo e relativamente recente e case inexistente en moitas linguas. Esta tese pretende examinar se os erros gramaticais producidos polos afásicos de Broca son unha consecuencia do dano selectivo das categorías funcionais nun destes grupos de linguas practicamente inexploradas, as linguas Ibero-Romances. O tema de estudo é considerado de interese científico xa que a caracterización dos síntomas do agramatismo non só leva a unha mellor comprensión da patoloxía e á creación de métodos máis eficaces tanto de diagnose como terapéuticos, senón que tamén proporciona pistas sobre a estrutura das variedades Ibero-Romances en adultos sen déficit adquirido.

A descrición formal dos resultados de produción e comprensión na fala agramática está construída no marco da gramática xerativa, incluíndo o Programa Minimista (Chomsky 1995ss) e as recentes propostas cartográficas (Belletti 2002, Cinque 1999, 2002, Rizzi 1997, 2004). É un dos propósitos desta tese facer unha reinterpretación en termos cartográficos de modelos neurolingüísticos estruturais previos, máis especificamente, do modelo de truncación coñecido como *Tree-Pruning Hypothesis*, 'Hipótese da Poda da árbore sintáctica' (Friedmann 1994ss; Friedmann e Grodzinsky 1997ss).

Seguindo esta hipótese, un elemento é máis ou menos susceptíbel de aparecer danado dependendo da súa posición na estrutura sintáctica, sendo as proxeccións máis baixas as máis propensas a estar preservadas e estado o lugar específico de truncación suxeito a variación dependendo da severidade do déficit agramático. As predicións desta hipótese son contrastadas con datos do catalán, o español e o galego. Para tal fin, un total de 8 tarefas foron especificamente deseñadas para observa-lo comportamento dunha selección de categorías funcionais localizadas en diferentes puntos da estrutura sintáctica tanto en produción coma en comprensión, pondo un maior énfase nas tarefas de produción. Tempo, concordancia, negación, auxiliares e clíticos son os temas de discusión no campo do SFlexión, mentres que interrogativas (tanto totais coma parciais) e relativas de suxeito proporcionan evidencia sobre o

campo do SComp. Estas tarefas experimentais, levadas a termo cun grupo experimental e outro control, aparecen contrastadas neste traballo cos resultados obtidos nunha exame retrospectiva da bibliografía especializada.

A orde relativa das categorías funcionais aparece coma un elemento determinante na preservación xa que, en liña coa TPH, amósase que canto máis elevada é a posición que ocupa un elemento dentro da estrutura sintáctica, máis susceptíbel é a aparecer danado, como reflicten taxas de erro tan baixas como 2.53% no caso da negación e 2.46% en concordancia en contraposición a 47.69% en interrogativas parciais e 37.33% en relativas de suxeito, cos datos indicando un claro paralelismo entre as tres variedades Ibero-Romances estudiadas. Nembargante, a posición estrutural en si mesma amósase insuficiente para dar conta de tódolos datos presentados, coma no caso do contraste entre interrogativas totais e parciais, clíticos de obxecto de 3ª persoa e reflexivos ou elementos modais e aspectuais. Lonxe de ser unha mera cuestión estrutural, a análise dos resultados indica que é precisa unha combinación de factores para dar conta dun xeito apropiado dos datos Ibero-Romances.

RESUMEN (versión española)

A pesar del gran número de experimentos llevados a cabo en el campo de la afasia de Broca y el agramatismo y de las propuestas formuladas en las últimas décadas, el estudio específicamente lingüístico de este campo es relativamente reciente y casi inexistente en muchas lenguas. Esta tesis pretende examinar si los errores gramaticales producidos por los afásicos de Broca son una consecuencia del daño selectivo de las categorías funcionales en uno de estos grupos de lenguas virtualmente inexplorados, el de las lenguas Ibero-Romances. El tema de estudio se considera de interés científico dado que la caracterización de los síntomas del agramatismo no sólo lleva a una mejor comprensión de la patología y a la creación de métodos más eficaces tanto de diagnóstico como terapéuticos, sino que también proporciona pistas sobre la estructura de las variedades Ibero-Romances en adultos sin déficit adquirido.

La descripción formal de los resultados de producción y comprensión en habla agramática está construida en el marco de la gramática generativa, incluyendo el Programa Minimista (Chomsky 1995ss) y las recientes propuestas cartográficas (Belletti 2002, Cinque 1999, 2002, Rizzi 1997, 2004). Es uno de los propósitos de esta tesis hacer una reinterpretación en términos cartográficos de modelos neurolingüísticos estructurales previos, más específicamente, del modelo de truncación conocido como *Tree-Pruning Hypothesis*, 'Hipótesis de la Poda del árbol sintáctico' (Friedmann 1994ss; Friedmann y Grodzinsky 1997ss).

De acuerdo con esta hipótesis, un elemento es más o menos susceptible de aparecer dañado dependiendo de su posición en la estructura sintáctica, siendo las proyecciones más bajas las más propensas a estar preservadas y estando el lugar específico de truncación sujeto a variación dependiendo de la severidad del déficit agramático. Las predicciones de esta hipótesis son contrastadas con datos del castellano, el catalán y el gallego. Para tal fin, un total de 8 tareas fueron específicamente diseñadas para observar el comportamiento de una selección de categorías funcionales localizadas en diferentes puntos de la estructura sintáctica tanto en producción como en comprensión, poniendo un mayor énfasis en las tareas de producción. Tiempo, concordancia, negación, auxiliares y clíticos son los temas de discusión en el campo del SFlexión, mientras que interrogativas (tanto totales como

parciales) y relativas de sujeto proporcionan evidencia sobre el campo del SComp. Estas tareas experimentales, llevadas a cabo con un grupo experimental y otro control, aparecen contrastadas en este trabajo con los resultados obtenidos en un examen retrospectivo de la bibliografía especializada.

El orden relativo de las categorías funcionales aparece como un elemento determinante en la preservación dado que, en línea con la TPH, se muestra que cuanto más elevada es la posición que ocupa un elemento dentro de la estructura sintáctica, más susceptible es a aparecer dañado, como reflejan tasas de error tan bajas como 2.53% en el caso de la negación y 2.46% en concordancia en contraposición a 47.69% en interrogativas parciales y 37.33% en relativas de sujeto, con los datos mostrando un claro paralelismo entre las tres variedades Ibero-Romances estudiadas. Sin embargo, la posición estructural en sí misma se demuestra insuficiente para dar cuenta de todos los datos presentados, como en el caso del contraste entre interrogativas totales y parciales, clíticos de objeto de 3ª persona y reflexivos o elementos modales y aspectuales. Lejos de ser una mera cuestión estructural, el análisis de los resultados indica que es necesaria una combinación de factores para dar cuenta de un modo apropiado de los datos Ibero-Romances.

I. INTRODUCTION

_____

Over two centuries of research have established that, innately, the left hemisphere of the human brain contains the major anatomical regions for language. Evidence comes from studies involving the injection of anesthetics (Wada 1949), focalized electrical stimulation (Penfield and Roberts 1959) and dichotic hearing (Kimura 1961), as well as from research into split-brain patients (Gazzaniga 1970) and language pathologies (Goodglass and Kaplan 1972). A correlation between damage to the left hemisphere and aphasia has been observed in almost 70% of cases vs. only 1% of cases when damage involves the right hemisphere.

Since 1796, when Gall's phrenology first linked particular mental faculties to brain areas, and more specifically since the 1870s, when the members of the old Connectionist School (Broca, Wernicke and Lichtheim) first defined damaged cerebral centers and the implications of such damage for language, the study of language pathologies has received considerable attention. The Connectionists' observations constituted the beginning of neurolinguistics and led to a growing interest in finding neural correlates to language functions (Obler and Gjerlow 1999;

Grodzinsky 2000; for a recent history of the field see Benton 2000). Especially relevant for the consolidation of the discipline was the more recent work of the Boston school during the 1970s with Geschwind, Goodglass and Kaplan as the most prominent representatives. This interest together with technical advances in the field of medicine (e.g. the development of functional neuroimaging [1]) has led to progressively more refined characterizations of the left hemisphere and the areas most closely related to language performance.

Nevertheless, different views about the relation between brain and language have persisted over time. While for localists (Gall, Broca) there are specific centers in the brain for different functions, holistic theories (Head, Goldstein) regard larger areas as responsible for language. Various intermediate positions are held by the associationists (Wernicke, Lichtheim), who argue that higher functions depend on the connection between cortical centers, the dynamic localizationists (Luria), who claim that different sub-functions are located in different parts of the brain, and hierarchical or evolution-based views (Jackson), which emphasize the role in language performance of different layers in the brain from the more primitive (understood as deeper) to more contemporary (Benton 2000, Ahlsén 2006).

From a localist perspective, the most generally accepted view is that the physical substratum for language extends from the anterior limit of area 45 to the posterior part of area 39 according to Brodmann's (1909) mapping of the brain, depicted in Figure 1 below. At the beginning of the 20th century, the German neurologist Korbinian Brodmann generated a map of the cortex covering the lobes of both hemispheres. He then numbered the areas by observing the psychological and behavioral consequences of their stimulation in live subjects. Brodmann associated the frontal lobe with cognitive functioning together with speech and language, the parietal lobe with somato-sensory processes, the temporal lobe with the processing of auditory information and semantics and the appreciation of smell, and the occipital lobe with the processing of visual information (see Figure 2).

---

[1] See Cabeza and Kingstone (2001) for a comprehensive summary of historical issues, the current state of affairs and future directions in the field.

The main cortical areas traditionally related to language are Broca's area (anterior part of the central sulcus[2]) – associated with production – and Wernicke's area, which extends through the transverse gyrus[3] and angular gyrus[4] (posterior part of the central sulcus) and is associated with sensory abilities (Luria 1970, 1973; Goodglass and Kaplan 1972; Damasio 1981 and Zurif 1990; among others). The brain structures that presumably handle language are shown in Figure 2.

Figure 1. Brodmann's map of the brain cortex (retrieved from http://spot.colorado.edu/~dubin/ talks/brodmann/brodmann.htm)

---

[2]　The central sulcus is a brain fissure extending upward on the lateral surface of both hemispheres. Also known as Rolando's fissure, it separates the frontal and parietal lobes (Moore and Dalley 1999).

[3] Transverse temporal gyrus: Also known as Heschl's gyrus, it is located in the area of the primary auditory cortex in the temporal lobe. It is associated with Brodmann's areas 41 and 42.

[4] The angular gyrus is located on the inferior portion of the parietal lobe. It is related to auditory and visual processing and language comprehension.

Figure 2. The physical substratum for language (adapted from Calderón González *et al.* 2001)

In the generative framework, the claim is made that humans' cognitive system determines the possible grammars of human languages and their form, i.e. underlies both language production and comprehension and contains the principles of Universal Grammar (UG), some of which are recursively applied (Chomsky 1957, 1967 and much subsequent work). The core of the language faculty is grammar, split into lexicon, phonology and syntax.

Syntactic principles are said to be specific to the language faculty, and autonomous of non-linguistic cognitive systems like hearing or memory. From this viewpoint, two predictions about language disorders follow. First, cases of language disorders in which knowledge of syntax is impaired while other cognitive systems remain unaffected are expected, i.e. an autonomous syntactic system could conceivably be selectively impaired as a result of brain lesions or genetic deficits. Recent neurolinguistic studies have provided evidence that lesions affecting certain specific areas of the left hemisphere may damage language performance while other activities remain unaffected (Zurif 1990; Obler and Gjerlow 1999; among others). Secondly, alterations in UG must involve impairments of both language production

and language comprehension. Grodzinsky (1990) claims that both modalities are affected in cases of agrammatic aphasia, albeit to varying degrees.

Grammatical deficits may thus be a good source of evidence on how the brain implements language, information against which theoretical linguistic constructs can be tested. In reference to Grodzinsky's (1990) work, Chomsky himself has suggested that carefully designed studies of deficit can provide evidence to support or refute major questions regarding language structure. Evidence from aphasia must interact with grammatical theory since UG must be able to account for all forms of attested grammars (Grodzinsky 1990). Syntactic errors can both serve as a new source of data for the study of theoretical linguistics and provide the discipline with 'an excellent testing ground for theories' (Grodzinsky 1990: 2). In turn, the application of syntactic theories to the analysis of clinical data can help us to achieve a better understanding of the linguistic problems faced by neurological patients.

The structure of this volume is articulated as follows: Chapter I provides the background to the study of aphasia. Using the human brain and more specifically the biological foundations for language as the starting point, a characterization of aphasia and its different symptoms is presented. The topic then is narrowed down to a definition of agrammatism in purely linguistic terms, based on recent studies in this discipline. Section 2 summarizes the main theoretical assumptions on which the analysis of our data will be based. Truncation theories proposed under the Principles and Parameters model (Chomsky 1981) to account for both child language (Rizzi 1993/4, 2005) and agrammatic speech (Friedmann (1994ss), Friedmann and Grodzinsky 1997, 2000; Hagiwara 1995) will be described, followed by a brief summary of later refinements of the theoretical framework including both Minimalism (Chomsky 1995ss) and Cartographic models (Belletti 2002; Cinque 1999, 2002, 2006; Rizzi 1997, 2004; and much related work). Section 3 presents the methodology of data collection employed during our experiment. It includes a detailed account of all the subjects under examination, in both experimental and control groups, as well as the procedure carried out during the experimental sessions.

Chapters II – IP-field – and III – CP-field – form the core of this dissertation. Each chapter is divided into various sections, each one focused on one of the

structures under investigation. After a description of spared grammar, the reader is presented with a summary of existing agrammatic data from research in diverse languages including Hebrew, Palestinian Arabic, Greek and a selection of Romance languages such as French or Italian, and Germanic languages such as English and German. A brief description of the experimental tasks used to elicit data is then provided, followed by a discussion of findings, including the production and comprehension of different syntactic nodes along the tree structure, and the introduction of the necessary modifications of the assumed framework. Tense, agreement, non-finite forms, negation, auxiliaries (temporal, modal and aspectual) and clitics are the focus of discussion in Chapter II, while Chapter III includes constructions involving the CP-field, i.e. questions (yes/no and wh-) and subject embeddings. Each chapter ends with a summary of findings and the main theoretical considerations involved.

The final chapter, Chapter IV, aims to provide a comprehensive summary of the full set of experimental results included in the different chapters, giving them coherence inside the framework which is reformulated in current linguistic terms and modified when required along the lines detailed in each chapter. The chapter is concluded with a discussion of issues for further research.

1. APHASIA AND AGRAMMATISM.

1.1. Aphasia

The term 'aphasia', literally meaning 'lack of communication by means of words', was coined by Trousseau in 1864 and refers to speech pathologies which appear after a lesion to the areas of the brain involved in language processing. These pathologies have to be understood as regressive since they affect subjects whose language systems functioned normally prior to onset. The etiologies of this syndrome are varied. It may be due to cerebro-vascular accident[5] (generally involving the middle

---

[5] Cerebro-vascular accident or CVA refers to a syndrome of vascular origin caused by the rupture or occlusion of a blood vessel in the brain. The interruption of the blood supply and the consequent lack of oxygen lead to focal loss of cerebral functions. Also know as 'stroke', it occurs in two basic forms, namely the **ischemic** form, resulting from the blockage of a blood vessel (e.g. as the result of a clot), and the **hemorrhagic** form, resulting from the rupture of a blood vessel.

cerebral artery[6]), intracranial hemorrhage, protrusion wound, tumor, brain infarction[7] and other physical agents such as progressive neurological diseases (e.g. dementias). However, syndromes such as deafness, muscle paralysis, memory or intelligence deficits and attention disorders must be distinguished from aphasic deficits. The type of aphasia reflects the locus and the extent of the lesion (Grodzinsky 1990).

This syndrome affects both comprehension and production in all modalities (speaking, understanding, as well as writing, reading and gesturing[8]) to varying degrees. Goodglass and Kaplan (1983) provide a severity rating scale for systematically measuring language skills in aphasics. This scale ranges from 0, the total absence of production and auditory comprehension, to 5, where no overt difficulties are observed. However, the neurolinguistic literature tends to use the terms 'mild', 'moderate' and 'severe' to classify aphasic subjects[9].

The language behavior associated with aphasic syndromes is subject to cross-individual variation in terms of not only linguistic deficits but also recovery patterns. Around one out of four aphasic patients recovers fully in 3 months, but after this period the chances of recovery become progressively smaller. After 6 months, one in four patients is still severely affected, but the possibility of complete recovery is increasingly low and improvements that occur are generally less significant

---

[6] The middle cerebral artery or MCA is the largest cerebral artery and the most commonly affected by CVAs. It supplies blood to most of the temporal, parietal and antero-lateral frontal lobes together with the basal ganglia* and internal capsule**. Among other neurological sequelae, lesions in the MCA may lead to aphasia.

* The basal ganglia (or basal nuclei) are a collection of clusters of nerve cells located below the cerebral hemispheres (in the white matter) and interconnected with the cerebral cortex, the thalamus and the brainstem. They are associated with motor control, cognition, emotions and learning. Damage to this portion of the brain may result in movement disorders.

** The internal capsule is a layer of white fibers connecting the cerebral cortex to the brainstem and the spinal cord. Infarctions to this area can affect sensory motor systems contralateral to the lesion site.

[7] Brain infarction refers to a pathological process caused by the interruption of the blood supply to a specific area of the brain, resulting in necrosis of the affected area.

[8] Reading, writing and gesturing are more complex since they directly depend on the motor system and its degree of preservation after the lesion. The discussion of such issues is outside the scope of this dissertation.

[9] This three-level classification (mild-moderate-severe) will be employed in the present thesis in order to be consistent with the terminology used in the medical diagnosis of our sample population.

(Goodglass and Kaplan 1972). In the recovery process, the degree of use of a particular language prior to brain damage, the patient's psychological state and the language used in the therapy all seem to play central roles[10]. The general pattern of recovery shows different rhythms across language modalities.

1.1.1. Classification of aphasic syndromes

Classical definitions of aphasic syndromes concur that aphasic patients tend to maintain certain linguistic skills. This is seen as an indicator of the fact that knowledge of language can be selectively impaired by brain lesions (Goodglass and Kaplan 1972). Historically, the two most influential approaches to the study of aphasia are those developed by Luria and his disciples on one hand and the Boston school on the other. Departing from the proposals put forth by Wernicke and Lichtheim in the late 19th century, various classification systems have been proposed to account for the differences in the manifestation of aphasic deficits, including those by Head (1926), Goldstein (1933) and Luria (1964).

Head (1926) classified aphasic syndromes into four groups: verbal, syntactic, nominal and semantic. This classification was soon enlarged by Goldstein (1933) who added 4 further syndromes, yielding a total number of 8 differentiated deficits. Three decades later, Luria (1964) readjusted these categories into 6 main groups, with 'language area isolation' and 'peripheric sensitive aphasia', two of the syndromes included in Goldstein (1933), disappearing. Nevertheless, in most cases, the differences among these classifications are mainly terminological. For example, Head's 'verbal aphasia' is labeled 'central motor aphasia' by Goldstein and 'efferent motor aphasia' by Luria.

Despite the difficulty of grouping aphasic patients due to considerable inter-subject variability, some syndromes are homogeneous enough to provide researchers in different disciplines with what has become a widely accepted aphasia classification system. This is the Boston classification system (Goodglass and Kaplan 1972, 1983), developed at the Aphasia Research Center in Boston.

---

[10] For a classification of recovery patterns in bilinguals and multilinguals see Paradis' (1977) review.

The Boston classification system includes 8 different syndromes clearly differentiated in two main groups according to the characteristics of speech output, namely fluent vs. non-fluent syndromes. Non-fluent aphasias (motor aphasia, transcortical motor aphasia, global aphasia and transcortical mixed aphasia) group together those syndromes which present major problems in the field of production – both spoken and written – while fluent aphasias (sensory aphasia, transcortical sensory aphasia, conduction aphasia and anomic aphasia) are generally associated with comprehension problems – again, whether orally or in written tasks (1).

(1)

Aphasia

[- Fluency]

[+ Comprehension]
Motor [* Repetition, * Naming]
Transcortical Motor [+Rep., *Naming]

[- Comprehension]
Global [- Repetition, - Naming]
Transcortical Mixed [+ Rep., * Naming]

[+ Fluency]

[+ Comprehension]
Conduction [- Repetition, * Naming]
Anomic [+ Repetition, - Naming]

[- Comprehension]
Sensory [- Repetition, * Naming]
Transcortical Sensory [+Rep,* Naming]

[+ relatively preserved; - impaired; * subject to variability]

It is important to understand that this distinction, which can be originally traced back to Carl Wernicke in 1874, is only helpful in terms of diagnosis and classification since, as we have already mentioned, aphasia always affects both modalities to a certain degree. Additionally, it has been acknowledged that considerable variation is attested crosslinguistically among patients with the same diagnosis (see Miceli, Silveri, Romani and Caramazza 1989 for an example). In this section we will only discuss those syndromes relevant to the description of our agrammatic sample, which means that we will concern ourselves exclusively with non-fluent aphasias.

Anatomically, all four types of non-fluent aphasia are the result of lesions affecting the area anterior to the central sulcus of the left brain hemisphere (also

known as Rolando's fissure). From a linguistic perspective, patients in this group present relatively spared comprehension abilities while production is more or less impaired. This impairment seems to extend to writing skills, which are only rarely better preserved than speech (Goodglass and Kaplan 1972, 1983).

Motor aphasia: This is classically associated with a lesion in Broca's area, an area no greater than one inch in diameter located on the posterior part of the left third frontal convolution near the cortical area that controls speech and facial movements – Brodmann's areas 44 and 45. The lesion typically extends, to varying degrees, to the surrounding areas, specifically to the Sylvian fissure[11] and the subcortical white matter (Aboitiz, García, Brunetti and Bosman 2006). Motor aphasia often presents an associated hemiplegia[12] on the side of the body opposite to the lesion. Due to its location and symptoms, this type of aphasia is also known as anterior or expressive aphasia and as Broca's aphasia – after the French neurologist Paul Pierre Broca (1861).

Damage to Brodmann's areas 44 and 45 has been classically associated with difficulties in speaking, since the posterior and inferior part of the frontal lobe is thought to control language coding. The affected patient's speech has been clinically characterized as slow, effortful and perseverative. Short utterance length is prevalent in motor aphasias; samples of verbal production contain mainly content words and have been claimed to lack most of the grammatical morphemes such as plural markers or free-standing function words (e.g. auxiliary verbs). Though the appearance of lexical and phonological paraphasias or even problems in word retrieval are not infrequent, lexically full items such as nouns, adjectives or verbs are fairly well preserved in Broca's aphasics (Grodzinsky 1990).

Comprehension is also diminished in motor aphasics, although this deficit may be unnoticeable in normal conversation. The same behavior is also attested in repetition, writing and reading aloud, while comprehension of read materials tends to be better. Broca's aphasics are generally aware of their deficit. Though awareness

---

[11] The Sylvian fissure, also known as lateral cerebral sulcus, is the deepest of the cortical fissures and separates the frontal and the temporal lobes in both hemispheres (see Figure 2).

[12] Hemiplegia and hemiparesis terms refer respectively, to the paralysis of or weakness in one side of the body.

may be helpful in recovery therapies, subjects suffering from this pathology tend to get frustrated easily about their lack of progress as a result.

Transcortical motor aphasia: This results from a lesion in the frontal lobe in the region superior and anterior to Broca's area. This type of aphasia, also classified as non-fluent, is characterized by echolalia (a tendency to repeat utterances in a perseverative way), intact reading skills and spared comprehension of both speech and writing, while voluntary writing is impaired.

Global aphasia: This is the most severe type of aphasia since its symptoms are a combination of those observed in motor and sensory aphasias. Associated with a lesion affecting both pre- and post-Rolandic areas, it affects all language modalities at the level of both production and comprehension. In the first stages, expressive capacities can be limited to the emission of meaningless syllables or stereotyped expressions. However, automatic language may be spared in global aphasics. In many cases, improvements in production are minimal, though comprehension can be recovered to a certain degree.

Transcortical or non-fluent mixed aphasia: This usually derives from the occlusion of the carotid artery[13] and, though it is considered part of the group of the non-fluent syndromes, it consists of impairment in both production and comprehension. This type of aphasia is consistent with a classification between motor and global deficits but, contrary to what is expected in the case of global aphasia, repetition skills are better preserved. Echolalia appears as one of the most prominent symptoms.

1.1.2. Related disorders

In addition to the disorders caused by aphasia, Goodglass and Kaplan (1983) highlight certain symptoms which, though different from those characterizing aphasia, are often associated with its appearance. These symptoms should be treated separately from syntactic deficits and should not be mixed up in the analysis of linguistic data. Besides motor problems (hemiplegia or hemiparesis) and visual deficiencies, the most common pathologies associated with aphasia are apraxia and

---

[13] The carotid artery is a paired structure in the neck that supplies blood to the head and brain. Blockage of one of the two branches of this artery may lead to a stroke.

dysarthria, dyslexia and dysgraphia, and pure word deafness. Their main features are summarized below.

Apraxia and dysarthria: Apraxia consists of difficulties in the control of sequences of voluntary movements in otherwise normal muscular systems. It appears after cortical damage and it can affect both sounds sequences (articulatory apraxia) and communicative gestures. Dysarthria consists of motor deficiencies contra-lateral to brain damage. When this deficiency affects the face or the neck, speech movements can be harder to carry out. Dysarthric patients can use repetition or imitation to improve their productions better than apraxics. Since both deficiencies affect the motor control for speech movements, their consequences are only observable in production. Both syndromes can vary in degree of severity.

Dyslexia and dysgraphia: These terms characterize dysfunctions in reading and writing abilities respectively. They are also known as acquired dyslexia and acquired dysgraphia to distinguish them from the syndromes observed in infants. Dyslexic patients present problems in reading. Not only their own manuscripts but also words in isolation or letters may be undecipherable to them. Dysgraphic patients manifest problems in both writing and spelling.

Pure word deafness: Defined for the first time by Lichtheim, this is sometimes considered an example of pure aphasia combined with dyslexia and dysgraphia (Kolb and Whishaw 2003). Patients suffering from pure word deafness cannot identify sounds as words and consequently cannot repeat them. Even though production is spared, comprehension is severely damaged.

1.2. Broca's area and agrammatism

Grodzinsky (2000) has argued that Broca's area is critically involved in highly structured syntactic abilities and transformational operations, though its participation in other processes such as lexical access is not ruled out. This refines the general assumption held for decades that Broca's area has a general role in syntactic processing and codification (Zurif and Caramazza 1976). Despite the fact that Broca's aphasic patients tend to use shorter and simpler sentences with lower rates for verb appearance than normal speakers or even fluent aphasics (Miceli, Silvery, Villa and Caramazza 1984; Martin 2003), new findings show that agrammatics have limited

problems with the building up of the tree structure and the interpretation of particular complex structures, though not all basic syntactic abilities are disrupted. This indicates that even though syntactic abilities are said to be entirely located in the left hemisphere, they involve more than one piece of tissue and are not restricted to Broca's area and its surroundings (Mohr, Pessin, Finkelstein, Funkenstein, Ducan and Davis 1978; Grodzinsky 2000).

In fact, Broca's area has been found not to be restricted to syntactic processing. It also plays a role in gesture recognition, mirror drawing, some aspects of musical analysis and working memory (Aboitiz *et al.* 2006). By the same token, though the right hemisphere has been claimed to have no involvement in syntax, it plays an important role in communication skills (Garrett 2003).

The specific role of Broca's area, observed through spontaneous speech and experimental tasks with pathological subjects, has led researchers to a new definition of the main symptom of Broca's aphasia: agrammatism – literally 'lack of grammar'. Seen in the light of current research, the term agrammatism, introduced by Jakobson in 1941, refers to a highly selective grammatical disturbance which affects non-fluent aphasic individuals cross-linguistically. Despite the inferences which can be drawn from the term, agrammatism is in fact a selective impairment in otherwise intact grammatical systems. So-called agrammatic patients tend to show a reduced set of pathological phenomena among which the most relevant feature is the omission or substitution of function words, i.e. both functional morphemes (tense, agreement, gender, case) and free-standing elements (e.g. articles, auxiliaries, complementizers, some prepositions). Nevertheless, major lexical categories, i.e. nouns, verbs or adjectives, remain intact (see Goodglass and Kaplan 1972; Tissot, Mounin and Lhermitte 1973; Caplan 1983; Miceli *et al.* 1989; Grodzinsky 1990; Menn and Obler 1990 or Ouhalla 1993; among others).

Contrary to what some authors have claimed (see Ouhalla (1993) for an example), not all functional elements are equally absent or incorrectly produced. Grodzinsky (1990) claims that word-structure properties remain part of the speaker's knowledge in agrammatic aphasias, thus blocking the occurrence of non-words. The morphology of the language spoken plays a crucial role in the allowance or ruling out of omissions and substitutions. While root-based morphology languages allow for the

omission of bound elements, stem morphology languages do not. Substitutions are always within categories (Nespoulous, Dordain, Perron, Ska, Bub, Caplan, Mehler and Lecours 1988). Moreover, a great body of research has shown that some functional categories systematically appear intact (Friedmann 2001; Martínez-Ferreiro 2003) as we will discuss in depth later on.

Therefore, the classical use of the term agrammatism to refer to 'an effortful, non-fluent, hesitating and telegraphic speech with lost patterns of rhythm' must be abandoned. Though complex constructions such as passive sentences, relative clauses and other subordinate constructions are generally agreed to be problematic for agrammatic patients (Menn and Obler 1990), classical examples such as the description of the 'cookie theft' (Boston Diagnostic Aphasia Examination, Goodglass and Kaplan 1983), illustrated in (2), have to be considered severe cases of agrammatism and not the prototypical case.

(2)

B.L.: Wife is dry dishes. Water down! Oh boy! Okay. Awright. Okay
 … Cookie is down… fall, and girl, okay, girl… boy… um
Examiner: What is the boy doing?
B.L.: Cookie is… um… catch
Examiner: Who is getting the cookies?
B.L.: Girl, girl!
Examiner: Who is about to fall down?
B.L.: Boy… fall down!
(from Avrutin 2001)

It has been well established that this pathology allows for individual differences in severity (Menn and Obler 1990; Friedmann 2005), ranging from severe to mild disruptions. While severe agrammatic subjects are speechless or preserve a

labored, persevering speech, mild agrammatics may show only a frequent associated anomia or paraphasia (deformation or substitution of words) together with some finer syntactic difficulties that are hard to detect in spontaneous speech.

In addition to the already mentioned deficit in the production of functional categories, the results of controlled experiments demonstrate that agrammatic patients also have problems with comprehension, more specifically with the link between traces and their antecedents (Grodzinsky 2000). Since the early 1970s, when Zurif, Caramazza and Myerson (1972) first considered 'agrammatic comprehension', linguists in the Principles and Parameters framework have generally assumed that the competence underlying both the comprehension and the production of language is the same (McCaffrey, McColl, Blackmon and Boone 2001) or only 'partially distinct' (Grodzinsky 2000; Grodzinsky, Wexler, Chien, Marakovitz and Solomon 1993). Therefore, both modalities are expected to be damaged in non-fluent aphasias (Grodzinsky 1990), even though there may be a difference in the extent. Grodzinsky's (1998) 'standard picture' for comprehension includes good performance on active constructions and subject clefts vs. poor performance on object clefts and some passive constructions, i.e. canonical sentences tend to be understood much better than non-canonical sentences. This stresses the need for an explanation of the at least apparent discrepancies between production and comprehension.

According to Thompson, Shapiro, Tait, Jacobs and Schneider (1996), since open-class lexical items seem to be available both in production and comprehension, the agrammatic deficit may reside either in the derivation of the syntactic structure or in sentence processing routines. Two different types of approach have been proposed in this respect: a) representational accounts, which focus on the linguistic representations that underlie language (Hagiwara 1995; Friedmann and Grodzinsky 1997; Grodzinsky 2000), and b) processing accounts, mainly focused on language in its use, i.e. access to grammatical representations (Hofstede and Kolk 1994; Crain, Ni and Shankweiler 2001). In this dissertation, we will mainly concentrate on structural/representational accounts to explain the production and comprehension deficits observed in our agrammatic sample since no measurements to assess processing capacity have been proposed. In order to introduce the relevant framework, the following section focuses on truncation models and, more

specifically, the Tree-Pruning Hypothesis, which is the syntactic hypothesis to depart with on our analysis of data.

2. THEORETICAL FRAMEWORK.

Though the suggestion that language pathologies can contribute to the study of language structure can be traced back to the 19th century with Badouin de Courtenay (1895) and Ferdinand de Saussure (1879) (Fromkin 2000), it was not until the middle of the 20th century (Alajouanine, Omredane and Durand 1939; Jakobson 1941) that linguists started exploiting the area of aphasiology – restricted up to that moment to neurologists, psychologist and philosophers – as a means of testing theories about non-pathological speech. Linguistic theory began to be used to provide the tools for data analysis, leading to detailed linguistic profiles of language deficits. While the first linguistic approaches were formulated within the functionalist framework, generative grammar soon started to be influential (Chomsky 1957), specially in relation to syntax (see Ahlsén (2006) for a summarized history of the discipline). Nevertheless, among the first proposed accounts from generativism we find Kean's (1979) work on phonology, proposing an analysis of agrammatism in terms of a deficit in phonological clitics based on Chomsky and Halle's (1968) work.

Regarding syntax, the proposal that syntactic representations could be rooted in unusually low nodes can be traced back to Rizzi (1993/4). In this work, revisited in Rizzi (2005) and centered around on the observation of Root Infinitives in infants, the author proposes that child language is characterized by its capacity to display truncated structures, i.e. during the acquisition process, children have the option of not fully projecting the syntactic tree up to the higher nodes. Hagiwara (1995) proposed a similar model in order to account for agrammatic deficits. A further truncation model is the Tree-Pruning Hypothesis (TPH) formulated by Friedmann (1994, 1998, 2001, 2002 and 2005) and Friedmann and Grodzinsky (1997, 2000) after the observation of Tense-Agreement dissociations in the production of Hebrew and Palestinian Arabic.

With Grodzinsky's breakdown-compatibility constraint in mind, linguistic theory plays a central role in every study of language impairment reviewed in this

piece of research, with the TPH as the backbone for our analysis. However, while the first formulation was grounded in the Principles and Parameters Approach (Chomsky 1981, 1986, 1991, 1993), here it will be enriched with the linguistic tools developed in the last few decades including not only Chomsky's (1995ff) Minimalist Program but also Cartographic approaches to sentential structure (Belletti 2002; Cinque 1999, 2002, 2006; Rizzi 1997, 2004).

2.1. Truncation models: Rizzi (1993/4, 2005), Hagiwara (1995), Lee (2003)

Rizzi's (1993/4, 2005) model departs from the Axiom on causal representation (see (3)) which states that CP is the root of all clauses even when there are no lexical elements reaching this position (Guasti 2002). This principle is claimed to be always operative in adult grammar but optional in child language.

(3)   CP = root
          (Rizzi 1993/4:378)

The author proposes a model to account for the fact that while some parameters are set very early in the process of acquisition (in line with Wexler's (1998) Very Early Parameter Setting [14]), infants produce instances of reduced structures unexpected in adult language to facilitate 'the task of the immature production system by reducing the computational load' (Rizzi 2005: 26). This is the case of the dropping of copulas or determiners, the use of root infinitives or the omission of tense specification, which all derive, according to Rizzi (2005), from the omission of external structural layers. Thus, omissions are grammatically based, i.e. they are parametric options available in UG. Once the system is fixed, i.e. once (3) is no longer optional, these possibilities are not available since they are performance-driven.

Child language is seen as subject to cross-linguistic variation regarding the possible categories that act as the root of the syntactic tree. As a consequence of rooting a sentence in a low node, all the projections above the truncation site are deleted from the representation, but the remaining structure must still be able to

---

[14] *Very Early Parameter-Setting*: Basic parameters are set correctly at the earliest observable stages, i.e. from the time that the child enters the two-word stage, around 18 months of age (Wexler 1998:25).

converge. The principles of grammar must hold in the reduced structure. For children, at least in some languages, AgrP, TP or VP can stand as the root of a clause, therefore accounting for both finite and infinitive structures.

To sum up, any arbitrary XP can act as the root of a sentence, with the restriction that every functional projection below this node must be present (and its requirements satisfied). Rizzi's Truncation Model, first formulated with the functional heads and projections proposed by Belletti (1990), is represented in (4).

(4)

In a latter revision of the model, Rizzi (2005) adapts his 1993/4 proposal to current Cartographic terms while maintaining that it is UG that defines the hierarchically ordered positions and that specific languages vary in the subset of categories they select as possible roots in child language. Parts of the universal structure, understanding it as the complex array of projections (investigated in Rizzi (1997) or Cinque (1999), among others), may be omitted, but the presence of a higher element immediately forces the presence of the lower ones.

Rizzi's (1993/4, 2005) Truncation Model was proposed to account for the phenomena observed in child data. A discussion of its implications for language acquisition is outside the scope of this dissertation. However, the predictions of such a structural account, which can tease out present vs. absent categories, have also been

applied to impaired populations. After the analysis of Japanese data of spontaneous speech and grammaticality judgments (Sasanuma, Kamio and Kubota 1990; Takizawa, Asano, Hatano, Hamanaka, Morimune and Miyazaki 1993; and Hagiwara 1990) and its comparison with French and Italian agrammatic production (Nespoulous, Dordain, Perron, Jarema and Chazal 1990; and Lonzi and Luzzatti 1993, respectively), Hagiwara (1995) claimed that low functional heads are accessible for agrammatics while higher ones may be difficult to handle since more merge operations are required[15], making them less economical.

Table 1 summarizes the results of the analysis of spontaneous speech by 4 Japanese agrammatics discussed in Hagiwara (1995).

	Mr. Saito Sasuma *et al.* (1990)	*Mrs. Hayasi* Sasuma *et al.* (1990)	*Mrs. T.* Takizawa *et al.* (1993)	*Y.Y.* Hagiwara (1990)
Negation	2	2	2	2
Postposition	2	2	2	2
Complementizers	1	1	0	*
Subj. Rel.	1	1	0	0

* - No data available   0 - High omission rates
1 - Omission of the feature   2 - Preserved feature

Table 1. Omissions in four Japanese agrammatic speakers – Spontaneous speech data (adapted from Hagiwara 1995: 100)

The results indicate a clear dissociation between negation and postposition (a Japanese functional category [-N, -V] – like English prepositions – which functions as a case particle cliticizing to nouns), which were found to be preserved, and complementizers and case-markers, which were frequently omitted. Since the former are claimed to occupy a lower position in the syntactic tree than the latter, the relative structural position of a functional head was taken as an indicator of its degree of preservation in these patients. These findings were corroborated by the results of an additional grammaticality judgment task run with two Japanese agrammatic subjects. The analysis of 240 sentences (20 grammatical and 20 agrammatical for each of the

---

[15] This is in line with Pancheva and Ullman's (2001) Hierarchy Complexity Hypothesis, which posits a deficit in structure building, more specifically in combination (Merge), to account for agrammatic patterns.

six experimental conditions) provided the percentages of correctness shown in Table 2, which point towards a clear dissociation between the IP and the CP domain.

	MY	*JK*
IP		
Tense	94%	91%
Negation	99%	97%
Postposition	91%	98%
CP		
Complementizer	60%	74%
Wh-Q morpheme	78%	72%
DP		
Case-markers	63%	83%

Table 2. Percentages of correctness in a grammaticality judgment task (adapted from Hagiwara 1995: 105)

Further evidence of preservation of lower nodes can be found in Italian and French. Nespoulous *et al.* (1990) explore the case of a French agrammatic subject, Mr. Auvergne, whose performance of negation, claimed to occupy low portions of the syntactic structure, was correct in contexts with both finite and non-finite verb forms. This use was seen as an indicator of the sparing of lower nodes (NegP, TP and AgrP).

The basic functional structure assumed by Hagiwara (1995) was that provided by Chomsky (1993), with agreement occupying a higher position than Tense, which was also found to be spared in this work. Hagiwara (1995) claims that a model based on the preservation of lower nodes vs. impairment of the higher ones can account for different degrees of severity of the agrammatic deficit. As in Rizzi's (1993/4, 2005) proposal, if functional categories related to high nodes of the syntactic structure are preserved, the preservation of the lower is claimed to be guaranteed.

Lee's (2003) proposal, siting impairment in lower nodes, i.e. the root is pruned, differs radically from Hagiwara's. However, this model, proposed to account for the selective impairment of verbal morphology in languages where tense is assumed to be lower than agreement (e.g. German – Wenzlaff and Clahsen 2004), fails to account for the results found for languages such as Hebrew and Palestinian Arabic which, as we will shortly discuss, were claimed to present the reverse order (Friedmann and Grodzinsky 1997). Additionally, Lee's (2003) proposal allows no

inferences regarding the phenomenology associated with the left peripheral end of the syntactic representation.

2.2. The Tree-Pruning Hypothesis (TPH)

Friedmann (1994, 1998, 2001, and much subsequent work) and Friedmann and Grodzinsky (1997, 2000) provide further evidence for selective impairment in agrammatism and argue that the cross-linguistic dissociation between preserved vs. damaged abilities is due to a deficit in the construction of the syntactic tree up to the tree top. According to Grodzinsky (1990), only representations and not grammatical rules (e.g. merge) are affected in agrammatism.

The Tree-Pruning Hypothesis (TPH hereafter), was first proposed to account for the Tense-Agreement dissociation discovered by Friedmann (1994, 1998, 2001) and Friedmann and Grodzinsky (1997, 2000). Through the study of Hebrew and Palestinian Arabic-speaking agrammatic aphasics, Friedmann and Grodzinsky report that the complexity of the error pattern of agrammatic subjects follows from the patients' inability to fully project the tree structure. In these languages, sentence completion, elicitation and repetition tasks revealed mastery of agreement inflection while tense was found to be problematic. The performance of RS in repetition and oral and written completion tasks in Hebrew is reproduced in table 3. Table 4 includes the responses of 11 Hebrew and 2 Palestinian Arabic agrammatics tested in Friedmann (1998).

	Tense		*Agreement*	
	% correct	(correct/total)	% correct	(correct/total)
Repetition	77%	(43/56)	100%	(56/56)
Completion	46%	(41/90)	93%	(66/71)
Total	58%	(84/146)	96%	(122/127)

Table 3. RS's Tense and Agreement Production in Hebrew (from Friedmann and Grodzinsky 2000)

		Tense		**Agreement**	
		% correct	(correct/total)	% correct	(correct/total)
Hebrew	Repetition	84%	(769/912)	100%	(908/912)
	Completion	58%	(438/760)	96%	(572/596)
Arabic	Completion	31%	(14/45)	91%	(42/46)
Total		71%	(1221/1717)	98%	(1522/1554)

Table 4. Tense and Agreement Production in Hebrew and Palestinian Arabic (from Friedmann and Grodzinsky (2000) and Friedmann (2001))

While tense inflection was more severely impaired for every patient independent of language, agreement morphology appeared almost intact (Friedmann 1994, 1998, 2001; Friedmann and Grodzinsky 1997, 2000). These results lead the authors to infer that structures represented in lower nodes were spared while the higher ones were problematic for agrammatic subjects.

Following Friedmann and Grodzinsky (1997), the variety of structural deficits is highly constrained, showing that it is the result of a specific representational deficit. This is formulated as in (5).

(5)   *Tree-Pruning Hypothesis (TPH)*

a)   C, T or Agr is underspecified in agrammatic production
b)   An underspecified node cannot project any higher
                              (Friedmann and Grodzinsky 1997: 420)

Friedmann and Grodzinsky propose a severity metric (6) based on the location of the defective node in the syntactic tree.

(6)   *Severity metric for agrammatism*

'For P_1, P_2… P_n, different variants of the syndrome, P_i is more severe than P_{i-1} iff N_i, the node impaired in P_i, is contained in the c-command domain of N_{i-1}, the node impaired in P_{i-1}'

(Friedmann and Grodzinsky 1997: 421)

All the experimental results involving repetition and completion point to the conclusion that agrammatic subjects project at least some functional categories. Friedmann (1994) claimed that while the Tense node is impaired for this population, the Agreement node is preserved. These findings refute a widespread neurolinguistic view that inflectional markers of low semantic value are generally omitted or substituted in agrammatism (Caplan 1985). If low-semantic-value were determinant, agreement would be predicted to be impaired since it does not have semantic content. On the other hand, tense morphology, which has semantic content, would be spared, contrary to observed fact (Friedmann and Grodzinsky 1997). Since the reverse picture is not attested, i.e. impaired Agreement with preserved Tense, predictions based on semantic value do not hold.

The narrowly constrained deficit observed in Hebrew and Palestinian Arabic agrammatic populations was taken by Friedmann and Grodzinsky as evidence to postulate a restrictive structural account, namely the TPH: the agrammatic syntactic tree is pruned at TP and consequently this node and those located in upper portions are deleted from the representation. A deficit in tense would imply other morphological and structural problems with elements occupying higher positions than tense. Later revisions including different degrees of severity and data concerning different nodes of the syntactic tree have brought about an expansion of the theory. According to Friedmann and Grodzinsky (1997, 2000) and Friedmann (2002), any node in the derivation is susceptible to impairment; from a certain node up, the phrase marker of agrammatic subjects is pruned. An element will be more or less susceptible to impairment depending on its position in the tree-structure, with lower nodes more likely to be preserved. Even though no problems are observed at the single word level, all functions of deleted nodes – those located from the pruning site up – are lost (Friedmann and Grodzinsky 2000). The pruning site varies in function of the degree of severity of the agrammatic deficit. From the given site up, the structure cannot be constructed, thus predicting variability in aphasic performance.

In order to account for the dissociation between impaired and spared nodes, the TPH was formulated in terms of impaired representations. The structural generalization departs from two main assumptions regarding functional elements: a) they are hierarchically organized and b) the syntactic derivation is bottom-up. Nodes are projected according to the X-bar scheme, i.e. each node has a specifier position and a head position. With Pollock's (1989) Split-Inflection hypothesis as the relevant general framework, the assumed hierarchical organization is CP-TP-AgrP-VP, with lower elements less likely to be impaired.

Contrary to the monolithic analysis of IP (Chomsky 1981), TP and AgrP are taken as two independent nodes in Pollock's (1989) Split-Inflection hypothesis. The decomposition of IP highlights the structural differences between inflectional affixes (which are separate entities at pre-phonological levels (Cinque 2002)). In addition, Chomsky's (1992) Checking theory has been equally relevant for the original formulation of the TPH. According to Chomsky (1992), lexical items enter the

derivation already inflected and movement takes place to satisfy checking requirements. Friedmann and Grodzinsky (1997) claim that underspecified features may result in the impairment of affixation since the lack of feature specification neutralizes the checking mechanism (which is claimed to remain intact).

According to Friedmann (2005), this linguistic generalization is valid to describe not only the agrammatic deficit but also the recovery patterns observed among patients. Friedmann (2005) tested the language production of SB, a native Hebrew speaker, for 18 months post-onset. The results showed that the spontaneous recovery of SB started with the recovery of lower nodes and ended with the recovery of the higher nodes, as represented in Table 5.

Months post onset	*4.5*	*13.9*	*17.9*
Agreement	60%-80%	80%-100%	80%-100%
Tense	60%-80%	40%-60%	80%-100%
Relative Clause	0%-20%	0%-20%	40%-60%

Table 5. Spontaneous recovery of one Hebrew-speaking agrammatic subject (adapted from Friedmann 2005)

Agreement inflection is the first recovered functional category, followed by improvements in tense and finally the emergence of relative clause production. The results also reconfirm the existence of three different sites for impairment that roughly correspond with three different degrees of severity of the agrammatic deficit: mild, moderate and severe deficits.

2.3. The Minimalist Program and Cartographic models

Just as the analysis of language pathology has broadened the empirical coverage of linguistic theories, the development of theoretical linguistics in the last ten years has provided researchers with more precise tools for the analysis of agrammatic data. The Minimalist Program (Chomsky 1995, 2000 and subsequent work) and Cartographic models (Belletti 2002; Cinque 1999, 2002, 2006; Cinque and Rizzi 2008; Rizzi 1997, 2004) are the most relevant contributions to be discussed in this dissertation.

The Minimalist Program[16], developed from the Principles and Parameters framework from which it inherits some basic assumptions, characterizes the Faculty of Language (FL) as a simple and non-redundant component of the mind/brain. In contrast to earlier versions of generative syntax, this program aims to reach a higher explanatory power by viewing economy considerations as central to the system and reducing grammar-specific machinery to a minimum (Chomsky 2004). Language is seen as 'an optimal solution to legibility conditions' (Chomsky 2000: 96). On these terms, the FL is reduced to two main components:

- Lexicon: set of grammatical objects formed by a subset of features out of the total that are universally possible.

- Computational system: what relates the semantic and the syntactic features of the items selected from the lexicon.

The parts of the computational system are Spell-out (the manifestation of the relevant linguistic information for the interface levels), and two levels of representation corresponding to the interfaces: the Conceptual-Intentional interface representation and the Sensory-Motor interface representation. At each derivational level, due to the phase-impenetrability condition, decisions about the required operations are only based on the configuration previously obtained. Representational levels can only contain interpretable features for the interface systems so that the Full interpretation principle[17] is fulfilled. Intermediate representational levels, i.e. D-structure and S-structure (Chomsky 1993), are abandoned due to their theory-specific nature in favor of the interface levels – non-linguistic modules independently justified (Chomsky 2006).

By means of the numeration, i.e. the selection of the particular subset of items to be computed, lexical items are drawn from the lexicon as fully inflected forms, including phonological, semantic and formal features. The possible effects of the relationship between features consist of different grammatical operations. Merge and Move are the two main processes of the computational component induced by formal features. Merge, which proceeds recursively, is a fundamental component of the

---

[16] For a recent sketch of the Minimalist Program, see Brucart, Gavarró and Solà (2009).

[17] Full Interpretation Principle: every element appearing in a linguistic structure must be interpreted (Chomsky 1986, 1995).

computational system. It is by means of merge operations that the system builds larger binary syntactic structures out of smaller ones, thus creating a hierarchical structure where a head X has a complement, and when these two elements are merged they do it with a specifier to the left.

(7)

```
                    XP
                  /    \
               YP       XP
                      /    \
                  Spec      X'
                          /    \
                         X      Comp
```

Merge may be external or internal. External Merge is in charge of the combination of two independent constituents. Internal Merge, Movement in previous versions, has to do with the combination of two objects when one is a constituent of the other.

Internal Merge consists of the displacement of an element from one position to a new one c-commanding it, and it is seen as a last resort operation governed by demands such as the satisfaction of discourse conditions or the scope marking of an operator (Chomsky 1995). Since this operation is not cost-free, optionality is not a possibility. Like any other syntactic operation, movement is only local, i.e. it can only be applied to a minimal structural domain. The configuration in which it applies can be minimally defined by a principle of minimal structural distance (Chomsky and Lasnik (1993) and references cited therein). Two types of movement are considered: rising to a specifier position (e.g. wh-movement) and head-to-head movement (Travis 1984ss), motivated by the need to eliminate uninterpretable features.

Morphological features (e.g. features associated with case, tense and agreement) are at the heart of the Minimalist Program. Lexical items are taken from the lexicon already inflected. Differences between languages are attributed to differences between features of lexical items, especially formal features. Formal features (e.g. Tense or φ-features) can be interpretable or uninterpretable.

Interpretable features are readable by the interface while uninterpretable ones need to be valued via Agree, an operation that relates features of the same type but occupying different structural positions so that they can be deleted from the narrow syntax (Chomsky 2001).

The checking relationship among formal features consists of the deletion of uninterpretable features through the derivation process. The relationships take place between the features of a lexical category and their corresponding ones in a functional category. Failure to eliminate morphological features at a pre-interface level will cause the derivation to crash.

The basic clause structure assumed in minimalist works is as follows (Chomsky 2000, 2001):

(8)   [CP [TP [vP [VP]]]]

Cartographic approaches to the syntactic representation proposed, based on considerable cross-linguistic studies, richly enlarged structures. Nevertheless, such a development of the tree does not enter into contradiction with Chomsky's program (9).

(9)   'The tension is only apparent. [...] the possibility that each "core category" [C, T, *v* and V] may, in fact, be shorthand for referring to a more articulated structural zone is explicitly acknowledged [in Chomsky 2001: 8].'

(Rizzi 2004: 6)

Cinque's (1999, 2002, 2006), Belleti's (2002) and Rizzi's (1997, 2004) Cartographic proposal shares features in its basic approach to the faculty of language with the MP such as interface conditions and economy considerations (Rizzi 2004) (10). Additionally, all the material inserted in a 'cartographic' tree structure has to be interpretable in Chomskian terms (11).

(10)   'There are clear points of connection [between cartographic projects and minimalism], such as the central role of economy considerations and the emphasis on the interfaces.'

(Rizzi 2004: 5)

(11)   'Syntactic representations should end up containing only information that can be visible, hence interpretable, to the other cognitive systems.'

(Belletti 2002: 5)

The aim of the Cartographic Program is the 'discovery and mapping out of the functional structure of natural language sentences' (Cinque 2002: 3). According to Rizzi (2005), UG defines the hierarchy of positions of clausal structure, which is articulated in three levels: the lexical, the inflectional and the complementizer levels (the same levels assumed by the MP). The lexical level is headed by the main verb or the nucleus of the predication (a noun or an adjective) which has thematic structure defining the configurational space in which thematic roles are assigned. The inflectional level is organized around functional heads mainly related to Tense/Asp. The higher portion of the syntactic representation is occupied by the complementizer system, which is defined as a heterogeneous set of functional categories (mostly discourse-related) including subordination marks, topics, focus or wh-elements.

Originally, the complementizer level was identified with CP, the lexical level with VP and the inflectional level with IP. However, in the 1980s these levels began to be characterized in 'cartographic' terms with single nodes regarded as complex clusters of functional projections, thus giving the syntactic representation its super-developed appearance. Larson (1988) provided the first proposal for the decomposition of VP, Pollock (1989) for IP and finally, Rizzi (1997) for CP.

According to the Cartographic approach, there is a universal hierarchy of constituents legitimized by functional elements. These elements may be overtly manifested or not, depending on their availability in particular languages. According to Rizzi (2005), 'in its maximal expression' the structural representation of a sentence starts from the left periphery – more specifically from the Force position (Rizzi 1997) – and includes both obligatory and optional positions. Only obligatory positions such as Force or Tense are seen as constituting the backbone of the clause. As an example, the hierarchy of adverbial positions for the IP-field contemplated by Cartographic approaches has been represented in (12):

(12)   *Cinque's (1999) classification of adverbs*

[*frankly* Mood$_{\text{speech act}}$ [*fortunately* Mood$_{\text{evaluative}}$ [*allegedly* Mood$_{\text{evidential}}$ [*probably* Mod$_{\text{epistemic}}$ [*once* T(Past) [*then* T(Future) [*perhaps* Mood$_{\text{irrealis}}$ [*necessarily* Mod$_{\text{necessity}}$ [*possibly* Mod$_{\text{possibility}}$ [*usually* Asp$_{\text{habitual}}$ [*again* Asp$_{\text{repetitive(I)}}$ [*often* Asp$_{\text{frequentative(I)}}$ [*intentionally* Mod$_{\text{volitional}}$ [*quickly* Asp$_{\text{celerative(I)}}$ [*already* T(Anterior) [*no longer* Asp$_{\text{terminative}}$ [*still* Asp$_{\text{continuative}}$ [*always* Asp$_{\text{perfect(?)}}$ [*just* Asp$_{\text{retrospective}}$ [*soon* Asp$_{\text{proximative}}$ [*briefly* Asp$_{\text{durative}}$ [*characteristically(?)* Asp$_{\text{generic/progressive}}$ [*almost* Asp$_{\text{prospective}}$ [*completely* Asp$_{\text{SgCompletive(I)}}$ [*tutto* Asp$_{\text{PlCompletive}}$ [*well* Voice [*fast/early* Asp$_{\text{celerative(II)}}$ [*again* Asp$_{\text{repetative(II)}}$ [*often* Asp$_{\text{frequentative(II)}}$ [*completely* Asp$_{\text{SgCompletive(II)}}$

(Cinque 1999: 106)

In Cartographic terms, tense is also seen as a series of functional heads including mood, tense and aspect (13).

(13)   MoodP$_{\text{epistemic}}$ > TP(past) > TP(Future) > MoodP$_{\text{irrealis}}$ > (…) AspP$_{\text{habitual}}$ > (…) > TP(Anterior) > AspP$_{\text{terminative}}$ > AspP$_{\text{continuative}}$ > (…) > VP

(Cinque 1999)

This hierarchy does not include an Agreement node. The status of AgrP as a separate node or its relative position with respect to TP has been more recently subject to debate. Chomsky's Minimalist Program (Chomsky 1995ff.) involves no agreement node, while Belletti (1990), Chomsky (1993) or Guasti and Rizzi (2002), among others, propose an agreement node or nodes higher than TP.

These differences have a clear effect when truncation theories are adopted. As we have shown above (in section 2.1.), tense has been found to be more severely impaired than agreement in agrammatic Hebrew and Palestinian Arabic speakers (Friedmann and Grodzinsky 1997). If under truncation no node is projected above an impaired one, models assuming the linear order AgrP > TP would make the wrong predictions since we would expect more severely impaired agreement morphology than tense morphology, contrary to fact. Cross-linguistic verb-morphology data is discussed in detail in Chapter III.

If Chomsky's (1995) program is assumed, since operations have been claimed to be spared in agrammatism (Grodzinsky 1990), no problems are expected with agreement (see Gavarró and Martínez-Ferreiro (2007) for a detailed discussion), as shown by Friedmann and Grodzinsky (1997). Friedmann and Grodzinsky (2000)

assume that differences in the degree of impairment in tense and agreement are due to the fact that they are checked with different mechanisms. Though the authors avoid the debate over the status of agreement as an independent node, they claim that it checks below T, that being the reason why it is preserved. The assumed order is that of Pollock (1989), corroborated for Arabic by Ouhalla (1994), where subject-verb agreement is checked below T.

If data on Hebrew and Palestinian Arabic agrammatism are analyzed under Cartographic terms, the checking point for agreement should be seen as lower than TP(Past) (13) so that even if this node is pruned, uninterpretable features of person and number can be eliminated. This would justify the tense-agreement dissociation. Since the preserved production of preverbal subjects has been attested in pathological subjects, it is assumed that subject-rising to the specifier of AspP is possible[18]. When TP(ast) is deleted from the representation, the intermediate functional projection AspP is assumed as the checking point for agreement (Gavarró and Martínez-Ferreiro 2007). This proposal produces the desired predictions for agrammatic dissociations in inflectional morphology.

3. METHODOLOGY

Even though there is a trend to approach agrammatic deficits through single-subject experimental paradigms (Caramazza 1984; Badecker and Caramazza 1985; Miceli *et al.* 1989; McReynolds and Thompson 1986), following principles established as early as the 19th century, this dissertation involves comparing groups of both pathological and non-pathological subjects while at the same time examining individual performances. Debate about the most suitable method to study language deficits has been recurrent in the literature (Badecker and Caramazza 1985; Caplan 1985, 1991; Caramazza 1986; Grodzinsky 1991; Grodzinsky, Piñango, Zurif and Drai 1999; Marshall 1986; Zurif, Gardner and Brownell 1989; Almagro 2002; and references cited therein). The study of spontaneous speech has been claimed to suffer from a number of shortcomings such as problems in data collection or the systematic

---

[18] This is the view of Cinque (1999, 2002), who argues that EPP features force subjects to rise to preverbal positions from its base-generation position in VP, a position where it cannot receive nominative case.

avoidance of complex structures by the subjects under examination (Crain and Thornton 1998; Friedmann and Grodzinsky 2000; Kolk, Kok, Zevenbergen and Haverkort 2003), who have been claimed to produce primarily simple or incomplete sentences (Christiansen, Goodglass and Gallager 1993; Thompson *et al.* 1996; and references cited therein).

Regarding the debate over the relative virtues of single case and group studies, authors defending groups (Caplan 1986; Grodzinsky 1991; Grodzinsky *et al.* 1999) claim that pattern generalizations and experimental replication are problematic when studying a single subject. In other words, results can be misleading since two individuals may show contradictory patterns of performance. By contrast, in group studies, despite individual variation, the performance is stable and reveals clear patterns of pathological phenomena. For example, Grodzinsky *et al.* (1999) examined data on comprehension abilities published over 16 years. The observation of the results involving actives, subject relatives and clefts with agentive predicates vs. passives, object-gap relatives and clefts revealed that the former group was interpreted at above-chance levels across studies while the latter group was comprehended at chance levels. The observation of individual results does not allow one to make inferences about the specific part of the distribution in which the performance of an isolated patient is placed. Therefore, it may lead to the conclusion that comprehension of both types of structures varies ramdomly.

Consequently, following Grodzinky (1991) and Grodzinsky *et al.* (1999), the research describe in this dissertation is based on experimental group testing. It involves applying a battery of tests designed to assess Ibero-Romance agrammatics' abilities in the construction of the syntactic tree as well as their comprehension of certain given structures. However, since homogeneity is difficult to achieve in agrammatic populations (Miceli *et al.* 1989), while group results are included, careful attention is also paid to individual results. Divergent behavioral patterns are analyzed in detail. Consequently, variability is addressed but in a way that allows for generalizations.

To obtain the relevant data for Ibero-Romance, a total number of 8 tasks were run with 24 agrammatic speakers of Catalan, Galician and Spanish and with a control group (n=15) matched for language. When possible, both production and

comprehension was measured on two occasions for each subject, with an interval of one year between sessions. These sessions (hereafter Test I and Test II) included the tasks listed below[19]:

- Test I:

    • Negation of simple tenses
    • Negation of compound tenses and verbal periphrasis
    • Question production
    • Production of relative clauses

- Test II:

    • Clitic production
    • Clitic comprehension
    • Tense comprehension
    • Comprehension of questions

3.1. Participants

Thirty subjects were selected to take part in each test, fifteen agrammatic aphasics and fifteen controls. In addition to these subjects, a Catalan-speaking moderate agrammatic (CM) subject was added as a case study to see how different degrees of severity in agrammatism might play a role in the observed linguistic deficits.

Agrammatic subjects were selected from the patient pool of three main centers: the Associació Sant Pau of Language Disorders in the metropolitan area of Barcelona, the Hospital Provincial of Pontevedra (CHOP) (together with two centers where patients are derived to in Poio and Vilagarcía) and the Hospital Meixoeiro of Vigo (CHUVI) in Galicia. The 24 agrammatics tested (of whom only 8 participated in both sessions) were classified as Broca's, mixed transcortical and global aphasics, based upon two main tests: the Western Aphasia Battery (WAB – Kertesz 1982) and the Boston Diagnostic Aphasia Examination (BDAE – Goodglass and Kaplan 1972, 1983). Catalan patients were tested with a Catalan or Spanish version of the WAB. This test, designed by Kertesz (1982) and adapted to Spanish by the Department of Neurology at the La Fe Hospital in Valencia, engages aphasics in a one-hour conversation to score informational content and spontaneous speech. Both aphasia

---

[19] A copy of the test in the three languages is included in Appendix I.

quotient (speech, comprehension, repetition and naming) and cortical quotient (reading, writing, praxis and construction) are calculated in order to classify adult patients according to aphasia type. Galician subjects in the Hospital Provincial of Pontevedra were tested with the Spanish version of the BDAE by García-Albea, Sánchez Bernardós and Del Viso (1998). This battery of tests, designed to measure language impairments derived from brain dysfunction in adults, evaluates processing functions together with response and perceptual modalities. With a length of 180 minutes, it allows for both a neuropsychological analysis and the measurement of language skills. No standardized protocol was used to diagnose Galician subjects in the Hospital Meixoeiro, where diagnoses are based on clinical judgments, i.e. on the observation of the production and comprehension of spoken language, nominalization and repetition, and reading and writing skills (Calderón *et al.* 2001).

With the exception of CM, the participants in test I (ten men and five women) were classified as mild agrammatics by clinical consensus and varied in age between 27 and 83 years, with an average of 55 years. Time post onset varied from 1 month to 11 years. All patients were right-handed. Individual patients' characteristics are presented in Table 6.

Subject	Gender/age (years)	Edu.	Etiology	TPO	Aphasia classification (severity)
Catalan					
C1	m/63	3	Ischemic CVA Left fronto-insular[20] infarction	5	Motor aphasia (mild)
C2	m/66	1	Ischemic CVA Left middle cerebral artery	4	Mixed Transcortical (mild)
C3	m/69	1	Ischemic CVA Left infarction affecting middle cerebral artery region	2	Motor aphasia (mild)
C4	m/70	3	Ischemic CVA Left middle cerebral artery	7	Global (mild)
C5	m/70	2	Ischemic CVA Left temporo-medial infarction	5	Mixed Transcortical (mild)
CM	m/28	2	Hemorrhagic CVA Left intraparenchymatous[21] hemorrhage affecting basal ganglia	6	Motor aphasia (moderate)
Galician					
G1	f/76	1	Ischemic CVA Left middle cerebral artery	0.9m	Motor aphasia (mild)
G2	f/83	1	Ischemic CVA Left, cardio-embolic	0.5m	Motor aphasia (mild)
G3	f/55	1	Hemorrhagic CVA Left intraparenchymatous hemorrhage affecting basal ganglia	3	Motor aphasia (mild)
G4	m/74	2	Ischemic CVA Left infarction affecting middle cerebral artery region	1.7m	Mixed Transcortical (mild)
G5	f/56	2	Hemorrhagic CVA Left intraparenchymatous hemorrhage	2	Motor aphasia (mild)

---

[20] The insula is a cerebral lobe with a triangular shape located at the bottom of the Sylvian fissure. It is associated with visceral functions and the integration of autonomic information. (See figure 2)

[21] Parenchyma refers to the internal functional tissue of an organ.

Spanish

S1	m/27	2	Cranial-Encephalic Traumatism Left fronto-temporal	3	Motor aphasia (mild)
S2	m/74	1	Ischemic CVA Left Infarction affecting pre-central area	0.4m	Motor aphasia (mild)
S3	m/61	3	Hemorrhagic CVA Left intraparenchymatous hemorrhage affecting basal ganglia	11	Motor aphasia (mild)
S4	m/64	1	Hemorrhagic CVA Left middle cerebral artery affecting basal ganglia	0.1m	Motor aphasia (mild)
S5	f/38	2	Ischemic CVA Left middle cerebral artery	7	Motor aphasia (mild)

m = male; f = female; 1 = Primary education; 2 = Secondary education; 3 = University education; TPO = Time post-onset: years, months (m); CVA = Cerebrovascular accident; CVD = Cerebrovascular disease

Table 6. Background information on experimental subjects – Test I.

A capital letter (C, G or S) identifies the language in which the test was run while a number from 1 to 5 identifies the subject[22]. Though all Catalan agrammatics participated in both tests, this was not possible in the case of the Galician and most of the Spanish patients. Due to the conditions under which the tests were run as well as

---

[22] Since some subjects had participated in a prior study designed to control for the behavior of tense and agreement (Martínez-Ferreiro 2003; Gavarró and Martínez-Ferreiro 2007), to allow readers to have full access to the complete array of data per individual subject, a table including the different codes is given below:

Catalan
C1 – CA (Martínez-Ferreiro 2003)
C2 – CB (Martínez-Ferreiro 2003)
C4 – CF (Martínez-Ferreiro 2003)
C5 – CE (Martínez-Ferreiro 2003)

Galician
G4 – GD (Gavarró & Martínez-Ferreiro 2007)
G5 – GE (Gavarró & Martínez-Ferreiro 2007)

Spanish
S1 – SG (Gavarró & Martínez-Ferreiro 2007)
S3 – SC (Martínez-Ferreiro 2003)
S5 – SG (Martínez-Ferreiro 2003)

the age and clinical problems of the subjects under examination, only the following participants were involved throughout both experimental sessions:

- Catalan Subjects: C1, C2, C3, C4, C5 and CM.
- Spanish Subjects: S3, S5.

To compensate for the drop-out of 8 patients, new subjects were brought into the study. Table 7 summarizes the background information of the participants of Test II who were not included in Test I. In order to facilitate the distinction, a different number has been attributed to them.

Subject	Gender/age (years)	Edu.	Etiology	TPO	Aphasia classification (severity)
Galician					
G6	f/80	1	Ischemic CVA Left middle cerebral artery	0,4m	Mixed Transcortical (mild)
G7	f/50	1	Hemorrhagic CVA Left temporo-occipital	0,2m	Mixed Transcortical (mild)
G8	f/77	1	Ischemic CVA Left middle cerebral artery	0,1m	Motor aphasia (mild)
G9	m/64	2	Hemorrhagic CVA Left intraparenchymatous hemorrhage	0,3m	Motor aphasia (mild)
G10	m/30	3	Ischemic CVA Left middle cerebral artery	1	Mixed Transcortical (mild)
Spanish					
S6	m/65	1	Ischemic CVA Multiple left infarctions affecting Sylvian region	9	Motor aphasia (mild)
S7	m/82	3	Ischemic CVA Left middle cerebral artery	0,1m	Motor aphasia (mild)
S8	m/42	2	Hemorrhagic CVA intraparenchymatous hemorrhage	3	Motor aphasia (mild)

1 = Primary education; 2 = Secondary education; 3 = University education; TPO = Time post-onset: years, months (m); CVA = Cerebrovascular accident

Table 7. Background information on experimental subjects – Test II.

As a group, the characteristics of the experimental subjects tested during the second experimental session were very similar to those included in Test I. Twelve men and four women, all right-handed and with an age ranging from 29 to 82 years

(mean age: 55.5), participated in the study. With the exception of CM, all subjects were considered mild agrammatics with a post-onset time varying from one month to 9 years.

In addition to the experimental subjects, fifteen control subjects (5 Catalan, 5 Galician and 5 Spanish speakers), who shared similar characteristics for age, gender and education with their pathological counterparts, were also tested for all the tasks included in this study. Like the experimental subjects, controls were all right-handed men and women (8 and 7 respectively) recruited in the areas of Barcelona and Pontevedra. The age ranged from 45 to 85 years old (mean: 53.6) and the level of education also varied across subjects. Out of the fifteen controls under study, four had primary studies, seven secondary studies and four had received universitary training. All the subjects declared themselves to be bilingual Catalan-Spanish or Galician-Spanish with a varying degree of L3 or even L4 knowledge (mainly English and French). Capital letters A, B and D identify Catalan, Galician and Spanish subjects respectively. Background information on control subjects has been given in Table 8.

Subject	Gender/age (years)	Edu.
Catalan		
A1	f/48-49	3
A2	f/65-66	1
A3	m/60-61	1
A4	m/51-52	2
A5	m/58-59	2
Galician		
B1	m/54-55	3
B2	m/58-59	3
B3	f/85-86	1
B4	f/53-54	2
B5	m/67-68	2
Spanish		
C1	f/53-54	2
C2	m/54-55	3
C3	m/45-46	2
C4	f/54-55	2
C5	f/56-57	1

Gender: (m)ale; (f)emale / Age: Session I – Session II
1 = Primary education; 2 = Secondary education; 3 = University studies

Table 8. Background information on control subjects.

The test results for control subjects were of crucial interest since they allowed us to establish statistically significant differences between degrees of impairment/non-impairment, with non-pathological results as the reference point to fix the distinction between impaired and spared categories.

3.2. Procedure

The first step in the experimental procedure was the collection of relevant background information for subjects in the experimental group regarding age, gender, education, handedness, and site and time of the lesion. Placing this step at the beginning of the session served two aims. First, the establishment of a conversation between the

experimenter and the subject was very useful for the collection of crucial data for the interpretation of the results. Second, it helped to relax subjects and prevent them from experiencing the test tasks as an examination carried out by a stranger.

The experiment for all the subjects tested in Barcelona took place in one-hour individual sessions in a quiet room in the Associació Sant Pau. The sessions for subjects tested in Galicia were also conducted individually making use of their regularly scheduled hours for logopaedic therapy sessions. Since each session was 30 minutes long, several of them were necessary for the completion of the test (the number varied with the patient, ranging from 2 to 4 sessions). No time limitations were imposed. The structure of the tests, each divided into four tasks, favoured fragmentation.

Tasks were read aloud by the experimenter at a normal reading speed and tokens were repeated when necessary. Five-minute pauses were inserted upon request and at the beginning of each new task. Examples were given at the beginning and experimental subjects were encouraged to correct their performance whenever they wished to do so. Some of the tasks required the additional use of pictures or a laptop. The total duration of the first test was from 40 to 100 minutes and the second from 30 to 60 minutes, depending on the length of the sessions and the degree of severity of the aphasic syndrome.

As noted, replicating the same steps followed with the experimental groups, the test was also performed on the three groups of control subjects (Catalan, Galician and Spanish). The tasks were run in a quiet place in thirty-minute individual sessions. As with experimental subjects, relevant background information was collected at the beginning of the session.

3.3. Statistical analysis

Due to the fact that the main goal of this study was to test for the existence of significant differences between groups of individuals (agrammatic subjects vs. control subjects) as well as among different types of errors (e.g. tense vs. agreement), statistical analyses were run on the results. Since the sample of individuals was quite small, nonparametric techniques were used for the sake of greater accuracy and to compensate for non-normalities.

Statistical analyses were carried out using the SPSS 15.0 for Windows. The comparisons among languages and individuals were analyzed by means of a Mann-Whitney U test. Similar to t-tests, the Mann-Whitney U test is a non-parametric analysis for assessing whether two independent samples come from the same distribution, with the observations being either ordinal or continuous measurements. Wilcoxon signed rank tests were used for the comparison between errors. This non-parametric test is used to check the median difference in paired data. Due to the fact that it avoids the assumption of normality, this test was preferred to the Student t-test, which is less sensitive for small samples with unknown distributions. For statistical decisions, the significance level was fixed at 1%, though differences at the 5% level ($p < 0.05$) were also noted.

II. IP-FIELD
_____

Since Pollock's (1989) seminal work, the inflectional field of the sentence (IP under Principles and Parameters (Chomsky 1981)) has been seen as an area susceptible to being decomposed into a rich array of functional projections. The first step towards the definition of the so-called IP-field includes the specification of Tense and Agreement as two independent functional nodes (Pollock 1989; Belletti 1990). Later Cartographical accounts (Belletti 2004; Cinque 1999, 2002, 2006; Cinque and Rizzi 2008; Rizzi 2004) continued this decomposition process, providing a more articulated structure capable of hosting different relevant elements. Chapter II groups together several phenomena located in this area, namely negation, tense and agreement, auxiliaries – temporals, modals and aspectuals – and, finally, clitics.

1. NEGATION
Despite the fact that the study of negation has been a widely debated topic in theoretical linguistics during the last decade, it has passed quite unnoticed in the study

of impaired populations. As a functional category, negation is susceptible to being impaired in agrammatic aphasia. However, the evidence we have nowadays mainly comes from studies of right hemisphere lesions and the role of this hemisphere in negation comprehension (e.g. Moore (1986), who found that impaired subjects had difficulty in the recognition and memorization of negative sentences).

Negation is manifested in all languages; hence, the examination of crosslinguistic differences in its expression and its interaction with other phenomena make the examination of negation a core topic not only for the syntactic characterization of agrammatic deficits but also for purely theoretical considerations. Two main types of negation are attested in propositions: sentential negation and constituent negation. Here, we concentrate on sentential negation, i.e. cases where the negative operator has scope over the entire proposition. Cases where negation only applies to a particular constituent (constituent negation) will not be considered.

Traditionally, sentential negation has been seen as subject to cross-linguistic variation along two dimensions: the behavior of the negative marker – which may cliticize onto the verb or behave as an adverbial – and the relative position of the NegP in the tree structure (Moscati 2006). According to Dahl (1979), three main patterns have been identified: Negation may appear as a) a morphological mark on the verb, b) an auxiliary form or c) a particle behaving as an adverb. During the early 1990s the relative position of negation markers with respect to the verb was seen as the result of parametric variation (Ouhalla 1990). Ever since Pollock (1989), the standard analysis has treated sentential negation as a functional category with the basic structure in (14).

(14)   NegP
                   ╱   ╲
              Spec   Neg’
                          ╱   ╲
                     Neg   XP

According to Rizzi 1993/4 or Cinque 1999, from a structural point of view, NegP constitutes a special case which doesn't seem to occupy a universal position in the syntactic structure of all languages. For Cinque (1999: 126), 'the evidence points

to generating a NegP on top of every adverb-related functional projection' (Cinque 1999: 126). Cross-linguistic differences are clearly illustrated in the examples in (15).

(15) a. Jan elmarlar-i ser-me-di-0   TURKISH
          John apples-ACC like-Neg-Past-Agr
      b. Ur-ad-y-xdel Mohand dudsha   BERBER
          Neg-Fut-Agr-arrive M. tomorrow
                              (Ouhalla 1990)

In the first example from Turkish, the negative marker is closer to the verb than tense. This pattern is inverted in the Berber example. Ouhalla (1990) recalls Baker's (1985) Mirror Principle according to which morpheme order is a reflection of the movement operations of V through the syntactic structure. The linear order of morphemes suggests that the structural position of NegP would be lower than TP in Turkish while higher than TP in Berber or English. This binary option was traditionally known under the name of C-Selection Parameter (Ouhalla 1990).

It is inside the IP system that negation may be realized in different positions with respect to the Tense projection: either before or after tense, according to Laka (1990), Ouhalla (1990) or Zanuttini (1997). (16) illustrates different proposals for the syntactic representation of polarity:

(16) a. ΣP (Polarity Phrase) > TP (Zanuttini 1997)

      b. NegP > TP (Van Kemenade 2000)

      c. TP > NegP (Pollock 1989)

      d. Multiple NegPs (Zanuttini 2001)

For the initial formulation of the TPH (Friedmann 1994ss; Friedmann and Grodzinsky 1997ff), which inherits the structural representation from Pollock (1989), negation fills a position lower than Tense Phrase in the syntactic representation. Therefore, this functional category is predicted to be preserved in agrammatic speech (17). The analysis of NegP in such a low position has been adopted by many scholars (Laka 1990; Chomsky 1995, among others).

(17) CP > TP > NegP > AgrP > VP

One of Pollock's (1989) major contributions to the investigation of negation was the observation that negative markers have a different distribution from VP-adverbs. Adopting recent Cartographic proposals, and more specifically Cinque's (1999) work on clause structure, the claim has been made (Zanuttini 2001) that four different positions, which do not overlap with those proposed for adverbs (Cinque 1999), may host negative markers. These positions are represented in (18). Since the options are made available by UG, cross-linguistic variation will reside in the selection of the NegP projections they instantiate.

(18) $NegP_1 > TP_1 > NegP_2 > TP_2 > NegP_3 > Asp_{perf} > Asp_{gen/prog} > NegP_4$

(Adapted from Zanuttini 2001: 532)

Besides structural position, the internal organization of NegP has also been claimed to be language-dependent. According to Ouhalla (1990), variation is restricted to whether the specifier, the head or both elements are lexically realized. The proposal follows that of Pollock (1989) who argued that a language such as French, which presents two elements for the expression of negation (*ne __ pas*), requires different positions for each element inside NegP, i.e. *ne* occupies the head and *pas* the specifier position of the functional projection (with the surface order obtained by means of movement operations).

1.1. Negation in Ibero-Romance

As in the majority of languages, according to Zeiljstra (2004), the Ibero-Romance varieties under examination, Catalan, Galician and Spanish, express sentential negation syntactically. According to Bosque and Demonte (1999), the negative meaning of a sentence in Spanish is the result of the presence of the adverb *no* or any other negative marker placed before the verb. This characteristic is shared by the other two Ibero-Romance languages under examination: see examplesin 19.

(19)   (Jo) **no** vull treballar.   (Catalan)
        (Eu) **non** quero traballar.   (Galician)
        (Yo) **no** quiero trabajar.   (Spanish)
        (I) not want-pres.1st.sg work-INF
        I don't want to work.

However, the number, structural position and status of markers are different across languages. Galician and Spanish express sentential negation by a single negative adverb (*non* in Galician and *no* in Spanish) while at least some varieties of Catalan may require the combination of two markers. These varieties, mainly documented in the areas of influence of central Catalan as well as Girona and Rosselló (Espinal 2002), may show an optional negative adverb (*pas*) in addition to the preverbal marker. Examples are given in (20):

> (20)　a.　La Maria no va (pas) aprovar.　　　　　　　　(Catalan)
> *the M.　not aux-pres.3ʳᵈ.sg (neg.adv) pass-INF*
> Mary did not pass.
>
> 　　　b.　La Maria no va aprovar (pas).
> *the M.　not aux-pres.3ʳᵈ.sg pass-INF (neg.adv)*
> Mary did not pass.
> 　　　　　　　　　　　　　　　　　　(Espinal 1991:34)

When the adverb is present, at first sight, Catalan resembles Standard French (SF), a language where negation is expressed by means of the two elements (in contrast to colloquial French, a variety in which *ne* is omitted). Nevertheless, in contrast to Catalan, SF *pas* has become the true negative marker with *ne* relegated to expletive negation (Espinal 2002). Zeijlstra (2004) considers three diachronical stages of development concerning negative markers which can be used to establish a typological characterization. French provides us with the prototypical example of development since the clitic element *ne* developed into the complex *ne ___ pas* and finally, in colloquial registers, was reduced to the negative *pas*.

> (21)　a)　Je **ne** dis.　　　　　　(Old French)
> 　　　　*I neg say*
> 　　　b)　Je **ne** dis **pas**.　　　(Standard French)
> 　　　　*I neg say neg*
> 　　　c)　Je dis **pas**.　　　　　(Colloquial French)
> 　　　　*I say neg*
> 　　　　　　　(Zeijlstra 2004: 57)

The three patterns can be identified in the following modern languages:

a)　languages with a preverbal negative marker (Italian and Portuguese).

b)   languages with both a preverbal marker and a post-verbal negative adverb (Standard French and some dialectal varieties of Catalan (optional)).

c)   languages with a postverbal marker (German).

These correspond to different phases in the Jespersen cycle (Jespersen 1917). While Phase I languages are characterized by expressing negation by means of a single marker attached to the finite verb, in Phase II languages an optional negative adverb may be inserted to overcome the phonological weakness of the negative marker. Phase II languages are less common and are considered transitional languages. Zeijlstra (2004) regards languages such as Galician or Spanish as corresponding to Phase I and languages such as Catalan as examples of Phase II. Languages of both Phases I and II are Negative Concord (NC) languages, i.e. languages in which two negative elements constitute one single semantic negation without cancelling each other ('NEG-absorption') (Haegeman 1995). This is the case of the three Ibero-Romance varieties under examination (22).

(22)   (Yo) <u>no</u> he visto a <u>ninguno</u>.   (Spanish)
        (I) not have-1st.sg seen to nobody
        I haven't seen anybody.

Negative Concord derives from the NEG-criterion (23):

(23)   *The NEG-criterion:*

a.   A NEG-operator must be in a Spec-head configuration with an X [NEG]
b.   An X [NEG] must be in a Spec-head configuration with a NEG-operator
     NEG-operator: a negative phrase in scope position
     Scope position: left-peripheral A'-position [Spec, XP] or [YP, XP]
                                        (Haegeman 1995: 106)

In line with the Minimalist Program, we will assume following Zeijlstra (2004: 249) that 'multiple [uNEG] features can stand in an Agree relation with one negative operator [iNEG] as long as no intervening negative elements have their [uNEG] features checked at an earlier stage of the derivation'.

NC may be strict or non-strict. Strictness has to do with the allowance of using a negative marker after a negative subject while maintaining the negative reading. The difference between Strict and Non-Strict Negative Concord languages is illustrated in (24a,b):

(24)   a. *Strict Negative Concord:*

'N-words are not allowed to occur by themselves, but have to be accompanied by a single negative marker.'

b. *Non-Strict Negative Concord:*

'N-words are not allowed to occur by themselves, but should be accompanied by a single negative marker, except when the n-word is in a preverbal (subject) position. Then it may not co-occur with a negative marker.'

<div align="right">(Zeiljstra 2004: 64)</div>

While Galician and Spanish are Non-Strict, Catalan presents both Strict and Non-Strict Negative Concord depending on the variety analyzed (25a,b):

(25)   a.   Res *(no) funciona (pas).   (Catalan)
            b.   Res (*no) funciona (pas).
                nothing neg. work-pres.3rd.sg (neg.)
                Nothing works.

<div align="right">(Zeijlstra 2004: 133)</div>

An example from Galician showing the ban on n-words (e.g. *ninguén* 'nobody' or *nada* 'nothing') appearing before negation in a position of dominance, is shown in (26a,b):

(26)   a.   * **<u>Ninguén</u> <u>non</u>** veu.   (Galician)
                nobody not come-pret.3rd.sg
                *Nobody didn't come.
            b.   Non veu ninguén.
                not come-pret.3rd.sg nobody
                Nobody came.

As shown above, in Catalan, Galician and Spanish, the position of the internal negative marker is always pre-verbal regardless of tense and verbal features, i.e. the

same position will be observed in both main verbs and copulas. The first studies by
Suñer (1994) to analyse examples like that represented in (27) argue for the relative
order NegP > TP, with VP-external adverbials such as *todavia* 'still' or *aún* 'yet'
occupying a position higher than negation (28a) and pre-verbal clitics following it
(28b) (Rizzi 1986a). This would hold for the three languages under investigation.

(27)   Los investigadores no tienen suficientes pruebas.   (Spanish)
        the investigators not have sufficient evidence
        Researchers do not have enough evidence.
                                                        (Suñer 1994: 346)

(28)   a.   Drea todavía/aún no sabe el resultado.   (Spanish)
                D.   still / yet not knows the result
                Drea does not know the result yet.
                                                        (Suñer 1994: 346)

        b.   Ella no se lo   compró.
                she not to him it buy-pret.3ʳᵈ.sg
                She did not buy it to/from him.

According to Zanuttini (1989), Romance languages where negation appears
pre-verbally have a lexically realized head with no overt material in the specifier, as
represented in (29), which shows, we would claim, that Galician behaves on a par
with Spanish.

(29)   Spanish: [$_{NegP}$ [$_{Neg°}$ *non/no*] [$_{VP}$ V$_{fin}$]]
        Catalan: [$_{NegP}$ *(pas)* [$_{Neg°}$ *no*] [$_{VP}$ V$_{fin}$]]
                                        (Adapted from Zeijlstra 2004: 175)

Evidence for negative markers in head position would be the fact that head
movement is blocked together with clitic climbing or verb movement (Zanuttini
2001). An example of the impossibility of clitic climbing in the presence of the
negative marker in Galician has been reproduced in (30) below.

(30)   a.   Iria quérea mercar.   (Galician)
                I. want-pres.3ʳᵈ.sg-it buy-INF
                Iria wants to buy it.
        b.   *Iria quérea non mercar.
                I. want-pres.3ʳᵈ.sg-it not buy-INF
                *Iria wants it doesn't buy.

c.   Iria non a quere mercar.
I. not want-pres.3rd.sg-it buy-INF
Iria doesn't want to buy it.

In these languages, the specifier position would be seen as filled by an abstract morpheme (Ouhalla 1990) to explain the restriction on movement of adjunct phrases. Adapting these proposals for the Ibero-Romance languages under examination takes the syntactic representation reproduced in (31) as standardly assumed (in line with Laka 1990; Zanuttini 1991; Rivero 1994; and others).

(31)

```
        NegP
       /    \
     Neg     TP
            /  \
           T    AgrP
               /    \
            Spec     Agr'
                    /    \
                  Agr     VP
                         /  \
                        V    ...
```

However, according to Zanuttini (2001), the surface position of negation in a pre-verbal position can be accounted for in terms of adjunction to the verb. Such a move would be justified by the fact that very little material may appear between negation and the verb. The negation morpheme cliticizes onto the verb and raises with it (Belletti 1990,1994). This is illustrated in (32). The proposal can be traced back to Pollock (1989), who claims that *ne* in French is clitic in nature and adjoins to the verb, hence raising with it.

(32)

This account would straightforwardly explain similarities in the distribution of clitic pronouns and negative markers since both cliticize onto the verb (Zanuttini 2001). This claim, also made for other languages such as Italian (Belletti 1990), seems to extend across the Ibero-Romance varieties under examination. The low position of Negation in the syntactic structure of Catalan, Galician and Spanish, lower than TP, would lead us to predict that it will be spared in our agrammatic sample if the TPH is assumed.

1.2. Previous research in agrammatism

Few studies have provided us with evidence indicating whether negation mechanisms are generally preserved or not in agrammatic aphasia. An exception can be found in the case of Japanese. Sasuma *et al.* (1990), Takizawa *et al.* (1993) and Hagiwara (1990) empirically tested tense and negation comprehension and negation production. Their findings, summarized in Hagiwara (1995) and plotted in Table 9, indicate that both categories can be retained in agrammatism.

Degree of preservation	*Mr. Saito* Sasuma *et al.* (1990)	*Mrs. Hayasi* Sasuma *et al.* (1990)	*Mrs. T.* Takizawa *et al.* (1993)	*Y.Y.* Hagiwara (1990)
Spontaneous speech	2	2	2	2

0 - High omission rates, 1 - Omission of the feature, 2 - Preserved feature

Grammaticality Judgment (% correct)	*MY* Hagiwara (1995)	*JK* (Hagiwara 1995)
Negation	99%	97%
Tense	94%	91%

Table 9. Negation and tense in spontaneous speech and grammaticality judgment (from Hagiwara 1995)

Hagiwara (1995) gives a structural justification for the degree of preservation of negation. Due to the low position of the NegP in the syntactic phrase marker (TP < NegP), which she takes from Pollock (1989) tense and its projection are more susceptible to being impaired than Negation. This relative degree of

impairment/unimpairmet between categories is also attested in the grammaticality judgment task.

1.2.1. Previous studies of Hebrew and Palestinian Arabic

Like what has been observed for Japanese, previous studies for Hebrew and Palestinian Arabic (Friedmann and Grodzinsky 2000) reveal spared negation skills in agrammatism. Only a 4% error rate was found for negation with main verbs.

Nevertheless, negation of main verbs in Hebrew always displays the order Neg-V with independence of tense. Hence, as Friedmann and Grodzinsky claim, even if it were impaired, due to its clitic character, negation would appear in the right position with respect to the verb. In fact, these authors show in Friedmann and Grodzinsky (1997) that for RS, a Hebrew-speaking patient, the relative position of copulas and negation was lost, leading to a failure in their use. RS produced only 24% of the items requiring the negation of a copular verb (18/76 sentences) correctly. Past and future tense copulas in Hebrew follow negation (33a) while present tense copulas precede negation (33b).

(33)   a. David <u>lo</u> haya/yihye melex Anglia.   (Hebrew)
       David neg was/will-be king of England

       b. David hu <u>lo</u> melex Anglia.
       David is neg king-of England
          (From Friedmann and Grodzinsky 2000)

RS's errors consisted of the placement of negation in front of the whole sentence, the substitution of sentence negation by constituent negation (34) or 'don't know' responses.

(34)   *David haya   lo melex anglia
       David copula-past neg king-of England
          (From Friedmann and Grodzinsky 2000)

1.2.2. Previous studies of Greek

Negation in Greek precedes all inflectional markers on the verb. Stavrakaki and Kouvava (2003) provide evidence of the use of the two Greek negative markers in

two non-fluent aphasics: a) the particle *den*, used with indicative mood, and b) the particle *min*, which co-occurs with subjunctive mood. The results of spontaneous speech, grammaticality judgment and the preference test[23] carried out with their sample are summarized below:

Task	Particle	SC	VF
Spontaneous speech	Den	9/26 (34.6%)	13/18 (72.22%)
	Min	0/5 (0%)	
Grammaticality judgment	Den	17/20 (85%)	20/20 (100%)
	Min	14/20 (70%)	18/20 (90%)
Preference task	Den	8/10 (80%)	10/10 (100%)
	Min	8/10 (80%)	9/10 (90%)

Table 10. Correct use of negation in Greek non-fluent aphasia

As illustrated in Table (10), there is wide task-dependent and cross-subject variation with grammaticality judgment and the preference task favoring the correct identification of negative markers. In contrast to the controlled tasks, spontaneous speech proved to be severely damaged in the case of SC and better preserved for VF, who reached levels of correctness around 72%. In erroneous production, both negative markers were replaced by the anaphoric form *ohi* 'no', as seen in the example in (35).

(35)   SC: *Ohi... ohi... ksehnao... ohi... ksehnao (= Ja na min ta ksehnao)
            No...no-forget-1s-no-forget-1s (= For-to-not-them-acc-forget-1s)
            So that I don't forget them.
                                                    (Stavrakaki and Kouvava 2003: 136)

Fyndanis, Tsapkini, Varlokosta, Petropoulou and Papathanasiou (2006) tested negation skills in the production and comprehension of two further patients diagnosed as non-fluent agrammatic aphasics and two matched control subjects. The tasks, a truth value judgment task (with sentence-picture pairs) and two anagram tests (with

---

[23] The patient was orally presented with first a grammatical and then an ungrammatical sentence and asked to choose the sentence that 'sounded better'.

and without pictures) including both affirmative and negative sentences, showed that whereas comprehension was almost completely spared, production was damaged when compared to affirmative sentences (significant differences were found at a 1% level).

The percentages of erroneous responses in negation are shown in Table 11, which clearly reveals the dissociation between production and comprehension.

	AB	*GT*
Comprehension	0/15 (0%)	4/15 (26,67%)
Production		
Anagram + Picture	13/16 (81.25%)	14/16 (87.5%)
Anagram – Picture	11/18 (61.11%)	17/18 (94.44%)

Table 11. Negation errors in 2 Greek agrammatic patients (adapted from Fyndanis *et al.* 2006)

The typology of errors included incorrect order of negation (23.64%), use of constituent negation instead of sentential negation (23.64%) and omission of negation (21.82%) as the most outstanding strategies used by Greek-speaking agrammatics. These results are claimed to pattern with the TPH, since NegP is assumed to occupy a higher position in the IP-field and is therefore expected to be highly susceptible to impairment.

1.2.3. Previous studies of Germanic languages

The fact that sentential negation may be problematic for aphasics was also documented for several Germanic languages such as English or Dutch. In her study of English agrammatism, Bebout (1993) found the production of negative morphemes (see 36a) easier for aphasics than that of sentential negation (36b) while asymmetries in comprehension were not detected.

(36)   a.   The shoe is untied.
         b.   The shoe is not tied.
                   (Bebout 1993)

Nevertheless, the evidence in this study was not gathered exclusively from non-fluent aphasics. In fact, only 44% of the subjects were formally diagnosed as

anomic or Broca's aphasics. So the results include also fluent cases, which may obscure the performance of the non-fluent population.

Further evidence from negation in grammaticality judgment in English agrammatic populations is provided by Grodzinsky and Finkel (1998), who analyzed 4 Broca's and 7 Wernicke's aphasics. Leaving the results for the Wernicke's aphasics aside, it was found that Broca's aphasia subjects had preserved abilities for detecting the grammaticality/ungrammaticality of negative sentences with an overall error rate of 13.4%. An example of the test sentences is illustrated in (37).

(37)   a. [+ Grammatical] – John has not left the office.
                                               John did not sit.
          b. [- Grammatical] – *John did not have left the office.
                                               *John sat not.
                                                          (Grodzinsky and Finkel 1998: 285)

Error percentages for these Broca's aphasics are shown in Table 12.

	FC		*RD*		*FA*		*WF*	
				Patient				
Errors	+ G	- G	+ G	- G	+ G	- G	+ G	- G
Negation	0%	13%	6%	25%	0%	10%	38%	6%

[+G / -G = judgment of grammatical/ungrammatical sentences (errors = false alarms/missings)]

Table 12. Grammaticality judgment in 4 English agrammatic patients (Grodzinsky and Finkel 1998: 286)

Arabatzi and Edwards (2002) studied the production of verb inflection with negative sentences in 8 English-speaking agrammatics. The elicitation task, including 15 sentences per subject, revealed that while only 20% of the sentences were correctly produced, 8.3% of the attempts to produce a negative sentence were abandoned. Nevertheless, no instances of omission of the negative marker were detected. As for substitutions, only one subject (PB) produced errors of this type (6.7%). The presence of negation did not prevent inflectional errors. On 17.5% of occasions, subjects omitted *do* and produced an inflected verb following negation. Negation preceded a non-finite form in 7.5% of the sentences.

Further evidence from English and Dutch Broca's aphasics is given by Rispens, Bastiaanse and van Zonneveld (2001). These authors studied data from 2 English and 3 Dutch agrammatic subjects in addition to 2 Norwegian patients (all matched with controls), who were asked to carry out comprehension and two sentence-anagram[24] (with and without pictures) tests. The individual results classified by task and construction type are summarized in Table 13.

	English			*Dutch*		*Norwegian*	
Negative sentences	LB	PB	HCL	TV	RB	ER	IN
Comprehension	6%	44%	6%	0%	0%	11%	50%
Production							
Anagram + picture	100%	100%	0%	0%	44%	11%	33%
Anagram – picture							
Actives	100%	80%	0%	80%	80%	20%	40%
Passives	100%	100%	100%	40%	0%	100%	20%
Perfect Present tense	100%	80%	0%	80%	100%	40%	100%

Table 13. Percentage of negation errors in English, Dutch and Norwegian (Rispens *et al.* 2001)

In terms of comprehension, there was high variability among subjects. Nevertheless, the results did not turn out to be significant with respect to affirmative sentences. The results for subjects LB, HCL, TV, RB and ER support the claim that comprehension is spared. In fact, errors by PB, LB and ER can be attributed to problems with the comprehension of reversible structures and are therefore not related to negation or its status as a spared/impaired category in agrammatism.

Moving to the production results, English patients performed worse than Dutch and Norwegian subjects. According to Rispens *et al.* (2001), these differences can be attributed to cross-linguistic differences in the internal structure of NegP. While the negative element would occupy the specifier position in both Dutch and Norwegian, in English, it occupies the head position, thus forcing '*do*' insertion. Agrammatic subjects display more difficulty in the construction of negative sentences

---

[24] Patients were expected to build up sentences using particular anagram cards (e.g. [The mouse] [is] [not] [caught] [by the cat]).

with negation words which are functional heads than with those occupying the specifier position.

The authors account for these data in pre-Minimalist terms (Chomsky 1992) and assume the basic order AgrOP > VP with the position of Neg subject to crosslinguistic variation. Under their approach, the results from Norwegian can be seen as evidence against a truncation hypothesis. While in English and Norwegian NegP occupies a position higher than AgrOP, in Dutch Negation is located between AgrOP and VP. Therefore, we would expect more errors in Norwegian subjects than in Dutch, a pattern that is not reflected in the results. Nevertheless, Rispens *et al.* (2001) stress that the number of observations is relatively low, so conclusions must be cautious. However, the analysis of *not* as a head is at least controversial. According to Belletti (1990), Zanuttini (1991) and Haegeman (1995), among others, it is the contracted form *–n't* that occupies the head position as suggested by its capacity to move along with copulas and auxiliaries. Since *not* can be crossed, it is claimed to be hosted in the specifier position while a phonologically null operator fills in the head position.

Concerning the error pattern, in English, subjects tended to omit the negative marker (whose presence is attested only once). This omission did not necessarily entail the omission of '*do*', which was never used in affirmative sentences but appeared four times in LB's negative responses and three times in PB's. Another observed error was the replacement of sentence negation with constituent negation, placing the negative particle after the verb (87% of the time for LB and 86% for PB). The substitution of sentential negation was also observed in Dutch and Norwegian subjects.

Bastiaanse, Rispens, Ruigendijk, Juncos-Rabadán and Thompson (2002) provide evidence from Spanish, English, Dutch and Norwegian agrammatic subjects. Leaving Spanish aside for the moment, their results showed a dissociation between English on the one hand, with 96.67% errors in the production of negative sentences, and Dutch and Norwegian on the other, with 7.78% and 37.78% errors, respectively. As in Rispens *et al.* (2001), the authors attribute this difference to the different status of negative elements, which occupy the specifier position in Dutch and Norwegian and the head position in English. According to this hypothesis, which would also

account for the results in Greek discussed in previous sections (Fyndanis *et al.* 2006), negation will be problematic for agrammatic patients depending on the position it occupies, i.e. depending on whether it is head or specifier.

1.2.4. Previous studies of Romance languages.

In contrast with the results for English, several studies of Romance languages such as Italian and French documenting the behavior of negation markers and their relative position with respect to adverbs and [± finite] verbs have shown that these markers are intact in agrammatic speech. This is clearly attested in Lonzi and Luzzatti (1993), who provide evidence from the spontaneous speech of 6 French agrammatic speakers documented in Nespoulous *et al.* (1990) and Tissot, Mounin and Lhermitte (1973), and report scores of 0% errors in the 8 occurrences of *ne __ pas*. Nevertheless, in the case of Italian, Chinellato (2007a) found impairment of preverbal sentence negation (only 13.5% of correct responses) vs. unimpairment of constituent negation (100% correct) in one Italian patient in a sentence completion test. These results are confirmed in Chinellato (2007b) for 5 agrammatic speakers of Italian/Northern Vicentino and Italian/Venetian, suggesting great variability in cross-linguistic results.

1.2.5. Previous studies of Ibero-Romance

There is no previous evidence from Catalan or Galician agrammatism as far as negation is concerned. The closely related results come from the observation of a Spanish group of Wernicke's aphasics by Juncos-Rabadán (1992). In this study, the author contrasted test results for subjects with left temporal lesions (diagnosed as Wernicke's aphasics) with results for right-damaged patients and controls. Wernicke's patients showed problems with the comprehension of sentential negation *no* in isolation. When reinforced by a negative polarity item (e.g. *nada* 'nothing'), comprehension improved significantly. In all cases, the comprehension of negation in declaratives was higher than 70% for all subjects tested. A summary of the results is provided in Table 14.

Constructions	Group 1 *Aphasics*	Group 2 *Right Lesion*	Group 3 *Controls*
Standard negatives	70.3%	89.6%	93%
Polarity Items: '*Nadie*' '*Nada*'	 96.4% 98%	 98.8% 100%	 100% 100%

Table 14. Percentage of correct negation comprehension in declarative structures (adapted from Juncos-Rabadán 1992)

However, a problem is suggested by the results for the control group, which failed to comprehend standard negatives in 7% of the instances. This may indicate problems attributable to the experimental design rather than the deficit under examination.

As noted above, additional evidence from Spanish can be found in the cross-linguistic comparison reported in Bastiaanse *et al.* (2002). In this article, which also includes data from English, Dutch and Norwegian agrammatic subjects, the authors document the results for 2 Spanish aphasics shown in Table 15.

Constructions	*Subject 1*	*Subject 2*
Negative sentences		
Anagrams + pictures	88%	44%
Anagrams – pictures		
Actives	80%	100%
Passives	100%	100%
PPT	60%	100%
Affirmative sentences		
Anagrams + pictures	0%	0%
Anagrams – pictures		
Actives	0%	0%
Passives	80%	100%
PPT	20%	80%

Table 15: Percentage of errors in Spanish agrammatic negation (Bastiaanse *et al.* 2002: 257)

Negative sentences are significatively more impaired than affirmative constructions (Wilcoxon Signed Rank test: $p < 0.05$, $Z = -2.29$). The difference is clear in the case of active sentences, which were correctly produced 100% of the time in affirmative sentences but only 33% of the time in negative sentences. Errors consisted of the placement of the negative marker at the end of the sentence or the

replacement of sentential negation with constituent negation. Since these data seem to contrast with the generally accepted view in agrammatism studies that negation is rarely affected (Bastiaanse *et al.* 2002; Hagiwara 1995; Lonzi and Luzzatti 1993), the authors stress that differences between negative and affirmative sentences may be obscured by the complexity of the constructions involved.

1.3. Experimental design: Sentential negation.

As part of the present study, in order to obtain further data for Spanish and fill in the gap for Catalan and Galician, two experimental tasks intended to elicit negation were carried out with 15 mild and 1 moderate Ibero-Romance agrammatic patients. A total number of 50 positive declarative sentences were presented to the 16 subjects, who were then asked to negate the senteces. Our goal was to determine whether they could provide the corresponding negative declaratives by means of the insertion of the negative marker.

In the first task, the items had simple tenses to avoid possible interferences with an auxiliary verb. The selected forms were the present, the imperfect and the future. Since in Catalan simple past is a compound form (e.g. *vaig anar* '(I) went'), it was eliminated from the test design for all three languages and replaced with the imperfect. The 25 sentences included in this block had a low number of words. Three tokens from the original test in Catalan, Galician and Spanish are reproduced in (38), (39) and (40) respectively.

(38) Avui demanem llibres.   (Catalan – present)
      today ask-pres.1st.pl books
      Today we ask for books.

Target answer: Avui   no   demanem   llibres.
                today not ask-pres.1st.pl books
                Today we do not ask for books.

(39) Os nenos actuaban   o martes.   (Galician – imperfect)
      the boys perform-imp.3rd.pl the Tuesday
      The boys were performing on Tuesday.

Target answer: Os nenos non   actuaban   o martes.
                the boys not perform-imp.3rd.pl the Tuesday
                The boys were not performing on Tuesday.

(40)   Mañana   recogeremos manzanas.   (Spanish – future)
         tomorrow pick-fut.1st.pl apples
         Tomorrow we will pick apples.

   Target answer: Mañana   no   recogeremos manzanas.
                 tomorrow not pick-fut.1st.pl apples
                 Tomorrow we will not pick apples.

In the second task, including again 25 tokens, auxiliaries and periphrasis were employed instead of simple forms. Nevertheless, since Galician does not have compound tenses, these forms were replaced by periphrastic constructions in all Galician tokens. Examples of the two types of declaratives presented to the patients appear in (41) and (42):

(41)   Vós destes en frega-los pratos.   (Galician)
           you took-pret.2nd.pl in wash-INF the dishes
           You took to washing the dishes.

   Target answer: Vós non destes en frega-los pratos.
                 you not took-pret.2nd.pl in wash-INF the dishes
                 You didn't take to washing the dishes.

(42)   Los carpinteros han terminado el trabajo.   (Spanish)
           the carpenters aux-pres.3rd.pl finished the job
           The carpenters have finished the job.

   Target answer: Los carpinteros no han terminado el trabajo.
                 the carpenters not aux-pres.3rd.pl finished the job
                 The carpenters haven't finished the job.

As in the first task, subjects were asked to produce the negative form.

1.4. Results

To detect possible unnoticed failures in our experimental design and to obtain control data from a non-pathological population, the tasks were first run with a sample of 15 control subjects. These subjects provided 100% correct negations both in the first task, involving the negation of declaratives with simple tenses, and in the second one, which involved negating structures with auxiliary verbs and periphrases.

Regarding the results from agrammatic subjects, we first carried out an error analysis by item. Graphs 1 and 2 include those tokens for which some degree of subject error was detected. As show in Graph 1, the negation of simple verbal forms was almost completely spared. Only three items out of the 25 included in the task were incorrectly produced by a subject in the experimental group.

Errors per Item: Negation of simple tenses

* The x-axis only includes tokens for which errors were detected.

Graph 1. Number of errors per item in negation of simple tenses, all languages

The Catalan version of the three problematic items are reproduced in (43).

(43) Token 2:   Ells sortien d'hora.   (Catalan version)
                  They were going out early.
      Token 19:   En Santi evitava els problemes.
                  Santiago was avoiding the problems.
      Token 20:   Els socis arriben a un acord.
                  The members reach an agreement.

Token 2 led to failure four times while only one error each was attested for tokens 19 and 20. Graph 2 shows the results obtained when auxiliaries and verbal periphrases were employed instead of simple tenses. An observable increase was found in the number of problematic items: 9 out of 25 items led to failure in the agrammatic group.

Errors per Item: Negation of auxiliaries and verbal periphrases

* The x-axis only includes tokens for which some errors were detected.

Graph 2. Number of errors per item in negation of auxiliaries and verbal periphrases, all languages

Despite the increase in errors from task I to task II, the high percentages of correctness meant that the total error rate never surpassed two per item with the already mentioned exception of token number 2 in the first experiment (nº of errors = 4). The results of these tasks indicate that, independently of the Ibero-Romance variety under examination, negation was spared in the agrammatic sample tested, as illustrated in graphs 3 and 4 below, where errors have been classified according to language, with results from the mild agrammatic sample (labeled as Catalan, Galician and Spanish) separated from those of the Catalan-speaking moderate agrammatic subject (CM).

**Negation production
Simple tenses**

*CM = Catalan moderate subject

Graph 3. Number of errors per item by language of subject, simple tenses

**Negation production
Auxiliary verbs and verbal periphrasis**

*CM = Catalan moderate subject

Graph 4. Number of errors per item by language of subject, auxiliary verbs and verbal periphrases

According to these results, negation is spared in production by our agrammatic sample independently of the severity of the agrammatic deficit. The total number of errors produced by mild agrammatics amounted 1.6% for sentential negation in constructions with simple tenses (6/375, 125 responses per language) and, though the percentage experiences a slight increase for complex verbal forms to 3.47% (13/375), the overall average of correct responses is 97.47%.

Leaving simple tenses aside for the moment, out of the 9 errors found for Catalan and Spanish complex verbal forms (out of 250 responses), 5 were in the presence of verbal periphrases and 4 with a temporal auxiliary. The 4 errors documented in Galician are considered a separate issue since all tokens were build around verbal periphrases as this language does not include complex verbal forms in its repertoire.

Considering individual results, the only anomalous behavior attested in our sample is that of S3 (Spanish experimental subject nº 3). He produced 6 out of the 9 errors observed in the Spanish group. His production of negation was especially impaired for auxiliaries and verbal periphrasis. Out of the 5 errors he produced with these constructions, 3 are cases of the use of *ninguno* 'none' instead of *no* 'no'. This use was either ungrammatical or generated very odd structures indicating poor command of this negation form, which in its cognate form is necessarily preceded by *no* in all the Ibero-Romance languages under examination (see 44 for an example).

(44)   Los socios   llegan   a *ningún acuerdo. --- S3
          the members arrive-pres.3rd.pl to none agreement
          The members reach *any agreement.

          TARGET: Los socios no llegan a un acuerdo.
                  the members not arrive-pres.3rd.pl to an agreement
                  The members do not reach an agreement.

In addition to cases of replacement with constituent negation, two extra cases of omission of the negative marker were also recorded.

Concerning Catalan, no single instance of the use of *pas* was detected. There are two possible explanations to this absence. First, as we have already mentioned in the introduction to this chapter, *pas* is mainly restricted to particular varieties of Catalan (Central Catalan, Gironès and Rossellonès). Its presence in the metropolitan area of Barcelona, where our subjects were recruited, is almost nonexistent. Second, since this negative adverb is optional, agrammatic subjects may have just avoided it for the sake of simplicity.

Despite the small amount of errors in our mild agrammatic sample, statistical measurements were carried out. A Wilcoxon Signed Ranked test revealed no significant differences in the production of sentential negation with simple tenses vs. complex verbal forms. Nevertheless, differences turn out to be significant when mild agrammatics were contrasted with control subjects using the Mann-Whitney U test. For simple tenses, differences were significant at a 5% level while for complex verbal clusters the difference was a more significant 1% level ($p < 0.01$).

In addition to these results, as indicated in Graphs 3 and 4, the negation test was also carried out on one moderate agrammatic subject. Though he only produced one productive negation error per task (4%), the number of '*don't know*' responses reached 8/50 (16% vs. 1.73% for mild subjects). However, this difficulty with completing the negation task may have been attributable to one or more of three factors: a) problems with negation, b) problems with tense or c) problems with repetition. Since those sentences with correct tense were correctly negated, we will attribute failure to a deficit in tense (further discussed in section 2).

1.5. Discussion

Conflicting evidence in the study of agrammatic populations indicates that negation is the locus of great variability:

a) across languages: Negation has been found to be spared in Japanese (Hagiwara 1995), Hebrew and Palestinian Arabic (Friedmann and Grodzinsky 2000) or French (Lonzi and Luzzatti 1993) and impaired in English (Rispens *et al.* 2001).

b) across modalities: Negation has been found to be spared in comprehension and impaired in production (see Fyndanis *et al.* (2006) for Greek).

c) across tasks: A task-dependency effect has been documented for Greek by Stavrakaki and Kouvava (2003) with grammaticality judgment and preference tasks easier to carry out than spontaneous speech. This effect was also found in Grodzinsky and Finkel (1998), who document preserved abilities for grammaticality judgment in English agrammatism.

d) across individuals: Stavrakaki and Kouvava (2003) document the case of two Greek subjects with very different results for negation. The same is attested in Rispens *et al.*'s (2001) study of English, Dutch and Norwegian as far as comprehension of negation is concerned.

Variation is also found in the way authors account for the observed deficit. While structural considerations are seen to be operative in the relative degree of impairment/unimpairment of negation by some authors (Hagiwara 1995; Friedmann and Grodzinsky 2000; Fyndanis *et al.* 2006), access to grammatical knowledge (Stavrakaki and Kouvava 2003) or differences in the internal structure of NegP (Rispens *et al.* 2001; Bastiaanse *et al.* 2001) have also been seen as the possible locus of impairment. This debate may be seen as an indicator that negation is not a crosslinguistically uniform phenomenon (Chinellato 2007; Moscati 2006).

Though it is not explicitly formulated for negation production, if we take a structural account such as the TPH based on Pollock's (1989) Split Inflection hypothesis, we would expect negation to take place at the lower portions of the

syntactic representation, leading us to correctly predict the observed unimpairment (consistent with Hagiwara 1995).

(45)   *Pollock's (1989) phrase marker*

```
                    CP
                   /  \
        (wh-question)   C'
                       /  \
                      C    TP
             (complementizer) \
                              T'
                             /  \
                            T    Neg P
                        (tense)  /  \
                               Agr P
                                /  \
                              Agr'
                             /  \
                          Agr    VP
                  (person, gender, number)
```

        Like Italian *non*, the preverbal Catalan, Galician and Spanish negative maker *no* is analyzed as an operator, clitic in nature, that occupies the head position of NegP, which is seen as linearly following tense heads. In this dissertation, we assume that Neg is first-merged in the lower portion of the syntactic representation and reaches the pre-verbal surface position by adjunction to the verb (Zanuttini 2001). The relative order of negation and the inflected verb is established before the verb moves to check tense features, i.e. even if a projection as high as TP(ast) in Cinque's (1999) hierarchy is not present, the negative marker would already appear to the left of the verb.

        Despite its functional nature, the results from our Ibero-Romance population show that negation is mostly spared in mild cases of agrammatism. Though differences with the control group proved to be significant, correct responses were as high as 97.47% for agrammatics. To account for our results, we have to adopt a structural account based on the low generation position of negation to justify its preservation.

Our findings for Spanish enter into contradiction with Bastiaanse *et al.*'s (2002) work, which shows error rates for the negation of active sentences as high as 77%. The authors base their analysis on the dissociation between the production of negation in languages such as Spanish or English, in which negation interferes with verb movement, and Dutch or Norwegian (with 26% errors in negative actives), in which the verb passes over the negative marker. Under this hypothesis, if negation blocks verb movement or cliticizes onto the verb, high error rates are expected (as would be the case for Spanish). Our data indicate that, even if negation interferes with verb movement, it can be preserved (97.4% correct responses for negation production in Ibero-Romance). This idea is reinforced since, contrary to Bastiaanse *et al.* (2002), we recorded no instances of negation in final position.

Additionally, Rispens *et al.*'s (2001) claim that negative elements in head position tend to be more susceptible to impairment in agrammatism does not seem to hold. The three Ibero-Romance varieties under investigation, i.e. Catalan, Galician and Spanish, have the head of NegP as the first merge site for the negative marker. Despite this fact, our experimental results show that negation may be spared even when it occupies head position.

Differences may also be attributed to the different nature of the production tasks (negation of given sentences vs. building up sentences from anagrams). Both Rispens *et al.* (2001) and Bastiaanse *et al.* (2002) acknowledge that the complexity of the constructions involved and the relatively low number of observations may have obscured their results. For a TPH-based account, what is crucial is that negation is predicted to be better preserved than higher nodes, starting with tense.

Due to its interaction with negation, the next step in our description of Ibero-Romance agrammatism is an examination of inflectional morphology. Section 2 analyzes in detail agrammatics' errors in the production of both tense and agreement derived from the first negation task (negation of simple tenses, see section 1.3) together with the results of a tense comprehension task. Root infinitives and verbless constructions are also discussed in this section as deriving from a failure in the correct production of the inflected form. The behavior of auxiliaries (tense, modals and aspectuals) documented in the second negation task will be addressed in section 3.

2. TENSE AND AGREEMENT

The degree of preservation of tense and agreement has been comprehensively documented in the literature, with inflectional errors clearly shown to be one of the most outstanding characteristics of agrammatism (Goodglass 1976; Grodzinsky 1984, 2000; Caplan 1985; among others). Nevertheless, the descriptions and explanations of such errors have differed over time. Goodglass and Kaplan (1983) and Caplan (1985) drew a distinction between erroneous omissions and substitutions in tense morphology. Omissions of inflectional affixes were taken to characterize agrammatism while substitutions were seen as a result of paragrammatism (Goodglass and Kaplan 1983). However, later studies suggest that the distribution of omissions vs. substitutions is in fact linked to language specific factors and not to different deficits (Menn and Obler 1990). Since some languages block the omission of inflection, which would result in the production of non-words – avoided by agrammatics, who preserve word formation skills, substitutions must be taken as part of the agrammatic deficit (Grodzinsky 1990; Friedmann and Grodzinsky 1997).

Among the various explanations, inflectional errors have been accounted for in phonological terms (Kean 1977), by processing accounts (Kolk and Heeschen 1992) and through syntactic theory (Hagiwara 1995; Friedmann and Grodzinsky 1997). We have already seen that there is evidence that inflection is selectively impaired and there is a dissociation between the behavior of tense and agreement. Subject-verb agreement data show relatively unimpaired performance, while tense tends to be cross-linguistically damaged in agrammatism (see Friedmann and Grodzinsky (1997) for Hebrew and Palestinian Arabic, Nadeau and Rothi (1992) for English, Wenzlaff and Clahsen (2004) for German, Nespoulous *et al.* (1988) for French, Miceli *et al.* (1989) for Italian or Alexiadou and Stavrakaki (2006) for Greek, among many others). Since temporal adjuncts tend to be preserved in the speech of agrammatic subjects, they may be seen as the indicator of a preserved concept of time (de Roo 2001). Hence, the underlying deficit cannot be attributed to general factors but must instead be the result of narrowly constrained deficits.

In addition to the tense-agreement dissociation, there are two other frequently observed aspects related to the inflected verb form, namely the omission of main verbs and the use of substitutory non-finite root forms, which merit a detailed

discussion in this section. The omission of finiteness, i.e. the lack of a finite verb in a sentence either due to omission or to the replacement of the inflected verb with a non-finite form, is an important symptom to consider when studying agrammatism. As Kolk *et al.* (2003) point out, this phenomenon gives aphasic speech its telegraphic appearance. Though anomia, i.e. difficulties in calling up words, can be made responsible for omissions, in this dissertation we will claim that, under certain structural conditions, both omissions and substitutions by non-finite forms in subjects with agrammatic aphasia are due to the structural deficit that underlies this pathology and follow from the predictions of truncation accounts such as the TPH.

Root Infinitives (RIs) / Optional Infinitives (OIs) in child language are a controversial topic in the literature, but their equally frequent presence in agrammatic speech (at least according to de Roo (2001)), has received less attention. However, though the number of proposals and the amount of data available are smaller, some cross-linguistic studies observing the behavior of Dutch, Hebrew or Palestinian Arabic agrammatics can be found in the literature (Friedmann and Grodzinsky 1997; de Roo 2001; among others). These will be used as the background for our discussion.

2.1. Verbal inflection in Ibero-Romance

This section aims to provide a summary of regular verb inflection in Catalan, Galician and Spanish adult grammars[25]. The richness of the inflectional system together with

---

[25] Among the noteworthy differences between Ibero-Romance languages, we find the distribution of regular and irregular forms. A regular verb in Catalan and Galician (*sentir – sento* 'to feel – I feel') can be irregular in Spanish (*sentir – siento* 'to feel – I feel'). In fact, for the three languages, regular and irregular forms can coexist in the same verbal paradigm:

E.g. *Poder* 'be able to':
yo **pue**do, tú **pue**des, el/ella **pue**de, ellos/ellas **pue**den, nosotros **po**demos, vosotros **po**deis
I/you/he/she/we/you/they can

Another divergent point has to do with verbal suffixes. Despite similarities, not all forms are shared by Catalan, Galician and Spanish. Compare the following forms for example.

a. Jo tinc.   (Catalan)
b. Eu teño.   (Galician)
c. Yo tengo.   (Spanish)
   I have

its formal diversity are shared characteristics among Ibero-Romance varieties. Finite verbs are created from the verbal root and a thematic vowel followed by tense/mood and person/number markers. All three languages are [–zero] morphology languages, i.e. roots are morphologically dependent units, in contrast to languages such as English, where bare roots are lexically well-formed words (*to work – I work*). As a consequence, neither Catalan nor Galician nor Spanish admit bare forms.

The thematic vowel is placed inmediately after the verb root and marks verb class. Ibero-Romance verbs can be classified according to the conjugation they pertain to as I (*-a-*), II (*-e-*) or III (*-i-*) verb classes depending on the thematic vowel they include under certain circumstances (46). The corresponding temporal suffixes of a verb depend on the conjugation class they belong to.

(46)   cant–a–r   com–e–r   conduc–i–r   (Spanish)

         sing I conj inf   eat II conj inf   drive III conj inf

Tense/mood affixes and agreement affixes appear in this order after the thematic vowel. The array of simple tenses available in each of the Ibero-Romance languages displays a slight cross-linguistic variation. While present, preterite, imperfect, future, and conditional for indicative, together with present subjunctive and past subjunctive, are common for the three languages, Galician includes a simple pluperfect form instead of the equivalent periphrastic form in Catalan and Spanish. This is due to the complete lack of composite verbal forms in Galician, which also results in a greater use of verbal periphrases[26]. The richness of the paradigm is clearly illustrated for Spanish by Centeno (1996), who describes its inflectional morphology as consisting of 71 forms to encode tense, mood, aspect and agreement.

Agreement markers cluster together person and number features, thus giving rise to six possible combinations, i.e. 1st, 2nd and 3rd person, singular and plural. In addition, a further simple tense including only person and number features is present in the case of Galician. This form is the inflected infinitive, which is employed in

---

The first person singular ending '-c' in Catalan is exclusive to this language (de Diego Balaguer, Costa, Sebastián-Galles, Juncadella and Caramazza 2004). Nevertheless, these differences are not central for our account. Hence, we assume that the same predictions will hold for all three languages.

[26] See Section 3 for a detailed account of these complex verbal clusters in Ibero-Romance.

embedded clauses with subject-verb agreement and subjects marked for nominative case but which lacks a tense specification independent of the matrix verb (Raposo 1987; Longa 1994). An example of the inflected infinitive is shown in (47).

(47) 1st andar   (*'to walk'*)
      2nd andar - ES
      3rd andar
      4th andar - MOS
      5th andar - DES
      6th andar – EN

Simple verb forms relevant to the results of the experimental tasks we used in our study are the Present, Preterite, Imperfect and Future. An example of a conjugated verb form from each the three languages investigated is shown in Table 16.

	Catalan	*Galician*	*Spanish*
Infinitivo	Cantar 'sing'	cantar 'sing'	cantar 'sing'
Present			
1 sg.	cant-o	cant-o	cant-o
2 sg.	cant-e-s	cant-a-s	cant-a-s
3 sg.	cant-a	cant-a	cant-a
1 pl.	cant-e-m	cant-a-mos	cant-a-mos
2 pl.	cant-e-u	cant-a-des	cant-á-is
3 pl.	cant-e-n	cant-a-n	cant-a-n
Preterite			
1 sg.	cant-í / vaig cantar	cant-ei	cant-é
2 sg.	cant-a-re-s / va-s cantar	cant-a-che-s	cant-a-ste
3 sg.	cant-à / va cantar	cant-ou	cant-ó
1 pl.	cant-à-re-m / va-m cantar	cant-a-mos	cant-a-mos
2 pl.	cant-à-re-u / va-u cantar	cant-a-stes	cant-a-ste-is
3 pl.	cant-a-re-n / va-n cantar	cant-a-ro-n	cant-a-ro-n
Imperfect			
1 sg.	cant-a-va	cant-a-ba	cant-a-ba
2 sg.	cant-a-ve-s	cant-a-ba-s	cant-a-ba-s
3 sg.	cant-a-va	cant-a-ba	cant-a-ba
1 pl.	cant-à-ve-m	cant-a-ba-mos	cant-á-ba-mos
2 pl.	cant-à-ve-u	cant-a-ba-des	cant-a-ba-is
3 pl.	cant-a-ve-n	cant-a-ba-n	cant-a-ba-n

Future			
1 sg.	cant-a-ré	cant-a-ré	cant-a-rei
2 sg.	cant-a-ràs	cant-a-rás	cant-a-rás
3 sg.	cant-a-rà	cant-a-rá	cant-a-rá
1 pl.	cant-a-rem	cant-a-remos	cant-a-remos
2 pl.	cant-a-reu	cant-a reis	cant-a redes
3 pl.	cant-a-ran	cant-a-rán	cant-a-rán

Table 16. Sample of verbal inflection in Ibero-Romance

2.2. Previous research in agrammatism

Most recent studies in agrammatism show that though subject-verb agreement is not completely spared, the number of tense errors is higher in all cases, independent of the experimental methodology used (see Friedmann and Grodzinsky (1997, 2000) for Hebrew and Palestinian Arabic or Wenzlaff and Clahsen (2004) for German). These findings corroborate the hypothesis that Tense and Agreement behave differently in agrammatism and indicate a clear dissociation between them. In addition, concerning error type, substitutions of the expected form for another member of the finite paradigm have been found to go hand in hand with the overuse of infinitives and participles instead of the required finite form (Radford, Atkinson, Britain, Clahsen and Spencer 1999). This is attested for languages such as English, French, Italian, Dutch, German, Hebrew or Palestinian Arabic (de Roo 2001, among others). An example of this error type can be seen in (48).

> (48)   andare ospedale. Non credere   parola   (Italian)
>   go-INF hospital. Not believe-INF word
>   (Radford *et al.* 1999: 246)

In this section, in order to provide a detailed account of inflectional disruptions in agrammatic speech, we review some studies that have tested the production of inflection.

2.2.1. Previous studies of Hebrew and Palestinian Arabic

The behavior of agrammatic Hebrew and Palestinian Arabic has been observed in four main studies: Friedmann (1998, 2001) and Friedmann and Grodzinsky (1997, 2000). The experimental tasks carried out together with the richness of verbal morphology in these two languages constitute a great testing ground since subjects

were forced to choose between 3 tenses and 12 agreement forms. These studies show that tense and agreement are dissociated and that, in all cases, tense is more problematic than agreement for subjects with agrammatic aphasia.

Friedmann and Grodzinsky (1997, 2000) analyzed data in two different studies, involving sentence repetition and sentence completion. The results showed that tense was impaired for the two languages investigated while agreement was almost intact. An example of a tense error from the completion task is given in (49).

(49)   * Maxar   dani   haya   ba-yam   (Past instead of Future tense)
         tomorrow Danny was in-the-sea   Intact agreement
                                    (Friedmann and Grodzinsky 2000: 91)

The specific results for each language, already provided in chapter I (section 2.2), are reproduced again for convenience in Tables 17 and 18.

	Tense		*Agreement*	
	% correct	(correct/total)	% correct	(correct/total)
Repetition	77%	(43/56)	100%	(56/56)
Completion	46%	(41/90)	93%	(66/71)
Total	58%	(84/146)	96%	(122/127)

Table 17. Tense and Agreement Production in Hebrew by one agrammatic subject (from Friedmann and Grodzinsky 2000)

		Tense		*Agreement*	
		% correct	(correct/total)	% correct	(correct/total)
Hebrew	Repetition	84%	(769/912)	100%	(908/912)
	Completion	58%	(438/760)	96%	(572/596)
Arabic	Completion	31%	(14/45)	91%	(42/46)
Total		71%	(1221/1717)	98%	(1522/1554)

Table 18. Tense and Agreement Production in Hebrew and Palestinian Arabic (from Friedmann and Grodzinsky 2000 and Friedmann 2001)

The main error type recorded was the replacement of one given tense by another form of the finite paradigm with no preferred 'unmarked' form. Leaving

finite forms aside, the results reported in Friedmann and Grodzinsky (1997) also include four substitution errors by non-finite forms out of 43 repetition and 91 sentence completion errors, indicating a quasi-intact sensitivity to verb finiteness. The authors account for this pattern in terms of the relative position of tense and agreement in the syntactic structure with tense claimed to occupy higher portions.

Further evidence from 12 Hebrew agrammatic speakers in Friedmann (2001) shows that, contrary to Germanic agrammatism where, as we will show below, infinitives are the preferred forms for substitution, Hebrew speakers take the option of substituting with finite forms. In this study, no instances of the use of infinitives are attested in the repetition task. An additional completion task with half infinitives and half finite verbs as target forms was carried out to corroborate preliminary findings. Again, the results showed that only 2% of the substitutions were with the non-finite form, the vast majority of errors being made within the finite paradigm.

2.2.2. Previous studies of Greek

Studies reporting inflectional errors in Greek (Stavrakaki and Kouvava 2003; Valeonti, Economou, Kakavoulia, Protopapas and Varlokosta 2004; Varlokosta, Valeonti, Kakavoulia, Lazaridou, Economou and Protopapas 2006) show the same pattern documented for Hebrew and Palestinian Arabic.

Stavrakaki and Kouvava (2003) report the case of two non-fluent aphasics through spontaneous speech and designed tasks (picture description, grammaticality judgment and preference tests). Both subject-verb agreement and tense morphology were examined. The results of spontaneous speech have been summarized in Table 19.

	SC	*VF*
Present Tense	(233/233) 100%	(150/150) 100%
Past Tense	(27/42) 64.28%	(33/40) 82.5%
Perfective Aspect	(13/25) 52%	(18/23) 78.26%
S-V agreement		
1s	(125/125) 100%	(35/35) 100%
2s	(13/13) 100%	(25/25) 100%
3s	(100/109) 91.74%	(70/70) 100%
1p	(7/10) 70%	(32/32) 100%
2p	(6/10) 60%	17/20 (85%)
3p	(16/20) 80%	(18/20) 90%

Table 19. Percentages of correct responses in Greek inflectional morphology, two subjects (Stavrakaki and Kouvava 2003)

Greek makes a distinction between past and non-past tenses. Patients experienced difficulties with past tense forms and perfective aspect, which occupy higher portions of the IP-field, whereas present forms (usually considered the default form) and subject-agreement were found to be almost completely spared. Compared with spontaneous speech, the results of the experimental tasks showed higher levels of performance (correctness over 80% for tense and aspect and 95% for subject-verb agreement). Errors with tense were towards the unmarked value, i.e. the present (Philippaki-Warburton 1973), while aspect errors consisted of the use of imperfective forms instead of the target ones. Regarding agreement, despite the high percentages of correctness, some substitutions of plural suffixes were detected in the spontaneous speech of one subject (SC).

Similar results were found by Valeonti *et al.* (2004). The authors studied the case of 8 aphasic subjects through grammaticality judgement tasks and a sentence completion task designed to observe subject-verb-agreement, tense and aspect. Agreement was found to be the least impaired category while tense and aspect were more problematic for the subjects under investigation (see Table 20).

Grammaticality judgment			*Sentence completion*		
Agr	*Tense*	*Aspect*	*Agr*	*Tense*	*Aspect*
11.5	32.0	31.3	23.7	38.4	42.9

Table 20. Error percentages in inflectional morphology for 8 Greek-aphasics (Valeonti *et al.* 2004)

Varlokosta *et al.* (2006) present results from sentence completion and grammaticality judgment in 7 Greek-speaking aphasics matched with controls. Subject-verb agreement, tense and aspect were tested to observe their relative degree of preservation/impairment, revealing again a dissociation between tense and aspect on the one hand and agreement on the other (see table 21). Only errors involving inflection (vs. lexical errors, i.e. errors in the verb root) are considered.

	INFL errors		
	Agr	*T*	*Asp*
Sentence completion	18.8%	37.5%	34.8%
Grammaticality judgement	9.8%	28.6%	28.8%

Table 21. Percentages of errors in Greek inflectional morphology, seven subjects

Despite different levels of overall performance among patients, differences between agreement on the one hand and tense and aspect on the other turned out to be consistent across tasks with agreement better preserved in all cases of dissociated results (4 out of 7 subjects). As for the rest (n = 3), two subjects showed almost completely unimpaired inflectional morphology and the third showed chance performance levels but with no observed dissociation among categories.

Further evidence on the relative degree of impairment of inflectional morphology in Greek is provided by Fyndanis, Varlokosta and Tsaplini (2008). In their study of 3 agrammatic patients tested for sentence completion, grammaticality judgment and sentence-picture matching skills, the authors again found dissociation between agreement, tense and aspect. Aspect was found to be the most severely damaged category (see Table 22).

	T	*Agr*	*Asp*
Sentence completion	45.54	11.61	36.16
Grammaticality judgment	35.52	29.37	51.79
Sentence-picture matching	41.48		

Table 22. Percentage of errors for verbal morphology in 3 Greek-speaking agrammatics

2.2.3. Previous studies of Germanic languages

The tense-agreement dissociation observed in Hebrew and Palestinian Arabic is consistent with not only Greek but also with findings for agrammatic German, Dutch and English. Höhle (1995) examined the behavior of tense and agreement in an oral sentence completion task with 10 German agrammatic speakers. An example of the task has been included in (50) below:

> (50)　Gestern morgen brach der Verkehr zusammen,　　　(*sein* 'to be')
> 　　　*Yesterday morning the traffic came to a halt,*
> 　　　weil alle Ampeln rot _____ .
> 　　　*because all traffic lights _____ red.*

The results showed a significant difference between tense and agreement errors (29% vs. 9%). While agreement errors were scarce, tense substitutions were frequent with no preferred default form observed. The same tendency was seen by Kolk (2000), who found a substantially higher number of tense errors than agreement errors (no percentage reported).

Further evidence from German is provided by Wenzlaff and Clahsen (2004). In their study of 7 agrammatic and 7 control subjects doing sentence completion tasks, agrammatics achieved lower correctness scores for tense than for agreement in all cases, confirming the tense-agreement dissociation in German (see Table 23).

	Tense	*Agreement*
	(% correct)	(% correct)
DB	70.0	95.2
EL	82.5	83.3
KM	72.5	90.5
MH	67.5	97.6
HM	75.0	92.9
WH	62.5	85.7
OP	47.5	100.0

Table 23. Tense and Agreement Production in German, seven subjects (adapted from Wenzlaff and Clahsen 2004)

Errors (31.8% tense vs. 7.8% agreement, on average) were mainly substitutions, though agrammatics did not revert to any default form. Differences between tense and agreement were significant in a Wilcoxon test: $Z = -2.37$, $p >$

0.05). The same performance pattern was repeated in the grammaticality judgment task but with even lower accuracy scores. The tasks were replicated with control subjects who performed close to perfectly (98.6 % of tense and 97.6% of agreement).

Kolk (2000) reported the same dissociation of tense from agreement in the case of 8 Dutch agrammatics tested through two elicitation tasks. The first task aimed at eliciting verb inflection production in either the present (14/28 items) or the past (14/28 items). Subjects were expected to read a set of words constituting a sentence presented randomly except for the verb (always given first) and then place them in the appropriate order, thus creating a finite sentence. Word order was not constrained by the context, so not only SVO but also VSO orders were allowed. The second task shared the same experimental characteristics but with a controlled word order for every item. As with German patients, tense was found to be more severely affected than agreement, although in the first task significant differences were only found in the elicitation of past inflection (48% tense vs. 23% agreement, $p < 0.05$). This is seen as an indicator that present tense inflection serves as a default in Dutch. The results of the second task revealed that, as observed for spontaneous speech, patients sometimes avoided finite morphology by using the infinitive. This was especially noticeable in embedded clauses ($p < 0.05$).

Concerning the use of non-finite forms, the observation of one Dutch agrammatic patient (GS) through two sessions of spontaneous speech (de Roo 2001) provides us with evidence. De Roo (2001) found that only 8% of the total number of answers contained a finite form. In addition to this high omission rate, the majority of the subject's finite sentences were constructed using the verb *zijn* 'be', usually in the form corresponding to the copula *is*. This form is analyzed as a dummy tense since it was employed in a fixed singular form 31/33 times and was found in unexpected contexts. According to de Roo (2001), both the employment of this dummy form and the replacement of a finite verb with an infinitive are justified since they avoid the need to move the verb to T. In addition, de Roo's (1995) results show that 40 out of 41 sentences which included a tense violation (finiteness omission) in Dutch agrammatic aphasia lacked all elements corresponding to the left peripheral area, i.e. interrogative operators and complementizers, among others.

De Roo, Kolk and Hofstede (2003) studied 13 Dutch agrammatic speakers and 8 control subjects in a picture description task created to elicit spatial expressions. The subjects carried out the test three times with different restrictions regarding the number of words per utterance. In the 'no instruction' condition, there was no limitation on the number of words. In the '3-word condition' and the '2-word condition' utterances could not be longer than 3 or 2 words respectively. While for controls finite sentences dominated in the no-instruction and the 3-word condition constructions, non-finite structures dominated both long and short utterances in agrammatic subjects. Though no percentages for the verb types used are given in the article, the authors assert that target verbs were 'usually' copulas. Findings are summarized in Table 24 below.

		Finite		*Non-finite*		*No verb*	
Controls	No instruction	204	86%	1	1%	31	13%
	3-word condition	201	85%	0	0%	37	15%
	2-word condition	65	15%	21	5%	355	80%
	MEAN	470	62%	22	2%	423	36%
Aphasics	Long utterances	107	38%	63	23%	110	39%
	Short utterances	48	14%	26	8%	263	78%
	MEAN	155	26%	89	15.5%	373	58,5%

Table 24. Finiteness in the production of Dutch agrammatic and control subjects (adapted from de Roo *et al.* 2003: 106)

Data available on English agrammatic deficits (Goodglass and Berko 1960; De Villiers 1978; Nadeu and Rothi 1992; and Benedet, Christiansen and Goodglass 1998) was found to be consistent with cross-linguistic findings as far as verbal morphology is concerned, i.e. tense is again more severely impaired than agreement in the production of English agrammatic speakers. No examples of agreement impairment with spared or better preserved tense have been documented.

Nadeau and Rothi (1992) give evidence from an English agrammatic subject. Agr violations were just 2% of the total while T violations reached 17%. However, in English tense and agreement are difficult to set apart (the {-s} marks both present tense and 3rd person singular agreement (51)) and consequently it is not clear if the omission rates should be attributed to difficulties in T, Agr or both.

(51)   a.   *The dog chase...

        b.   *She want to hear the news.

                                        Morphologic errors: Story Completion Test
                                        (Nadeau and Rothi 1992: 651)

Across tasks, Agr was claimed to be almost intact in the story completion test while in the cloze test of inflectional morphology (Goodglass and Berko 1960), the patient failed to produce 20% of past and present tense endings. The results for the story completion task, which were analyzed by the authors from a phonological perspective, are included in Table 25.

Present [-z]	*Present [-εz]*	*Past [-d]*
50%	33%	33%

Table 25. Percentages of incorrect answers in English in a story completion task, one subject (from Nadeau and Rothi 1992)

Past [-d] together with present [-εz] were correctly produced in 67% of the total number of responses but present [-z] turned out to be more problematic. Eighteen inflectional errors were observed in the cloze test. These results receive support from another study by Goodglass and Berko (1960). Findings from 21 aphasic patients showed that the mean of errors in inflection was 22.8%. Nevertheless, tense and agreement errors were analyzed together, providing us no information on the tense-agreement dissociation.

De Villiers' (1978) results are slightly different. She found similar mean omission rates for 3rd person singular -s and past tense -ed (35.1% vs. 28.2%). Again, since English inflectional morphology is difficult to take apart, it is unclear whether the omission rates are attributable to T, Agr or both.

Benedet, Christiansen and Goodglass (1998), in a study comparing the behaviour of English and Spanish agrammatism, provide evidence from 7 English agrammatic subjects. Their results showed that while 58% of Agr impairment was observed, the percentage of errors in T reached 85%. Individual results are shown in Table 26 below.

	Agreement	*Tense*
Subject a	*	20–29%
Subject b	30–39%	0–9%
Subject c	30–39%	20–29%
Subject d	60–69%	0–9%
Subject e	60–69%	10–19%
Subject f	10–19%	20–29%
Subject g	30–39%	0–9%

* No percentage available.

Table 26. Correct tense and agreement production in English, seven subjects (adapted from Benedet *et al.* 1998: 326)

Concerning error type, a further study by Arabatzi and Edwards (2002) with 8 English-speaking agrammatics in a sentence completion task showed a clear preference for omission of inflection, as would be expected for stem-based morphology languages (Grodzinsky 1990). Out of the 57.5% of inflectional errors, tense omission was the most frequent error type (33.8% vs. 17.5% tense substitutions). A summary of data is given in Table 27.

	Verb error analysis (%)
Bare stem production	
Omission of V inflection	13.3%
Auxiliary omission	7.5%
'to' omission	2.9%
Aux + Aspect omission	2.9%
Progressive 'be' omission	7.1%
Tense substituted	17.5%
Erroneous	1.3%
Other	5%
Total	57.5%
Correct	42.5%

Table 27. Inflectional errors in eight English-speaking agrammatics (Arabatzi and Edwards 2002)

2.2.4. Previous studies of Romance languages

Similar studies of languages typologically closer to Catalan, Galician and Spanish, namely French and Italian, have also been carried out (Miceli *et al.* 1989; De Blesser, Bayer and Luzzati's 1996; Garraffa 2003, 2007; Chinellato 2002, 2004; among others). Miceli *et al.* (1989) documented inflectional errors in 20 Italian agrammatic speakers in a study that places special emphasis on the role of severity in the

classification of agrammatic subjects relative to their syntactic difficulties. Subjects in the study were separated in this fashion into three groups: those with T and Agr impaired, those with intact T and Agr and those with T impairment and intact Agr (n = 4). As expected under the TPH, no cases of Agr impairment without T impairment were observed. Substitution rates were calculated together for all bound morphemes documented in this study. Consequently, no separate percentages for tense and agreement errors were provided. Concerning non-finite forms, among the 20 subjects included in the study, 3 of them (T.F., G.F. and G.G.) replaced finite forms with citation forms in respectively 95.4%, 96.4% and 100% of the errors produced (see (52) for an example) but the percentages of substitution varied to a great extent across subjects as indicated by the data in Table 28.

(52)   [Sono] rivenuto dentro perche' dolore continuamente sentire.
        Come again in because pain continuously to feel
        I came back in because I was feeling pain continuosly.

                                (Adapted from Miceli *et al.* 1989: 486)

Subject	Number of Violations	*N*	%
A.A.	10	6	60.0
F.A.	24	7	29.2
F.B.	3	2	66.7
C.D.	12	2	16.7
F.D.	23	15	65.2
C.D.A.	16	2	12.5
G.D.C.	20	6	30.0
E.D.U.	28	5	17.9
G.F.	55	53	96.4
T.F.	65	62	95.4
F.G.	5	3	60.0
G.G.	10	10	100.0
M.L.	2	1	50.0
A.M.	13	7	53.8
M.M.	9	2	22.2
B.P.	24	11	45.8
C.S.	3	2	66.7
F.S.	42	23	54.8
L.S.	10	3	30.0
M.U.	8	6	75.0
Total	382	228	52.42

Table 28. Non-finite forms in 20 Italian-speaking agrammatics (adapted from Miceli *et al.* 1989: 469)

A second set of Italian data comes from De Blesser, Bayer and Luzzatti's (1996) study. Their study of two patients with agrammatic aphasia in a structured production task again revealed the subjects' continued mastery of general principles of agreement. Only 8% of incorrect agreement responses were recorded in simple sentences with past participle suffixes. A further distinction between number and gender agreement in these constructions was considered. The past participle in *essere* constructions needs to agree with the subject noun phrase while in structures with *avere* it needs to agree with a clitic if one is used. The results showed that when subject agreement was required, as in the example in (54), number was better preserved than gender.

(53) a. Io   sono   andat<u>o</u>.   (Italian)
         I be-pres.1ˢᵗ.sg walk-past.part-masc.sing
         I went.

      b. Io   sono   andat<u>a</u>.
         I be-pres.1ˢᵗ.sg walk-past.part-fem.sing
         I went.

Going back to the question of the tense-agreement dissociation, in a study with one Italian agrammatic subject (M.R.) in spontaneous production, Garraffa (2007) found 35% tense errors (21/60) vs. 5% (3/60) agreement errors in lexical verbs. The results of a completion task showed the same pattern (63.8% (23/36) tense vs. 5% (5/36) agreement errors). Evidence for the appearance of root infinitives as substitutes for finite forms can be found in a previous study by the same author (Garraffa 2003). The percentage of use of this form reaches 20% of the total number of responses. Out of the 45 lexical verbs in finite contexts present in the data, the subject produced 9 infinitives.

Contrary to other studies, Chinellato's (2002, 2004) results from spontaneous speech in one agrammatic subject showed that agreement was more severely impaired than tense. Regarding agreement morphology, he found a more fine-grained error pattern in Northern Italian dialectal agrammatism. Number agreement was hardly ever produced by the patient under examination and it was generally substituted with singular forms (Chinellato 2002). 4th, 5th and 6th persons were seen as the most costly forms. By contrast, first person singular was found to be always

spared. According to the author, the feature [+ plural] seems to be more costly (or inaccessible) during syntactic derivation. The dissociation between 4th and 5th person on the one hand and the 6th on the other is justified due to the similarity of the latter with the 1st and 3rd person in the varieties under investigation. In order to properly represent the deficit, the author assumes Poletto's (2000) complex AgrP represented in (54).

(54)

Poletto (2000) expands the Agreement field to 3 different functional projections, each encoding the +/− value of a single feature (55).

(55)   Speaker P: [± speaker]
        Hearer P: [± hearer]
        Number: [± number]

For Chinellato's (2002) agrammatic subject, [± speaker] feature is intact, [± hearer] feature is underspecified and [± number] is inaccessible. Similar evidence has been documented by Fabbro (2001) and Fabbro and Frau (2001). Chinellato (2002) concludes that, whenever a feature in a syntactic field is unspecified, it blocks higher ones within the same field (Field Damage Hypothesis). However, the deficit is specific. Hierarchically higher or lower portions of the tree may be independently affected or preserved.

Further confirmation of the selective inflectional deficit in mild agrammatic French subjects is attested in the data in Nespoulous *et al.* (1988) and Nespoulous *et al.* (1990). These studies revealed that T and higher nodes were impaired while agreement stayed intact in the two patients under examination. One of the subjects, Mr. Clermont, had only tense errors with spared agreement. In addition, he showed

clear problems with tense consistency in a narrative-production task together with a complete avoidance of the use of complex tenses. The second subject, Mrs. Auvergne, presented milder problems with verbal morphology, producing 96% of main verbs correctly. The results of Nespoulous *et al.* (1990), as summarized in Gavarró (2003), appear in Table 29.

	Correct	*Incorrect*	*Omission*
Mr. Clermont	92% (120)	3% (4)	5% (7)
Mrs. Auvergne	96% (92)	4% (4)	0% (0)

Table 29. Main verb production errors for two French-speaking agrammatic subjects (adapted from Gavarró 2003)

The small number of errors does not reveal any preferred default form in substitution errors. Two examples of this kind, extracted from Nespoulous *et al.* (1988), are reproduced below as (56).

(56)   'Get': *obtint* (preterite)   (French)
              Target: *obtient* (present)

        'Bring': *ai apporté* (present perfect)
              Target : *apporterai* (future)
                          (Nespoulous *et al.* 1988: 282)

2.2.5. Previous studies of Ibero-Romance

Ibero-Romance varieties have remained almost unexplored to date. The first study involving Spanish is that by Benedet, Christiansen and Goodglass (1998), which includes a comparison of production and comprehension deficits in Spanish and English agrammatism. To collect the Spanish data, an adapted version of Goodglass, Christiansen and Gallagher's (1993) Morphosyntax Battery in English was performed on 6 Spanish subjects. The tasks used for the analysis of oral production were completion of given sentences and one-sentence descriptions of target pictures. The results for the production and comprehension of T and Agr in Spanish showed significant differences between these two categories. While only 36% Agr errors were detected, the rate of Tense errors was as high as 94.5%. The main error in verbal

agreement was substitution of the inflection. A summary of the individual production
scores on the Morphosyntax Battery is displayed in Table 30.

	Agreement	*Tense*	*Low-Content verbs*
Subject 1	60–69%	0–9%	0–9%
Subject 2	50–59%	0–9%	10–19%
Subject 3	60–69%	0–9%	0–9%
Subject 4	80–89%	0–9%	40– 49%
Subject 5	80–89%	30–39%	80–89%
Subject 6	30–39%	0–9%	0–9%

Table 30. Tense and Agreement production errors in six Spanish-speaking agrammatics (adapted
        from Benedet *et al.* (1998: 326))

Martínez-Ferreiro (2003) provides the first evidence of the production of 7
Catalan mild agrammatic speakers together with 7 Spanish agrammatics and 14
controls through repetition and completion tasks which replicated those used by
Friedmann (1998). The results showed a significant difference (two-way ANOVA)
between the production of tense and agreement, tense being more severely impaired.
Due to the mildness of the agrammatic deficit of the sample, agreement appeared to
be almost entirely spared. Three subjects (CC, CG and SE) showed no agreement
errors across the test and two more (SA and CD) reached only 1%, the same mean as
with the control subjects.

Though there was a clear asymmetry between the number of errors in
repetition and completion tasks – out of 269 errors, 48 were repetition errors and 221
were completion errors, showing a clear task-dependency effect – the dissociation
between tense and agreement was maintained. This difference also held across
languages. Individual results for the experimental group (number and percentage of
errors) are summarized in Table 31.

	Catalan			
	Tense		**Agreement**	
	Repetition	Completion	Repetition	Completion
CA	2% (1/50)	20% (10/50)	0% (0/50)	10% (5/50)
CB	24% (12/50)	26% (13/50)	8% (4/50)	6% (3/50)
CC	2% (1/50)	18% (9/50)	0% (0/50)	0% (0/50)
CD	0% (0/50)	10% (5/50)	0% (0/50)	2% (1/50)
CE	6% (3/50)	28% (14/50)	2% (1/50)	12% (6/50)
CF	8% (4/50)	14% (7/50)	0% (0/50)	6% (3/50)
CG	0% (0/50)	10% (5/50)	0% (0/50)	0% (0/50)
Total	**6% (21/350)**	**18% (63/350)**	**1.43% (5/350)**	**5.14% (18/350)**

	Spanish			
	Tense		**Agreement**	
	Repetition	Completion	Repetition	Completion
SA	2% (1/50)	4% (2/50)	0% (0/50)	2% (1/50)
SB	4% (2/50)	32% (16/50)	2% (1/50)	26% (13/50)
SC	2% (1/50)	30% (15/50)	0% (0/50)	18% (9/50)
SD	2% (1/50)	14% (7/50)	0% (0/50)	10% (5/50)
SE	0% (0/50)	16% (8/50)	0% (0/50)	0% (0/50)
SF	2% (1/50)	50% (25/50)	4% (2/50)	12% (6/50)
SG	2% (1/50)	32% (17/50)	0% (0/50)	8% (4/50)
Total	**2% (7/350)**	**25.71% (90/350)**	**0.86% (3/350)**	**10.86% (38/350)**

Table 31. Tense and Agreement production errors by 7 Catalan-speaking and Spanish-speaking agrammatics (Martínez-Ferreiro 2003)

Another contrast between Ibero-Romance languages can be found in de Diego Balaguer *et al.* (2004), which analyzed the case of two agrammatic bilingual Catalan-Spanish speakers. By means of a sentence completion task, patients were tested for their ability to correctly produce verbal morphology in regular and irregular verbs. Both patients showed more problems with irregular than with regular forms. JM correctly produced 92.2% of regular verbs vs. 59.3% of irregular verbs. For MP, 84.3% regular verbs were produced correctly while the percentage for irregular forms fell to 47.9%. A summary of the main morphological errors is given in Table 32. Percentages are relative to the total number of errors per subject, language and verb type.

	L1 – *Spanish*				L2 – *Catalan*			
	Regular		Irregular		Regular		Irregular	
	JM	MP	JM	MP	JM	MP	JM	MP
Infinitive forms	-	-	-	3 (7%)	-	-	-	-
Person agreement	-	-	3 (6%)	1 (2%)	1 (25%)	-	6 (21%)	7 (19%)
Tense agreement	-	1 (7%)	2 (4%)	-	-	-	-	1 (3%)
Tense and person	-	-	5 (10%)	-	-	-	-	-
Mixed + tense	-	1 (7%)	-	3 (7%)	-	-	-	-

Table 32. Morphological errors in 2 Catalan and Spanish bilingual agrammatics (adapted from de Diego Balaguer *et al.* 2004)

Across categories, 2 tense and 10 agreement violations were detected in the case of JM together with 5 cases of mixed errors. MP produced 6 tense errors vs. 8 agreement errors. Substitutions with non-finite forms were only observed in the case of MP. Infinitives represented 7% of his total number of errors. Although these results seem to contradict the vast majority of cross-linguistic findings in agrammatic aphasia, the low number of errors (8 tense, 18 agreement and 5 mixed errors for the two subjects in the two languages under investigation) blocks the possibility of making generalizations.

Moreno-Torres Sánchez (2005) provides further evidence from 10 agrammatic Spanish speakers and 10 controls in sentence completion and grammaticality judgment tasks. The general results, which also include mood, show that agreement was better preserved than tense which in turn was better preserved than mood. Percentages are shown in Graph 5, adapted from Moreno-Torres Sánchez (2005). The same tendency was found across individuals. Statistical analysis showed that differences between Agreement, Tense and Mood were significant except for the Tense-Mood contrast.

Graph 5. Mood, Tense and Agreement production errors by 10 Spanish-speaking agrammatics

Gavarró and Martínez-Ferreiro (2007) examined the inflectional productions of 7 Catalan, 7 Galician and 7 Spanish-speaking agrammatic subjects matched with 21 controls in elicitation and sentence repetition tasks[27]. Findings showed relatively spared subject agreement and impaired tense marking for all subjects cross-linguistically. Statistical analysis (Wilcoxon signed rank test) showed that, despite the mildness of the subjects' disorder, the differences were significant for all three languages (Catalan: $Z = -2.37$, $p < 0.05$, Galician: $Z = -2.37$, $p < 0.05$, Spanish: $Z = -2.20$, $p < 0.05$). A summary of data (including number and percentage of errors) is provided in Table 33.

---

[27] The Catalan group (both experimental and control) coincides with that of Martínez-Ferreiro (2003).

| | Repetition | | | |
| | Tense | | Agreement | |
	Experimental	Control	Experimental	Control
Catalan	6% (21/350)	0.28% (1/350)	1.43% (5/350)	0% (0/350)
Galician	1.43% (5/350)	0% (0/350)	0.57% (2/350)	0% (0/350)
Spanish	2.57% (9/350)	0% (0/350)	0.28% (1/350)	0% (0/350)

| | Completion | | | |
| | Tense | | Agreement | |
	Experimental	Control	Experimental	Control
Catalan	18% (63/350)	0.57% (2/350)	5.14% (18/350)	2.57% (9/350)
Galician	41.71% (146/350)	3.43% (12/350)	8.86% (31/350)	2.28% (8/350)
Spanish	28.86% (101/350)	1.14% (4/350)	13.14% (46/350)	1.43% (5/350)

Table 33. Tense and agreement production errors as a percentage of total responses by 7 Catalan, 7 Galician and 7 Spanish-speaking agrammatic subjects (from Gavarró and Martínez-Ferreiro 2007)

In line with Martínez-Ferreiro (2003), there was an observable difference between the results for repetition and those for sentence completion. However, tense proved to be more severely damaged for all subjects in both tasks. Among the errors, which were all substitutions of the expected form with another member of the paradigm, no preferred or default form was detected. An example of a substitution tense error in Catalan is given in (57).

(57)   Ahir, la nena *renta els plats*.   (Catalan)
            Yesterday, the girl *washes the dishes.

Target answer: Ahir, la nena *rentava els plats.*
                    Yesterday, the girl washed (*imperfect*) the dishes.

Leaving T and Agr morphology aside, data on the use of non-finite root forms in Ibero-Romance are very scarce. Two different samples are discussed here. Sample 1 includes evidence of the production of 7 Catalan, 7 Galician and 14 Spanish-speaking mild agrammatic subjects in delayed repetition and completion tasks (Martínez-Ferreiro 2003 and Gavarró and Martínez-Ferreiro 2007). Sample 2 is a moderate agrammatic Catalan-speaking subject (CM) performing the same tasks.

The results from the 7 Catalan and 14 Spanish-speakers under study included no examples of the use of a non-finite form. This contrast slightly with the data from Galician-speakers. While 5 of these subjects rated 0% in the production of non-finite forms instead of a finite form, several examples of this use can be found in the production of the other two subjects (for G5[28] they represent 3% of the total number of errors and for GF, 2%). The relevant items are reproduced in (58).

(58) a. *Eu tocar   o piano.   (G5: Delayed Repetition)
          I   play-*INF* the piano

Target form: Eu toquei o piano.
           I play-pret.1st.sg the piano
           I played piano.

  b. *Onte,   ti   escribi-la carta.   (GF: Completion)
       yesterday, you write-*INF* the letter

Target form: Onte, ti escribíche-la carta.
           yesterday you write-pret.2nd.sg-the letter
           Yesterday, you wrote the letter.

  c. *Onte,   eu bailare[29]   nada.   (G5: Completion)
       yesterday, I dance-INF nothing

Target form: Onte, eu bailei moito.
           yesterday I dance-pret.1st.sg a lot
           Yesterday, I danced a lot.

  d. *Hoxe, vós escoita-la   música.   (G5: Completion)
       today, you listen-INF the music

Target form: Hoxe, vós escoitades música.
           today you listen to-pres.2nd.sg music
           Today, you listen to music.

  e. *Hoxe, os nenos   leer   o xornal.   (GF: Completion)
       today, the children read-INF the newspaper

Target form: Hoxe, os nenos len o xornal.
           today the children read-pres.3rd.pl the newspaper
           Today, the children read the newspaper.

---

[28] G5 (as well as CM) also participated as subjects in the experiments which are the focus of the present dissertation.

[29] An epenthetic 'e' is traditionally added to infinitives in some dialectal varieties of Galician. Further examples have been marked in our corpus of errors (Appendix II, Test II).

The percentages of error for G5 and GF were very similar to those attested for child language in Ibero-Romance according to studies such as Torrens (1995, 2002), which documents low occurrence of these forms in the speech of infants. This can also be seen in Davidson and Legendre (2001). In their study, the authors provide data from 3 children included in the Serra-Solé corpus for Catalan (CHILDES database). This data is provided in Table 34.

Children	*Stage 2b[30]*	*Stage 3b*	*Total NFRFs*
Pep (1;6.23 – 3;3.18)	20% (9/45)	10% (8/229)	3.44% (29/844)
Gisela (2;1.23 – 3;10.2)	5% (1/22)	4% (2/45)	0.86% (6/695)
Laura (1;9.7 – 3;5)	3% (1/34)	8% (17/217)	3.75% (27/720)

Table 34. Percentage of non-finite root forms (NFRF) in Catalan child language (adapted from Davidson and Legendre 2001)

Additional evidence from 1 Spanish monolingual child from the Linaza corpus is provided by Grinstead (2000) (see Table 35). In agreement with Torrens' (1995) findings, this study also revealed low percentages of non-finite root forms in the language under analysis[31].

Spanish	*Infinitive*	*Gerund*	*Participle*	*Totals*	*%*
Juan I (1;7 – 1;9)	0	0	0	0/27	0%
Juan II (2;0 – 2;1)	0	2	1	3/212	1.41%

Table 35: Percentages of non-finite root forms in Spanish child language (adapted from Grinstead 2000: 128)

Going back to the clinical results from Martínez-Ferreiro (2003) and Gavarró and Martínez-Ferreiro (2007), in addition to the low number of substitutions with non-finite forms, there were only two instances of sentences lacking a verb. These

---

[30] Davidson and Legendre (2001) use Predominant Length of Utterance (PLU) (Vainikka, Legendre and Todorova 1999) in order to break the process into developmental stages. For the Catalan children, four stages of development are demonstrated, labeled here as 2b, 3b, 4b, and 4c, with the last of these representing an adult-like stage in the development of functional categories.

[31] Child data analysis is outside the scope of this dissertation. For further discussion see Torrens (1995, 2002), Guasti (2002) or Grinstead (2000), among others.

two examples from the Spanish sample illustrate the omission of the lexical verb *trabajar* 'work' and the copula *ser* 'be', reproduced as (59) and (60).

(59)   *Ayer,   Ana todo el día.
        yesterday Ann all the day
       *Yesterday, Ann all day long.

Target answer: Ayer,   Ana   trabajó   todo el día.
             y*esterday Ann work- pret. 3rd. sg. all the day*
             Yesterday, Ann worked all day long.

(60)   *Los campos verdes.
       the   fields green
       * The fields green.

 Target answer: Los campos   están   verdes.
             the fields be-pres. 3rd. pl. green-pl.
             The fields are green.

These results suggest that the abilities of mild agrammatic subjects are only partially lost since they do not allow finiteness omissions. The tasks were replicated with 28 control subjects. No single instance of finiteness omission was found.

Results from CM, a Catalan moderate agrammatic, show the interaction between the degree of severity of the agrammatic deficit and the increase in the number of non-finite forms and verbless structures. As with mild agrammatics, the subject was presented with 100 tokens (50 in the repetition task and 50 in the completion task). The results appear in Table 36.

	CM's verbal production
Ungrammatical infinitives	11
Verbless structures	9
'Don't know' responses	11
Total nº of responses	100

Table 36. CM's production of verbal forms in Catalan

Out of the total number of given sentences, 11 were 'don't know' responses and 9 lacked a verb. Out of the 80 tokens with a verbal form, the results showed that

CM produced infinitives 11 times, raising the percentage of occurrence to 13.75% (vs. 2% or 3% for the mild subjects).

Further evidence from Ibero-Romance comes from European Portuguese. Cerdeira (2006), using the same methodology as in Friedmann and Grodzinsky (2007), documented no dissociation for tense and agreement. The results were consistent across tasks. For repetition, both tense and agreement were correctly produced in 59% of cases. In the completion task, tense was correct in 52% of the agrammatic responses whereas agreement was slightly more spared (55%).

2.3. Experimental design: Tense and agreement

We examined the results of the negation production task (described in section 1.3) with regard to verbal inflection. Since the transformation of a positive declarative into a negative declarative implies the preservation of the inflected verb form, our experiment on negation allows for the extraction of new evidence on the tense-agreement dissociation in agrammatic production. In terms of verbal morphology, the task was a mere repetition task. As observed in previous studies, repetition tends to reduce the number of errors to very low percentages since it is well preserved in the subjects under examination. The selected tokens included a verb which appeared in a simple tense in the indicative (present, imperfect or future) to avoid the possible interference that an auxiliary verb might entail.

In addition to these results, to verify the degree of preservation of tense comprehension, a picture-sentence matching task was performed by our experimental sample. The task, which included 25 experimental items, consisted of making the right match between the sentence read by the experimenter and one of the pictures presented to the subject. Token 11 has been reproduced below as an example (61). It shows a slide from the Power Point presentation used to present the experiment visually.

> (61)   El chico   abrió   el   bote.   (Spanish)
>   *the boy open-past.3rd.sg the jar*
>   The boy opened the jar.

Subjects were expected to identify the correct picture, i.e. the one matching the sentence they had heard. In the case of Token 11 shown in (61), the left-hand picture is intended to elicit the future ('*The boy will open the jar*') while the picture in the center of the slide illustrates the present ('*The boy is opening/opens the jar*'). Hence, the correct answer would be the right-hand picture, since the jar is already open.

2.4. Results

2.4.1. Tense and agreement

Following the same procedure as in Martínez-Ferreiro (2003), each error of verbal inflection was counted as a tense error, an agreement error or both. Examples of each error type have been included in (62) below:

(62) a. Jordi no anirà a la piscina. --- C2   Catalan
J. not go-fut.3rd.sg to the swimming-pool   (tense error)
George will not go to the swimming-pool.

   Target: En Jordi no anava   a la piscina.
the J. not go-imp.3rd.sg to the swimming-pool
George was not going to the swimming-pool.

   b. *Almodóvar no dirigí esta película. --- S1   Spanish
A.   not direct-pret.1st.sg this film   (agreement error)
*Almodóvar did not direct this film.

Target: Almodóvar no   dirigía   esta película.
         A.   *not direct-imp.3ʳᵈ.sg this film*
         Almodóvar was not directing this film.

c.   Non... non... non, Xurxo á piscina non. --- G1   Galician
         no   no   no X. to-the swimming-pool not   (mixed error)
         No… no… no, George to the swimming-pool not.

Target: Xurxo non   ía   á   piscina.
         X. not go-imp.3ʳᵈ.sg to-the swimming-pool
         George was not going to the swimming-pool.

Results for the control group (n =15, i.e. 5 subjects per language) included only 6 errors in verbal morphology out of 375 responses, all of them tense substitutions. The percentages of correctness reach 100% for agreement and 98.4% for tense for the three languages under investigation, since only 2 errors were attested for each language. Returning to our agrammatic sample, Graphs 6 and 7 respectively show the errors in tense and agreement production per item. Given that no item led to failure in all cases, and taking control results as evidence for the validity of our experimental design, all 25 items were included in the results. In the case of tense, the number of errors per item ranges from 0 (tokens 3 and 5, among others) to 7 (tokens 4, 7 and 9). Errors involving agreement morphology are less frequent, with error rates ranging from 0 to 1 per item.

* The x-axis includes all 25 tokens of the experiment.

Graph 6. Number of errors per item in tense production

Errors per Item: Agreement Production

* The x-axis includes only those tokens for which errors were detected.

Graph 7. Number of errors per item in agreement production

A summary of data separated by language appears as percentages in Table 37 and as numbers of responses in Graph 8, which also shows the number of 'don't know' responses.

	Tense		*Agreement*	
	% correct	(correct/total)	% correct	(correct/total)
Catalan	85.48%	(106/124)	94.35%	(117/124)
Galician	84.43%	(103/122)	99.18%	(121/122)
Spanish	86.40%	(108/125)	99.20%	(124/125)
Total	85.44%	(317/371)	97.54%	(362/371)

Table 37. Tense and agreement production errors by 15 agrammatic speakers of 3 Ibero-Romance varieties

Graph 8. Number of tense and agreement production errors and 'don't know' responses by 15 agrammatic speakers of 3 Ibero-Romance varieties

These results parallel those documented in Martínez-Ferreiro (2003) and Gavarró and Martínez-Ferreiro (2007) for repetition of positive declaratives. Errors were then broken down according to specific type and sorted in order of decreasing frequency, with tense and agreement considered separately. The resulting breakdown of tense errors is provided in (63) and represented in Graph 9. The corresponding breakdown of agreement morphology is provide in (64) and illustrated in Graph 10.

(63)   Classification of Tense errors according to frequency:

1. Present substitutes for Imperfect (14/54)
2. Present substitutes for Future (13/54)
3. Future substitutes for Imperfect (10/54)
4. Preterite substitutes for Imperfect (4/54)
5. Present Perfect substitutes for Present (2/54)
6. Non-finite verb forms (2/54)
7. Future substitutes for Present (2/54)
8. Omissions of main verb (2/54)
9. Conditional substitutes for Imperfect (2/54)
10. Preterite substitutes for Present (1/54)
11. Preterite substitutes for Future (1/54)
12. 'Be able to' + INF (1/54)

Graph 9. Typology of tense errors according to frequency

(64)   Classification of Agreement errors according to frequency:

1. Non-finite verb forms (2/9)
2. Omissions of main verbs (2/9)
3. 1st pl. substitutes for 3rd pl. (2/9)
4. 1st sg. substitutes for 1st pl. (1/9)
5. 1st sg. substitutes for 3rd sg. (1/9)
6. 3rd pl. substitutes for 1st pl. (1/9)

Graph 10. Typology of agreement errors according to frequency

As far as tense is concerned, and as expected after informal conversation with therapists working with our sample groups, there was an observable tendency for our subjects to replace the target tense by the Simple Present. This is illustrated in Graph 9, where 27 out of the 54 tense errors are instances of present forms in contexts where their appearance leads to ungrammaticality. Though with respect to agreement no substitutions by 2nd person endings were attested, due to the small amount of errors, no generalisations like those formulated by Chinellatto (2002, 2004) can be drawn regarding the preferred form for substitution.

To complete this purely descriptive analysis, statistical tests were run to determine the significance of tense-agreement dissociation. A Wilcoxon signed rank test showed that differences were significant at a level of $p < 0.01$ ($Z = -3.318$). The relative behaviour of the three languages was also measured with a Mann-Whitney U test, but neither for tense nor for agreement were significant differences found among languages. A further distinction was considered for statistical analysis, namely the production of impaired vs. control subjects. A comparison of the accuracy of

production of tense and agreement by the two populations showed that while for tense the differences between agrammatics and controls were significant (Mann-Whitney U test: p < 0.01, Z = -4.218), differences in agreement production were not (p > 0.05, Z = -2.398).

In addition to mild agrammatic subjects, our moderate agrammatic Catalan subject was also tested for tense and agreement inflection. The results summarized in Table 38 show that both functional categories were more severely damaged in this patient than in the mild sample:

Error type	*Number of errors*
Verbless Structures	12
'Don't know' responses	8
Non-finite forms	1
Tense errors	1
Agreement errors	0
Total	22/25

Table 38. Verbal production errors by a Catalan moderate agrammatic subject

A close look at the production of CM shows that 20 items were produced as verbless structures or 'don't know' responses. Therefore, only 5 examples of a verb were attested, out of which 3 were correct answers, one was a case of finiteness omission and the last was an instance of tense substitution.

So far we have been discussing production results. However, not only production skills were tested in the experimental sessions. A comprehension task was also performed to assess the patients' abilities with tense morphology. The results showed that this functional category is also damaged in agrammatic comprehension albeit to a lesser extent than in production.

We first tested the abilities of a control group with 15 subjects (5 for each language under examination). Out of the 375 responses, only one case of misinterpretation of tense was found. This occurred when Catalan Control nº 1 identified the spoken past form in Token 1 with the picture representing the future. The prompt and the corresponding picture are reproduced in (65).

(65)   'The man ate a lot.'

As with the production results, an analysis of agrammatic errors per item was carried out with our mild agrammatic sample. It showed that while some tokens were produced correctly by all subjects (n = 5), others such as token 15 were misidentified on 6 occasions. Nevertheless, as in the production task, there was no experimental item that none of the patients could identify. The results are illustrated in Graph 11.

* The x-axis includes all 25 tokens of the experiment.

Graph 11. Number of errors per item in tense comprehension

The general results are represented in graph 12. Out of 125 responses per language, 22 errors were found in the Catalan group (17.6% of the total number of responses), 17 in the Galician group (13.6%) and 21 in the Spanish group (16.8%).

Graph 12. Tense comprehension errors by 15 agrammatic speakers of Ibero-Romance

Different error types were sorted in order of decreasing frequency. As with production, the most common error was the identification of a future or past form as a present form. While the present tense was misidentified 10 times (less than future (n = 27) or past forms (n = 23)), it was used as the substitute form on 36 occasions. A breakdown of error types is given in (66).

(66)   Classification of errors according to frequency:

        a. Future identified as present: 18
        b. Past identified as present: 18
        c. Future identified as past: 9
        d. Present identified as past: 8
        e. Past identified as future: 5
        f. Present identified as future: 2

A simplified summary of data according to the preferred form for substitution is shown in Graph 13, which clearly shows misidentification of a different tense as present as the most frequent error. No differences were attested in this respect among the three Ibero-Romance varieties under investigation.

Graph 13. Errors in tense comprehension according to frequency

The percentages of error showed no significant differences between the results for tense comprehension and tense production (Wilcoxon Signed Rank test, p > 0.05). This pattern of impairment is consistent across languages with no significant differences except for the contrast between experimental and control subjects, which was significant at a 1% level (Mann-Whitney U test: Z = -4.308). Nevertheless, it must be remembered that our production data came from the negation task, a mere repetition task regarding verbal morphology. This methodology has been claimed to keep agrammatic errors to a minimum. Martínez-Ferreiro (2003) documents a discrepancy between repetition and completion results for tense and agreement with the latter constituting the harder task. Hence, though our results show that not only production but also tense comprehension is damaged in agrammatic aphasia, the extent to which each modality is compromised can not be established given the different nature of the tasks.

CM's abilities for tense comprehension were also tested in order to compare them with the sample of mildly affected subjects. The results showed a clearly higher number of errors with respect to his mild counterparts. If we compare the percentages, 16% (60/375) of the responses for tense were erroneous in the mild agrammatic sample while this percentage rises to 52% (13/25) in the case of the moderate subject. In terms of the nature of errors, in all cases (n = 13), CM selected a present form. Seven were errors in the identification of the past form and 6 in the interpretation of future forms.

2.4.2. Root Infinitives and verbless constructions

In addition to errors in inflectional morphology, we also search our production data for cases of omission of finiteness. As far as control subjects were concerned, non-finite forms never substituted for finite forms in their responses. The results for mild agrammatics were very similar, with such substitutions being practically non-existent. Non-finite forms were not detected in Galician or Spanish and only two cases were registered in the data for mild agrammatic Catalan subjects, i.e. 1/25 sentences in the case of C2 and the same for C4. The relevant items are reproduced below as (67) and (68):

(67)   *Sandra no comprar les flors.   --- C2   (Catalan)
         S. not buy-INF the flowers
         *Sandra not buy the flowers.

Target: La Sandra no comprava flors.
         the S. not buy-imp.3rd.sg flowers
         Sandra was not buying flowers.

(68)   *El Marc no vendre   el cotxe. --- C4   (Catalan)
         the M.   not sell-INF the car
         *Marc not sell the car.

Target: En Marc no   vendrà   el seu cotxe.
         the M. not sell-fut.3rd.sg the his car
         Marc will not sell his car.

In fact, the verb in example (67) is a homophone with *comprà* 'he/she bought', a synthetic form of the simple past which co-exists in Catalan with the periphrastic form *va comprar* 'he/she bought'. Under this view, (67) need not be an instance of finiteness omission. However, the use of the synthetic past is currently quite restricted geographically to areas like València, Mallorca and Eivissa) which are very removed the metropolitan area of Barcelona (where it is mainly restricted to literary contexts (Perea 2002)), so we must be cautious about drawing conclusions. The advanced age of the speakers may argue, however, in favour of the relatively archaic *comprà*.

In addition to these data, only two omissions of lexical main verbs were detected, one in the Catalan sample (69) and the other in the Galician sample (70):

(70) *L'Andrea no ens… --- C4   (Catalan)
       the'A.   not us
       *Andrea not us...

Target: L'Andrea no ens saludarà.
        the'A.   not us greet-fut.3rd.sg
        Andrea will not greet us.

(71) Non... non... non, Xurxo á   piscina   non. --- G1   (Galician)
       no   no   no X. to-the swimming-pool not
       No… no… no, George to the swimming-pool not.

Target: Xurxo non   ía   á   piscina.
        X. not go-imp.3rd.sg to-the swimming-pool
        George was not going to the swimming-pool.

The performance of CM, as we have already illustrated in Table 35, shows a much higher number of errors with respect to those observed for mild subjects, which corroborates the tendency observed in previous tests carried out with the same patient. Though only one example of non-finite form use was attested (71), out of the 25 tokens presented to the subject, 12 were produced without a verb. An example of this type is shown in (72).

(71) *Demà   no   mirar Joan.   (Catalan)
       tomorrow not look-INF J.
       *Tomorrow not look John.

Target: Demà   no   veurem   en Joan.
        tomorrow not see-fut.1st.pl the J.
        Tomorrow we will not see John.

(72) *Demà no pomes.   (Catalan)
       tomorrow not apples
       *Tomorrow not apples.

Target: Demà   no   recollirem   pomes.
        tomorrow not pick-fut.1st.pl apples
        Tomorrow we will not pick apples.

2.5. Discussion

Although the rate of errors in verb inflection has been claimed to range from 50% to 70% in agrammatism (Faroqi-Shah and Thompson 2004, 2007; Saffran, Berndt and

Schwartz 1989), the nature of the task carried out – a mere repetition task as far as inflection is concerned – together with the degree of severity of the patients in our sample favoured the appearance of relatively low error percentages (14.56% for tense and 2.46% for agreement). The results presented so far show a clear parallel with those documented in previous studies (Martínez-Ferreiro 2003; Gavarró and Martínez-Ferreiro 2007) and provide further evidence for the selective impairment of functional categories, with tense more severely disturbed than agreement (in line with De Bleser and Luzzatti 1994; Friedmann and Grodzinsky 1997; Höhle 1995; Wenzlaff and Clahsen 2004; and many others).

　　　While our observations on agreement revealed spared morphology – no significant differences with control results – regarding tense, our findings show that impairment extends across modalities, i.e. not only production but also comprehension skills were found to be impaired. In production, errors were mostly substitutions towards an unexpected finite form. Verbless constructions and substitutions with non-finite forms were found to be extremely rare in the Ibero-Romance samples investigated.

2.5.1. Tense and agreement

Despite some contradictory evidence (Chinellatto 2002, 2004; De Diego Balaguer *et al.* 2004), our results go hand in hand with those for many other languages (Hebrew, Palestinian Arabic, Greek, English, German, Italian and French). First, substitutions of inflectional morphology were attested for the three populations under examination (Catalan, Galician and Spanish agrammatics). By contrast, out of a total number of 63 errors, no single instance of inflection omission was documented (in line with Miceli *et al.* (1989) or Benedet *et al.* (1998), among many others). The three languages under study are stem-based morphology languages which, according to Grodzinsky (1990), blocks the possibility of omitting bound morphemes. Since morphology is spared, agrammatic subjects were found to avoid the production of non-words, i.e. patients did not have the option of producing stems in isolation.

　　　Secondly, despite the low number of errors, the results of our Ibero-Romance sample also indicate a cross-linguistically solid dissociation between tense and agreement. The generally agreed tense-agreement dissociation has been approached

from different perspectives. Leaving aside some phonological accounts (Nadeau and Rothi 1992), there are three main proposals discussed in the literature to account for the deficit in T:

a) The Tree-Pruning Hypothesis (Friedmann 1998, 2001 and Friedmann and Grodzinsky 1997, 2000): The tree is pruned below T in agrammatic aphasia.

b) The tense underspecification hypothesis (Wenzlaff and Clahsen 2004): Tense features are underspecified in agrammatic aphasia[32].

c) Processing accounts: The grammatical representation is intact but either access is impaired (Valeonti *et al.* 2004), grammatical rules and processes are damaged (Arabatzi and Edwards 2002) or the processing demands are excessive for a damaged system (Fyndanis, Varlokosta and Tsapkini 2008).

Out of the three explanations, only the Tree-Pruning Hypothesis provides us with exact predictions regarding the behavior of agreement, which is expected to be relatively spared. Our Ibero-Romance agrammatic speakers consistently showed more difficulties with tense marking than with subject-verb agreement, which did not differ from control subjects. This pattern of performance, which reached levels of significance in statistical tests, was found in our survey across languages and across subjects within each language group. The fact that agreement is cross-linguistically less impaired than tense indicates that the two functional categories behave differently in agrammatism.

The TPH (Friedmann and Grodzinsky 1997) was first proposed assuming the relative order shown in (73a). Tense deficits in Hebrew and Palestinian Arabic agrammatics were justified in terms of tense's hierarchically higher structural position with respect to agreement, which is claimed to project inconsistently in patients suffering from agrammatism. A structural account based on (73b) or (73c) would make the opposite predictions, i.e. preserved tense and impaired agreement, which was not found in any of the languages under investigation in the present piece of

---

[32] Chinellato's Field Damage Hypothesis relates to Wenzlaff and Clahsen's Underspecification Hypothesis, with the former claiming the existence of damaged fields instead of functional categories.

research[33]. As for (73d), Minimalist approaches do not make any prediction without any further assumptions on agreement[34].

(73)   *Agreement:*

      a.   Pollock (1989): TP > AgrP

      b.   Belletti (1990): AgrP > TP

      c.   Chomsky (1992): $Agr_sP > TP > Agr_oP$

      d.   Chomsky (1995 and subsequent work): AgrP no longer seen as an independent functional node

Cinque (1999 and much subsequent work) proposes an extension of Pollock's (1989) Split inflection hypothesis into a decomposed TP-field. The resulting array of functional nodes encodes all the inflectional features of the verb (tense, mood, modality, aspect, voice), the order of which is UG-determined. According to Cinque (1999), adverbs and suffixes or free-standing morphemes are assumed to merge as specifiers and heads, respectively, within the synthetic hierarchy shown in (74):

(74) $ModP_{epistemic} > TP(past) > TP(Future) > MoodP_{irrealis} > (…) AspP_{habitual} > (…) > TP(Anterior) > AspP_{terminative} > AspP_{continuative} > (…) > VP$

Cinque (1999) claims that agreement may occur at different positions in the hierarchy. Gavarró and Martínez-Ferreiro (2007) argue that, in order to give a proper explanation to the findings for Catalan, Galician and Spanish agrammatism, agreement must take place in a designated position lower than TP(past). The authors assume along with Chomsky (1995 and subsequent work) that AgrP is no longer an independent functional node but rather an operation. EPP features and not

---

[33] The only putative counterexample is that of Korean (Lee 2003).

[34] According to the feature inheritance system, Chomsky (2008) proposes that subject-verb agreement is obtained upon establishing an Agree relation between T and the subject (in Spec-vP). Nevertheless, φ-features are seen as inherited from C. If subject agreement were to take place before transfer to the interfaces, the contrast between the valued and the unvalued elements would be lost to the interface systems, hence, it would be opaque for semantics. This is avoided if C, the element triggering Spell-out, is seen as marked for φ-features. However, since C is not transferred at the end of the phase, the feature must be inherited by T at the time of transfer. Consequently, validation and transfer take place at the same time.

person/number agreement are held responsible for subject movement, i.e. EPP features alone force movement of the subject to the front of tense-mood projections (as also assumed by Cinque 1999). Following Gavarró and Martínez-Ferreiro (2007), the predictions of the TPH hold since the deletion of TP(ast) and higher nodes will not interfere with agreement, which would be checked in a lower portion of the syntactic tree in the area available to agrammatic subjects. This proposal accounts for both the dissociation between tense and agreement and the relatively higher percentages of error observed for tense morphology with respect to agreement.

Consequently, we can dispense with Wenzlaff and Clahsen's (2004) Underspecification Hypothesis. Recently, again, Clahsen and Ali (2009) have claimed that the deficit is specific to tense and derives from the underspecification of the feature [±Past]. They use evidence of tense, agreement and (subjunctive) mood marking in the sentence-completion and grammaticality judgment of 9 English agrammatic subjects to show the following hierarchy of errors: tense > mood > agreement, with the latter best preserved. Since mood is claimed to be higher than tense in English (Schütze 2004) but their results are better for mood than tense, they argue that the TPH would not predict their subjects' performance.

However, a look at the individual results provided by Clahsen and Ali (2009) reveals a great deal of variation not only across patients but also across tasks. For example, BG performed equally well for tense and mood in the completion task (90% vs. 91.65%) and better for tense than for mood in the judgment task (75% vs 58.3%). In the completion task, RC's responses followed another tendency with tense better preserved than mood (70% vs. 63.75%) which in turn was better than agreement (63.75% vs. 40%). In the judgment task, JP also performed better for tense than for mood (85% vs. 83.35%) but better for agreement (95%). This is also the case of PB (75% vs. 63.35% in completion and 67.5% vs. 62.15% in judgment) or BM (70% accuracy for tense vs. 61.1% for mood in judgment). Thus, the conclusions of Clahsen and Ali are not really substantiated by their own data. In addition, underspecification of tense does not explain why mood is more severely damaged than agreement, features that are difficult to distinguish in the language under study.

Regarding the nature of errors, for tense, in contradiction to many studies which do not reveal a clear preferred form for substitution (Nespoulous *et al.* 1990;

Friedmann and Grodzinsky 1997, 2000 or Wenzlaff and Clahsen 2004), the use of the present appears as the most common strategy for substitution in our agrammatic sample (60% of errors). This coincides with Stavrakaki and Kouvava's (2003) findings for Greek and Kölk's (2000) findings for Dutch, among many others. Note that the present is morphologically unmarked (it is represented by a zero morpheme) in these three Ibero-Romance languages. The TPH, however, makes no prediction as to the resort to unmarked forms once a node is prejudiced.

Structurally, though Cinque's hierarchy does not provide us with a specific functional head for present tense, the results seem to point to the ordering in (75), where the present would occupy a low position in the TP-field. This hierarchy leads us to expect, consistent with what we actually found, that $TP_{(past)}$ would be the most severely damaged tense, followed by $TP_{(future)}$. $TP_{(present)}$, by contrast, would be the best preserved form.

(75) $TP_{(past)} > TP_{(future)} > TP_{(present)}$

Regarding agreement, as we have already mentioned, the small amount of errors does not allow for inferences about a pattern of decifit based on person and number distinctions. Nevertheless, in agreement with Chinellato (2002, 2004)[35] and Stavrakaki and Kouvava (2003), who documented a high incidence of substitution of plural forms, out of the total number of errors in agreement morphology (n = 5) in our results, only one substitution of a singular form was attested. Contrary to Chinellato's (2002, 2004) claim that number is hardly ever produced – based on his study of clitics – plural forms are used in substitution for other plural forms (3 out of 4 times). 1st, 2nd and 5th person were found to be spared. Two of the substitution errors were towards the 1st person.

In comparison with the results from our mild agrammatic sample, the results for the Catalan moderate agrammatic subject show a sharply higher number of errors, a reflection of the greater degree of severity of the agrammatic deficit. However, in

---

[35] Chinellato's analysis comes from the observation of clitics which are treated as agreement markers. This goes in line with Sportiche (1998) or Duarte and Matos (2000), among others, who claim that Romance clitics are undergoing a diachornic process that 'takes free morphemes and turns them into agreement affixes' (Duarte and Matos 2000: 126).

general his errors display the same pattern as that seen with mild agrammatics, despite the higher number of responses lacking a main verb (12/25 verbless structures). Tense, crucially dependent in higher sections of the syntactic representation than agreement, was found to be more severely impaired, i.e. the tense-agreement dissociation not only has been found to hold cross-linguistically but is also observable across different degrees of severity of the agrammatic deficit[36].

2.5.2. Root infinitives and verbless constructions

In addition to deficits in tense morphology, verb retrieval problems have been well documented in the literature on agrammatism (Saffran, Schwartz and Marin 1980; Miceli *et al.* 1984; and many others). Impaired skills have been traditionally accounted for by means of two main hypotheses:

a) The argument structure complexity hypothesis (Lee and Thompson 2004): The number of arguments of a given verb may have an effect on verb retrieval (e.g. *he laughed* vs. *he hit the ball*).

b) The derived order problem hypothesis (Bastiaanse and van Zonneveld 2005): Moved constituents may have an effect on verb retrieval (e.g. *the man snores* vs. *the man fell*).

Hence, theme movement, argument number and scrambling effects have been seen as underlying the agrammatic deficit in verb production (both in isolation and in sentence production). Nevertheless, the mild Ibero-Romance agrammatic population tested in this piece of research showed almost nonexistent problems with verb retrieval. Out of 375 responses only 2 were lacking a main verb, i. e. 0.53% of the total, indicating that verb retrieval difficulties are not generalized across agrammatics. In fact, it seems to be restricted to more severe deficits, as confirmed by our data from

---

[36] Dissociations between tense and agreement can also be documented in non-impaired populations. De Vincenzi, Rizzi, Portolan, Di Matteo, Spitoni and Di Russo (in preparation) demonstrated, by controlling reading times, that subjects were sensitive to tense errors later than to agreement errors when faced with a controlled stimulus introducing one violation or the other. In this study, assymetries are analyzed in terms of computation requirements. According to this view, processing tense would be more complex than processing agreement and that is the reason why reaction times are longer. How this proposal is implemented remains to be clarified.

CM, our moderate agrammatic subject, who failed to produce sentences containing a main verb 48% of his responses (12/25).

Regarding the appearance of Root Infinitives, according to De Roo (2001), similarities between child language and agrammatic speech are expected in the use/avoidance of non-finite forms. This observation is based on her assumption that agrammatic and child language share similar properties. The (at least superficially) similar linguistic patterns between these two populations inspired the formulation of several hypotheses such as Jakobson's (1941) Regression Hypothesis, according to which language disruption shows the reverse pattern from language acquisition, with the earlier acquired features lost later in cases of damage. The crosslinguistic distinction related to the presence vs. absence of RIs, attributed to the inflectional system of the languages under study, is seen as central in de Roo's (2001) work. While in pro-drop languages such as Japanese or Hebrew RIs are either hard to detect or avoided (Hagiwara 1995; Friedmann and Grodzinsky 1997), their presence in non pro-drop languages such as Dutch, English, Italian, French or German is claimed to be more prominent (de Roo 2001).

Data from the mild agrammatic sample in Catalan, Galician and Spanish, all three pro-drop languages, seem to indicate that they pattern together with Japanese or Hebrew, finiteness omissions being scarce, i.e. in practically zero instances are finite forms substituted with non-finite forms in our Ibero-Romance data. Nevertheless, observations of more severe deficits show an increase in this type of error, as documented for our Catalan moderate agrammatic. Contrary to Jakobson's (1941) and de Roo's (2001) proposals, Friedmann and Grodzinsky (2000) claim that, though resemblances between child language and agrammatism seem clear, they are in fact only apparent. While agrammatics substitute tense inflection, for children the use of non-finite forms constitutes a transitory stage in the development of their linguistic system (see Wexler 1994; Borer and Rohrbacher 1997).

Thus, though the scarce appearance of infinitival forms substituting for finite forms in Ibero-Romance can be interpreted as a feature shared with child language, it must be remembered that these commonalities are only partial. In fact, there seems to exist an asymmetry between child and pathological language regarding allowance of non-finite root forms. Italian children do not allow for root-infinitives as a

substitution strategy for finite tenses due to internal properties of the language (Guasti 2002), yet researchers in the field of agrammatism (de Roo 2001; Friedmann 1994; Friedmann and Grodzinsky 1997) have found that this language is permissible with regard to substitutions with non-finite root forms. This was observed by Garraffa (2003), who documented a 20% substitution rate for infinitives in an Italian agrammatic patient. This may be taken as an indicator that, despite similarities, the use of non-finite forms is controlled by different mechanisms in child and pathological speech. This idea is reinforced by the contrast between the output of Catalan mild agrammatics and their moderate counterpart who, despite sharing the same L1, shows higher substitution rates for non-finite verb forms. CM replaced finite verbs with infinitives on 13.75% of occasions while only 2 subjects out of 28 mild agrammatics used infinitives and even then at rates not reaching higher than 3% (G5). The experimental setting may have also favoured the appearance of inflection. According to Prévost and White (1999, 2000), in adult second language acquisition, a problem can arise with the realization of surface morphology in spontaneous speech. This hypothesis, known as the Missing Surface Inflection Hypothesis, postulates that, even though learners have knowledge of both the functional structure and the features of tense and agreement, they resort to non-finite forms[37].

The production results for 7 Catalan and 14 Spanish speakers tested in Martínez-Ferreiro (2003) and Gavarró and Martínez-Ferreiro (2007) include no examples of non-finite root forms in substitution for finite forms, fully confirming our expectations. Nevertheless, previous studies on Italian agrammatism (Miceli *et al.* 1989; Garraffa 2003), indicating a marked presence of non-finite forms, are then difficult to explained.

If Galician is considered, some instances of Root-Infinitives are attested. Though the number of errors is minimal, there must be some factor licensing their appearance. Expecting an oscillation on the assignment of agreement à la Rizzi does not seem feasible, since we assume that morphology and lexicon are intact in agrammatic aphasia. Let us consider an alternative proposal related to the language-specific characteristics of verbal morphology in Galician.

---

[37] Many thanks to A. Belletti for this observation.

In addition to the non-finite non-agreeing infinitive, Galician presents an Inflected infinitive in its verbal paradigm, a verbal form used in subordinated structures that lacks a tense specification independent of the matrix verb (Raposo 1987) (76).

(76)   De teres   feito aquelo, agora estaría solucionado.   (Galician)
         of have-inf.2nd.sg done that, now be-cond.3rd.sg solved
         If we had done that, now it would be solved.

This form, which is only accepted with non-matrix declarative verbs, presents some specific characteristics not shared by any other form of the verbal paradigm, among them, a ban on pre-verbal subjects, as seen in (77b)

(77)   a. O mestre afirmou facérmo-las cousas.   (Galician)
             the teacher claimed-3sg make-INF-1pl-the things

         b. *O mestre afirmou os nenos faceren as cousas.
             the teacher claimed-3sg the kids make-INF-1pl the things

         c.   O mestre afirmou faceren os nenos as cousas.
             the teacher claimed-3sg make-INF-1pl the kids the things

                                                         (Longa 1994: 27)

If we take the assumptions of truncation hypotheses with the array of projections postulated by the Cartographic Program and the refinements already introduced, we expect that all elements appearing higher than TP(ast) will be deleted from the representation when the tree is truncated at TP. By contrast, agreement – an operation taking place lower than the pruning site – is expected to be spared. The inflected infinitive is compatible with a spared representation from TP(ast) downwards since it may be seen as an extra form patients may opt for in the event of substitution. If the examples in (58) (reproduced for convenience as (78) below) are analyzed under this view, we find that (78a) and (78c) could be interpreted as correct for agreement even though they are ungrammatical forms since they appear in simple declaratives (not in subordinated constructions, the only case where this verb form can be used grammatically). The unavailability of a Subject position, i.e. a node in the upper portion of the left peripheral area, would permit these forms in agrammatic

speech. This interpretation would resolve the problem of the appearance of infinitival forms only in Galician and not in Catalan and Spanish. Nevertheless, examples (78b), (78d) and (78e) are more problematic since they would have to be interpreted as agreement violations.

(78) a. *Eu tocar   o   piano.
            I   play-*INF* the piano

      b. *Onte,   ti   escribi-la carta.
            yesterday, you-*sing* write-*INF* the letter
      c. *Onte,   eu bailare   nada.
            yesterday, I dance-INF nothing

      d. *Hoxe, vós   escoita-la   música.
            today, you–plur listen-INF the music

      e. *Hoxe, os nenos   leer   o xornal.
            today, the children read-INF the newspaper

Interestingly, only 1st/3rd person singular forms are used, those without a visible morphological specification, i.e. homophonous to the non-finite non-agreeing infinitival form. Though no conclusion can be drawn given the scarce amount of data available to date, this proposal at least addresses the problem of the absence of substitutions with overtly inflected infinitives.

In line with Rizzi's (1993/4) proposal, the use of infinitives is expected to be banned in the Ibero-Romance varieties under examination. Since nodes lower than TP(ast) are preserved, there is nothing blocking the raising of the verb to the Asp heads where Agree is claimed to be applied. As for finite forms, in order to check strong uninterpretable φ features, infinitives must move from their VP-internal position to a position in the IP-field. Mild patients will use finite forms checked correctly for agreement and sometimes wrongly for tense, depending on the presence or absence of the functional projection TP(ast) and those relatively higher than it.

If verbs move up to tense projections in order to check uninterpretable features, when both T and lower portions of the IP-area are deleted from the representation, the verb cannot check inflection, thus opening the possibility for non-finite forms to appear. Friedmann and Grodzinsky (1997) claim that this would be the only way to construct a sentence rooted in VP due to the fact that the verb would

remain unmoved in its base-generated position, i.e. in VP-internal position. However, in Ibero-Romance the infinitive has been claimed to raise like any other verbal form, thus Ibero-Romance patients do not systematically revert to infinitives in the case of the mild agrammatic sample analyzed in this piece of research. The question remains for Italian, with 20% substitution by non-finite root forms (Garraffa 2003) in a mild patient or high variability among patients (Miceli *et al.* 1989).

Hence, despite Friedmann and Grodzinsky's (2000) claim that for Romance languages substitutions of tense mainly tend to be with non-finite forms (especially participles and infinitives) as quoted in (79) below, in Ibero-Romance this assertion is restricted to our moderate agrammatic patient. By contrast, for our mild agrammatic sample, participles were not produced and infinitives were extremely scarce.

(79)   'In Romance, the picture is more complicated, first of all,
         because (…) the only existing data is spontaneous speech, and
         secondly, because tense substitutions in Romance are mainly to
         the non-finite forms: participles and infinitives.'
                              (Friedmann and Grodzinsky 2000: 89)

The statement in (79) appears to be incorrect in two respects. Data from controlled tasks, though scarce, indicate that, contrary to Germanic languages, Romance agrammatic speakers show quasi-intact mastery of verb finiteness with no attested substitutions with participial forms. While Kolk (2000), de Roo (2001) or de Roo *et al.* (2003) have found a clear tendency to avoid finite morphology in Dutch, the results for Romance have not (Martínez-Ferreiro 2003; de Diego Balaguer *et al.* 2004; Gavarró and Martínez-Ferreiro 2007). As we will be seeing shortly, participles are avoided. In fact, the tree-pruning hypothesis makes no predictions regarding substitution patterns in the case of a damaged TP.

In sum, in this section we have shown that deficits in verb morphology are highly selective. Our Ibero-Romance sample corroborated previous evidence that, while agreement morphology is spared for all subjects and languages in the case of mild agrammatic deficits, tense is more severely damaged. The mildness of the examined deficits prevented subjects from omitting main verbs or from using non-

finite forms commonly attested with our moderate agrammatic subject CM, whose results highlight a clear increase in errors directly related to the severity of the deficit. Regarding error type, errors in the mild group consisted of the substitution of (mainly) tense morphology with another member of the finite paradigm. No omissions were attested. These findings are compatible with a structural description of the deficit. As predicted by the TPH, agreement, claimed to be checked in a lower position than TP(ast), is better produced cross-linguistically and across-subjects than tense, which occupies a relatively higher position. Crosslinguistic varitation remains a pending issue.

3. AUXILIARIES

Temporal, modal or aspectual auxiliaries may differ from main verbs in several respects. The most outstanding properties are (a) phonological reducibility – auxiliaries can be clitics or affixes while main verbs are always independent words –, (b) a defective inflectional paradigm, (c) the ability to occur as a semantically empty filler of a syntactic position – restricted to the domains of tense, modality and aspect (Barbiers and Sybesma 2004: 396).

Auxiliary verbs have been traditionally claimed to be categorially distinct from main verbs. They may be considered functional or quasi-functional items (in contrast to lexical verbs) (Guéron and Hoekstra 1995; Zagona 2002). Syntactically, distinctions with respect to the latter can be restricted to three main characteristics:

- Functional verbs cannot assign theta-roles to arguments (Pollock 1998).
- They are subject to ordering and co-occurrence restrictions.
- They allow for only one type of complementation.

The presence of a special category Aux to host auxiliaries different from V(erb) can be traced back to Chomsky's earliest works (1957). According to Ouhalla (1990), auxiliaries are claimed to project an AspP instead of a VP. Similarly, Guasti (1993/4) and Rizzi (1993/4) claim that auxiliary verbs must occupy a dedicated T position in the IP structural area.

In recent syntactic works, as functional elements, auxiliaries are approached as elements having their own phrasal structure (Zagona 2002) which is intimately

linked to the complex IP-field (Barbiers and Sybesma 2004; Schütze 2004). Cinque's (1999, 2002, 2006) Cartographical Proposal includes these forms in the head positions of the universally ordered functional projections which host the relevant adverbs in their specifiers. The meaning of the verb determines its position in the hierarchy (80).

(80)   Cinque's (2006) Inflectional hierarchy

$MoodP_{Speech\ act}$ > $MoodP_{evaluative}$ > $MoodP_{evidential}$ > $ModP_{epistemic}$ > TP(Past) > TP (Future) > $Mood_{irrealis}$ > $ModP_{alethic}$ > $AspP_{habitual}$ > $AspP_{delayed\ (or\ 'finally')}$ > $AspP_{predispositional}$ > $AspP_{repetitive(I)}$ > $AspP_{frequentative(I)}$ > $ModP_{volitional}$ > $AspP_{celerative(I)}$ > TP (Anterior) > $AspP_{terminative}$ > $AspP_{continuative(I)}$ > $AspP_{perfect}$ > $AspP_{retrospective}$ > $AspP_{proximative}$ > $AspP_{durative}$ > $AspP_{progressive}$ > $AspP_{prospective}$ > $AspP_{inceptive(I)}$ > $ModP_{obligation}$ > $ModP_{ability}$ > $AspP_{frustrative/success}$ > $ModP_{permission/ability}$ > $AspP_{conative}$ > $AspP_{completive(I)}$ > VoiceP > PerceptionP > CausativeP > $AspP_{inceptive(II)}$ > ($AspP_{continuative(II)}$) > AndativeP > $AspP_{celerative(II)}$ > $AspP_{inceptive\ (II)}$ > $AspP_{completive\ (II)}$ > $AspP_{repetitive(II)}$ > $AspP_{frequentative(II)}$

(Cinque 2006: 12, 76, 82, 93)

As a consequence of the TPH, frequent disruptions of auxiliaries are expected. Since temporal auxiliaries, modals and aspectuals are related with portions of the IP-field, they are susceptible to impairment. Dissociations are expected not only between verbs and auxiliaries but also within the auxiliary group, crucially depending on different structural positions.

The functional nature of low content verbs would account for the high omission rates of both copulas and auxiliaries attested in the agrammatic literature. Nevertheless, together with this high omission rate, dissociation between copulas on the one hand and auxiliaries on the other can also be detected. The results of Sasanuma, Kamio, and Kubota (1990) from two Japanese agrammatics indicated that the latter were better preserved than the former (omission rates: 7/37 and 1/31 for auxiliaries vs. 3/7 and 6/10 for copulas), which may be taken as an indicator of different structural position.

To give a proper explanation of copula omission, attention to the nature of these elements must be paid. Following Rizzi (1993/4), copulas have no lexical content so they only behave as the bearers of the inflectional features. As a result, we would expect copulas to behave like free-standing functional words and impairment

would therefore be straightforwardly predicted. However, there is a crucial difference between copulas and auxiliaries. While modal verbs and some auxiliaries like English *do* are generally assumed to be base-generated in the IP-field, copulas such as *have* or *be* have been claimed to undergo movement to T (Lasnik 1999; Pollock 1989; and much subsequent work). Since the behavior of auxiliaries in agrammatism may be of special interest for theoretical approaches to language, after a brief characterization of auxiliaries in Ibero-Romance, we will analyze new evidence from Catalan, Galician and Spanish and compare it to previous findings from other agrammatic populations. Copular verbs are outside the scope of this dissertation and will be addressed in further research.

3.1. Auxiliaries in Ibero-Romance

In Ibero-Romance, both compound tenses and verbal periphrases require the presence of an auxiliary. These clusters include a verb in a non-finite form (the past participle in the case of compound tenses) preceded by an auxiliary (temporal, modal or aspectual) bearing person/number morphology (Gómez-Torrego 1999; Cartagena 1999). In these cases, the auxiliary has lost, at least partially, its original meaning if it can act as a main verb as well.

In Cartagena's (1999) classical classification, while compound tenses are considered to be retrospective (81), i.e. used to survey the past, verbal periphrasis can be seen as prospective compound tenses (82): this group includes modals, aspectuals and a mixed group including forms of dubious classification among which we find temporal meanings.

(81)   a. Nosaltres havíem demanat una pizza.   (Catalan: Past Perfect)
           we have-imp.1st.pl asked-for a pizza
           We had asked for a pizza.

        b. Demà,   ja   l'hauràs   demanat.   (Catalan: Future Perfect)
           tomorrow already it'have-fut.2nd.sg asked-for
           Tomorrow, you will have already asked for it.

        c. Tú   has   bailado con María.   (Spanish: Present Perfect)
           you have-pres.3rd.sg danced with M.
           You have danced with Mary.

(82)   a. Els mariners havien de sortir al mar.   (Catalan: Modal periphrasis)
            the sailors have-imp.3rd.pl of go-out-INF to-the sea
            The sailors had to go to sea.
         b. Ti tardaches en chegar.   (Galician: Mixed periphrasis)
            you last-past.2nd.sg in arrive-INF.
            It took you a long time to arrive.

         c. Las niñas se echaron a llorar.   (Spanish: Aspectual periphrasis)
            the girls themselves start-pret.3rd.pl to cry
            The girls started crying.

Catalan and Spanish compound perfect tenses are formed using the simple tenses of the auxiliary *have* and the past participle of the main verb. Five tenses in the indicative (present perfect, past perfect, pluperfect, future perfect, conditional perfect) and two more in the subjunctive (present perfect subjunctive, past perfect subjunctive) are the most frequently used forms[38]. The full paradigm of compound tenses in Spanish is exemplified in (83).

(83)   A. INDICATIVE: Present perfect – *He comido* 'I have eaten'
                           Preterite perfect – *Hube comido* 'I had eaten'
                           Past perfect – *Había comido* 'I had eaten'
                           Future perfect – *Habré comido* 'I will have eaten'
                           Conditional perfect – *Habría comido* 'I would have
                                                                       eaten'

         B. SUBJUNCTIVE: Present perfect – *Haya comido* 'I ate'
                             Past perfect – *Hubiera/-se comido* 'I had eaten'

The conjugation of the tenses included in the experimental design in Catalan and Spanish is reproduced in Table 39.

---

[38] Verbal forms such as Spanish *hubiere hecho* (Future Perfect Subjunctive) are no longer in use (Cartagena 1999).

E.g. Eat		*Catalan*	*Spanish*
Present Perfect	1st sg	He menjat	He comido
	2nd sg	Has menjat	Has comido
	3rd sg	Ha menjat	Ha comido
	1st pl	Hem menjat	Hemos comido
	2nd pl	Heu menjat	Habéis comido
	3rd pl	Han menjat	Han comido
Past Perfect	1st sg	Havia menjat	Había comido
	2nd sg	Havies menjat	Habías comido
	3rd sg	Havia menjat	Había comido
	1st pl	Havíem menjat	Habíamos comido
	2nd pl	Havíeu menjat	Habíais comido
	3rd pl	Havien menjat	Habían comido

Table 39. Present Perfect and Past Perfect in Catalan and Spanish

Our experimental design was modified to replace the compound tenses we used for Catalan and Spanish with verbal periphrases for Galician, since compound tenses are nonexistent in Galician[39]. Like compound tenses, periphrastic forms are composed of an inflected form expressing mood, tense, person and number morphology, and a non-finite verb form (infinitive, gerund or past participle). Modal periphrases (e.g. *deber* 'must' + *INF* – Spanish) express obligation, need or desire, i.e. modality, while aspectual periphrases (e.g. *ir a* 'go to' + *INF* – Spanish) are related with the action (e.g. terminative periphrases or durative periphrases, among others). The mixed group includes clusters such as Spanish *venir a* 'come to' + *INF* (Yllera 1999).

The auxiliary verb and non-finite form may be linked directly (84a), by means of a preposition (84b) or by a complementizer (84c).

---

[39] According to Veiga (1991), the Galician system derives from proto-Romance varieties that antedate the temporalization of compound forms. But the ban against perfect auxiliaries has an exception, as in the case of Portuguese, with the verb *ter* (from Latin *tenere* 'to have'), which may be used as an auxiliary verb:

> Teño comido con Maria moi amiudo.
> *have-pres.1st.sg eaten with M. very often*
> I have eaten with Mary very often.

The use of the auxiliary *ter* 'to have' in Galician substitutes for the absence of the auxiliary *haber* 'to have', thus constituting a true morphosyntactic/functional form (see Giorgi and Pianesi (1997) for a complete discussion of Portuguese).

(84)   a. Nós podiamos cose-la chambra.   (Galician)
            we can-imp.1ˢᵗ.pl sew-the shirt
            We could sew the shirt.

        b. Pola mañá deixou de chover.
            by-the morning leave-pret.3ʳᵈ.sg of rain-INF
            In the morning, it stopped raining.

        c. Eu tiña que estudiar moito.
            I have-imp.1ˢᵗ.sg that study-INF a lot
            I had to study a lot.

Despite constituting a single predicate, some other elements, e.g. adverbs, can be found in between verb forms – see (85a). (85b) is an example from Gómez-Torrego (1999) where the subject is located between the auxiliary and the verb.

(85)   a. No podemos en absoluto establecer diferencias.   (Spanish)
            not be able to-pres.1ˢᵗ.pl at all establish-INF differences
            We can't detect any differences at all.

        b. ¿Puede alguien decirnos lo que pasó?
            be able to-pres.3ʳᵈ.sg somebody tell-INF-us...
            Can somebody tell us...?
                                                    (Gómez-Torrego 1999: 3326)

3.2. Previous research in agrammatism

A review of the literature shows a consistent cross-linguistic agrammatic pattern in auxiliary/copula production. Spontaneous data from fourteen languages, including Dutch, Swedish, French, Finnish or Japanese in Menn and Obler (1990) indicate high omission rates with both copulas and auxiliaries as compared to verbs. Copula omission ranges between 36% and 60% in mandatory contexts in these languages in which instances of tense substitutions co-exist with omissions. These omissions will be shown to be constant cross-linguistically not only when copulas and auxiliaries act as verbs but also in their appearances as auxiliary forms.

3.2.1. Previous studies of Hebrew and Palestinian Arabic

No direct test on auxiliary verb production is provided in Friedmann and Grodzinsky (1997, 2000). Nevertheless, concerning copulas, based on the observations of Hebrew agrammatic data, the authors claim that, as a consequence of their position in T,

copulas are expected to be impaired in agrammatic aphasia. This pattern follows from the predictions of the TPH: impairment to the T node will affect the production of copulas. Friedmann and Grodzinsky's findings show that copular tense is, in fact, impaired while agreement remains intact, as found for verbs. Problems in production generate both tense substitution and omission errors. In Table 40, out of the 30 errors registered in the repetition task, 50% were omissions of the copula and 50% substitutions.

	Tense		*Agreement*	
	% correct	(correct/total)	% correct	(correct/total)
Repetition	50%	(30/60)	100%	(60/60)
Completion	20%	(9/46)	100%	(36/36)
Total	37%	(39/106)	100%	(96/96)

Table 40. Copula inflection in Hebrew-speaking agrammatics (from Friedmann and Grodzinsky 2000)

The results of an oral and written completion tasks show a similar distribution: 12 tense substitutions, 17 copula omissions and 8 '*don't know*' responses. The authors claim that this account is also valid for auxiliaries (Friedmann and Grodzinsky 1997). High disruption levels are expected in languages in which compound tenses are made up of an auxiliary verb and an infinitive or past participle such as the ones under examination in the present research.

3.2.2. Previous studies of Greek

As mentioned above, according to Cinque (1999), adverbs occupy the specifier position of a full array of projections in both CP and IP fields. This makes these elements of special relevance to verify our theoretical assumptions on the Cartographical distribution of modals and aspectuals. Alexiadou and Stavrakaki (2006) provide us with evidence from adverb placement in a Greek-English bilingual agrammatic obtained by means of production and comprehension tasks consisting of a constituent ordering and a contrastive grammaticality judgment task respectively. The results appear in Table 41.

Adverb type/tree layer	*Incorrect responses*		*Marked responses*	
Constituent ordering	*Greek*	*English*	*Greek*	*English*
Speaker-oriented/CP layer	7/12 (58.33)	5/12 (41.66%)	2/12 (16.66%)	5/12 (41.66%)
Modal/MoodP layer		5/12 (41.66%)	8/12 (66.66%)	7/12 (58.33%)
Negation/NegP layer	2/12 (16.6%)	4/12 (33.33%)	3/12 (25%)	5/12 (41.66%)
Aspectual/AspectP layer		7/12 (58.33%)	3/12 (25%)	
Manner/VP layer			1/12 (8.33%)	2/12 (16.66%)
Adverb type/tree layer	*Incorrect responses*		*Marked responses*	
Gram. judgement	*Greek*	*English*	*Greek*	*English*
Speaker-oriented/CP layer	2/12 (16.6%)	4/12 (33.33%)	2/12 (16.6%)	1/12 (8.33%)
Modal/MoodP layer		3/12 (25%)	3/12 (25%)	3/12 (25%)
Negation/NegP layer		3/12 (25%)	2/12 (16.6%)	
Aspectual/AspectP layer		2/12 (16.6%)	1/12 (8.33%)	
Manner/VP layer		1/12 (8.33%)	2/12 (16.6%)	

Table 41. Performance on adverb placement task by a Greek-English bilingual agrammatic
(Alexiadou and Stavrakaki 2006: 213, 215)

According to the authors, Cinque's (1999) tree hierarchy determines the patient's level of success (with adverbs related to the lower portions of the syntactic representation better preserved than their relatively higher counterparts). Despite clear asymmetries between production and comprehension (with the latter better preserved) and between the results for Greek on the one hand and English on the other, the pattern of impairment remains constant.

3.2.3. Previous studies of Germanic languages

Evidence from copular and auxiliary verb production in English has been reported by Nadeau and Rothi (1992). In this case study, spontaneous speech revealed dissociation between these elements and verb production. While the omission rate of *be/have* verbs by the subject under examination reached 36%, only 7% of verb omissions were attested. The rate of auxiliary omission was 22%. These results are summarized in Table 42 below.

Morpheme	Number of omissions / %
Auxiliaries	16/73 (22%)
Copula (*be/have*)	20/56 (36%)
Main Verb	11/158 (7%)

Table 42. Verb production by a single English-speaking agrammatic (adapted from Nadeau and Rothi (1992: 648))

Another study focused on English comes from Bastiaanse and Thompson (2003), who analyzed the case of 8 agrammatics in terms of their ability to produce finite lexical verbs and auxiliaries. In this study, structures were classified as V-in-V, Aux-in-I and Aux-in-C according to a base-generation vs. moved position distinction. In English, auxiliary *do* and modals have been traditionally assumed to be first-merged in T, while auxiliaries *be* and *have* are taken to undergo short movement to this position (Pollock 1989 and subsequent work). The results showed that though sentences both with and without movement of the verb turned out to be impaired, percentages of correct answers were higher for base-generated forms (37.8% vs. 15.63%). Regarding auxiliaries, the most frequent error was the omission of the auxiliary, observed in cases of both Aux-in-I and Aux-in-C. In the case of Aux-in-C, failure to move the auxiliary to C was also equally prominent (aux. omission: n = 23; movement failure: n = 24). As for Aux-in-I, omissions coexisted with the production of bare forms (aux. omission: n = 12; stem: n = 7).

Bastiaanse and Thompson (2003) claim that it is verb movement that causes deficits in agrammatic speech and explain errors by claiming that V-in-V and Aux-in I, respectively depending on V and I, are damaged to the same extent. The results of a sentence completion task, involving 9 Dutch and 6 English-speaking agrammatics and showing that moved finite verbs in Dutch and moved auxiliaries in English are significatively more difficult, are taken as evidence for the claim that verb movement has a role in 'at least some' agrammatic deficits. This proposal is in contradiction with Cinque (1999, 2006), who claims that all auxiliaries are base-generated in a dedicated position in the IP-field, as we will show in our discussion.

3.2.4. Previous studies of Romance languages

Miceli *et al.* (1989) provide evidence from 20 Italian agrammatics in the production of short narratives. In this study, the authors observed the occurrence of freestanding

and bound grammatical morphemes. Their results regarding omissions and substitutions of auxiliaries are reproduced in Table 43.

		Auxiliaries	
Subject	*N*	% Om.	% Sub.
A.A.	4	75.0	25.0
F.A.	9	33.3	-
F.B.	13	23.1	7.7
C.D.	23	8.7	8.7
F.D.	44	27.3	2.3
C.D.A.	32	3.1	3.1
G.D.C.	2	100.0	-
E.D.U.	19	21.0	31.6
G.F.	18	72.2	-
T.F.	30	63.3	10.0
F.G.	8	-	50.0
G.G.	8	-	-
M.L.	20	5.0	-
A.M.	28	28.6	3.6
M.M.	9	33.3	22.2
B.P.	8	25.0	37.5
C.S.	6	16.7	-
F.S.	5	80.0	-
L.S.	8	37.5	12.5
M.U.	2	-	-
Total	296	32.66	10.71

Table 43: Errors in the production of auxiliaries by 20 Italian-speaking agrammatics (adapted from Miceli *et al.* 1989: 462-3)

Taken together, and even though considerable cross-subject variation is observed (from 3.1% to 100% omissions and from 2.3% to 50% substitutions), the results show a higher percentage of omissions than substitutions of auxiliary forms (32.66% vs. 10.71%). This data confirms the fact that agrammatics tend to omit free standing function words but keep the option of substituting them, thus indicating a disruption in the production of auxiliary verbs derived from the agrammatic deficit.

Further evidence from Italian can be found in Gavarró (2003). Based on the results of 2 agrammatic subjects reported in Miceli and Mazzucchi (1990), she claims that the behavior observed for *be/have* verbs suggests the implication of higher parts of the syntactic tree than for full lexical verbs. The contrast between production errors involving main verbs and *be/have* verbs is displayed in Table 44.

	Verb type	Omissions (%)
Mr. Rossi	Main V	21 (17%)
	Be / Have V	17 (57%)
Mr. Verdi	Main V	3 (3%)
	Be / Have V	2 (8%)

Table 44. Omissions of verbs by 2 Italian-speaking agrammatics (adapted from Gavarró 2003)

A third study observing the inflectional morphology of an Italian agrammatic subject (M.R.) in spontaneous speech (132 narrative sentences) by Garraffa (2007) shows low use of functional verbs consistent with the observations of previous studies. The results appear in Table 45.

Functional verbs N= 48	Contexts	Productions	% omissions
Auxiliaries	14	0	100
Copula	26	3	88.4
Lexical *have*	8	2	75
TOTAL	48	5	89.5

Table 45. Low use of functional verbs in an Italian-speaking agrammatic (Garraffa 2007)

As for the use of auxiliaries, out of the 14 contexts, the subject failed to produce these forms in all cases. In other words, the omission rate reached 100%, a percentage similar to that observed for copulas (88.4%).

Further evidence from Romance languages was presented by Nespoulous, Dordain, Perron, Bub, Caplan, Mehler and Lecours (1984) and Nespoulous *et al.* (1988, 1990), who examined the production of copulas and auxiliary verbs by two French agrammatic speakers. Agrammatic subjects were found to produce fewer auxiliaries and modals than controls. The authors report that one of the subjects, Mr. Clermont, showed difficulties in both copula and auxiliary verb production in addition to a complete avoidance of complex verbal tenses, which were attributed to problems in auxiliary production. His results for narrative tasks showed an omission rate of 50% both for copulas (7/14) and auxiliaries (10/20). The other subject, Mrs. Auvergne, correctly produced 77% of auxiliary forms. These results are summarized

in Table 46. Additionally, evidence from Mr. Clermont's performance in vertical reading showed improvement for auxiliaries but the levels of success remained at the 50% level for copular verbs (Table 47).

	Expected morphemes	*Correctly Supplied*		*Substitutions*		*Omissions*	
	N	*N*	*%*	*N*	*%*	*N*	*%*
Mr. Clermont							
Auxiliaries	20	10	50	1	5	9	45
Have-be verbs	14	7	50	0	0	7	50
Mrs. Auvergne							
Auxiliaries	35	27	77	5	14	3	9
Have-be verbs	23	22	96	0	0	1	4

Table 46. Errors in 4 narrative tasks by two French-speaking agrammatics (adapted from Nespoulous *et al.* (1988) and Gavarró (2003))

	Expected morphemes	*Correctly Supplied*		*Substitutions*		*Omissions*	
	N	*N*	*%*	*N*	*%*	*N*	*%*
Auxiliaries	10	9	90	0	0	1	10
Have-be verbs	4	2	50	1	25	1	25

Table 47. Mr. Clermont's errors in 'vertical' reading in French (adapted from Nespoulous *et al.* (1988))

These results contrast with the production of verbs by the same subjects (92% correct for Mr. Clermont and 96% correct for Mrs. Auvergne) indicating that, while main verbs can be considered unimpaired, auxiliaries are affected in the speech of agrammatic subjects. An example of the omission of a temporal auxiliary taken from Nespoulous *et al.* (1988) has been reproduced below as (86).

(86)   *Je perdu   la   parole.
        I lost-past.part the word
        I lost my speaking ability.

Expected form: J'ai   perdu   la   parole.
                 I'have-pres.1st.sg lost-past.part the word
                 I have lost my speaking ability.

The fact that *be/have* verbs are impaired while main verbs are spared is taken as evidence for the claim that the former merge in a relatively higher structural position than main verbs (Gavarró 2003).

3.2.5. Previous studies of Ibero-Romance

Data from Ibero-Romance is relatively scarce. Some hints on the behaviour of Spanish *be/have* verbs in the speech of 6 agrammatics can be found in Benedet *et al.* (1998). In this study, the authors calculated the percentage of omission errors and found a 50% wrong response rate. Table 48 summarizes the individual results.

	Be/Have verbs
Subject 1	0–9%
Subject 2	10–19%
Subject 3	0–9%
Subject 4	40– 49%
Subject 5	80–89%
Subject 6	0–9%

Table 48. Percentages of right answers on the Morphosyntax Battery (adapted from Benedet *et al.* (1998: 326))

Except for the case of subject 5, who correctly produced 80-89% of *be/have* verbs, the results of the morphosyntax battery indicate that these forms are problematic in agrammatic aphasia. The results for subjects 1, 3 and 6 clearly reveal this deficit, with percentages of correctness lower than 10%. Nevertheless, no separate classification attending to the nature of *be/have* verbs is provided in the study. By contrast, the results of our own mild agrammatic sample will allow us to trace more fine-grained distinctions between temporals, modals and aspectuals not only in Spanish but also in Catalan and Galician.

3.3. Results

In the present study, in order to get further data on the production of auxiliaries, the repetition skills for complex predicates were observed for the three languages under investigation. Nevertheless, due to differences in the verbal system, which in the case of Galician does not include compound tenses in its repertoire, only the Catalan and the Spanish group included temporal auxiliary tokens in the experimental design. Out

of the 25 tokens included in the task, the Catalan and the Spanish test prompt forms contained 12 periphrastic forms and 13 compound tenses while the Galician form contained verbal periphrases exclusively.

We first examined the results of the negation production task (described in section 1.3) with regard to compound tenses. Neither the Catalan nor the Spanish data from our 10 controls (five per language) included any erroneous responses. All subjects correctly repeated the expected verbal form. For our Catalan and Spanish mild agrammatic sample, an analysis per item showed that the level of success varied across experimental tokens. The total number of errors oscillated between 1 and 3 with the exception of token 2, which was incorrectly produced 4/10 times. No token was correctly produced 100% of the time or failed 100% of the time. Performance by token is illustrated in Graph 14.

Errors per Item: Repetition of compound tenses

* The x-axis includes only experimental tokens containing a complex verb
  form: temporal aux. + past participle.

Graph 14. Number of errors per item in the repetition of compound tenses

As far as the general results are concerned, 8 errors were found among the Catalan data and 16 in the Spanish. This means that the percentage of correct production of the temporal auxiliary forms reached 87.69% in the case of Catalan and 73.33% in the case of Spanish. Moreover, in the case of Catalan, 3 subjects (C1, C3 and C4) showed spared abilities for the repetition of these auxiliary verb forms. Table 49 summarizes individual results.

	Catalan			Spanish	
	% correct	(correct/total)		% correct	(correct/total)
C1	100%	(13/13)	S1	53.85%	(7/13)
C2	61.54%	(8/13)	S2	69.23%	(9/13)
C3	100%	(13/13)	S3	92.31%	(12/13)
C4	100%	(13/13)	S4	84.61%	(11/13)
C5	76.92%	(10/13)	S5	76.92%	(10/13)
Total	87.69%	(57/65)	Total	75.38%	(49/65)

Table 49. Individual results for auxiliary verb repetition

In (87), errors are classified according to type and frequency of appearance in our Catalan and Spanish sample.

(87) Classification of errors according to type and frequency:

1. Tense substitutions (10/24)
   - present perfect substitutes for pluperfect (6/10)
   - pluperfect substitutes for present perfect (4/10)
2. Auxiliary omission + tense substitution (7/24)
   - preterite substitutes for present (5/7)
   - present substitutes for imperfect (1/7)
   - preterite substitutes for imperfect (1/7)
3. Auxiliary omission (Main V adopts the given tense) (6/24)
4. *Don't know* responses (1/24)

Our results indicate that 58.33% of the erroneous utterances lacked an auxiliary form. Temporal auxiliary omission with or without tense substitution is the most common error (n = 13). In 7 out of the 13 occurrences, the tense of the auxiliary verb was not respected when the complex form was substituted with a simple tense. Nevertheless, a temporal auxiliary was present in 41.67% of the agrammatic wrong responses, with the violation being a tense substitution (generally towards the present: 60% as already documented for simple tenses).

Even though the repetition of temporal auxiliary verb forms in experimental and control subjects revealed significant differences at a level of $p < 0.01$ (Mann-Whitney U test, $Z = -3.106$), high percentages of correctness were recorded for both languages indicating that, depending on the mildness of the deficit, agrammatics may preserve their abilities for temporal auxiliary verb repetition to a certain degree. Cases

such as those of C1, C3 and C4, who correctly repeated auxiliary forms 100% of the time, support this claim. In fact, C1 produced no errors in the tense repetition task either (vs. C3, who produced 3/18 errors and C4 who produced 5/18 errors).

Data from our Catalan moderate agrammatic subject were also analyzed for his skills in the repetition of complex verbal forms. The results suggest that the deficit in the production of temporal auxiliaries increases with the degree of severity of agrammatism. Despite the nature of the task, CM's '*don't know*' answers together with verbless structures represented 69.23% of the total number of elicited responses. Among the items including a verb (n = 4), only two were repeated correctly. A non-finite form and a tense substitution constituted the remainder of CM's responses. These errors have been classified in Table 50.

	CM
'Don't know' responses	5
Verbless structures	4
Non-finite forms	1
Tense substitutions	1

Table 50. Classification of errors according to error type in a Catalan moderate agrammatic

Leaving compound tenses aside, the ability to repeat sentences containing verbal periphrases could also be indirectly observed through the sentence negation task described in section 1.3. 12 tokens in the Catalan and the Spanish versions of the test and 25 in the case of Galician included a construction of this type. Only three errors were found among data from our control group. Since one was a tense substitution (B4 - Galician Ctrl n°4), only two simplifications were attested. These errors (found in the Catalan sample) only represent 1.38% (2/145) of the total number of repetitions of verbal periphrases.

An analysis per item of the data of our agrammatic sample revealed that all experimental tokens led to failure in some trial. For Catalan and Spanish subjects, the number of errors ranged from 1 with token 11 to 8 with token 19. In the case of Galician the variability across items was such that while token number 6 was correctly produced by the 5 patients of the group, tokens 11 and 17 were problematic

in all cases. The performance by token for Catalan and Spanish is illustrated in Graph 15 while Galician is represented in Graph 16 below.

Errors per Item: Repetition of verbal periphrasis

* The x-axis includes only the 12 tokens in the experimental design containing verbal periphrases.

Graph 15. Number of errors per item in the repetition of verbal periphrases in Catalan and Spanish

Errors per Item: Repetition of verbal periphrases in Galician

* The x-axis shows all the 25 tokens included in the experimental design.

Graph 16. Number of errors per item in the repetition of verbal periphrases in Galician

The general results show that the repetition of verbal periphrases was problematic in 43.26% of instances (106/245). Catalan and Galician subjects correctly repeated complex verbal clusters around half of the time (51.67% and 56% respectively). Nevertheless, there was great variability across subjects. While C1 produced only one error, in the same task C2 was only able to correctly repeat one periphrastic construction. In contrast, their Spanish counterparts, who proved to be the most spared group for this construction type, produced quite homogeneous results (the level of success reached 63.33%). Tables summarizing individual results in the three languages are shown below.

	Catalan			Spanish	
	% correct	(correct/total)		% correct	(correct/total)
C1	91.67%	(11/12)	S1	66.67%	(8/12)
C2	8,33%	(1/12)	S2	83.33%	(10/12)
C3	50%	(6/12)	S3	58.33%	(7/12)
C4	66.67%	(8/12)	S4	41.67%	(5/12)
C5	41.67%	(5/12)	S5	66.67%	(8/12)
Total	51.67%	(31/60)	Total	63.33%	(38/60)

	Galician	
	% correct	(correct/total)
G1	40%	(10/25)
G2	44%	(11/25)
G3	68%	(17/25)
G4	68%	(17/25)
G5	60%	(15/25)
Total	56%	(70/125)

Table 51. Individual results for the repetition of periphrastic constructions

In (88), errors are classified according to type and frequency of appearance.

(88)   Classification of errors according to type and frequency:

1. Simplification of complex verbal clusters (56/106)
2. Simplification of complex verbal clusters + tense substitutions (35/106)
    - Present perfect substitutes for the expected form (13/35)
    - Preterite substitutes for the expected form (7/35)
    - Pluperfect substitutes for the expected form (4/35)
    - Present substitutes for the expected form (3/35)
    - Future substitutes for the expect form (3/35)
    - Imperfect substitutes for the expected form (3/35)
    - Conditional substitutes for the expected form (2/35)
3. Dks (9/106)
4. Tense substitutions (4/106)
    - Present substitutes for the expected form (1/4)
    - Preterite substitutes for the expected form (1/4)
    - Imperfect substitutes for the expected form (1/4)
    - Conditional substitutes for the expected form (1/4)
5. Simplification of complex verbal clusters + tense/agreement substitutions (1/106)
    - Present substitutes for the expected form (1/1)
    - 3rd plural substitutes for the expected form (1/1)

6. Tense/Agreement substitutions (1/106)
        - Futures substitutes for present
        - 2nd plural substitutes for 1st plural.

While 79.24% of the errors had to do with a simplification of the verbal cluster, it is interesting to note that 16.04% of the responses consisted of the replacement of a modal or an aspectual by a temporal auxiliary form. The remaining 4.72% of the errors were tense/agreement substitutions which did not affect the complexity of the verbal cluster.

The three language groups showed a clear tendency to substitute the given periphrases with simpler verb forms. This error type represented 91/106 errors (see Graph 17 below). In some cases (35/91), in addition to simplification, a violation of tense was also detected. As we have already seen with simple tenses and temporal auxiliaries, present forms were the preferred forms for substitution.

1. Simplification of complex verbal clusters
2. Simplification of complex verbal clusters + T substitution
3. 'Don't know' responses
4. Tense substitutions
5. Simplification + T/Agr substitution
6. T/Agr substitution

Graph 17. Errors in the repetition of periphrastic forms

Statistical analysis revealed that the production of modals and aspectuals is compromised in agrammatism. Differences between experimental and control subjects were attested at a 1% level for Catalan and Spanish (Z = -3.841) and at a 5% level for Galician (Z = -2.795) in a Mann-Whitney U test. A Wilcoxon signed rank

test revealed no significant differences between tense and modals/aspectuals in Catalan and Spanish while for Galician these differences were significant at a 5% level (Z = -2.023)

Regarding the type of periphrasis involved in the tested constructions, the Catalan and the Spanish sample included 33.33% (4/12 items per subject) modal, 58.33% (7/12) aspectual and 8.33% (1/12) forms where a clear classification as modal or aspectual could not be made[40]. The results showed no differences among different types, with modals damaged 42.50% of the time (17/40 total responses), aspectuals 42.86% of the time (30/70) and unclassified verbal periphrases 40% of the time (4/10). The results are illustrated in Graph 18.

Graph 18. Distribution of verbal periphrases tokens and error rates for Catalan- and Spanish-speaking agrammatics.

In the case of Galician, the distribution was different. 28% (7/25 items per subject) modals, 68% (17/25) aspectuals and 4% (1/25) unclassified forms were included in the experimental design. Again, as for Catalan and Spanish, modals and aspectuals were found to be impaired to a similar extent (48.57% (17/35 total responses) for the former and 43.53% (37/85) for the later). Unclassified forms were found to be damaged to a 20% (1/5). Galician results are illustrated in Graph 19.

---

[40] In other words, clusters sharing characteristics of the two groups such as *tardar en* 'to take time to' + INF.

Graph 19. Distribution of verbal periphrases in Galician agrammatics

Items included in the experimental design covered the following categories in accordance with Cinque (2006):

(89) $ModP_{epistemic} > TP(Past) > (...) > AspP_{repetitive(I)} > (...) > AspP_{terminative} > (...) > AspP_{durative} > (...) > AspP_{inceptive(I)} > ModP_{obligation} > ModP_{ability} > (...)$

Table 52 below shows errors according to structural position.

		Catalan & Spanish (errors/total answers)	*Galician*
Aspectuals	Repetitive	0% (0/0)	40% (8/20)
	Terminative	32.5% (13/40)	40% (10/25)
	Durative	70% (14/20)	60% (9/15)
	Inceptive[41]	30% (3/10)	40% (10/25)
Modals	Obligation	40% (12/30)	46.67% (14/30)
	Ability/ Possibility[42]	50% (5/10)	60% (3/5)
Modals/Aspectuals		40% (4/10)	20% (1/5)

Table 52. Errors in verbal periphrasis according to Cinque's (2006) typology

Our sample also includes results from the repetition of periphrases task by the moderate agrammatic subject, CM, who had problems with the production of all the items containing a periphrastic form (12/12). His '*don't know*' responses together with verbless structures represent the majority of errors (7/12), reducing the items with an overt verb to 5. Four substitutions with non-finite forms and a tense/agreement violation confirm CM's deficit in the repetition of complex verbal clusters. A breakdown of errors by type is shown in Table 53.

---

[41] Inchoative and ingressive periphrastic forms are included in inceptive.

[42] Though the most likely interpretation for this modal verb is ability, it may also indicate possibility:

      Item 14: Nosaltres podíem cosir la camisa.
           We could sew the shirt.

The absence of context makes it impossible to determine whether the patients are using the epistemic reading since no test such as the impossibility of co-occurrence with auxiliaries or the ban on their appearance in its finite form (Picallo 1990; Gavarró and Laca 2002) can be applied. If the example is seen as an epistemic modal, it would occupy a structural position preceding all functional heads, as illustrated in (89) in accordance with Cinque's (2006) schema.

	CM
'Don't know' responses	4
Verbless structures	3
Non-finite forms	4
Tense substitutions	1
Agreement substitutions	1

Table 53. Classification of errors in a moderate agrammatic according to error type

3.4. Discussion

The TPH predicts deficits in the TP-field which can cause disruptions to the representation of copulas and auxiliary verbs if tense inflection is damaged. Significant differences at a 1% level with respect to control subjects' performance confirmed that, insofar as auxiliaries crucially depend on high parts of the tree structure, they were susceptible to impairment[43]. This coincides with previous findings in the literature such as Nespoulous *et al.*'s (1984, 1988, 1990) for French, Nadeau and Rothi's (1992) for English, Friedmann and Grodzinsky's (1997, 2000) for Hebrew and Palestinian Arabic, Benedet *et al.*'s (1998) for Spanish and Garraffa's (2007) for Italian, among many others.

Our results also indicate that this effect increases with the severity of the deficit. CM found especially problematic the repetition of complex verbal clusters, producing not only structures without a verb but also providing us with further examples of substitutions with non-finite forms. In the preceding section, we noted that such substitutions were almost completely absent from mild agrammatics' speech yet a productive substitutory strategy in the case of our moderate Catalan agrammatic subject.

In line with Nespoulous *et al.* (1984, 1988, 1990), Nadeau and Rothi (1992) and Gavarró (2003), a comparison of these results with those for tense and agreement obtained for main verbs, showing impairment at 15% for tense and 3% for agreement, indicates an increase in the number of errors with modal and aspectual auxiliaries (57% preserved across languages).

---

[43] It is important to emphasize that we draw the distinction between impaired vs. spared categories in terms of the presence or absence of significant differences with respect to control performance.

If we assume with Cinque that auxiliaries are categorically distinct from verbs, agrammatic results seem to indicate under the TPH that the former are first merged in a higher part of the tree than the latter in the set of functional projections of the IP-field that hosts adverbs in the specifier position (90) (Friedmann and Grodzinsky 1997, 2000; Gavarró 2003; Alexiadou and Stavrakaki 2006).

(90) $ModP_{epistemic} > ... > ModP_{alethic} > AspP_{habitual} > AspP_{delayed\ (or\ 'finally')} > AspP_{predispositional} > AspP_{repetitive(I)} > AspP_{frequentative(I)} > ModP_{volitional} > AspP_{celerative(I)} > ... > AspP_{terminative} > AspP_{continuative(I)} > AspP_{perfect} > AspP_{retrospective} > AspP_{proximative} > AspP_{durative} > AspP_{progressive} > AspP_{prospective} > AspP_{inceptive(I)} > ModP_{obligation} > ModP_{ability} > AspP_{frustrative/success} > ModP_{permission/ability} > AspP_{conative} > AspP_{completive(I)} > ... > AspP_{inceptive(II)} > (AspP_{continuative(II)}) > ... > AspP_{celerative(II)} > AspP_{inceptive(II)} > AspP_{completive(II)} > AspP_{repetitive(II)} > AspP_{frequentative(II)}$

(Cinque 2006)

If, on the contrary, we take movement as central for the deficit (Bastiaanse and Thompson 2003), we would expect, contrary to observed facts, higher percentages of error for main verb production since main verbs also undergo movement to check tense morphology.

Leaving modals and aspectuals aside for the moment, the high levels of correctness with temporal auxiliaries must not pass unnoticed since they were correctly produced 81.53% of the time by Catalan and Spanish agrammatics, very close to the tense error rates for main verbs, which may be seen as an indicator of shared structural position ($p < 0.05$, $Z = -1.897$). As we mentioned above, while modal verbs and some other auxiliaries have been claimed to be base-generated in the IP domain, others such as *have* or *be* have been claimed to undergo movement to T (Lasnik 1999; Pollock 1989 and subsequent work; Schütze 2003). Again, this pattern of performance would not be predicted if movement was taken to be central for the explanation of the deficit. However, in our sample, statistical differences (at a 5% level) were only found for Galician. For Catalan and Spanish, as we had already observed for temporal auxiliaries, no differences were found with respect to tense production errors.

Concerning error type, though most research reports a clear preference for omission (Nespoulous *et al.* 1984, 1988, 1990; Nadeau and Rothi 1992; Garraffa

2007), copulas and auxiliaries have also been found to be substituted (Miceli *et al.* (1989) for Italian). Substitution errors of tense in copular constructions were already noted in Friedmann and Grodzinsky (1997) in an embedded sentence production task. These errors can be accounted for in the same terms as tense errors in main verbs – i.e. to avoid the production of a non-word, any member of the paradigm can substitute for the expected form – and they do not present any challenge to the TPH (Friedmann and Grodzinsky 2000). The same explanation would hold in the case of tense substitutions with auxiliary verbs. In our sample, as observed for main verbs, present tense is often taken as the default form. The lack of specific tense morphology of this form may be seen as responsible for this preference. However, we will not seek to predict this preference, since the other options would be left unaccounted for.

The small number of experimental items included in our repetition task does not allow us to make generalizations regarding the behavior of modals as opposed to aspectuals. Since both forms have been claimed to reside in relatively close structural positions in the upper portions of the IP-fied, the mildness of our agrammatic sample together with the nature of the task from which results were extracted may have obscured finer distinctions. More systematical observations are needed in order to verify Cinque's hierarchy in Ibero-Romance agrammatism. Contrary to Alexiadou and Stavrakaki's (2006) findings for adverbs and even though aspectual forms included in the experimental design (repetitive, terminative, durative and inceptive) are structurally higher than the modals under investigation (obligation, ability) (see 92 before), no significant differences were found among them. In fact, modals seem to be more severely damaged than aspectuals in our sample.

Though at first sight this may be seen as problematic for a structural account that takes Cinque's (2006) hierarchy as its central tenet, the nature of the verbs labelled under *ability* has already been acknowledged to be ambiguous, with epistemic and ability reading both possible. Cinque (2006) claims that the motivation for the relative order of some modal and aspectual heads had remained undetermined in his 1999 work. In 2006, taking the rigid relative order of "restructuring" verbs, he establishes the order of Asp heads by refining the positions for root modals. If we look back at Cinque (1999), Mod projections including both ability and possibility are

claimed to occupy a higher position than the Asp projections under investigation (91), a position reserved for ModP$_{epistemic}$ in his 2006 work.

(91)   Puedo   volver   a   llevarte   los apuntes.
        can-pres.1st.sg reurn-INF to bring-INF-you the notes
        I can bring you the notes again.

    Mod(possibility)

            Asp(repetitive)

                        V(erb)P

    Puedo   volver a   llevarte los apuntes

Under this assumption, i.e. if we take modals to be higher than aspectuals or if we interpret the example in (91) as an epistemic, our results will immediately follow. In fact, other proposals such as Schütze (2003) start out with the same linear order but locate Mod projections at higher positions in the IP-field. Further experimental tasks focused on the production of periphrases are necessary before we can draw up an exact classification of deficits. Despite this fact, our results are consistent with a TPH-oriented account since impairment is predicted by the crucial implication of the higher layers of the IP-field.

With the present data we can claim that, as functional projections, modals and aspectuals are more severely affected than verbs in agrammatic subjects. Their intimate relation with the IP-fields makes that observation predictable under the structural terms given by the TPH. However, what these preliminary findings also seem to indicate is that portions of the structure including immediately consecutive functional categories (as in the case of modals and aspectuals) may be damaged 'as a block' without reflecting an increasing level of difficulty. Temporal auxiliaries were found to pattern separately, as expected, since their base generation position is assumed to be lower. The fact that these elements have to undergo an extra movement operation does not seem to have influenced our subjects' performance. In the case of

the auxiliaries we investigated, structural considerations seem to have determined the rate of success.

4. CLITICS

Clitics are syntactically independent morphological units corresponding to two main groups: Wakernagel's clitics, enclitically attached to the first constituent of the clause, and 'adverbal' clitics, either enclitically or proclitically attached to the verb (Ledgeway and Lombardi 2005). According to Duarte and Matos (2000), Romance clitics correspond to the adverbal type, i.e. in contrast to full DPs or strong pronouns, they appear in a position adjacent to the verb, though examples of interpolation may still be found in the case of Galician, as illustrated in (92) (from Álvarez, Monteagudo and Regueira 1986).

(92)   Fai o que che eu digo.   (Galician)
        do the what you I say-pres.1st.sg
        Do what I say.

The intervention of strong pronouns may be seen as a characteristic reminiscent of early stages in the diachronic proccess affecting Romance clitics (Duarte and Matos 2000) and is not accepted in modern Catalan (93a) or Spanish (93b):

(93)   a.   *Fes el que et jo dic.   (Catalan)

        b.   *Haz lo que te yo digo.   (Spanish)
              do the what you I say-pres.1st.sg
              *Do what you I tell.

The placement of clitics varies in the languages under investigation. While Galician uses the enclitic pattern as the unmarked form, in Catalan and Spanish they tend to appear proclitically (94).

(94)   a. Comeuno.   (Galician)
           eat-pret.3rd.sg-it
           He/She ate it.

b. Lo comió.   (Spanish)
it eat-pret.3rd.sg
He/She ate it.

Since Rivero (1986), the clausal structure and the status of clitics in western Ibero-Romance varieties has been a recurrent topic of debate. Recent studies on cliticizations postulate that clitics are hosted in a functional projection residing between the CP and the IP-area (Raposo and Uriagereka 2005; Ledgeway and Lombardi 2005) in order to account for the enclitic pattern displayed by Galician and European Portuguese together with Asturian. This reinforces the need for a richly developed tree structure like the one we have been assuming so far. Under the TPH, the immediate implication of assuming a clitic phrase located in portions of the tree structure higher than TP and AspP/ModP is that clitics will be disrupted in required contexts.

Concerning the tree structure of pronominal clitics, two competing theoretical approaches are proposed in the literature to account for the high position of these elements (van Riemsdijk 1999):

a) The Affix hypothesis: Clitics are generated at first merge in their surface position as functional heads (Jaeggli 1982; Sportiche 1996, 1998).

b) The DP hypothesis: Clitics move from the argumental position where they are generated (Kayne 1975, 1989 and subsequent work; Uriagereka 1995).

According to Kayne (1991) or Raposo (2000), clitics are left-adjoined (when they appear proclitically) or right-adjoined (when they appear enclitically) to the head of a functional projection that hosts the raised verb (Uriagereka 1995). Two different approaches have been discussed regarding placement alternations. On the one hand, 'traditional approaches' (Lema and Rivero 1990, 1991; Barbosa 2000) – as labeled by Fernández-Rubiera (2009) – claim that PF-filters are behind the alternation between enclisis and proclisis while 'left peripheral approaches' (Raposo and Uriagereka 2005; Benincà 2006) relate it to verb movement. Following the latter, clitics are first merged as full pronouns in argument position and move cliticizing onto the verb. According to Belletti (1999) or Duarte and Matos (2000), among others, movement is

justified by the fact that Romance clitics have a strong feature (either case or V-host) that needs to be checked. Nevertheless, this analysis has trouble explaining cases of clitic doubling such as that illustrated in (95), where *le* is doubled by *a Mafalda* (Jaeggli 1982).

(95)   Miguelito *le* regaló un caramelo *a Mafalda*
         M.   her   gave   a   candy   to M.
                        (van Riemsdijk 1999: 7)

In addition to the syntactic interpretations which combine functional projections and movement (Cardinaletti and Starke 1999), PF interpretations of cliticization (e.g. Kayne 1994) assume that the verb remains in a functional head of the IP-system just to the right of the projection hosting the clitic (AgrO according to Belletti (1999)). This reflects the idea that, even though the sequence clitic + verb are phonologically adjacent, they reflect two distinct functional heads that occupy different structural positions. Not only multiple adjunction but right adjunction to the same head is banned. Under this approach, enclisis is seen as either the result of the left-adjunction of the verb to the clitic position (Uriagereka 1995) or a consequence of the verb skipping this position (Kayne 1991, 1994). Traditionally, language variation was accounted for in terms of different functional heads hosting the clitic (AgrS in Spanish vs. a head relatively higher than that – between AgrS and C – in the case of Galician) (Madeira 1992; Uriagereka 1995; van Riemsdijk 1999). Nevertheless, we will assume that despite surface differences, clitic elements share structural position.

According to Uriagereka (1995), clitic placement is conditioned by the specific and referential nature of clitic elements. Clitics can be characterized either as pronouns [+ pronominal, -anaphoric] or, in the case of reflexive forms, as anaphors [- pronominal, + anaphoric]. In both cases, they need to be referentially indexed with a *pro* in object position (Borer 1983, Jaeggli 1986, van Riemsdijk 1999, Uriagereka 1995). If we take into consideration Baker's (1985) mirror principle and the relative position of tense inflection and clitics (e.g. *com-e-o* 'he/she eats it'), we can claim that in Galician, these forms move to/are generated in a position higher than tense in the syntactic tree. This position, where the associated *pro* licenses clitics, may be the

same as that proposed by Sportiche (1996) with the variant with respect to languages such as Catalan or Spanish (which present a pro-clitic pattern) of attracting the verb to derive the enclitic pattern. The basic structure for clitics according to Sportiche (1996) is represented in (96) below.

(96)

```
              /\
          pro    ClP
               /    \
             Cl      TP
                   /    \
                  T      vP
                       /    \
                      v      VP
                           /    \
                          V      DP
                                 |
                                pro
```

In line with Sportiche (1996), Raposo and Uriagereka (2005) and Ledgeway and Lombardi (2005), among many others, Cardinaletti and Roberts (2002) argue that clitics are located higher than the projections where verbal morphology is checked in an expanded TP area. Different labels have been used to identify the functional projection that hosts clitic elements: Cl_{IO} and Cl_{DO} (Sportiche 1998), FP (Uriagereka 1995), WP, ΣP (Martins 2000). The position clitics are attributed to occupy corresponds to F in terms of Uriagereka (1995), a position encoding speaker–reference dependencies.

According to this proposal, the verb moves to F in languages of the Galician type. Uriagereka (1995) claims that the verb itself has a strong F feature that needs to be checked in archaic languages, thus justifying movement. This is not applicable to the case of Catalan and Spanish, where F is weak. Because of this, the verb remains in TP after checking tense and agreement features and does not move to F until LF. The contrast is illustrated below in the simplified structures of (97) and (98).

(97)

```
              FP
         ┌────┴────┐
         F          TP
       fixo-o    ┌───┴────┐
          ↑↑ T           ...
                      ┌───┴────┐
                               VP
                          ┌────┴────┐
                          V          DP
                                     │
                                     tᵢ
```

(Galician)

(98)

```
              FP
         ┌────┴────┐
         F          TP
              ┌──────┴────┐
              T          ...
          lo+hizo    ┌────┴────┐
                              VP
                         ┌────┴────┐
                         V          DP
                                    │
                                    tᵢ
```

(Catalan or Spanish)

Based on Raposo and Uriagereka (2005) and Rizzi (1997), González i Planas (2007) and Fernández-Ruibera (2009) place F projections even higher, in Foc° and Finº respectively. According to González i Planas (2007), Spec-Foc is assumed to host the elements that force proclisis such as focalized phrases and quantified subjects or the verb in the case of enclisis. This assumption, rooted on his observation of pronominal clitics in Astur-Leonés (a Romance variety spoken in Northern Spain close to the area of influence of Galician), allows the derivation of all possible configurations. Following Fernández-Ruibera (2009), it is Finitenessº, a phase head, which may be held responsible for the different clitic patterns and cross-linguistic variation in Finite contexts. The underlyinig idea is that in Western Ibero-Romance varieties (Asturian, European Portuguese and Galician), Forceº may collapse to Finº in the absence of left-peripheral material, i.e. the whole area may be reduced to a single functional projection. These claims contradict analysis according to which clitics would occupy a lower position in the syntactic representation.

The clitic systems of Catalan, Galician and Spanish – which includes many forms out of which only accusative clitics will be taken into consideration – provide us with a unique testing groud for theories due to their differences in clitic ordering. Clitics have received much attention in the field of theoretical linguistics due to their complexity. Evidence from pathology may offer us further evidence by which to compare different proposals. After a brief description and summary of previous findings in other impaired populations, new evidence from our Ibero-Romance agrammatic sample will be analyzed below.

4.1. Clitics in Ibero-Romance

Syntactically, clitics are independent elements which function as pronouns. The forms relevant for our analysis are monosyllabic, phonologically dependent elements which behave more like affixes than full words and must therefore occupy an unstressed position close to the verb to which they are adjoined proclitically or enclitically (see Bonet (2002) or Todolí (2002) for Catalan and Álvarez *et al.* (1986) for Galician). Only other clitics can intervene[44] (see Kayne (1975) for a general description of Romance pronominal clitics). A example from Galician appears in (99).

(99)   a. Viuno   (Galician)
           see-pret.3rd.sg-him/it
           He/she saw him/it.

        b. Viumo
           see-pret.3rd.sg-me-it
           He/she saw it for me.

We will concentrate only on direct object clitics, i.e. accusative clitics, including both reflexive and non-reflexive forms. The direct-object clitic paradigm of the three Ibero-Romance varieties is shown in Table 54.

---

[44] With the already mentioned exception of Galician, which allows for the intervention of strong subject pronouns (Álvarez *et al.* 1986).

Function		Form		
		Catalan	Galician	Spanish
CD	Personal	em (m'), et (t'), es (s'), ens, us, es (s')	me, te, se, nos, vos, se	me, te, se, nos, os, se
	Definite 3rd person	el, la (l'), els, les	o, lo, no/ a, na, os, los, nos/ as, las, nas	lo, la, los, las

Table 54. Clitics in Ibero-Romance

In Spanish and Galician (though not in Catalan) personal clitics substitute for a DP introduced by *a* 'to' while definite clitics (which can have a [± animate] antecedent) substitute for a definite DP. As already pointed out in Kayne (1975), given the unstressed nature of clitic forms, they are subject to certain phonological restrictions. While stressed pronouns can appear in subject position or as the complement of a preposition, clitics cannot (100a, b). They are equally ill-formed in cases of comparison (101a, b) or verb ellipsis (102), where a stressed form is required.

(100) Catalan:
a. Anirem al cine amb *vosaltres*.   (Todolí 2002: 1347)
b. *Anirem al cine amb *us*.
   We will go to the cinema with *you* (stressed/unstressed).

(101) Galician:
a. É mellor ca *ela*.
b. * É mellor ca *a/se*.
    He/she is better than *her/herself* (stressed/unstressed).

(102) Spanish:
*Lo recogerá, pero no *la*.
He/she will pick him up but not *her*.

Further restrictions are their inability to appear in isolation (103a,b) or coordinated (104), together with the impossibility of being focalized (105):

(103)   Catalan:
      a.   Qui vindrà? *Jo*.   (Todolí 2002: 1347)

      b.   Qui vindrà? **Me*.
                 Who will come? *I/*me*.

(104)   Galician:
       *Xoán trouxoo e *a*.   (Fernández-Soriano 1999)
       John brought *him/it* and *her/it*.

(105)   Spanish:
       *LA recuerdo.   (Gavarró, Mata and Ribera 2006)
       **HER/it* remember.

The opposition between reflexive and non-reflexive forms is only expressed in 3rd person clitics, where a different inventory is used for reflexive and non-reflexive constructions. While reflexive pronouns are not subject to gender and number variation, 3rd person non-reflexive forms are variable so that their antecedents can be traced back. 1st and 2nd person accusative clitics are invariable forms in all cases.

There are two main approaches to Romance reflexive clitics, the argumental and the non-argumental approach. According to the first approach, Romance reflexives are syntactic arguments, though there is some controversy over the status they have as internal arguments (Rizzi 1986b) or external arguments (Kayne 1989; Sportiche 1998). According to the second approach, Romance reflexives operate on argument structures (Grimshaw 1982, 1990, Reinhart and Siloni 2004). Under this approach, reflexive elements absorb one of the arguments from the argument-structure representation. While reflexive clitics involve argument absorption (106a), non-reflexive forms license and identify a *pro* object (106b).

(106)   a. Tú$_i$ te$_i$ miras.   (Spanish)
        you$_i$ you$_i$ look
        You look at yourself.

      b. Yo$_j$ te$_i$ miro [*pro$_i$*].
        I$_j$ you$_i$ look [pro$_i$]
        I look at you.

      c. * Yo$_j$ te$_i$ miro.
        I$_j$ you$_i$ look

d. *Tú_j te_i miras [*pro*_i].
    you_j you_i look [pro_i]

In (106a), there is one thematic role less. The absortion process, assumed to be pre-syntactic, deletes one thematic role from the syntax (Belletti 1982; Grimshaw 1982; Rosen 1990; Reinhart and Siloni 2004). (106b) illustrates the relevant configuration for non-reflexive clitic forms with a *pro* allowed by the object agreement paradigm (Jaeggli and Safir 1989; Sportiche 1996).

Regarding clitic distribution, there is considerable formal variation in the languages under analysis. Catalan and Spanish show the same pattern, with reflexive and non-reflexive clitics appearing in pre-verbal position with finite forms and postverbally with non-finite forms and imperatives. In Galician, clitics tend to occupy post-verbal positions. In this respect, Galician patterns with Portuguese and Astur-Leonés against the rest of the Romance varieties in the Iberian Peninsula, with enclisis as the unmarked form for the placement of pronominal clitics (González i Planas 2007). The relevant contrast is exemplified below in (107) and (108).

(107)   Reflexive: Cat : *S'*ha vist / Veure*'s*.
                          Gal : Viu*se* / Non *se* viu / Ver*se*.
                          Sp. : *Se* ha visto / Ver*se*.
                          'She has seen *herself* / To see *herself*.'

(108)   Non-reflexive: Cat: *La* vigilava / Vigilar-*la*.
                          Gal: Vixába*a* / Non *a* vixiaba / Vixia*la*.
                          Sp.: *La* vigilaba / Vigilar*la*.
                          'I/He/She watched over *her* / To watch over *her*.'

Exceptions to the Galician enclitical pattern are observed with negation (109a) and most subordinate constructions (109b) as well as with quantifiers (109c) and focalizations (109d) (Uriagereka 1995; Raposo and Uriagereka 2005). In infinitival clauses, there are contexts in which both patterns appear in free variation (109e).

(109)   a. Non o ten ouvido.   (Uriagereka 1995: 95)
            not it have-pres.3rd.sg heard
            He/She hasn't heard it.

b. Quero que o oiades.   (Uriagereka 1995: 95)
   want-pres.1st*.sg that it hear-pres.subj.2*nd*.pl*
   I want you to hear it.

c. Todo o mundo o veu/*veuno.   (Uriagereka 1995: 83)
   all the world it see-pret.3rd*.sg/*see-pret.3*rd*.sg-it*
   Everybody saw it.

d. Ate a María o viu.
   even the M. it see-pret.3rd*.sg*
   Even Mary saw it.

e. De facelo, faino ben. / De o facer(es), faino ben.
   of do-INF-it do-imp.2nd*.sg-it well/of it do-INF do-imp.2*nd*.sg-it well*
   If you do it, do it well.

   The contrast between enclisis and proclisis is attributed by Uriagereka (1995)
to the heavy nature of F in languages such as Galician relative to Spanish or Catalan.
A heavy F is characteristic of what he classifies as 'archaic' languages and presents
the appearance of clitics as stranded affixes. The author claims that archaic Vs encode
strong F features which under some circunstances can be mophologically encoded as
in the inflected infinitival forms found in languages of this type[45]. In the examples in
(109), an interfering element blocks the raising of the verb to F and hence the order
V+Cl cannot be obtained. Thus, cross-linguistic differences can be accounted for in
parametric terms. The V-to-F parameter shows the positive value for Galician and the
negative value for Catalan and Spanish (Uriagereka 1995; Otero-García 2002).

4.2. Previous research in agrammatism

From the perspective of the TPH, clitics seem susceptible to impairment when lower
(T, Asp) nodes are impaired. Findings on typologically different languages such as
Italian or French (Miceli *et al.* (1989) and Nespoulous *et al.* (1988) respectively) on
the one hand and Greek (Stavrakaki and Kouvava 2003) on the other point in this
direction with high attested rates of clitic omission.

---

[45] See section 2 of the present chapter for a detailed description of this extra form in the Galician
inflectional paradigm.

4.2.1. Previous studies of Greek

Stavrakaki and Kouvava (2003) analyze the case of two non-fluent Greek aphasics in spontaneous speech. The results in Table 55 show poor production levels for clitic object forms in contrast to ceiling performance for strong personal pronouns and genitive clitics. Errors, which where mainly attested with third person object clitics, had to do with omissions of the required forms.

	SC	*VF*
Strong pronouns (1st, 2nd and 3rd person)	12/12 (100%)	11/11 (100%)
Genitive clitics (1st, 2nd and 3rd person)	8/8 (100%)	12/12 (100%)
Clitic object pronouns		
1st person	1/4 (25%)	3/8 (37.5%)
2nd person	-	3/10 (30%)
3rd person	2/15 (13.33%)	2/20 (20%)

Table 55. Correct production of clitics in two Greek agrammatic subjects (Stavrakaki and Kouvava 2003)

These results indicate a non-homogeneous behavior of pronouns. The authors attribute variation to the syntactic-semantic properties of different pronoun types. According to them, object pronouns (especially 3rd person forms) are more susceptible to impairment since co-reference is indirect, in contrast to strong pronouns. Structural considerations are not taken into account in the analysis.

Further evidence related to Greek direct object clitic production comes from a single case study discussed in Nerantzini (2008). Both pre- and post-verbal clitics were tested, with results showing that independently of clitic ordering restrictions, these elements were compromised in agrammatic aphasia. The three conditions under investigation – indicative and subjunctive constructions (where the clitic appears pre-verbally in Greek) and imperative constructions (where it appears post-verbally) – were produced ungrammatically at rates of 77.7%, 55.5% and 88.8% respectively. Though the main error type was omission of the clitic element (75%), substitutions and agreement errors were also recorded. It is important to note that, since sentences with full NPs are grammatical in Greek, these were counted as correct answers.

4.2.2. Previous studies of Romance languages

Data from Italian agrammatism show that pathological subjects produce fewer pronominal clitics than healthy ones (Miceli *et al.* 1989; Lonzi and Luzzatti 1993; Miceli and Mazzucchi 1990; Chinellato 2004). Through the observation of the behaviour of 20 agrammatics in short narrative tasks, Miceli *et al.* (1989) found both omissions and substitutions of clitic forms in mandatory contexts. Individual performances are listed in Table 56.

Subject	*N*	% Om.	% Sub.
A.A.	5	-	-
F.A.	15	46.7	-
F.B.	11	-	18.2
C.D.	114	7.0	9.7
F.D.	62	16.1	8.1
C.D.A.	13	53.8	7.7
G.D.C.	9	44.4	-
E.D.U.	40	10.0	15.0
G.F.	11	36.4	-
T.F.	15	100.0	-
F.G.	28	14.3	-
G.G.	13	15.4	-
M.L.	32	-	9.4
A.M.	36	8.3	8.3
M.M.	15	80.0	-
B.P.	7	14.3	42.9
C.S.	16	18.7	6.2
F.S.	24	50.0	-
L.S.	15	20.0	13.3
M.U.	18	33.3	11.1
Total	499	28.44	7.5

*(Column group header: **Clitics** spanning N, % Om., % Sub.)*

Table 56. Errors in the production of clitics by 20 Italian-speaking agrammatics (adapted from Miceli *et al.* 1989: 462-3)

While only 7.5% of the attested forms (both correct and incorrect) were substituted, 28.44% of the clitics were omitted. Despite the enormous individual differences reported in this study (7% to 100% omissions and 6.2% to 42.9% substitutions), which were attributed to the differences in severity of the agrammatic deficit of the participants, clitic forms were found to be generally damaged. Since the data was treated as a whole, no classification of errors according to clitic type can be established.

Though Lonzi and Luzzatti's (1993) study has adverb distribution as the central topic of examination, the authors also report on omission of pronominal clitics in their study of three agrammatic Italian-speakers. These results coincide with Chinellato's (2004), which documented severe damage in both subject and object clitics in three mild chronic Veneto-speaking agrammatics, who always omitted both forms. A completion task involving the same patients was described in Chinellato (2007), with the results shown in Table 57.

Subject	N=7	Proclitic (affirmative)	Enclitic (interrogative)
	% correct	1.5	2.4
Object	N=7	Proclitic	Enclitic
	% correct	22.5	43.75

Table 57. Correct subject and object clitic production (adapted from Chinellato 2007: 82-83)

Further evidence from Italian is discussed in Rossi (2007). Her analysis of both spontaneous speech and designed tasks involving agrammatics revealed a lower incidence of pronominal clitics than in control subjects. There was a clear tendency to omit these forms in contexts where they were required, though these omissions coexisted with substitutions by the full DP. Despite natural differences in the frequency of production of different clitic types (observed both for impaired and non-impaired populations), agrammatic speakers were found to produce significantly fewer reflexive, direct object and indirect object clitics – the most commonly used forms (in contrast to partitive, locative and impersonal clitics, which were found to appear less frequently) – than controls. These differences are attributed to the case-related features of the former group (e.g. person and number features). A summary of results is shown in Table 58.

	Direct object clitics	***Indirect object clitics***
Declarative sentences	57%	37%
Imperative sentences	55%	22%

Table 58. Correct direct and indirect clitic production by Italian-speaking agrammatics (Rossi 2007)

These results indicate dissociation between direct and indirect object clitics, with the latter more severely impaired. These differences, which proved to be statistically significant, coincide with previous results in the literature as well as observations of spontaneous speech. The author accounts for her findings in terms of feature load since the indirect object clitic is claimed to hold a higher number of case-related features. Another interesting dissociation has to do with error types. While direct object clitics were found to be either omitted or substituted with full NPs, indirect object clitics were only omitted. Substitution with a PP headed by *a* 'to' seemed to be banned. These findings point towards an underlying syntactic deficit.

Evidence confirming this pattern in French agrammatism is provided by Nespoulous *et al.* (1988) who describe the production of clitics in a single case study (Mr. Clermont). Under the epigraph of clitics the authors include preverbal objects and reflexive pronouns without establishing a distinction between them. The relevant comparison is established between subject pronouns and clitics, with the latter harder to produce. While the few errors in subject forms tended to be substitution errors, clitics tended to be omitted. A summary of the results is given in Table 59.

	Expected morphemes	*Correctly Supplied*		*Substitutions*		*Omissions*	
	N	*N*	*%*	*N*	*%*	*N*	*%*
Narrative speech	36	12	33	5	14	19	53
Sentence rep.	20	9	45	1	5	10	50
Reading	40	23	57.5	6	15	11	27.5
Total	96	44	45.8	12	12.5	40	41.7

Table 59. Correct clitic production by a single French-speaking agrammatic (adapted from Nespoulous *et al.* 1988)

Data was extracted from different tasks grouped together in three main blocks. 'Narrative speech' included four narrative tasks where clitics displayed the highest rate of omissions among the obligatory items. 'Sentence repetition' included two extra tasks, while 'Reading' grouped together sentence reading and reading a text aloud. In all cases, clitic production was attested at around the 50% level and below.

4.2.3. Previous studies of Ibero-Romance.

Evidence from Spanish comes from the spontaneous speech of a River Plate Spanish-speaking Broca's aphasic tested by Reznik, Dubrovsky and Maldonado (1995). The authors analyzed the production of pronouns and found a significant number of errors in pronoun use. Only 55.08% of the expected forms (including possessives and personal/reflexive forms) were produced in obligatory contexts. As far as clitic pronouns were concerned, the number of errors reached 56.14%. Table 60 summarizes the results for personal/reflexive forms.

	Personal/Reflexive
Correct	17/46 (36.96%)
Omissions	29 (63.04%)
Substitutions	0 (0%)

Table 60. Personal/Reflexive clitic error production by a River Plate Spanish agrammatic (Reznik, Dubrovsky and Maldonado 1995)

The authors claimed that the results indicate processing difficulties with abstract categories such as clitic pronouns, which were impaired at a rate of 63%. No substitutions were reported, with all 29 errors being instances of omission. The claim is made that only a syntactic deficit can explain these findings since no significant morphological errors were detected.

Gavarró (2008) provides us with evidence from the interpretation of reflexive and non-reflexive clitics in Catalan. In her study of 3rd person forms in a truth conditional task, she documented a dissociation among the two types of elements, with reflexives spared and 3rd person clitics impairmed, especially in ECM contexts.

4.3. Experimental design: Clitic production and comprehension.

In order to examine the production and comprehension of object clitics and reflexive pronouns in Ibero-Romance, two experimental tasks (production and comprehension) were designed and carried out with our sample, i.e. 15 mild agrammatics and their control counterparts together with one moderate agrammatic. The production task consisted of 25 questions formulated by the experimenter to be answered with the aid of pictures illustrating the target answer. Out of the 25 tokens, 13 implied the use of an object clitic and 12 elicited reflexive forms. Due to the observed differences in the

surface position of clitics in Catalan and Spanish on the one hand and Galician on the other, proclitic or enclitic pattern, were tested in the respective languages, as illustrated in (110) and (111).

(110) a.   Què fa el noi amb el cotxe?   (Catalan)
               what do-pres.3rd.sg the teenager with the car
               What is the teenager doing with the car?

Target answer: (El noi) el renta.
               (the teenager) it wash-pres.3rd.sg
               The teenager/He is washing it.

       b.   Qué fai o mozo co coche?   (Galician)
               what do-pres.3rd.sg the teenager with-the car
               What is the teenager doing with the car?

Target answer: (O mozo) lávao.
               (the teenager) wash-pres.3rd.sg-it
               The teenager/He is washing it.

(111) a.   ¿Qué hace la niña con el columpio?   (Spanish)
               what do-pres.3rd.sg the girl with the swing
               What is the girl doing with the swing?

Target answer: (La niña) se columpia.
               (the girl) herself swing-pres.3rd.sg
               The girl/She is swinging.

       b.   Qué fai a nena co bambán?   (Galician)
               what do-pres.3rd.sg the girl with-the swing
               What is the girl doing with the swing?

Target answer: (A nena) bambéase.
   (the girl) swing-pres.3ʳᵈ.sg-herself
   The girl/She is swinging.

Comprehension data was obtained by means of a forced-choice task. Subjects were expected to choose the picture which matched the sentence orally produced by the experimenter, which contained either an object pronoun (13 tokens) or a reflexive form (12 tokens). A slide extracted from the experimental materials has been reproduced in (112).

(112)

In this case, the relevant distinction would be: (113a.) vs. (113b.).

(113) a.   La hermana mayor la suena.   (Spanish)
                 the sister older her blow-pres.3rd.sg
                 The older sister is blowing her (younger) sister's nose.

       b.   La hermana mayor se suena.
                 the sister older herself blow-pres.3rd.sg
                 The older sister is blowing her nose.

Both possibilities were illustrated in the two pictures and it was the subjects' task to identify the correct match in each trial.

4.4. Results

Considering controls first (n = 15), in the production task, only one error out of 375 responses was recorded. This consisted of the production of the expected clitic + the DP it should substitute for – an ill-formed instance of doubling.

(114) *El renta el cotxe.   (A1 – Catalan control 1)
       it wash-pres.3rd.sg the car
        *He is washing it the car.

Target answer: (El noi) el   renta.
                 the teenager it wash-pres.3rd.sg
                 The teenager is washing it.

In the comprehension task, control subjects correctly identified clitic forms 100% of the time for all three languages. These results were taken as evidence of the validity of the experimental design.

As for agrammatics, regarding production results, an analysis per item revealed differences in the level of success of the mild agrammatic sample across experimental items. Graph 20 shows the number of the errors in object clitic production. The number of wrong responses per token ranged from 5 errors (tokens 24 and 25) to 12 errors (token 9). No tokens generated 100% failure or success.

Errors per Item: Object Clitic Production

* The x-axis represents token number in the order they apperared in the experiment.

Graph 20. Number of errors per item in object clitic production

This was also true for the production of reflexive pronouns, as can be seen in Graph 21. In this case, the number of errors is clearly lower than in the case of object clitics and this is reflected in the total number of errors per item, which ranges from 1 error (tokens 14 and 20) to 6 errors (token 16).

Errors per Item: Reflexive Pronoun Production

* The x-axis represents token number in the order they appeared in the experiment.

Graph 21. Number of errors per item in reflexive pronoun production

The overall results of the elicitation task show that object clitics were more severely impaired than reflexive pronouns in the mild agrammatic sample. Despite individual differences, this dissociation was consistent for every patient in the three languages under analysis. In fact, significant differences were found in the production of object clitics vs. reflexive pronouns ($p < 0.01$, $Z = -3.409$) in a Wilcoxon Signed Rank test, while a Mann-Whitney U test revealed no differences across languages. Significant differences were also found in the performance of experimental vs. control subjects ($p < 0.01$) for constructions involving either a reflexive pronoun ($Z =$

-3.988) or a clitic form (Z = -4.903). Individual results are shown in Table 61 and Graphs 22 and 23.

		Object Pronouns		*Reflexive Pronouns*	
		% correct	(correct/total)	% correct	(correct/total)
Catalan	C1	46.15%	(6/13)	83.33%	(10/12)
	C2	7.69%	(1/13)	83.33%	(10/12)
	C3	23.08%	(3/13)	75%	(9/12)
	C4	30.77%	(4/13)	75%	(9/12)
	C5	92.31%	(12/13)	100%	(12/12)
Mean		40%	(26/65)	83.33%	(50/60)
Galician	G6	69.23%	(9/13)	75%	(9/12)
	G7	30.77%	(4/13)	100%	(12/12)
	G8	53.85%	(7/13)	75%	(9/12)
	G9	38.46%	(5/13)	75%	(9/12)
	G10	76.92%	(10/13)	91.67%	(11/12)
Mean		53.85%	(35/65)	83.33%	(50/60)
Spanish	S3	0%	(0/13)	100%	(12/12)
	S5	7,69%	(1/13)	100%	(12/12)
	S6	38.46%	(5/13)	75%	(9/12)
	S7	53.85%	(7/13)	83.33%	(10/12)
	S8	53.85%	(7/13)	83.33%	(10/12)
Mean		30.77%	(20/65)	88.33%	(53/60)
Total		41.54%	(81/195)	85%	(153/180)

Table 61. Production of clitics in agrammatic Ibero-Romance

Graph 22. Production of object clitics in agrammatic Ibero-Romance

Graph 23. Production of reflexive pronouns in agrammatic Ibero-Romance

An analysis of errors according to frequency has been included to provide some insights into the observed deficit (115). The underlying pattern is also illustrated in Graph 24 below.

(115)   Classification of errors in clitic production according to frequency:

1. Repetition of the given DP (53/141)
2. Clitic omission (46/141)
3. Wrong clitic selection (17/141)
4. Wrong answer (14/141)
5. Clitic doubling (5/141)
6. Clitic reduplication (4/141)
    -    Duplication of the reflexive form (3/4)
    -    Reflexive se + DO clitic (1/4)
7. Dks (2/141)

Graph 24. Agrammatic clitic production broken down by type as per (115)

Out of the 141 errors, 82% of the agrammatic responses lacked a clitic. Repetition of DPs instead of the expected substitution with the required pronoun, exemplified in (116), and clitic omission (117) were the most common errors.

(116)   ¿Qué hace el chico con el coche?   (Spanish)
        what do-pres.3rd.sg the teenager with the car
        What is the teenager doing with the car?

Answer: Lava el coche.
        wash-pres.3rd.sg the car
        He is washing the car.

Target answer: Lo lava.
        it wash-pres.3rd.sg
        He is washing it.

(117)   ¿Qué hace la mujer con el pastel?   (Spanish)
        what do-pres.3rd.sg the woman with the cake
        What is the woman doing with the cake?

Answer: Come.
        eat-pres.3rd.sg
        She is eating.

Target answer: Lo come.
        it eat-pres.3rd.sg
        She is eating it.

Errors labelled as wrong answers (n = 14) included unexpected utterances which contained no clitic forms. In addition to the wrong selection of clitics (n = 17), there were also instances where a clitic was produced without deleting the DP it represented. Among the 5 responses of this kind, 3 were produced with the wrong clitic form, thus giving rise to agreement errors in both person and number, as was also observed in some reduplication errors. Out of the two sentences displaying the correct clitic, the example in (118) is especially interesting since it can be analyzed as an instance of right dislocation.

(118)   *El   canvia   el llit. --- C5
        it change-3rd.sg the bed
        *She is changing it the bed.

Target: La   dona   el   fa.
            the woman it make-pres.3rd.sg
            The woman is making it.

Given this interpretation, the sentence would be permissible in Catalan (*El canvia, el llit*). However, the absence of any pause after the verb led us to include it as an instance of clitic doubling, not allowed in any of the languages under investigation.

The final distribution of omission and substitution errors in clitic production in our mild agrammatic sample is illustrated in Graph 25. Responses labelled as wrong answers (n = 14) and 'don't know' responses (n = 2) have been left outside the count despite not including any clitic form together with cases of clitic doubling where the clitic was correctly supplied (n = 2).

Graph 25. Distribution of clitic omissions and substitutions

In contrast to the production task, our findings from the comprehension task indicate lower percentages of error for both object clitics and reflexives. Control subjects performed 100% correctly for both forms. Four subjects in our mild agrammatic sample (C3, G10, S5 and S6) also showed ceiling performance and four more (C1, C4, G9 and S3) made only one error. A close look at the level of success per item revealed that in tokens related to object clitic comprehension, the number of errors ranged from 0 errors for token 22 to 5 errors for token 6 (see Graph 26).

Errors per Item: Object Clitic Comprehension

* The x-axis includes only those tokens with object clitic forms.

Graph 26. Number of errors per item in object clitic comprehension

The number of tokens correctly identified by our mild agrammatic sample increased with reflexive pronouns (see Graph 27). No error was observed in the comprehension of tokens 5, 21 and 23. In fact, there was a general decrease in the number of errors for these pronominal forms which parallels that documented for production. This was clearly manifested by the low error rates (max. of 2 errors per item: item nos. 1, 7, 9 and 15).

Errors per Item: Reflexive Pronoun Comprehension

* The x-axis includes only those tokens with reflexive forms.

Graph 27. Number of errors per item in reflexive pronoun comprehension

The results broken down by language are shown in Table 62.

	Object clitics		Reflexive pronouns	
	% correct	(correct/total)	% correct	(correct/total)
Catalan	92.31%	(60/65)	93.33%	(56/60)
Galician	81.54%	(53/65)	93.33%	(56/60)
Spanish	93.85%	(61/65)	90%	(54/60)
Total	89.23%	(174/195)	92.22%	(166/180)

Table 62. Clitic comprehension in Ibero-Romance agrammatism

With the exception of S7, who made 4 errors with reflexive forms vs. only one in the identification of object clitics, the comprehension of reflexive pronouns was better across individuals and across languages than the comprehension of object clitics. However, due to the small total number of errors, as was the case for control subjects, no significant differences were found in the statistical analysis. Differences across languages were also statistically analyzed. No differences were observed across Ibero-Romance varieties in a Mann-Whitney U Test. Significance was found in the contrast between the performance of experimental vs. control subjects (Mann-Whitney U Test: $p < 0.01$, $Z = -3.205$ for reflexive pronouns, $Z = -3.457$ for clitic pronouns).

As expected, the comparison between production and comprehension also showed statistically significant differences for both object clitics and reflexive pronouns (Wilcoxon Signed Rank test). Nevertheless, in the case of reflexive pronouns, these differences were only significant at the 5% level ($p < 0.05$, $Z = -2.276$) and not at the 1% observed for object clitics ($p < 0.01$, $Z = -3.243$).

In addition to the mild sample we have been discussing so far, clitic production and comprehension in the moderate agrammatic subject were also tested to contrast the two different degrees of severity. In the production task, CM omitted both object clitics and reflexive pronouns 100% of the time. In addition, 8 out of his 25 responses did not include a verbal form and 6 were produced with non-finite verb forms. This reinforces our claim that the appearance of these verb forms is subject to variability, with the severity of the agrammatic deficit a determining factor.

The comprehension results for the moderate agrammatic subject, as in the case of mild agrammatics, indicated a clear dissociation with respect to production

since comprehension was found to be better, especially in the case of reflexive pronouns. Only 1 out of 13 reflexive forms was misinterpreted, while object clitic recognition was found to be more severely compromised, with 8 out 12 forms incorrectly identified.

4.5. Discussion

Our review of the literature consistently shows that clitic elements are impaired in agrammatic aphasia (Nespoulous *et al.* 1988; Miceli *et al.* 1989; Reznik, Dubrovsky and Maldonado 1995; Stavrakaki and Kouvava 2003; Chinellato 2004; Rossi 2007; Nerantzini 2008). Although perhaps not universally (see Chinellato (2004) on Veneto subject and object clitics), a dissociation between subject and object forms has been commonly documented (Nespoulous *et al.* 1988; Stavrakaki and Kouvava 2003). In addition, some clitic types have been found to be better preserved than others, as is the case, for example, of genitive clitics in Greek, which were found to be relatively more spared than object clitics (Stavrakaki and Kouvava 2003), and indirect object clitics in Italian, which were more impaired than direct object clitics (Rossi 2007). Though omission has been found to be the most common error type, these studies also reveal substitution errors.

The results of our first task – elicited clitic production – show that these forms were compromised in agrammatic speech, albeit to a varying degree. A significant dissociation between object clitics and reflexives (consistent across Ibero-Romance varieties) was detected in the mild agrammatic sample. While reflexive forms reached a maximum correctness rate of 85% for all three languages and all subjects scored higher than 75%, object clitics were more severely impaired for the three languages under investigation (with 3 subjects not even reaching 10%). Though the comprehension results showed better scores – with the already mentioned exception of S7 – they replicated the same pattern observed for production[46].

---

[46] As argued in Grodzinsky and Reinhart (1993), due to the requirements for the computation of co-reference, dissociation between non-reflexive and reflexive object clitics is not restricted to language pathologies in adults or children but is also present in different modes of monolingual and bilingual acquisition, be it L1 or L2 (early and late) (Bennati 2007). Examples in the course of L1 acquisition in French and Italian can be found in Müller, Crysmann and Kaiser (1996) or Hamann and Belletti (2006), among others. Object clitics were found to be systematically more problematic than subject clitics and reflexive forms. According to Hamann and Belletti (2006), the degree of difficulty of their

The case of CM, who was unable to produce any clitic form, clearly shows an increase of the deficit in clitic production associated with the degree of severity of agrammatism. The dissociation between non-reflexive and reflexive forms seems to disappear in moderate agrammatics, with both being impaired to the same extent. Nevertheless, the performance of CM in comprehension, much better preserved than production, show again the same dissociation documented for mild subjects, with reflexive forms better preserved than object clitics.

We argue that object clitics are spelled out on a specific functional projection – that we will label F as in Uriagereka (1995) – which is located in upper portions of the syntactic structure. This allows us to expect the high error rates observed in our data. Uriagereka (1995), Raposo (2000) and Raposo and Uriagereka (2005) propose that it is only out of uniformity considerations that the two clitic orderings are claimed to share the same syntactic structure at LF, with F occupying a high position in between the CP and IP layers. Under these assumptions, we would predict that, contrary to what our results show, enclitic forms would be more severely damaged than proclitic elements since the former occupy a higher structural position at PF. Though it may indeed by the general tendency, this prediction is not fully validated by our Ibero-Romance sample, which showed no significant differences across languages regarding the pro-clitic/enclitic contrast. To explain this data on structural grounds, we must postulate that the two clitic forms share a single structural position, since otherwise dissociations would be predicted.

With respect to reflexive forms, contrary to what was expected after the observation of direct object clitics, and despite the fact that arguably they pattern together with the former as far as their position relative to the verb is concerned, they yielded an unexpected significantly lower number of errors. Assuming a model where both clitic forms occupy the same structural position, a deficit in the projection of the syntactic tree would not appear to provide sufficient explanation for our data.

Thus, the deletion of an argumental position with reflexive forms seems to be crucial to account for the observed dissociation. Arguably, in Minimalist terms, the reflexive constructions under analysis can be seen as containing a single DP with two

---

computation underlies the delay in acquisition. For Crysmann and Müller (2000), the argumental structure of the sentences containing the two forms is at the root of this dissociation.

identical copies and two thematic roles (in line with Hornstein 1999, 2001). Given that both copies are valuated for case, the second copy must be underspecified (containing only a person phi-feature (Bonet 1995)), which would enable it to appear as an underspecified argument (Alboiu, Barrie and Frigeni 2004). Hence, constructions involving object clitics and constructions involving reflexive forms are not equivalent in terms of number of arguments.

But differences between reflexive pronouns and object clitics are not restricted to the number of arguments. According to Uriagereka (1995), clitics need to be referentially indexed with a *pro*. The dissociation observed in our data may also be justified in terms of the additional presence of this phonologically null element in the experimental tokens eliciting non-reflexive forms, which may be prejudicing the production of one clitic form over the other. In fact, the preference for overt material vs. phonetically unrealized elements has already been documented in agrammatic patients for subject clitics (Reznik, Dubrovsky and Maldonado 2005). In their study of subject pronouns in River Plate Spanish, the authors provide evidence of an agrammatic subject who overused subject personal pronouns in subject position (40.54% of the subjects were realized as personal pronouns out of 43.02% of the sentences with a lexicalized subject), a pro-drop language. Since no pragmatic reason had forced their appearance, the authors claimed that the subject was experiencing difficulties processing non-lexical elements. Reznik, Dubrovsky and Maldonado (2005) thus claim that empty elements result in the production of erroneous utterances or the substitution of null elements with their overt counterpart, i.e. since non-overt forms are harder to compute, they are avoided. However, such a claim can be dangerous since syntactic representations are plentiful in phonologically unrealized elements.

In addition to the reflexive/non-reflexive contrast seen in our results, a significant difference was found for the distinction between production and comprehension across populations and languages, as we have already noted. Though the nature of the task (a forced-choice task) may have favoured patients' performance, the low percentages of errors observed indicate that comprehension skills were better preserved than production skills in all patients for the three languages (Catalan, Galician and Spanish), independent of the degree of severity of

the agrammatic deficit. The mild sample showed almost entirely spared clitic comprehension. Yet the general pattern was the same as that observed in production, with reflexive forms faring better than object clitics. In terms of error types, the main error was the repetition of the given DP instead of replacing it with the expected clitic. Though in isolation these sentences may be perfectly grammatical, in the context they were uttered they were unfelicitious.

Given this picture and in order to account for the full array of our results for Ibero-Romance clitic production, we claim that the high structural portions of the syntactic tree involved in the production of clitics (relatively higher than the portions devoted to verb morphology) make them susceptible to impairment in agrammatic populations. *F* position is the same for both enclitic and proclitic pronouns, be they reflexive in nature or not. In addition to structural considerations, the nature of the elements entering the derivation were also found to play a role in the level of success of agrammatic aphasics, thus explaining differences between object clitics and reflexive pronouns.

5. CONCLUSION.

As we have seen throughout this chapter, the IP-field of Ibero-Romance agrammatics is selectively impaired. The pattern of damage, which can be circumscribed to syntactic factors, has been claimed to be explicable in structural terms. So far, we have assumed the TPH and sentential structure proposed by Cartographical approaches to language (Belletti (ed.) 2004; Cinque 1999, (ed.) 2002; Rizzi (ed.) 2004) and provided evidence for the inner structure of the IP-field based on agrammatic Ibero-Romance.

Regarding the functional categories under examination, no previous data are available on Catalan and Galician agrammatism with the exception of some studies such as Martínez-Ferreiro (2003), Diego Balaguer *et al.* (2004) and Gavarró and Martínez-Ferreiro (2007), which explore all verb morphology. The number of observations is not significantly higher in the literature on Spanish, where results are scarce and sometimes contradictory. This is the case, for example, for negation, mainly in Bastiaanse *et al.* (2002), where negation was found to be impaired, in

contradiction with our own results. These differences may be attributed to different degrees in the severity of the patients under examination or to differences in experimental design. However, they would not enter into contradiction with the TPH since this hypothesis only predicts that Neg will be less impaired than T or C but does not imply that it is necessarily preserved.

The same lack of consistency can be also documented for verbal morphology and finiteness omission as analyzed in the following studies: Benedet, Christiansen and Goodglass (1998), Martínez-Ferreiro (2003), Moreno-Torres Sánchez (2005) and Gavarró and Martínez-Ferreiro (2007) vs. de Diego Balaguer *et al.* (2004). Despite the cross-linguistically agreed dissociation observed between tense and agreement morphology, with the latter favored over the former, de Diego Balaguer *et al.* (2004) documents the opposite pattern, with tense better preserved than agreement. However, the most striking differences are documented in the case of L2, while in L1 the number of morphological errors is very small for both categories.

The other functional elements under investigation in the present research, namely auxiliary verbs and clitic pronouns, have passed largely unnoticed by researchers in the field of agrammatism in Spanish, with the exception of Benedet *et al.*'s (1998) study on auxiliary verb production, which reports impairment rates of about 50%, and Reznik, Dubrovsky and Maldonado's (1995) work on clitics, which also found them to be compromised.

Given this state of affairs, it is one of our aims to characterize the overall pattern of relative impairment/unimpairment of functional categories in Ibero-Romance agrammatic populations. A summary of our findings, including the data from our mild and moderate samples, is shown below in Tables 63 and 64 and plotted in Graphs 28 and 29, which include only production data.

Prod.	Category	% errors	Main error type	Task
	Negation	2.53%	Omissions	Elicited production
	Agreement	2.46%	Substitutions	Repetition
	Tense	14.56%	Substitutions	Repetition
	Temporal Aux.	18.47%	Omissions	Repetition
	Modals and Aspectuals	43.26%	Omissions	Repetition
	Clitics	58.43%	Omissions	Elicited production
Compr.	Category	% errors	Main error type	Task
	Tense	16%		Sentence-picture matching
	Clitics	9.33%		Sentence-picture matching

Table 63. Summary of findings: mild agrammatics

Ibero-Romance Mild Agrammatics: The IP-field

Negation 2,53 — Agreement 2,46 — Tense 14,56 — Temporal Aux. 18,47 — Modals & Aspectuals 43,26 — Object clitics / Clitics 58,46 / 36,73

*The dotted blue line indicates combined results for object clitics and reflexive forms.

Graph 28. Ibero-Romance agrammatic IP-field: Production errors by mild agrammatic subjects

Prod.	*Category*	*% errors*	*Main error type*	*Task*
	Negation	20%	*Don't know r.*	Elicited production
	Agreement	88%	MV omissions	Repetition
	Tense	88%	MV omissions	Repetition
	Temporal Aux.	84.61%	MV omissions	Repetition
	Modals and Aspectuals	100%	MV omissions	Repetition
	Clitics	100%	Omissions	Elicited production
Compr.	*Category*	*% errors*	*Main error type*	*Task*
	Tense	52%		Sentence-picture matching
	Clitics	36%		Sentence-picture matching

Table 64. Summary of findings: moderate agrammatic

Graph 29. Ibero-Romance agrammatic IP-field: Production errors by a moderate agrammatic subject

In Graph 30, the production results for the mild agrammatic sample have been broken down according to language. The results show a clear similitude among Ibero-Romance varieties, which was confirmed by statistical tests. This can be attributed to the similarity in the grammatical system underlying the three languages.

Graph 30. Ibero-Romance mild agrammatic production errors, broken down by language

As illustrated in Graph 30, our results show that there is an increasing percentage of errors as a function of the structural position an element occupies in the syntactic tree, with relatively low functional categories better preserved than higher ones. Though significant differences were found between agrammatics and controls in all the experimental tasks, we observe that our agrammatic subjects have almost completely spared abilities for sentential negation and agreement but yielded high error rates for modals, and aspectuals, and object clitics. Regarding negation, our results consistently show that it appears better preserved than tense in the three languages under investigation, which would lead us to claim that it is located in lower portions of the tree (getting its surface position via movement as a cliticized element onto the verb). Unimpairment in agreement morphology prevented us from finding a pattern of differences across persons like that documented by Chinellato (2002, 2004).

The individual results for the different language groups are represented in Graphs 31, 32 and 33. With a very small number of exceptions (see C5 or G5), inter-subject variation respects the general tendency, as we would expect from a structural account.

Graph 31. Catalan agrammatic errors in the IP-field

Graph 32. Galician agrammatic errors in the IP-field

Graph 33. Spanish agrammatic errors in the IP-field

Despite the match with the predictions of the TPH, considering theoretical issues from the perspective that the empirical field of agrammatism grants us, we

propose a modification of the original assumptions of Friedmann (1994, 1998 and much subsequent work) regarding the nature of agreement. Following Minimalist proposals and the proposal in Gavarró and Martínez-Ferreiro (2007), agreement is seen as an operation taking place in a position lower than TP(ast). If TP(ast) is regarded as the pruning site that accounts for the observed tense errors documented in this chapter, the operation of agreement would be expected to be completed without interferences. This is exactly what our results reveal: tense-agreement is dissociated, with spared agreement and tense impairment subject to variability. Since the deficit seems to be limited to functional categories, the operation of agree is expected to be spared, as indeed it is.

If TP is seen as an array of functional nodes encoding tense, mood and aspect, as proposed by Cinque (1999), an advantage of this model is that it provides a more accurate hierarchy for the location of pruning-sites in agrammatic deficits. So far our data is consistent with a structural account along the following lines:

(119) ModEpistemic > AspDurative > AspTerminative > ModPermission/ability > ModObligation > AspInceptive > AspRepetitive > TP(ast) – Temporal Auxiliaries > Neg

(Adapted from Cinque (2006))

Regarding production, tense and temporal auxiliaries are found to be damaged to the same extent and in all cases better preserved than modals or aspectuals – among which no differences were detected – indicating relatively lower position of the former with respect to the latter. Left for further research is the assessment of agrammatics' performance on the different modal and aspectual heads as well as adverbs in Cinque's (2006) hierarchy through a balanced task. One possibility is that pruning affects whole chunks of the tree instead of independent nodes. This may have some resemblance to Chinellato's 'Field-Damage Hypothesis' (FDH), according to which it is a complete functional domain and not independent functional nodes that is susceptible to impairment in agrammatic aphasia. However, contrary to this approach, we claim that specific damage to a portion of the syntactic representation will have an effect on the hierarchically higher nodes. The FDH have no implications for either

higher or lower fields, failing as it does to predict the unimpairment/impairment patterns documented along this dissertation.

Despite deficits in the TP-field, non-finite forms and omissions of the main verb are almost nonexistent for our mild agrammatic sample. Sensitivity to verb finiteness has been found to be preserved in the three languages, despite the occurrence of examples of root forms in Galician, which can be justified in independent terms as substitution errors due to the existence of the Inflected infinitive in the verbal paradigm of this language. The ban on non-finite forms in substitution for finite ones contradicts Friedmann and Grodzinsky's (2000: 89) claim that tense substitutions in Romance are 'mainly to the non-finite forms: participles and infinitives'.

In fact, for finiteness omission, we have documented a systematic relation between position and clinical severity. Both substitutions by non-finite forms and main verb omissions have been found to be directly related with the degree of severity in agrammatism, and while they are both almost nonexistent in our mild agrammatic sample, they are prominent in the case of CM, our Catalan moderate agrammatic. A graph illustrating the contrast between populations has been included below as Graph 34.

Graph 34. Degrees of severity in production errors

Leaving purely structural considerations aside for the moment, it is important to emphasize the dissociation found between object and reflexive clitic production

(damaged to the same extent independent of their enclitic vs. pro-clitic position). As we have already discussed, while object clitics were found to be severely impaired in our mild agrammatic sample, the degree of impairment of reflexive forms was relatively lower. Since, arguably, both forms share structural position, it must be concluded that there are other factors which lead to the impoverishment of the patients' output. Differences in the level of success can be attributed to two main factors:

a) Number of arguments: Constructions involving object clitics and constructions involving reflexive forms are not equivalent in terms of number of arguments (in line with Hornstein 1999, 2001).

b) Presence vs. absence of a *pro* element: a *pro* element is required in the case of non-reflexive object clitics whereas such a phonologically null element is absent in the case of reflexive forms (Uriagereka 1995).

In both cases, increasing complexity would facilitate the collapse of the derivation in the case of non-reflexive forms and favour the correct production of reflexive pronouns, as attested in our data.

To end up, in this section we have introduced various results from our comprehension experiments. Though our data are admittedly limited and large-scale testing is still needed, the results for tense and clitic comprehension give us some important clues as to the degree of impairment of this modality. In both cases, despite impairment with respect to adult non-pathological subjects, the percentages of correct responses by agrammatics are higher than those we report for production. Nevertheless, error patterns follow the same tendency as in production. This has implications for the picture of agrammatism offered to date in studies like Grodzinsky (1990) or Friedmann and Grodzinsky (1997), where production is characterized in a way completely different from comprehension.

III. CP-FIELD

Chapter III focuses on the examination of several constructions whose derivations involve the highest projections of the syntactic representation, namely the CP-field, and explores its structure based on findings with agrammatic data. As has been widely documented, the production of questions (both total and partial) and embeddings constitute an area of great difficulty for agrammatic subjects. This is not surprising given that wh-question words (e.g. *who*, *where*, etc.) and complementizers require the participation of the left periphery which, as we assume throughout this dissertation, is harder to access for patients with anterior lesions in the left hemisphere (see Saffran, Berndt and Schwartz 1989; Menn and Obler 1990; Friedmann and Grodzinsky 2000; Friedmann 2001, 2002; Thompson *et al.* 1996).

Since Bresnan's (1970) proposal according to which Comp is part of the syntactic representation of sentences, a great amount of debate has arisen about the structure of CP and how different elements are accommodated within it. In Friedmann and Grodzinsky's (1997) original TPH formulation, the relevant structure for the representation of these constructions is that reproduced in (120) assumed from

basic X-bar theory: a specifier position which accommodates wh-words and a head position for the complementizer.

(120)   *Friedmann and Grodzinsky's (1997) CP node*

```
                          CP
                         /  \
                 (wh-question)  C'
                               /  \
                              C    TP
                      (complementizer)
```

This proposal follows Chomsky and Lasnik's (1977) rule 'Move wh-phrase' which places the wh-phrase to the left of the complementizer. However, as we have already discussed in the previous chapter for the IP-field, in this dissertation we follow the Cartographical approaches to the tree structure and claim that CP is not a single node but rather a complex array of functional projections including specific positions for the different elements accommodated in the left peripheral area (e.g. topic or focus) (Rizzi 1997, 2002). Such a move will allow us to distinguish the benefits of the adoption of a more articulated structure relative to non-Cartographical approaches.

With this preliminary picture in mind and in order to give a complete description of the CP-field, both question production and comprehension and subject relative clause production will be examined with our sample of Ibero-Romance agrammatic subjects by means of three experimental tasks: two tasks of elicited production (questions and embeddings) and a sentence-picture matching task (designed to check both wh-question and wh-word comprehension). Yes/no questions and wh-questions are analyzed together in section 1 since, due to language-specific properties, both question types are claimed to require the participation of higher parts of the syntactic tree in Ibero-Romance. The production of embeddings is discussed in 2. The chapter ends with a summary of findings together with the main conclusions derived from our Ibero-Romance data (section 3).

1. WH- vs. Y/N QUESTION PRODUCTION

The Ibero-Romance varieties under examination show two main patterns of direct question formation: wh- questions and yes/no questions. Wh- questions ask for specific information while yes/no questions (also called total questions) require either an affirmative or a negative answer. In addition to these question types, these Ibero-Romance varieties also permit disjunctive interrogatives. This type of question, illustrated in (121), which request the selection of an alternative from among two or more possibilities, will not be tested in this dissertation.

> (121) ¿Quieres <u>té</u> o <u>café</u>?   Té.   (Spanish)
>   *Do you want some tea or coffee? Tea.*

Based on our findings in the IP-field and starting from the assumption that agrammatic subjects retain the notion of question (Friedmann and Grodzinsky 2000; Friedmann 2002), difficulties found in the production of interrogative sentences and comprehension of wh-questions and wh-words by agrammatic patients is analyzed from a structural perspective, as derived from restrictions in the accessibility to the higher nodes of the syntactic tree.

1.1. WH- question formation in Ibero-Romance

Following Rizzi's (1996) Wh- Criterion (122), we assume the overt movement of an interrogative constituent to the left periphery as one of the central properties for the derivation of all wh-questions in Ibero-Romance (Torrego 1984; Zagona 2002).

> (122) *The Wh- Criterion*
>   a. A wh- operator must be in Spec-head configuration with $X^0_{[+Wh]}$.
>   b. An $X^0_{[+Wh]}$ must be in a Spec-head configuration with a wh-operator.
>
>   (Rizzi 1996:64)

Examples of both direct and indirect wh-question formation in Spanish are reproduced below:

> (123) a. *Qué* le pasa?   (Spanish)
>   '*What*'s the matter with him/her?'

b. Nunca me cuenta *qué* le pasa.
'He/She never tells me *what*'s the matter with him/her.'

Traditionally, clause-initial wh-phrases have been hypothesized to occupy various positions, namely SpecCP (Brucart 1993, Zagona 2002), SpecIP (Goodall 1991) or a low position in the CP area (Rivero 1978), seen in this study as a recursive node that can be projected more than once under requirement. According to Chomsky (1981, 1986, 1992), the wh-operator moves from its original VP internal position and occupies an A-bar position, SpecCP, while C^0 hosts a [+wh] head (Chomsky 1981, 1986, 1992). Evidence from the position of first-merge of the wh-constituent is provided by examples of wh- in situ such as 'echo questions', as illustrated in (124).

(123)   Speaker 1: Esperaba una oportunidad mejor.   (Spanish)
                     He/She was waiting for a better opportunity.
          Speaker 2: ¿Esperaba *QUÉ*?
                     She was waiting for *WHAT*?

In contrast, some theoretical approaches place interrogative markers in a position outside the CP-field, namely the relatively lower IP-field. For Goodall (1991), SpecIP would be the landing position for wh-movement (125).

(125)   [$_{IP}$ Wh-phrase [$_{INF}$ V+INFL [$_{VP}$ Subject V'...]]]
                              (Zagona 2002: 248)

The same is assumed for some Romance varieties (Barbosa 2001). Based on their studies of Catalan and Spanish, Vallduví (1992), Solà (1992) and Zubizarreta (1998), among others, have claimed that the lack of asymmetries between questions and declaratives regarding the distribution of subjects – which have to appear post-verbally (see (125a) from Rivero (Barbosa 2001)) – may be taken as an indicator that the wh-element rests in Spec-IP.

(126)   a. Qué ha (*Juan) leído (Juan)?   (Spanish)
               'What has J. read J.?'
                    (Barbosa 2001: 26-27)

    b. Ha (*Juan) leído (Juan)
       'Has J. read J.'

Following Chomsky (1977), various authors (see Rivero (1978) for an example) claim that CP is a recursive node and place the wh- element in a low specifier of CP. Evidence from the analysis of Focus phrases – indicating movement to a higher position – lead to the proposal of an intermediate node between CP and IP where wh-phrases would land (127).

(127)   ... [$_{CP}$ [$_C$^{0} que] [$_{XP}$ para quién $_X$^{0} [$_{IP}$ (Subject) [V + INFL]...]]]
                  that   for whom
                                    (Zagona 2002: 248)

This landing site has been claimed to be FocP based on the fact that wh-phrases and focus phrases cannot be fronted in the same clause (128) and the relative order between topic and wh-operators is restricted (129).

(128)   a. *¿Cuándo las MANZANAS compraron?   (Spanish)
         'When the apples they bought?'

       b. * ¿Las MANZANAS cuándo compraron?
         'The apples when they bought?'
                      (Zagona 2002: 251)

(129)   a. Il premio Nobel, a chi lo daranno?   (Italian)
         the prize N. to whom it gave.fut.3rd.pl

       b. *A chi, il premio Nobel, lo daranno?
         to whom the prize N. it gave.fut.3rd.pl
         'To whom will they give the Nobel Prize?'
                      (Barbosa 2001: 25)

Additionally, wh-constituents appear to the right of complementizers in certain embedded clauses. The example in (130) from Brucart (1993) provides evidence for the need for multiple positions in the CP area.

(130)   Luis dijo que cuándo vendrías.
        L. say- pret.3rd.sg that when come- cond.2nd.sg
        *Luis said that when would you come.

The indirect interrogative in (130) includes both a complementizer *que* and an interrogative pronoun *cuándo*. Since the complementizer occupies C^0 and the wh-element is perhaps the specifier of CP, a construction showing the complementizer to the left of the wh- constituent would be problematic.

In pre-Minimalist and pre-Cartographical terms, two proposals to account for cases of doubly filled Comp, also possible in Catalan and Galician, are those by Plann (1982) and Suñer (1986). Plann (1982) attributes the capacity of recursion to the CP projection and therefore proposes a duplication of this functional node. Suñer (1986) also relies on recursion to account for these data but proposes a double Spec position. This proposal contradicts Fuki and Speas's (1987) claim that every functional projection has a single specifier position. The underlying idea of recursion is common to both proposals.

Rizzi's (2002) CP-field includes a whole set of functional nodes to cover all the phenomena related to the left periphery. In fact, the author claims that C is a structural zone delimited by Force (expression of clausal type) and Fin (finiteness agreement with IP) (Rizzi 1997, 2002). The lexicalization of elements in this system is subject to language variation (Rizzi 2005). The relevant structure is that in (131).

(131)   Force > (*Top) > **Int** > (*Top) > **Focus** > (*Mod) > (*Top) > Fin

        - Force: expression of clausal type.
        - (*Top): optional positions for topicalization.
        - Int: interrogative.
        - Focus: emphasized elements.
        - (*Mod): modifier, a position where adverbs can appear.
        - Fin: finiteness agreement with IP.

As with the IP-field, the Cartographical approach, developed during the last decade by Rizzi, Cinque, Belletti and collaborators, provides researchers with theoretical tools to place the material relevant for our analysis in this section. We may assume that wh-elements in main questions move to either the specifier of Foc following Rizzi (2001) or a Q- position immediately lower than Foc following Rizzi

(2006) from its original position which, according to Cinque (1999), would be the Specifier of a functional head of the inflectional system.

Nevertheless, an important asymmetry within wh-elements can be found in the case of some non-argumental (adjunct) wh- phrases. A close look at the case of *why* clearly shows these asymmetries among wh-question types. According to Rizzi's (1990, 2001) proposals, the interrogative element *why* is base-generated in Comp rather than moved from a lower position. Direct evidence for this claim can be found in the contrast between *pourquoi* and other wh- elements. While the latter can appear in situ, *pourquoi* cannot, as shown in example (132). While in (132a) the wh-element can appear in situ, in (132b) there is no such possibility. Further evidence of the distinction is provided by the impossibility of stylistic inversion (132d), which is allowed with other wh-interrogatives, at least in colloquial registers (132c).

(132)   a.   *Comment* a-t-il parlé ?   (French)
                 'How did he speak?'

                 Il a parlé *comment*?
                 'He spoke how?'

       b.   *Pourquoi* a-t-il parlé ?
                 'Why did he speak?'

                 *?Il a parlé *pourquoi* ?
                 'He spoke why?'

       c.   *Quand* a parlé Jean?
                 'When did Jean speak?'

                 Quand Jean a parlé?
                 'When did Jean speak?'

       d.   *Pourquoi* Jean a parlé ?
                 'Why did speak Jean?'

                 *?*Pourquoi* a parlé Jean?
                 'Why spoke Jean?'

                 (Adapted from Rizzi 1990: 47)

Rizzi (1990) accounts for these data in terms of the Empty Category Principle according to which traces must be properly governed (Chomsky 1981). In (131b) *pourquoi* cannot be properly head-governed postverbally by any inflectional projection. Since it does not have any IP-internal position, it manifests [+Wh-] in C. This proposal implies, as the author claims, that no trace will be found within the clause in the case of *pourquoi* (as opposed to *comment*).

In contrast to other wh-elements, *why* will occupy a higher position in the articulated CP-field represented in (131), namely the specifier of INT, where it will be base-generated (Rizzi 2001, 2006). This explains co-ocurrence with focus in main and embedded clauses as seen for Italian in (133) and the absence of I to C movement – not required since INT is intrinsically endowed with the wh-feature.

(133)   a. Mi domando perché QUESTO avremmo dovuto dirgli,   (Italian)
            non qualcos'altro.
            'I wonder why THIS we should have said to him,
            not something else'

        b. Non so come mai IL MIO LIBRO gli ha dato, non il tuo
            'I don't know how come MY BOOK you gave to him, not yours'

                                                                    (Rizzi 2001)

According to this proposal, the contrast between movement and base-generation of the interrogative operator and the presence vs. absence of traces related to wh- elements would be at the root of the dissociation among wh-elements.

Two further issues to be discussed are the relative position of both the subject and verb in wh-questions. As illustrated for Spanish in example (134), there are restrictions on the position the subject may occupy in this type of questions.

(134)   a. ¿Con quién   vendrá Juan hoy?   (Spanish)
            with whom come-fut.3rd.sg J. today

        b. * ¿Con quién Juan vendrá hoy?
            with whom J. come-fut.3rd.sg today

        'With whom will John come today?'

                                                                    (Zagona 2002: 243)

In particular, DPs and strong pronouns cannot intervene between wh-phrases and verbs (135a,b) just as they cannot occupy a position between an auxiliary and the main verb (136a,b) (Cardinaletti 2007: 58).

(134)   a. * Chi Gianni ha invitato?   (Italian/Spanish)
            * ¿Quién Juan ha invitado?
            'Who John has invited?'

        b. * Chi lui ha invitato?
            * ¿Quién él ha invitado?
            'Who he has invited?'

(135)   a. * Chi ha Gianni invitato?   (Italian/Spanish)
            * ¿Quién ha Juan invitado?
            'Who has John invited?'

        b. * Chi ha lui invitato?
            * ¿Quién ha él invitado?
            'Who has he invited?'

According to Cardinaletti (2007), the subject must occupy a position either to the right or to the left of both wh-phrase and verb. This generalization stands for the three languages under investigation, namely Catalan, Galician and Spanish, as well as for Italian and French, among others. Nevertheless, there is an important exception in the case of certain non-argumental (adjunct) wh- phrases such as *why*, where both pre- and post- verbal subjects may be accepted as grammatical, at least in Galician and Spanish (137).

(137)   a. ¿Por qué Juan dice eso?   (Spanish)
            for what J. say-pres.3rd.sg that

        b. ¿Por qué dice Juan eso?
            for what say-pres.3rd.sg J. that

            'Why does John say that?'
                        (Zagona 2002: 51)

In fact, not only the position of wh-elements seems subject to variation across different forms, since there appears to be a general argument/adjunct asymmetry with

respect to V-fronting and its obligatoriness in interrogatives in Ibero-Romance (138) (see Torrego (1984) for a detailed account on Spanish data).

(138)   ¿En qué medida la constitución ha contribuido a eso?   (Spanish)
         'To what extent has the constitution contributed to that?'

                                        (Torrego 1984: 106)

Leaving aside the case of *why*, the apparent subject-verb inversion observed with most wh-operators has been traditionally claimed to follow from the presence of the wh-word or its trace in Comp to fulfill the Wh-criterion. To derive the order VS, the subject must occupy a lower position than the verb. This is obtained, according to Torrego (1984) and Suñer (1994), who follow Rizzi (1982), by having the subject right-adjoined to the VP. In fact, the position of postverbal subjects in Romance has been a widely debated topic in the literature. While some authors claim that it may remain in SpecVP, where it is base-generated (Costa 2000), others argue that subjects must move from this position and appear either as right-dislocated elements – substituting into the specifier of a topic phrase – (Villalba 2000) or in the specifier of a specific projection higher than VP (Ordoñez 2007).

Following Cartographical approaches, Belletti (2004) proposes a clause-internal periphery according to which the postverbal subject appears in a very low position within the structure of the sentence, more specifically between the IP-field and the VP-field. The position of low adverbs[47] (Cinque 1999) with respect to subjects seems to favor this analysis (see 139).

(139)   Capirà   **tutto**   Maria   (Italian)
         understand-fut.3rd.sg everything M.
         Will Mary understand everything?

                                (From Belletti 2004: 19)

---

[47] Cinque's (1999) hierarchy of functional categories distinguishes among two adverb types: low-ranked adverbs such as manner or locative adverbials linked to the VP-area, and high-level adverbs such as sentence adverbs linked to the IP-field. Low adverbs are claimed to be base-generated close to the verb they modify and inside the scope of high adverbs.

Since the subject remaining in its original position internal to the VP may be seen as problematic for case assignment, the (nominative) subject is claimed to occupy a low Topic position postulated to deal with differences in informational content between preverbal and postverbal subjects in wh-interrogatives (see (140)). This clause-internal periphery is located in the lower area of the IP-field (what we call TP-field in this dissertation).

(140)   *The clause-internal periphery*

```
        TopP
       /\
      Focus P
         /\
        Top P
           /\
            vP
```

The subject generated in VP, in accordance with the VP-internal subject hypothesis (Koopman and Sportiche 1991), moves to reach its surface position, which may be pre- or post-verbal depending on the construction[48].

Going back to example (139), not only subject position has been subject to debate in traditional GB-theory and later Cartographical approaches. Controversy is also found with respect to the movement of the verb to the CP-domain. While some authors argue for V-raising to the left periphery (Rizzi 1997, 2001), others claim that lexical verbs remain in the IP-field (Suñer 1994).

Traditional accounts highlight across-language variation in the acceptability of the intervention of certain phrases between the wh-word and the verb. This is attributed to the position of the verb in the syntactic representation (Suñer 1994), which is claimed to vary according to the inflectional characteristics of a given language. Catalan, Galician and Spanish are languages with full inflectional paradigms that accept the appearance of particular phrases between the wh-element

---

[48] This claim contradicts Torrego (1984), Zubizarreta (1998) and Gutiérrez-Bravo (2002), who postulate that in wh-questions the subject remains in VP-internal position. Since for these authors wh-phrases in Spanish are rooted in TP instead of CP, the position of SpecTP would be already occupied by the wh-operator. This would force the subject to remain in VP since they assume no intermediate node between CP and TP. According to Costa (2004), SpecVP is suitable for the subject to surface since checking requirements can be satisfied in that position under Agree (Chomsky 2000).

and the verb, namely negation, frequency adverbs and aspectual adverbs such as *still* or *never* (141). This marks a difference with respect to English.

(141) a.   Quén *non* chegou a tempo?   (Galician)
             who not arrive-pret.3rd.sg on time
             Who did not arrive on time?

       b.   Qué traballo *aínda* non remataches?
             which job still not finish-pret.2nd.sg
             Which job haven't you finished yet?

       c.   A cal *nunca* chegaches a coñecer?
             to whom never arrive-pret.2nd.sg to know
             Which one did you never get to know?

According to Suñer's (1994) proposal, which is based on Spanish data, the position of the inverted verb in Ibero-Romance is assumed to be lower than in the case of English where, with the exception of subject questions, it is traditionally claimed to occupy C position. INFL-to-C movement of the verb cannot be postulated for Ibero-Romance due to the appearance of pre-verbal subjects and pre-verbal adverbs in some contexts [49]. The resulting syntactic representation according to Suñer's (1994) proposal for both inverted and non-inverted questions is shown in (142).

---

[49] Contrary to Torrego (1984), who claims (following Chomsky 1986) that the verb moves higher to the left periphery - the head of Comp in the terminology used - instead of remaining in the TP-field.

(142)

```
          CP
         /  \
       Wh-   C'
            /  \
           C    IP
               /  \
          Subj/pro  I'
                   /  \
                  V    VP
                      /  \
              t_Subj/Subj  V'
                          /  \
                        t_V   DO
```

Since, according to Cinque (1999), adverbs are not adjoined to the syntactic representation but occupy the Spec position of dedicated functional nodes in the CP/IP-field, and considering the optionality of verb placement with respect to some adverbs (143), wh-phrases and verbs must occupy different portions of the syntactic structure (Cardinaletti 2007). The verb must move to some of the dedicated head positions in the IP-field to check inflectional morphology but not to the CP-field (as is the case for the majority of pro-drop languages).

(143) a. * Che cosa di nuovo hanno fatto / fanno?   (Italian)
           'What again [they] have done / do?'

       b. Cosa forse potevamo evitare?
          'What perhaps [we] could avoid?'

                    (Cardinaletti 2007: 4)

Regarding the position of the verb and the subject, we will follow Suñer's (1994) and Cardinaletti's (2007) proposal in that the verb does not move to the CP-area in wh- interrogatives in Ibero-Romance but remains in its dedicated position in the IP-field. Additionally, as far as the position of the inverted subject is concerned, in order to be consistent with our assumption of a rich array of projections for TP, we

assume Belletti's (2004) clause-internal periphery – located in the lower portion of the IP-field – in order to accommodate the post-verbal subject.

Two further characteristics of Ibero-Romance wh- questions are the allowance of multiple questions – with only one of the wh-words moved from its base-generation position – and the disallowance of preposition stranding. The formation of multiple interrogatives is perfectly grammatical in Catalan, Galician or Spanish. In this kind of structure, one of the interrogative phrases appears clause-initially and the rest remain in situ (144).

(144) ¿Qué libro   le   mandó   a quién?   (Spanish)
       Which book CL (Dat.) send-pret.3rd.sg to whom
       Which book did he/she send to whom?

                                    (Zagona 2002: 19)

In contrast to languages such as English, preposition stranding is not allowed in Ibero-Romance since prepositional groups are necessarily pied-piped with the wh-word (145).

(145) a.   *En qué* andas a pensar?   (Galician)
            in what walk-pres.2nd.sg to think-INF

       b.   *Qué andas a pensar en?
            what walk-pres.2nd.sg to think-INF en

            'What are you thinking about?'

1.2. Yes/No-question formation in Ibero-Romance

Yes/no interrogatives in Ibero-Romance differ from wh-interrogatives in many respects. First, inversion is not a requisite in the case of yes/no interrogatives (Ordoñez 1996; Wheeler, Yates and Dols 1999) (146).

(146) a. ¿Está   María en casa?   (Spanish)
          be-pres.3rd.sg M. at home

       b. ¿María está   en casa?
          M. be-pres.3rd.sg at home

          'Is Mary at home?'

                                    (Zagona 2002: 50)

As shown by Torrego (1984), in the absence of wh-movement the obligatory inversion does not apply and yes/no questions in Ibero-Romance can therefore be constructed either simply by means of intonation (SVO) (146b) or by changing constituent order (VSO/VOS) (146a) (Payrató 2002; Suñer 1994; Zagona 2002). Nevertheless, in Spanish, in the cases of overt lexical subjects, the SVO order is a marked option. Since they are based on a previous declarative, they present presupposed content, i.e. old information. By contrast, the VSO order constitutes the unmarked option (Escandell-Vidal 1999). This distinction may account for examples such as those seen in (147).

(147)   a. ¿Ha hecho Juan el más mínimo esfuerzo por ayudarme?
        b. *¿Juan ha hecho el más mínimo esfuerzo por ayudarme?
            'Has John made the slightest effort to help me?'
                                            (Escandell-Vidal 1999: 3953)

While (147a) allows for either a positive or a negative answer, (147b) points to a negative one, being thus ungrammatical as a request for new information. In Galician, despite the fact that postverbal subjects are more common, the distinction is not so clear, with both options allowed as a request for new information. Regarding Catalan, in contrast to Galician and Spanish, VOS and not VSO yes/no interrogatives correspond to the grammatical form. This means that, despite similarities, there is no exact match among Ibero-Romance varieties in this regard, a fact that has also been acknowledged for other Romance varieties (Zubizarreta 1998; Costa 2000b or Belletti 2001, 2002; among others).

A further difference in the case of Catalan, in contrast with Galician and Spanish, is that yes/no questions can be headed by *que* (148), though the use of this complementizer is subject to dialectal variation (Rigau 1998; Payrató 2002).

(148)   Que hi ha una esquerda al sostre?   (Catalan)
        INT there is a fissure in-the ceiling
        Is there a fissure in the ceiling?

Similar elements can be found in several other Romance varieties such as central and southern Italian dialects (*che* in Tuscan, *chi* in Sicilian):

(149)   Chi a puzzu addumari a luci?   (Sicilian)
        INT it be able to-pres.1ˢᵗ.sg switch-on the light
        Can I switch on the light?
                        (Cruschina 2007)

Cruschina (2007) claims that despite the fact that the complementizer and the interrogative element in these constructions can be homophonous, they are in fact different elements, as is morphologically marked by the distinction between the interrogative particle *chi* and the complementizer *che* in Sicilian.

Though different claims have been made regarding the structure of yes/no questions (see Friedmann (2001) for the proposal of TP as root in Hebrew and Palestinian Arabic), since Suñer (1994), it has been assumed that a null operator in SpecCP is at work in total interrogatives so that the required [+WH] feature in C^0 can be justified and the Wh-Criterion satisfied. If we assume that all yes/no questions are headed by an interrogative operator, we would expect that both the null and the overt particles share the same structural position.

Assuming a split CP-field as proposed by Rizzi (1997, 2001), the interaction of overt operators with topic and focus positions (150) – the interrogative operator can precede a fronted informational Focus (150a) and follow a Topic (150b) – has been taken as evidence for the claim that these elements occupy a position between Force and Focus, namely Int (see (131)) (Cruschina 2007).

(150)   a.   Chi a Maria salutasti?   (Sicilian)
                INT to M. Greet-pret.2ⁿᵈ.sg

        b.   A Maria chi a salutasti?
                to M. INT her greet-pret.2ⁿᵈ.sg

                'Did you greet Maria?'

We assume that Int position is the base-generation site for both the null and overt interrogative operators in yes/no questions. This position is shared by certain other elements such as *why* (discussed in section 1.2) or *se* 'if' (Rizzi 2001), which

have similar properties concerning the scope of the operator over the clause and verb adjacency. Contrary to wh-questions, both adverbs and focalized elements are allowed to appear between the verb and the interrogative operator in yes/no questions (Cruschina 2007). An example involving an adverb is shown in (151).

> (151) Que potser hem de sortir?   (Catalan)
>   *INT maybe have-pres.1ˢᵗ.pl of go-out-INF*
>   Do we maybe have to go out?

As we saw in sections 1.1 and 1.2, both yes/no questions and wh-questions in Ibero-Romance may be seen as crucially involving the CP-field. Under this assumption, due to their structural similarity, the behavior of the two constructions is expected to be alike, though differences in the landing site of wh-operators on the one hand and the base generation of yes/no operators on the other – with the former lower than the latter – are expected to interfere with the level of success of our agrammatic population.

The assumption of IP-rooted wh-questions would have immediate consequences for structural models. Under this assumption, wh-questions would be expected to be spared, unlike embeddings, since they would not depend on the CP-area. As we will show in section 1.3., this turned out not to be the case in our data. Regarding yes/no questions, we claim that they must be analyzed as a homogeneous group regardless of their format (SV-VS, with or without overt operator), which depends on the availability of the left periphery to be projected. Agrammatic data will be used to argue for this analysis.

1.3. Previous research in agrammatism

Severe disorders in agrammatic question production have been documented for several languages such as Hebrew, Palestinian Arabic, English or German (see Thompson and MacReynolds 1986; Friedmann 2002; Burchert, Swoboda-Moll and De Bleser 2005). Nevertheless, most of these studies have paid attention to production skills only (Friedmann and Grodzinsky 1997, 2000; Friedmann 2001; Stavrakaki and Kouvava 2003; and others). If we observe wh-question comprehension, the field is almost entirely unexplored in agrammatism with a few

notable exceptions such as Salis and Edwards' (2005) and Dickey, Choy and Thompson's (2007) studies of English and Stavrakaki and Kouvava's (2003) data on grammaticality judgment in Greek. In this section, a brief summary of some relevant results is provided.

1.3.1. Previous studies of Hebrew and Palestinian Arabic

Several studies by Grodzinsky and Friedmann considered agrammatic question production both in Hebrew and in Palestinian Arabic. Friedmann and Grodzinsky (1997, 2000) reported very poor results in the spontaneous production of one Hebrew-speaking agrammatic subject. Out of 440 sentences of spontaneous speech, there were only 3 wh-questions of the type [Wh- + DP]. The subject's production of yes/no questions was better preserved (11 well-formed sentences) and it was occasionally observed that there was substitution of a wh-question with a question of this type. The authors make the claim that yes/no questions were more frequently available to the patients in these languages due to structural factors since yes/no questions were claimed by the authors to differ from declaratives only in intonation and by hypothesis would not require the movement of a constituent to CP.

To further assess this phenomenon, Friedmann (2001) analyzes spontaneous speech (14 Hebrew- and Arabic-speaking agrammatics) and also the results for two structured tasks, namely question repetition and question elicitation with 10 Hebrew- and Arabic-speaking agrammatics matched with controls. As shown in Table 65 below, the results show a consistent impairment in wh-question production across tasks.

Spontaneous speech (n=14)	Wh-question production
2272 utterances	13% (13/100)
Repetition (n=10)	Wh-question production
Agrammatics Controls	57% (188/327) 100% (200/200)
Elicitation (n=10)	Wh-question producion
Agrammatics Controls	23% (63/274) 100% (240/240)

Table 65. Correct question production in Hebrew- and Palestinian Arabic-speaking agrammatics (adapted from Friedmann 2001)

Friedmann (2002) focuses not only on wh-question production but also on a comparison between the production of wh- and yes/no questions by 13 Hebrew-, 2 Palestinian Arabic- and 1 English-speaking agrammatic, both in sentence elicitation and repetition tasks, as well as spontaneous speech. The results show that in Hebrew and Palestinian Arabic agrammatism wh- questions are highly problematic while the ability to produce yes/no questions is preserved; again this is attributed to the fact that the latter do not require the participation of CP. The results of the elicitation task for both wh- and yes/no questions appear in Table 66.

		Wh- questions		Yes/No questions	
		% correct	(correct/total)	% correct	(correct/total)
Hebrew	AL*	8%	(2/24)	88%	(21/24)
	RA*	15%	(7/48)	100%	(9/9)
	ML*	44%	(21/48)	100%	(24/24)
	HY*	13%	(6/48)	88%	(21/24)
	RN*	27%	(13/48)	67%	(12/18)
	IE*	29%	(7/24)	100%	(24/24)
	PK*	14%	(3/21)	92%	(22/24)
Arabic	HH*	21%	(5/24)	65%	(15/23)
Mean		22%	(64/285)	87%	(148/170)
Hebrew	RS	0%	(0/20)		
	AG	0%	(0/6)		
	TA	45%	(5/11)		
Mean		13%	(5/37)		

Table 65. Correct responses by Hebrew- and Arabic-speaking agrammatics in a question elicitation task (from Friedmann 2002)

In English, the CP layer is claimed to be required for both wh- and yes/no questions due to the compulsory presence of an auxiliary verb in this area and, as expected by the authors under the predictions of the TPH, the results show a general impairment in question production. The total number of experimental items was 24 for each question type. The specific results are summarized in Tables 67 (wh-questions) and 68 (yes/no questions).

Wh- questions	*Nº of occurrences*
Disjunctive y/n questions	9/24
Single nouns	7/24
Single verbs	3/24
Single wh-morphemes	2/24
Dks	2/24
Agrammatic y/n questions	1/24

Table 67. Wh-question production by one English agrammatic in a question elicitation task (adapted from Friedmann 2002)

Yes/No questions	*Nº of occurrences*
Y/N without auxiliary first	17 (4 without subject)/24
NP + yes or no?	5/24
Disjunctive y/n questions	2/24

Table 68. Yes/no question production by one English agrammatic in a question elicitation task (adapted from Friedmann 2002)

Despite impairment, there is a noticeable tendency to produce yes/no questions independently of the type of question required. These questions are generally ungrammatical due to the lack of the auxiliary form in initial position (e.g. *You want juice?*). Rising intonation in an otherwise declarative sentence was the strategy used by the subjects.

1.3.2. Previous studies of Greek

In order to delimit the locus of impairment, Stavrakaki and Kouvava (2003) tested both mastery of wh-words and awareness to structures related to high portions of the syntactic tree. The authors reported 100% correct usage of wh-words in the spontanous speech of two non-fluent aphasics. Nevertheless, one of the subjects (SC) only produced formulaic questions (e.g. *what is that?*), while for the other (VF), 7/15 responses also corresponded to structures of this type.

The results of two controlled tasks showed that the two subjects judged correctly operator movement in embedded questions (100% correct) but, with [*Which* + NP] questions, their performance decreased to 60% in the case of SC and 90% in the case of VF. Both subjects showed ceiling performance for both embedded and [*Which* + NP] constructions in the preference task. These results indicate grammaticality awareness of structures occupying a high position in the syntactic tree.

1.3.3. Previous studies of Germanic Languages

In addition to Friedmann's (2002) results (see 1.3.1), further evidence of the performance of English agrammatics was analyzed by Thompson and McReynolds (1986). The four agrammatic patients tested with a question production task with

pictures reported 0-8% correct wh- questions. Thirteen additional subjects tested using a story completion task produced 0-24% correct forms (see Wambaugh and Thompson 1989; Thompson, Shapiro and Roberts 1993 and Thompson *et al.* 1996).

Nevertheless, the number of wh-morphemes produced by agrammatics seems to be subject to variability. In data from narrative and conversational discourse samples, Thompson *et al.* (1996) observed random selection of wh-morphemes during wh-question production. Only 2-33% of the sentences produced by the 7 agrammatic subjects were complex (as opposed to the 57% in non-impaired productions), indicating a clear avoidance of this type of construction. Regarding the number of wh-morphemes, they ranged from 0 occurrences to 10, the same number as for controls. Individual results are shown in Table 69.

Subjects	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Controls*
Nº wh-morphemes	8	10	0	8	2	1	2	10

Table 69. Wh-morphemes produced by 7 English-speaking agrammatics and controls during narratives (adapted from Thompson *et al.* 1996)

The general conclusion derived from these studies, which focused on the effects of syntactically-based speech therapy for wh-questions on agrammatic patients, is the existence of a severe deficit in constrained sentence production in English prior to treatment. The authors also observed dissociation between wh-morpheme selection and wh-question formation. In addition, Thompson *et al.* (1993) reported that the two agrammatic patients they tested used intonation to express questions and avoided movement (wh-movement, subject-auxiliary inversion). An example of the resulting construction is illustrated in (152a) with (152b) showing the target form.

(152)   a. *Thief chase?

          b. Who did the thief chase?

                  (Thompson *et al.* 1993: 597)

Comprehension of both wh- and yes/no questions has also been observed through structured tasks. Dickey, Choy and Thompson (2007) provide evidence from a listening task involving both wh- and yes/no questions and object clefts evaluated through eyetracking in 12 individuals with agrammatic aphasia. Sentences with visible wh-movement (e.g. object relatives (153)) were found to present difficulties for agrammatic individuals (in line with Caramazza and Zurif (1976), among others).

(153)   Point to who$_i$ the bride was tickling [t$_i$] at the mall.
                    (Dickey and Thompson 2006: 218)

The results are shown in Table 70.

	Agrammatic subjects (% correct)	Control subjects (% correct)
Wh-questions	70%[*]	100%
Yes/no questions	86.7%	95%
Object clefts	67%	94%

   * No separate percentages are given for subject and object questions.

Table 70. Comprehension of wh-moved structures in 12 English-speaking agrammatic subjects and controls

As we have already seen for production, agrammatic subjects showed more difficulties with questions involving wh-movement than with yes/no questions. Agrammatic results were found to be statistically poorer in wh-questions and object cleft comprehension than for control subjects; the results did not differ from chance. For yes/no question comprehension, no significant differences were detected with respect to control results.

Through the observation of one English-speaking agrammatic in an act-out task, Salis and Edwards (2005) found that comprehension of subject wh-questions (e.g. *who/what/which cow kicked the hippo?* (Salis and Edwards 2005: 86)) was preserved while comprehension of object ones (e.g. *which cow did the hippo kick?*

(Salis and Edwards 2005: 86)) was impaired. The results (% correct) are shown in table 71.

		Subject	*Object*
Simple	Who	75%	50%
	What	75%	42%
	Which	92%	8%
Raising	Who	100%	25%
	What	100%	8%
	Which	100%	0%
Padded	Who slowly	92%	33%
	Who just now	83%	8%
	Which slowly	58%	0%
	Which slowly now	75%	17%
	Who	83%	42%
	What	92%	25%

Table 71. Wh-comprehension by an English-speaking agrammatic subject (adapted from Salis and Edwards 2005)

Again, according to the authors, an overall effect of order of constituents could be observed. The vast majority of subject constructions were better understood than object constructions, and almost all of them were above chance. None of the object wh-interrogatives generated levels of correctness above 50%. Significant differences were found in a Wilcoxon Signed Rank test ($p < 0.01$). In constrained tasks, agrammatics evidenced problems in producing sentences with inverted thematic-role order (Caplan and Hanna 1998). Sentences with moved constituents have also been found much harder to understand than those without visible movement by other authors (Grodzinsky 1998). All these are instances of comprehension impairment as it has been understood since the seminal work of Grodzinsky and the Trace Deletion hypothesis (1984b, 1986, 1990, 1995, 2000).

In addition, the observed assymetries between *who* and *which* were documented earlier for English by Hickok and Avrutin's (1996) study of two Broca's aphasics. These authors claim that not all chains are affected in agrammatism, only binding chains. The different position occupied by heads and specifiers in CP may

underlie this deficit. However, consideration of these matters would take us too far afield.

As far as yes/no questions are concerned, several studies indicate that the production of this type of question is also impaired in English-speaking agrammatics (Friedmann 2002). Auxiliary inversion has been found to be avoided in wh-interrogatives (Thompson *et al.* 1993). Since the presence of an auxiliary in initial position is also a requirement for the construction of yes/no questions, they are likewise expected to be disrupted. Bastiaanse and Thompson's (2003) study corroborates these findings. Difficulties in the production of yes/no questions would therefore be due to a language-specific property of English. As happens with wh-questions, yes/no questions require a spared C node to accommodate the auxiliary. This characteristic may account for the observed crosslinguistic differences.

A close observation of the case of German provides us with similar data to those obtained for English. The results of 8 agrammatic German-speakers both in question elicitation tasks and spontaneous speech were reported by Burchert, Swoboda-Moll and De Bleser (2005). In the elicitation test, the patients produced 48% of wh- and 38% of yes/no questions correctly. The differences between question types were not significant except for AF and WR, whose production of yes/no questions was better preserved. MP also showed this pattern, but differences were not significant. The performance of these agrammatic individuals, which reveals considerable variation across subjects, is summarized in Table 72.

		Wh- questions		Yes/No questions	
		% correct	(number)	% correct	(number)
German	MP	79%	(19)	96%	(23)
	AF	54%	(13)	92%	(22)
	WR	38%	(9)	88%	(21)
	JK	79%	(19)	17%	(4)
	JR	79%	(19)	4%	(1)
	RK	38%	(9)	4%	(1)
	WE	17%	(4)	4%	(1)
	RG	4%	(1)	0%	(0)
Mean		48%	(11.6)	38%	(9.1)
Range	SD	7.1	(1 - 19)	10.7	(0 – 23)

SD – Standard deviation

Table 72. Correct responses by 8 German-speaking agrammatics in a question elicitation task (adapted from Burchert, Swoboda-Moll and Ria De Bleser 2005)

1.4. Experimental design: Wh- & yes/no question production and wh-question & word comprehension

In our study, in order to carry out a quantified analysis of the level of success in the production of y/n and wh- questions, and since spontaneous production of complex structures is rare and difficult to evaluate, the production and comprehension of interrogatives in Catalan, Galician and Spanish were tested through structured tasks. Partially replicating Crain and Thornton (1998), Friedmann and Grodzinsky (2000), Friedmann (2002), both elicitation and sentence-picture matching tasks were performed to assess the production of yes/no and wh-questions, and the comprehension of wh-questions and words. Each task included 25 items and was conducted with 16 experimental subjects as well as 15 control subjects.

1.4.1. Production task

In the production test, 12 tokens were aimed at eliciting yes/no questions and 13 corresponded to wh-questions (see Appendix 1 for the complete list). Starting with yes/no interrogatives, prompts were simple declaratives headed by *maybe* with the preverbal subject in topic position. Since we were concerned about controlling pragmatic aspects and in order to avoid the method used by either Crain and Thornton (1998) or Friedmann (2002), which may bias towards a y/n question without S-V

inversion (see (154) for an example extracted from Hamann 2006), we opted for a formulation of tokens which were more neutral in relation to the target answer (155).

(154)   Je   sais   qu'il   aime   jouer   au Gameboy.   (French)
I know-pres.1st.sg that'he love-pres.3rd.sg play-INF to-the Gameboy
I know that he loves playing with the Gameboy.

Demande-lui s'il   aime   aussi regarder la télé.
ask-him   if'he love-pres.3rd.sg also watch the tv
Ask him if he also loves watching TV.

(Hamann 2006)

(155)   Puede que Pedro toque   el   piano, pregúntamelo.   (Spanish)
maybe that P. play-pres.sub.3rd.sg the piano, ask-IMP-2nd.sg-me'it
Maybe Peter plays the piano, ask me.

Target question: Toca   el   piano?
play-pres.3rd.sg the piano
Does he play the piano?

Notice that while (154) allows the copy of the last part of the sentence as a possible answer – *Il aime aussi regarder la télé?* – reducing the exercise to a mere repetition task, this effect is softened in (155).

As far as wh- questions are concerned, based on Friedmann and Grodzinsky (2000) and Crain and Thornton (1998), two types of experimental tokens were included. The difference between them resided in the clues given to the subject. In Type I – Friedmann type (156) or 'indefinite' in Garraffa's (2003) work – subjects do not have any information on the required wh- word or the position this word may occupy.
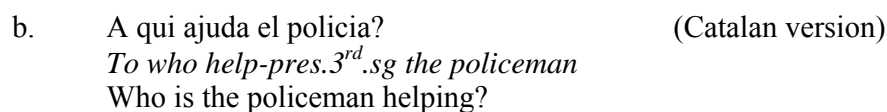
(156)   *Type I: constructions without wh-word.*

Vou   ir   a   algures...   (Galician version)
go-pres.1st.sg go-INF to somewhere
I am going to go somewhere…

e   ti   queres   sabe-la   data.
and you want-pres.2nd.sg know-INF-the date
and you want to know the date.

Target question: Cando   vas   ir?
                   when go-pres.2ⁿᵈ.sg go-INF
                   When are you going to go?

Sentences of type II (157), sluicing constructions or Thornton type, force the choice of the given wh- element, so they cannot be used to test the patients' abilities to select the correct wh-word:

(157)   *Type II: sluicing constructions.*

       Juan   busca   una cosa…   (Spanish version)
       J. search-pres.3ʳᵈ.sg a thing
       John is looking for something…

       y tú quieres saber lo qué.
       and you want-pres.2ⁿᵈ.sg know-INF clit. what
       and you want to know what.

Target question: ¿Qué   busca   Juan?
                   what search-pres.3ʳᵈ.sg J.
                   What is John looking for?

Examples such as (158) were avoided since, in the varieties under examination, they may allow for the repetition of the embedded question without introducing changes in word order (Hamann 2006: 161).

(158)   Demana-li   on   viu.
       ask-IMP.2ⁿᵈ.sg-him where live-pres.subj.3ʳᵈ.sg
       Ask him where he lives.

Experimental items were counterbalanced with regard to the argument/adjunct nature of the wh-phrase. Target wh- questions (13 items) included 7 adjunct and 6 argument questions in random order. No subject questions were introduced in the experimental design in order to leave this issue for further research.

Among the tokens intended to elicit wh-questions, we paid special attention to WH- 7 (intended to elicit *How old are you*?) and WH- 9 (*Where are you from?*). Since these tokens can be considered idiomatic expressions, it may follow that they

behave differently. Nevertheless, these differences were not attested by the results of our experiment and we therefore analyzed them together with the rest of the items.

1.4.2. Comprehension task

In addition to the elicitation task, a sentence-picture matching task was performed to assess agrammatics' comprehension of wh-interrogatives by means of items with subject and object questions. The exercise consisted of two types of tokens randomly presented to the subjects by means of a Power Point presentation. For each test item, one or two pictures were presented to the subject, who was instructed to point to the picture/character in the slide that matched the sentence read aloud by the experimenter. Half of the tokens checked question comprehension, as exemplified in (159a) and (159b) below.

(159)   *Question comprehension:*

a.   ¿Quién pinta a la modelo?   (Spanish version)
        who paint-pres.3rd.sg to the model?
        Who is painting the model?

Target response: Subject points to painter.

b.   A qui ajuda el policia?   (Catalan version)
        To who help-pres.3rd.sg the policeman
        Who is the policeman helping?

Target response: Subject points to the tourist.

The remaining tokens were designed to check the degree of impairment of wh-words. An example is shown in (160):

(160)   *Comprehension of wh-elements:*

Què va menjar en Joan?   (Catalan version)
what aux-past.3rd.sg eat the J.
What did John eat?

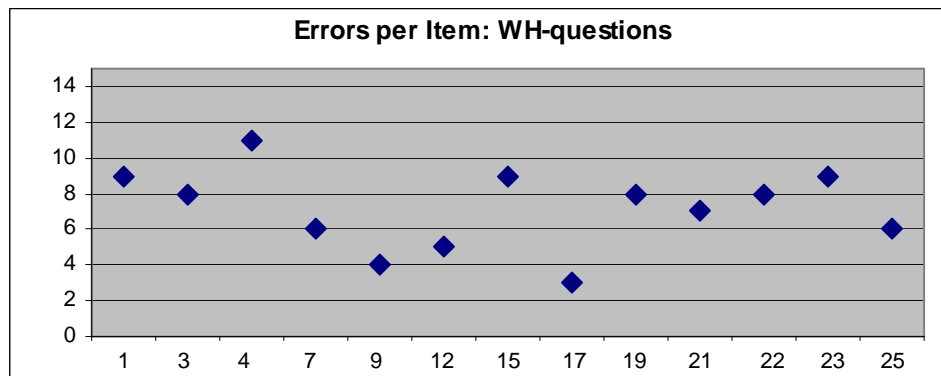*Target response*: Subject points to the plate of food.

1.5. Results

1.5.1. Production results

Regarding the results of the elicitation task, as can be seen in Table 73 below, control subjects produced correct answers 99% of the time for both wh- and yes/no questions. (A full report of errors is included in Appendix II. No differences were found across question types or across language types.

	WH-		*Y/N*	
	% correct	(correct/total)	% correct	(correct/total)
Catalan	100%	(65/65)	100%	(60/60)
Galician	98.46%	(64/65)	100%	(60/60)
Spanish	98.46%	(64/65)	98.33%	(59/60)
Total	98.97%	(193/195)	99.44%	(179/180)

Table 73. Question elicitation by Ibero-Romance-speaking control subjects

Though the performance of control subjects can be taken as confirmation of the validity of our experimental design, the first step in the analysis of the production results for our agrammatic sample consisted of an analysis per item in order to detect possible anomalies. This analysis revealed that subjects produced errors with all the experimental tokens for both wh-questions and yes/no questions. Moreover, there was no item such that all subjects failed to produce it. For wh-questions, the number of errors ranged from 3 (item 17) to 11 (item 4). The difference between items was narrower for yes/no questions, where the error rate varied from 2 (item 10) to 7 (items 2, 5 or 6). This is illustrated in Graph 35 for wh- items, and Graph 36 for yes/no items.

Errors per Item: WH-questions

Graph 35. Number of errors per item in wh-question production

Graph 35 shows that the behavior of the two tokens eliciting what might be regarded as idiomatic constructions (tokens 7 and 9) did not differ from that of the other tokens. Consequently, as already mentioned, data from these tokens was analyzed together with the rest of the wh-question production data.
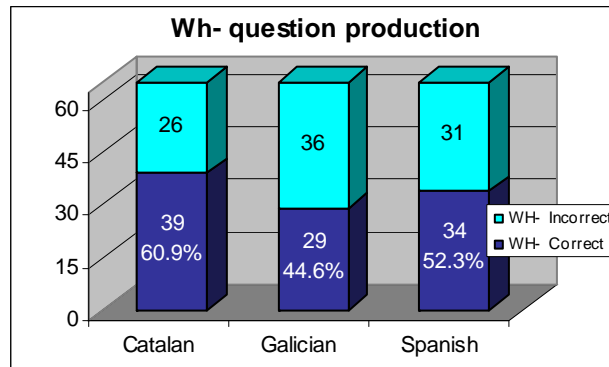
Errors per Item: Y/N Questions

Graph 33. Number of errors per item in yes/no question production

Concerning the specific results, the elicitation task shows an observable deficit for both question types, though it is more evident in the case of wh-questions. A summary including individual patients' results is shown in Table 74.
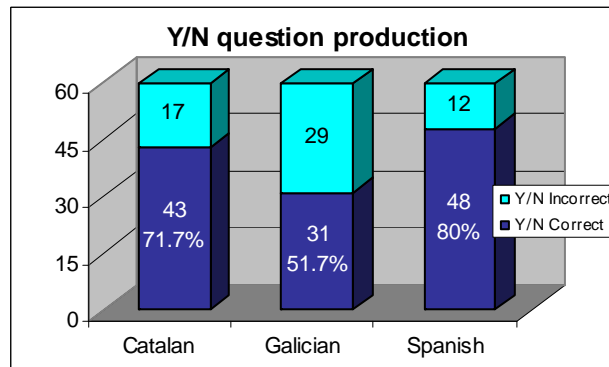
		WH-		Y/N	
		% correct	(correct/total)	% correct	(correct/total)
Catalan	C1	53.85%	(7/13)	100%	(12/12)
	C2	69.23%	(9/13)	83.33%	(10/12)
	C3	61.54%	(8/13)	91.67%	(11/12)
	C4	46.15%	(6/13)	75%	(9/12)
	C5	69.23%	(9/13)	8.33%	(1/12)
Mean		60%	(39/65)	71.67%	(43/60)
Galician	G1	0%	(0/13)	41.67%	(5/12)
	G2	46.15%	(6/13)	0%	(0/12)
	G3	61.54%	(8/13)	83.33%	(10/12)
	G4	53.85%	(7/13)	58.33%	(7/12)
	G5	61.54%	(8/13)	75%	(9/12)
Mean		44.61%	(29/65)	51.67%	(31/60)
Spanish	S1	61.54%	(8/13)	91.67%	(11/12)
	S2	46.15%	(6/13)	100%	(12/12)
	S3	30.77%	(4/13)	33.33%	(4/12)
	S4	61.54%	(8/13)	75%	(9/12)
	S5	61.54%	(8/13)	100%	(12/12)
Mean		52.31%	(34/65)	80%	(48/60)
Total		52.31%	(102/195)	67.78%	(122/180)

Table 74. Question elicitation by Ibero-Romance-speaking agrammatics

The number of errors involving wh-questions is represented in Graph 37 and that of yes/no questions in Graph 38 below. 65 responses were elicited for wh-questions (13 responses x 5 subjects per language). For yes/no questions, the number of responses per language was 60.

Graph 37. Wh- question production in agrammatic Ibero-Romance

Graph 38. Y/N question production in agrammatic Ibero-Romance

The graphs show that although both question types are problematic for agrammatic speakers as a whole, wh-questions are more severely impaired than yes/no questions. This tendency is observable across the three languages under analysis. Nevertheless, if individual results are taken into consideration, the production of yes/no questions seems to show a double dissociation which is evident in the contrast between the results for C1 (12/12 correct answers) and G2 (0/12 correct answers). In addition, even though for the vast majority of subjects wh-questions were found to be harder to produce than yes/no questions, it was also possible to find subjects performing the reverse pattern (C5 and G2) and one subject for whom both question formation strategies were problematic (S3).
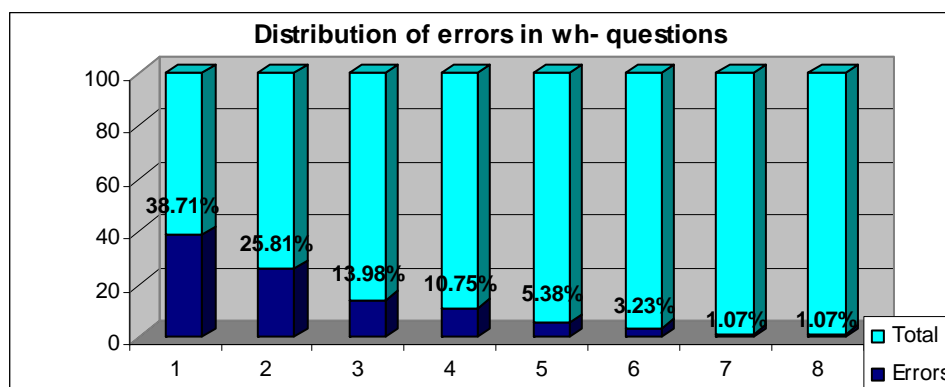
A Wilcoxon signed rank test was run to compare the number of errors in the production of wh- and yes/no questions in agrammatic patients. The differences proved to be significant at a 5% level (i.e. $p < 0.05$, $Z = -1.993$) but not at 1% level

mainly due to the anomalous behaviour of C5 and G2, whose results will be discussed later on. Differences across languages were not shown to be significant for any of the two question types in a Mann-Whitney U test.

Based on Friedmann's (2002) analysis, the errors produced by agrammatic subjects were classified according to type. Errors in wh-question production have been listed in order of decreasing frequency in (161) and represented in Graph 39. The *x* axis shows error types while the *y* axis indicates the number of errors.

(161)   *Classification of errors in wh- questions according to frequency:*

1. Y/N questions substitute for wh- questions (36/93)
2. Wrong wh- morpheme selection (24/93)
     a. *What* substitutes for the target form: 10 + 1 *in what*
     b. *Who* substitutes for the target form: 4 + 1 *to whom*
     c. *How* substitutes for the target form: 4
     d. *How many* substitutes for the target form: 1
     e. *Where* substitutes for the target form: 2
     f. *When* substitutes for the target form: 1
3. Declarative sentences (13/93)
4. Unexpected question, i.e. the given answer does not correspond to the formulated wh-question (10/93)
5. 'Don't know' responses (5/93)
6. Wh- + DP (3/93)
7. Wh- substituted by why (1/93)
8. Wh- in situ (1/93)

Distribution of errors in wh- questions

1. Y/N questions substitute for wh- questions
2. Wrong wh- morpheme selection
3. Declarative sentences
4. Unexpected question
5. DKs
6. Wh- + DP
7. Wh- substituted by *why*
8. Wh- in situ

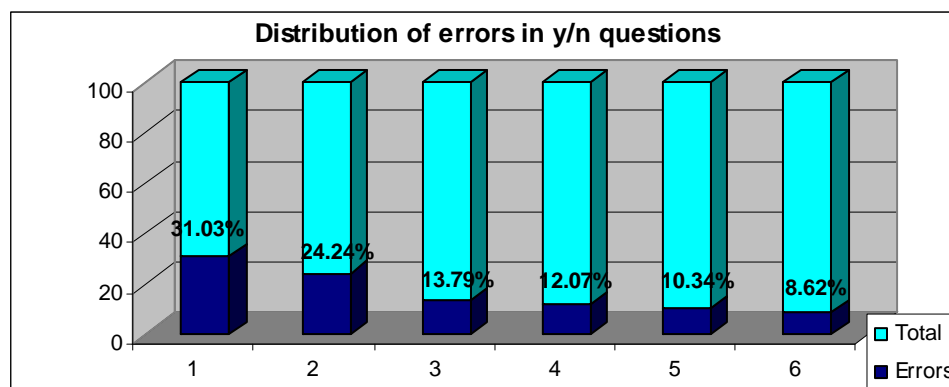Graph 39. Agrammatic wh- question production, classification of error types

The most common error was the replacement of a wh- question with a y/n question (n = 36). However, instances of the reverse case, where a wh- substituted for a yes/no question (n = 6), were also recorded. The use of unexpected wh- words with wh-interrogatives was found on 25 occasions, the occurrence of these substitutions being equally common across question types (argument or adjunct). Among the unexpected wh- words found, there seemed to be a tendency to produce argument questions with the question markers *what* and *who* (16 substitutions) while cases of substitution by question markers such as *where* or *when*, traditionally corresponding to adjunct questions, were scarce.

Errors in yes/no questions are presented in like fashion in (162) and Graph 40.

(162)   *Classification of errors in yes/no questions according to frequency:*

1. *Why* substitutes for y/n questions (18/58)
2. Declarative sentences (14/58)
3. 'Don't know' responses (8/58)
4. Unexpected questions, i.e. the given answer does not correspond to the formulated y/n question (7/58)
5. Wh- questions substitute for y/n questions (6/58)
    a. *What* substitutes for the target form: 1 + 1 *in what*
    b. *How* substitutes for the target form: 1

      c. *How many* substitutes for the target form: 1
      d. *Where* substitutes for the target form: 2
6. *How is it* substitutes for y/n questions (5/58)

Distribution of errors in y/n questions

1. *Why* substitutes for y/n questions
2. Declarative sentences
3. Dks
4. Unexpected questions
5. Wh- questions substitute for y/n questions
6. *How is it* substitutes for y/n questions

Graph 40. Agrammatic y/n question production, classification of error types

For yes/no questions, the substitution by *why* appears as the most common incorrect response. Nevertheless, these cases are restricted to Catalan and Galician and are not found in Spanish. While among wh-interrogatives only 1 substitution with *why* was found (G5 – token 24), this operator was employed as a substitute for a yes/no question 18 times, representing 31% of responses. This strategy is illustrated in (163).

    (163)   Por qué   es   boa cociñeira?   (Galician)
           for what be-pres.3rd.sg good cook
           Why are you a good cook?

    Target: Es   boa   cociñeira?
           be-pres.3rd.sg good cook
           Are you a good cook?

Substitution of the expected question with a declarative was the second strategy used in order of decreasing frequency, with 14 errors (24%) found. Examples of the error types can be found in Appendix II.

As mentioned above, the cases of C5 and G2 deserve a special mention due to the anomalous behavior they displayed with respect to the wh-/yes/no dissociation. In the case of C5, the pattern of errors was particularly marked. Out of 11 errors, 4 were substitutions of the expected yes/no question with an interrogative headed by *why* and 5 substitutions began with *Com és que* 'How is it that'. This pattern was paralleled by G2, who was unable to produce any yes/no questions at all, employing instead a *why* question for 10 out of 12 items.

Since wh-items were elicited by means of two different experimental contexts, we conducted an analysis that separated target utterances according to whether they lacked a wh-word (type I) or constituted a construction with sluicing (type II). The results showed that out of the 93 errors for wh-question production, 51 involved items intended to elicit type I (54.84% of the total number of responses) while 42 belonged to type II (45.16%). A more detailed analysis is shown in Table 75.

	Language	*Type I:* *No wh-word*	*Type II:* *Sluicing*
WH- substituted with Y/N	Catalan	3	6
	Galician	5	7
	Spanish	7	8
WH- substituted with WH-	Catalan	10	6
	Galician	6	5
	Spanish	9	3
DKs	Catalan	1	0
	Galician	9	4
	Spanish	1	3
Total		51	42

Table 75. Errors in wh-production according to experimental design differences

At first sight, the methodology did not affect the outcome significantly. Starting with the substitutions with a yes/no question, contrary to what we could have expected, there were more substitutions with a yes/no question in constructions with sluicing than in the constructions without a wh-word. This implies that subjects

ignored the presence of the wh-operator in their attempt to construct the interrogative sentences. This tendency can be observed in all three of the languages under analysis but is clearly more prominent in the case of Catalan. The label 'substitutions of wh-questions with wh-questions' includes problems with wh-word selection (including the case of substitution with *why*), unexpected questions, clusters of a wh-operator + a NP and a case of wh- in situ. There were no significant differences among languages in this respect. The third error type (labeled DKs in table 75) groups specific '*don't know*' responses together with declarative sentences. Out of the 18 errors in this group, 10 were found among type I items and 8 in contexts with sluicing. Especially prominent is the number of DK results for Galician. The difference is attributable to the fact that all the Galician subjects were tested during their stay in hospital and therefore, despite their also being classified as mild agrammatics, their condition may have been slightly more severe than that of their Catalan and most of their Spanish counterparts. No significant differences were observed between type I tokens (Friedmann type) and type II tokens (Thornton type).

The results of the contrast between argument and adjunct questions also deserve special attention. Out of the total number of errors in wh-questions (n = 93), 43 involved items requiring an argument question (46.24% of the total number of questions of this type) and 50 involved items requiring an adjunct question (53.76% of the total elicited of this type). An analysis of data in terms of presence vs. absence of the wh- element in the experimental design is shown in Table 76.

	Language	*Argument questions*	*Adjunct questions*
Constructions without a wh-word	Catalan	5	8
	Galician	8	12
	Spanish	6	11
Sluicing constructions	Catalan	9	4
	Galician	8	8
	Spanish	7	7
Total		43	50

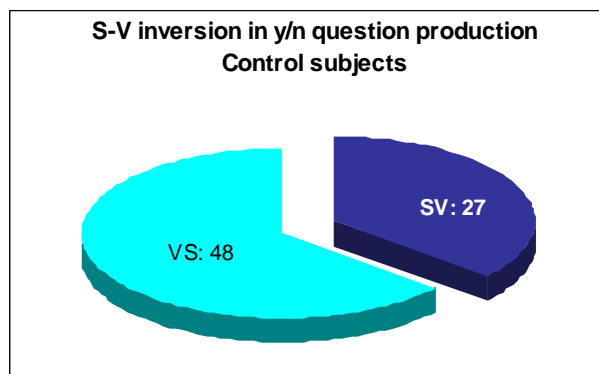Table 76. Errors in wh-production according to question type

In the case of target constructions without a wh-word, Friedmann type, the three languages showed the same pattern, with adjunct questions more severely impaired than argument questions (31/50 errors vs. 19/50 respectively). Nevertheless, in sluicing constructions, the Catalan group showed the reverse tendency (4/13 errors for adjunct questions vs. 9/13 for argument questions), i.e. more problems with argument interrogatives, while the Galician and Spanish groups exhibited the same number of errors for argument and adjunct questions (15/30 errors for each type of target).

As noted previously, in addition to the group of mild agrammatics, a single moderate agrammatic native speaker of Catalan also took part in the experiment. His results show a general deficit in question production that is independent of the nature of the experimental items (wh- or yes/no questions). Out of the 25 items (13 wh- and 12 yes/no), he was only able to properly utter one wh- interrogative.

As predicted by our hypothesis, the production of both partial and total interrogatives by agrammatics was significantly poorer than that of their control counterparts at a 1% level ($p < 0.01$, $Z = -4.892$ for wh-questions, $Z = -4.017$ for yes/no questions). In addition, further differences between these two populations were found in the production of yes/no questions. While control subjects mainly produced structures with S-V inversion, the opposite behaviour was found among experimental subjects. In fact, agrammatic subjects did not produce any case of overt pronoun subject with inversion while the control group produced 5 out of 12 interrogatives of this kind. A summary of the control results is shown in Table 77 and Graph 41, while experimental group data are summarized in Table 78 and Graph 42. The tables show the percentages of correct yes/no questions that include an overt subject either preceding or following the verb. (Full data are available in Appendix II.)

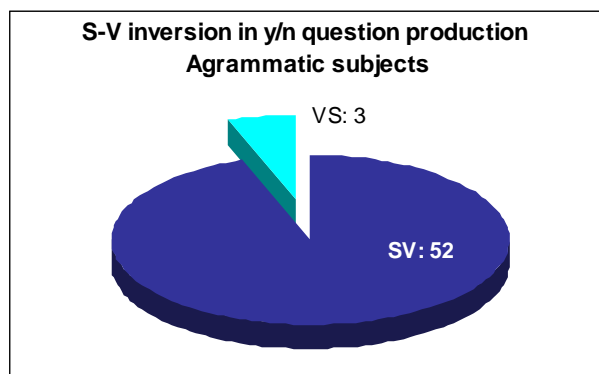| *CTRL*	*Correct*	*Overt Subject*	*S-V*	*V-S*
Catalan	100% (47/47)	48.94% (23/47)	43.48% (10/23)	56.52% (13/23)
Galician	100% (46/46)	56.52% (26/46)	32% (8/26)	69.23% (18/26)
Spanish	97.92% (47/48)	55.32% (26/47)	34.61% (9/26)	65.38% (17/26)
Total	99.29% (140/141)	53.57% (75/140)	36% (27/75)	64% (48/75)

Table 77. Subject-verb inversion in yes/no questions, control subjects

Graph 41. Subject-verb inversion in yes/no questions, control subjects

EXP	Correct	Overt Subject	S-V	V-S
Catalan	70.83% (34/48)	44.12% (15/34)	100% (15/15)	0% (0/15)
Galician	50% (25/50)	48% (12/25)	83.33% (10/12)	16.67% (2/12)
Spanish	78.72% (37/47)	75.68% (28/37)	96.43% (27/28)	3.57% (1/28)
Total	66.21% (96/145)	57.29% (55/96)	94.54% (52/55)	5.45% (3/55)

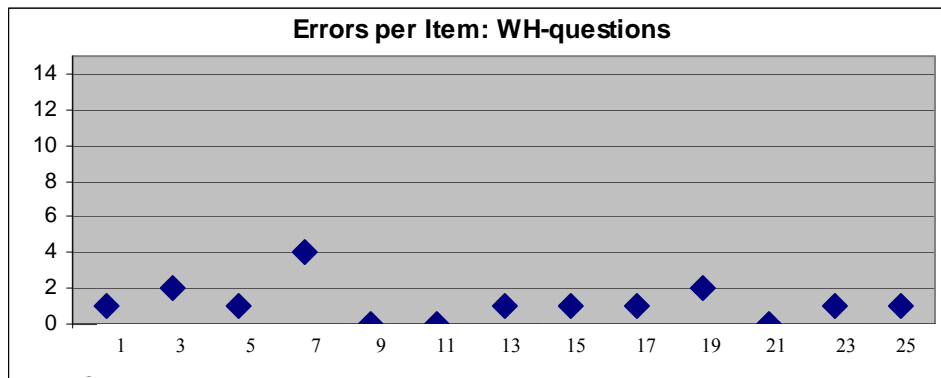Table 78. Subject-verb inversion in yes/no questions, experimental subjects

Graph 42. Subject-verb inversion in yes/no questions, experimental subjects

1.5.2. Comprehension results

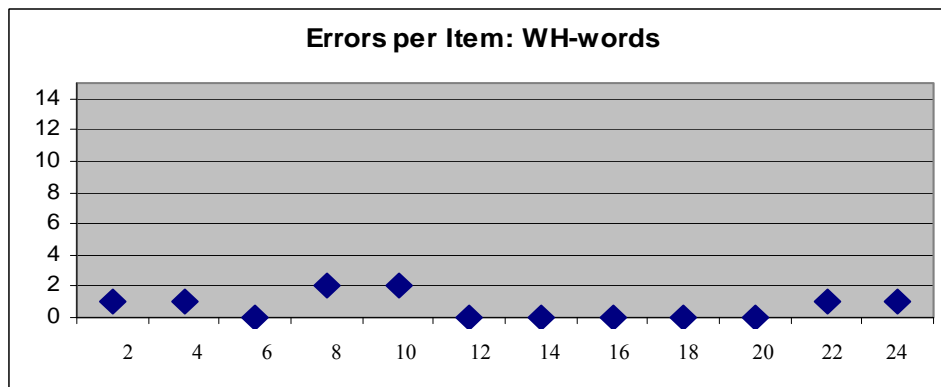In addition to the production task, a sentence-picture matching exercice was run with both controls and agrammatics to test subjects' comprehension abilities for both wh-questions and wh-words. The control group correctly identified 100% of the experimental tokens. Regarding experimental subjects, an analysis by item revealed that both comprehension of subject and object wh-questions and comprehension of

wh-elements was almost entirely preserved also in our agrammatic sample. The highest number of errors for an individual item was observed in wh-question comprehension. Token 7 was incorrectly identified in 4 instances. A relatively high number of experimental items (9/25) were correctly identified by all groups, as can be seen in Graph 43 – which illustrates wh-word comprehension – and Graph 44 – representing failure in the recognition of wh-questions.

* The x-axis shows only those tokens aimed at eliciting wh-questions.

Graph 43. Number of errors per item in wh-question comprehension by our mild agrammatic sample

* The x-axis shows only those tokens related to wh-words.

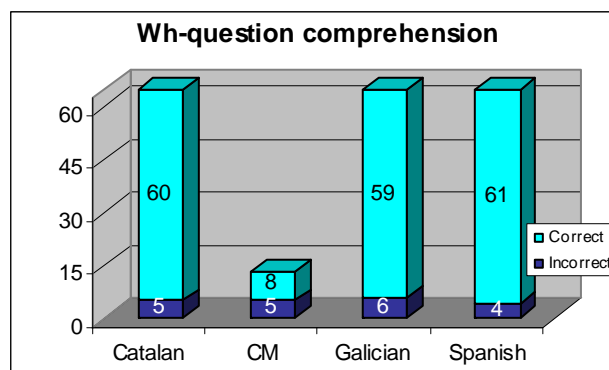Graph 44. Number of errors per item in wh-word comprehension by our mild agrammatic sample

Though asymmetries in the experimental design make a direct contrast impossible – neither subject nor object questions with animate objects have been elicited in the production task – the low incidence of errors per item contrasts sharply with our production results (where we saw up to 7 errors per experimental item),

indicating differences between modalities. Despite the low number of errors by agrammatics, there was a difference between their results and the results for controls. Table 79 and Graphs 45 and 46 below show the overall results of subject and object wh-question comprehension (with *who* and *to whom*) and wh-word comprehension respectively.

	WH-questions		*WH-words*	
	% correct	(correct/total)	% correct	(correct/total)
Catalan	92.31%	(60/65)	96.67%	(58/60)
CM[*]	61.54%	(8/13)	92.31%	(12/13)
Galician	90.77%	(59/65)	93.33%	(56/60)
Spanish	93.85%	(61/65)	96.67%	(58/60)
Total	90.38%	(188/208)	95.34%	(184/193)

*CM - Catalan moderate

Table 79. Wh- comprehension in Ibero-Romance agrammatism

Graph 45. Wh-question comprehension in Ibero-Romance agrammatism

Wh-word comprehension

Graph 46. Wh-word comprehension in Ibero-Romance agrammatism

The wh-question comprehension task included both subject questions (7/13) and object questions (6/13) with animate subjects (*who* vs. *to whom*). A breakdown of our results showed that subject questions (e.g. *¿Quién pinta a la modelo?* 'who is painting the model?') generated only 5/15 (33.33%) errors in the mild agrammatic sample, i.e. 4.76% of the total number of responses for this question type (n = 105). Object constructions (e.g. *A qui ajuda el policia?* 'who is the policeman helping?') were incorrectly produced 10/15 (66.67%) times, representing only 11.11% of the total number of responses for this structure (n= 90).

If we observe in detail the results for wh-word comprehension (8 errors in total for the mild agrammatic sample), the majority of errors occurred in tokens where the target was headed by the wh- operator *how* (n = 4). *What* was observed to be problematic on three occasions and *when* on one. The low number of errors (8/180) does not allow us to detect any fine-grained pattern in the preference for some wh-words.

The results of the moderate agrammatic subject show that wh-word comprehension is almost intact despite the higher degree of severity of his deficit (1/12 errors). His comprehension of wh-questions, however, was worse than wh-word recognition: CM produced 5 errors out of 13 responses. A clear dissociation can be seen between production and comprehension skills.

In sum, our results revealed that error rates were lower for wh- word comprehension than for wh- question comprehension for all three languages and all patients independently of the degree of severity of their agrammatic deficit, as the results of CM reveal. Nevertheless, the statistical analysis only shows significant

differences at a 5% level across the two variables (Wilcoxon Signed Rank test, Z = -1.933). Regarding the contrast across languages, no differences were attested. For wh-words, significant differences (again at a 5% level) were found between experimental and control subjects (Mann-Whitney U test: $p < 0.05$, Z = -2.678) while for wh-questions differences between the two groups were relevant at a 1% level (Mann-Whitney U test: $p < 0.01$, Z = -3.202).

1.6. Discussion

Wh-questions have been found to occur less frequently in the speech of aphasic patients than in non-pathological adult speakers (Thompson and Doyle 1991). This clearly indicates a deficit which partially blocks the appearance of interrogative constructions in agrammatic subjects. Data from typologically different languages such as Hebrew, Palestinian Arabic, English or Greek seem to confirm this fact. As mentioned earlier in this chapter, Thompson and McReynolds (1986), Wambaugh and Thompson (1989), Thompson *et al.* (1993, 1996), Friedmann (2001, 2002) and Stavrakaki and Kouvava (2003), among many others, found that wh- questions were severely impaired in agrammatic patients[50].

Our results show that both question production and comprehension skills differ between agrammatics and control speakers with wh-questions severely compromised. Two different explanations have been proposed in the literature to account for the cross-linguistic deficit in question production and comprehension: movement deficits and truncation deficits. Wh-movement has been claimed to be impaired in agrammatism (Salis and Edwards 2005; Dickey, Choy and Thompson 2007) or movement operations avoided (Thompson *et al.* 1993); nevertheless, as we will discuss shortly, this approach fails to account for the complete set of agrammatic deficits. By contrast, a truncation deficit, and the crucial involvement of the CP-field – located in the higher portions of the syntactic tree – is more successful at predicting the observed pattern of performance (Friedmann 2001, 2002; Friedmann and Grodzinsky 1997, 2000).

---

[50] However, it is important to remember that, regarding question formation, there are wide cross-linguistic differences. Inferences are difficult to make without details from non-pathological adult grammar.

1.6.1. Wh- vs. yes/no questions

Focusing on production first, our results differ from those observed in spontaneous speech (since patients were required to produce structures they would otherwise avoid (Friedmann 2002)). Nevertheless, both wh- and yes/no questions were found to be impaired to some extent in our agrammatic sample. The experimental tasks allowed us to observe that the degree of impairment varies across question types and also as a function of the severity of the individual deficits. In the case of wh-questions, the more severely impaired construction, the production of sequences of the type 'wh- + NP' (e.g. *What house?*) or the case of wh- in situ (C3 - *Jo vull saber què* 'I want to know what') show that patients do not have lexical problems with the retrieval of wh-words. This idea is reinforced by the low percentages of errors in wh-elements found in the comprehension task (8/180 wh-words misinterpreted for mild agrammatics) – indicating unimpairment of the lexical comprehension of wh-words.

Given that the results for the control group (with rates of correctness higher than 99%) indicate the validity of our experimental design, our corpus of errors can be taken as solid evidence for a selective deficit in agrammatic question production. We claim that syntactic factors underlie both the deficit observed in agrammatic patients' ability to build up questions and the dissociation between wh- and yes/no question production, and we will therefore explore structural considerations to account for them (in line with Friedmann 2001, 2002).

In the analysis of Hebrew put forward by Friedmann (2001, 2002) and Friedmann and Grodzinsky (1997, 2000), wh- words occupy a position in the specifier of CP, the highest structural position in their account and, therefore, the most susceptible to being impaired in agrammatism under a truncation model. Following these authors, wh- questions would be impossible or at least extremely difficult to produce and also hard to read or repeat for agrammatics, since they require the correct projection of the syntactic tree up to its higher nodes. Though our results show that the correct production of these questions in Ibero-Romance is not completely banned in agrammatic aphasia, wh-questions are certainly damaged. The degree of optionality can be accounted for in terms of differences in the degree of severity of the agrammatic deficit.

Damage was seen to be more severe than in the case of yes/no interrogatives, with the expection of two subjects (C5 and G2). Moreover, the most frequent strategy used by subjects to overcome problems in wh-question formation proved to be that of replacing them with a yes/no question. Friedmann and Grodzinsky account for this dissociation in terms of presence vs. absence of CP, with yes/no questions claimed to be rooted in TP and hence more accesible for agrammatic patients. The dissociation between different types of interrogatives in our Ibero-Romance sample patterns together with Hebrew and Palestinian Arabic (Friedmann 2001, 2002), where yes/no interrogatives do not involve subject-verb inversion. Nevertheless, according to Suñer (1994), in Spanish (and presumably also in Hebrew and Palestinian Arabic), a non-overt element heads every yes/no question (to satisfy the Wh-Criterion (Rizzi 1990)). This phonetically unrealized element is seen as responsible for subject-verb inversion, which is optional in the case of Catalan, Galician and Spanish total interrogatives. The phonetically unrealized operator of yes/no questions, as in the case of wh-words, is claimed to be rooted in the CP area. In order to account for our results in the same terms as Friedmann and Grodzinsky did, we would have to claim one of the following:

a)   There is a possibility of producing total questions rooted in TP, i.e. in the absence of the null operator residing in the CP-area, or

b)   The interrogative operator of yes/no questions resides in a lower position than that of wh-elements in the CP-area.

Exploring the first proposal, if we were to take the avoidance of SV inversion as evidence of the absence of the null operator, it would seem pausible to claim that no node higher than TP is required for our agrammatic sample to build up yes/no questions (in line with Friedmann 2001, 2005). Our results show that while control subjects prefer the inverted form, the agrammatic subjects of the three languages tend to use the non-inverted option (52 vs. 3 correct responses), i.e. an SVO structure as seen in declaratives. Thompson *et al.*'s (1993) findings for English yes/no questions patterns with Ibero-Romance findings since English agrammatics frequently rely on intonation to build up an interrogative out of an otherwise declarative sentence.

Nevertheless, contrary to English, these constructions are perfectly grammatical in Ibero-Romance. Further indication of the possible absence of CP-involvement is the systematic avoidance of the overt operator *que* by our Catalan agrammatic sample[51].

Friedmann (2005) claims that it is the absence of overt material in the CP area which accounts for the preservation of yes/no questions of the type *You like humus?*. This strategy of question formation would be available for all those patients with spared verbal morphology. The absence of the left periphery, i.e. the fact that yes/no questions without inversion rely on TP – would justify the high percentages of grammatical answers for yes/no questions in our Ibero-Romance sample as well as the fact that they are better preserved than wh-questions. The dissociation between different types of interrogatives is consistent with Hebrew and Palestinian Arabic (Friedmann 2001, 2002) where yes/no interrogatives are claimed not to involve subject-verb inversion.

A preliminary conclusion at this point would be that the TPH together with Hagiwara's (1995) proposal, according to which the CP-field is the harder node to access due to its position at the left of the syntactic representation, seems to be validated, reinforcing Grodzinsky's (2000) claim that Broca's area is actively involved in the construction of the upper parts of the syntactic tree. Nevertheless, there are two main problems of such an account. First, according to Suñer's (1994) proposal, yes/no questions are headed by a null interrogative base-generated operator in the left peripheral area independently of the relative order of the verb and subject. The crucial involvement of this area would account for the significant differences between agrammatic and control groups regarding the production of total interrogatives, but the dissociation between total and partial interrogatives would remain unexplained. In addition, some authors postulate that wh- questions in Spanish are rooted in the TP-area (Zubizarreta 1998, Gutierrez-Bravo 2002). Since the wh-

---

[51]   We only recorded one instance of an overt yes/no question operator. The relevant example is (i):

   (i)   Que busca una cosa?   ---   C3
        that search-3rd.sg a thing
        'Is he/she looking for something?'

Target: Què   busca   en Joan?
        what search-pres.3rd.sg the J.
        'What is John looking for?'

operator is claimed to occupy the position of the pre-verbal subject, the VS order is seen as compulsory in these constructions. Under this view, both yes/no and wh-interrogatives can be built up in the absence of the left periphery and the dissociation between question types would again not be predicted.

However, Rizzi (1997, 2001, 2002, 2004) provides us with arguments for a dissociated position for the two question types included in the CP-area. Let us rephrase the discussion with the full array of functional projections à la Rizzi (introduced in (130)) – with Int and Focus as the crucial nodes for the description of yes/no and wh-questions respectively. Contrary to Spanish and Galician, there are Romance languages which display an overt array of operators for yes/no questions. This is the case of some Sicilian dialects studied in Cruschina (2007). According to the author, the interrogative operator would occupy the position INT (higher than Focus – landing site for wh-elements) where it is base-generated. If the Catalan operator *que*, used in yes/no interrogatives in some varieties, is analyzed together with its Italian counterparts, it seems plausible that the same is applicable to null operators. Nevertheless, the claim that null interrogative operators in total interrogatives are base-generated in INT is problematic for a truncation account since it would attribute a higher position to yes/no questions than to wh-questions (Int > Focus), leading us to predict the reverse from what we actually observed as far as number of errors is concerned (notice that differences in the level of success turned out to be significant to a 5% level, with yes/no questions favored over wh-questions). Under the TPH, only C5 and G2 results – showing complete failure in their construction of yes/no questions – would follow.

1.6.2. Substitutions by *why*

The Cartographical approach to the structure of the left periphery straightforwardly predicts the use of *why* questions in substitution for yes/no questions in Catalan (5/58 errors in our data) and Galician (13/58). The fact that only *why* and no other wh-operator enter into competition with the production of yes/no questions may indicate that the null operator in yes/no questions and *why* compete for the same structural position. If we assume that the operator *why* is base-generated in INT (together with yes/no operators) while the remaining wh- operators are moved to Foc, the TPH

predicts that questions headed by *why* will be more severely impaired than other wh-questions. If, as we have claimed, a position as high as Focus is not always available for agrammatic speakers, to explain our results we would have to postulate that questions introduced by *why* are base-generated in a relatively lower position, perhaps at the right edge of the left periphery, contradicting data on non-impaired adult populations (Rizzi 2002). The crucial piece of evidence provided by Rizzi (2002) to claim that *why* occupies a structural position relatively higher than other wh-elements is that while elements such as *perché* 'why' and *come mai* 'how come' can co-occur with focus (164a) (and not follow it (164b)), ordinary wh- element cannot (165).

(164)   a. Perché QUESTO avremmo dovuto dirgli, non qualcos'altro?
            Why THIS we should have said to him, not something else

         b. *QUESTO perché avremmo dovuto dirgli, non qualcos'altro?
            THIS why we should have said to him, not something else

         'Why should we have said this to him, and not something else?'

                                                    (Rizzi 2002)

(165)   a. *A chi QUESTO hanno detto (non qualcos'altro)?
            'To whom THIS they said (not something else)'

         b. *QUESTO a chi hanno detto (non qualcos'altro)?
            'THIS to whom they said (not something else)'

                                                    (Rizzi 2002)

Despite differences among Romance varieties, this seems also to be the case of the Ibero-Romance varieties under investigation, as illustrated in (166) for Catalan, where the degree of acceptability differs between (166a) and (166b).

(166)   a. ?Per què AIXÒ hauríem degut dir-li, no pas una altra cosa?
            Why THIS we should have said to him, not something else

         b. *AIXÒ per què hauríem degut dir-li, no pas una altra cosa?
            THIS why we should have said to him, not something else

         'Why should we have said this to him, and not something else?'

Hence, it seems clear that the position of *why* must precede Foc, a position for which both wh-elements and focalized elements compete. A further difference between *why* and other wh-operators has to do with multiple wh-fronting. While there are languages such as Bulgarian in which more than one wh-element may move to the left periphery, giving it scope over the verb (167 – 168a), this is not allowed in the case of *why* (168b), where it has scope over the whole sentence.

    (167)   Koj kogo vižda?   (Bulgarian)
                who whom sees
                Who sees whom?
                      (Citko and Grohmann 2001)

    (168)   a. Kŭde kakvo koga e jal?
                   what where when is eat
                   Where did he eat what and when?

                 b. Zaşto kŭde kakvo e jal?
                   why where what is eat
                   *'Why he ate what and where?'
                   Why did he eat what he ate where he did it?

If we follow Rizzi (2002) and Cruschina (2007), and claim that INT is the base-generation position of both *why* and yes/no operators (null and overt), we can account for the observed pattern of substitution. In addition to structural considerations, we must explore another factor that may induce agrammatic subjects to fail in the production of the target interrogative sentence. In our Ibero-Romance sample, the overt operator *why* seems preferable for some agrammatic patients with respect to the null operator of a yes/no question, raising the question of the role of overt vs. null elements.

In addition to the use of *why* as a filler, another interesting phenomenon revealed by our experiment is the appearance in our corpus of expressions of the type *com és que* 'How is it that' found in the Catalan data. This expression, produced by C5 (i.e. Catalan subject nº 5), was found to provide this agrammatic subject with an alternative strategy to avoid S-V inversion and fill the position of the null interrogative marker with overt material. If we analyze *com és que* as a chunk base-

generated in the left periphery in the position of INT, the parallel with *why* (and *how come – How come she went?*) is immediately apparent.

Such an analysis coincides with what is seen in the field of language acquisition. *Com és que* parallels the French construction 'wh- + *est-ce que*' (Hamann 2006). The results for L1 acquisition of French indicate that this chunk can be seen as a routine and therefore decomposition into smaller parts is avoided. According to Rooryck (1994), *est-ce que* is a complex wh-morpheme which is base-generated in C_0[52]. The fact that *est* cannot be used in any other tense together with the lack of intonation argues, according to Zuckerman (2001), for the treatment of the construction as a complex wh-morpheme meaning *is it true that*.

In fact, the appearance of forms such as *how is it that* is not only circumscribed to a single case in our data. Similar expressions are used by both experimental subjects and controls (166a). *Saps si* or *sabes si* 'do you know if' (produced by C2, C4 and S3 and control subjects A4 and D4), *no crees que* 'don't you think that' (S3), *es verdad/posible que* 'is it true/possible that' or *é certo que* 'is it certain that' (S4 and control subject B2) or *estás segura de que* 'are you sure that' (control subject B2) are other variants employed (169b-d). All these expressions share the characteristic that they can emerge without S-V inversion.

(169)   a. Com és que t'agrada viatjar?   (C5 – Catalan)
        how be-pres.3rd.sg that you'like-pres.3rd.sg travel
        How is it that you like travelling?

Target: T'agrada   viatjar?
        you'like-pres.3rd.sg travel
        Do you like travelling?

        b. Saps si estan cansats?   (C4 – Catalan)
        know-pres.2nd.sg if be-pres.3rd.pl tired
        Do you know if they are tired?

Target: Estan cansats els nens?
        be-pres.3rd.pl tired the kids
        Are the kids tired?

---

[52] This claim contradicts Plunkett (1998, 1999), who sees these constructions as periphrastic questions and analyzes them as complex syntactic structures.

c. ¿No te parece que los niños están cansados?   (S3 – Spanish)
   not you-CL seem-pres.3ʳᵈ.sg that the kids be-pres.3ʳᵈ.pl tired
   Don't you think that the kids are tired?

Target: Están cansados los niños?
   be-pres.3ʳᵈ.pl tired the kids
   Are the kids tired?

d. É verdade que Andrés minte moito?   (B2 - Galician)
   be-pres.3ʳᵈ.sg true that A. lie-pres.3ʳᵈ.sg a-lot
   Is it true that Andrew lies a lot?

Target: Minte moito Andrés?
   lie-pres.3ʳᵈ.sg a-lot A.
   Does Andrew lie a lot?

1.6.3. SV vs. VS in yes/no questions

An analysis of the sentences correctly produced and including an overt subject reveals that there is a clear dissociation in the behavior of the agrammatic and control subjects in this respect. Agrammatic subjects favour SV over VS, contrary to the pattern displayed by control subjects. The inversion of the subject and verb seems to be systematically avoided either by using the non-inverted option (in the case of yes/no questions) or through the insertion of some element compatible with the order SV (such as *how is it that* to substitute for wh-questions). Since control subjects consistently produce total interrogatives with the order VS, it does not seem plausible that the pragmatics of the experimental task could have biased the results[53]. In the case of yes/no questions, 55 instances of correct y/n questions with overt subject were found in the agrammatic Ibero-Romance languages under analysis, out of which only 5.5% were produced with the order VS (vs. 64% for control subjects).

The Ibero-Romance varieties under examination are instances of null subject languages, i.e. they allow post-verbal subjects regardless of the nature of the verb (Rizzi 1982; Belletti 1988). This is due to the possibility of licensing a null pronominal subject, an 'associate' (Chomsky 1995), in the pre-verbal position, as illustrated in (170).

---

[53] Pragmatic measurements to check the contrast between yes/no questions produced with the order SV and declaratives are left for further research.

(170)   a.   Ha   trucat   en   Joan.   (Catalan)
                 have-pres.3rd.sg phone-past.part the J.
                 John has phoned.

        b.   Foi   Xoán.   (Galician)
                 go-pret.3rd.sg X.
                 John went.

        c.   La   ha   hecho   Juan.   (Spanish)
                 it-CL-fem have-pres.3rd.sg do-past.part J.
                 John has done it.

Traditionally, there have been two competing analyses to account for subject-verb inversion in terms of the position of the subject: a) VS is a derived order obtained by movement of the subject from its first-merge position (Belletti 1988) or b) VS is the consequence of the subject in situ (Borer 1986). Starting from the VP-internal subject hypothesis, according to which subjects originate in SpecVP (Koopman and Sportiche 1991), we assume that inverted subjects fill a position in the clause-internal periphery and establish a relation with an associate filler, an either overt or non-overt expletive, in pre-verbal subject position. Case and agreement are checked via Agree between the post-verbal subject and the preverbal expletive (Belletti 2001).

According to Belletti (2001, 2004), there is a complex array of positions above VP, more specifically, a clause-internal periphery displaying a significant resemblance with the left periphery (with designed positions for Topic and Focus) (Rizzi 1997, Cinque 1999). To derive the order V-S, the inverted subject moves to the Spec of one of these functional projections and the verb rises higher to the IP-field (or further up to C). Examples such as those in (171) showing the relative position of low adverbs and post-verbal subjects can be taken as evidence of the low position occupied by these adverbs.

(171)   Entendeu todo ben/correctamente María.   (Galician)
        understand-pret.3rd.sg all well/correctly M.
        Mary understood everything well/correctly.

The post-verbal subject may be in the specifier of one of the topic and focus positions represented below in (172) since it can be interpreted as new information, focus (173a), or given information, topic (173b)[54].

(172)   [TopP Top [FocP Foc [TopP Top ... VP]]]

(Belletti 2001, 2004)

(173)   a.   - Chi ha parlato?   FOCUS   (Italian)
                - Ha parlato Gianni.
                Who has spoken?
                *Has spoken Gianni.

        b.   - Che cosa ha poi fatto Gianni?   TOPIC
                - Ha (poi) parlato, Gianni.
                What has Gianni finally done?
                *Has (finally) spoken, Gianni.

(Belletti 2004)

Since there is no case assigner for the post-verbal subject in its first merge position, the subject must move to one of the two designed positions in the clause-internal periphery, i.e. Foc or Top, in order to be licensed (Belletti 2001). Unlike declaratives, where the subject may be in focus, in the case of questions, we find it in a topic position (Belletti 2004)[55].

However, the claim has been made that the post-verbal subject occupies a different position in Catalan and Spanish (Solà 1992, Ordoñez 2007), as depicted in (174).

(174)   [SSubj   SX   [SFocus]

(Ordoñez 2007: 254)

---

[54] Designed positions for topic and focus in the left periphery are not suitable to accomodate post-verbal subjects (Belletti 2004). This conclusion is based on differences in interpretation and intonation in Italian. First, the inverted subject cannot be high in the clause structure due to, among other factors, its interaction with low adverbs. In addition, the peripheral focus position is associated with a contrastive interpretation and carries a special stress, something that does not occur with postverbal subjects.

[55] I am grateful to A. Belletti for her comments on this issue.

According to Ordoñez (2007), the order V S XP (with XP = NP, PP, AdjP) derives from the movement of the subject to SSubj. V S XP is obtained when the subject appears in SFocus. While in Spanish different positions with respect to verbal complements are allowed, in Catalan the subject must follow all complements. This behavior has led to the claim that only focus position (in Belletti's (2001, 2004) model) is suitable for the Catalan subject (Ordoñez 2007). Despite this contrast, our data show that the order SV is favored independent of the language used (Catalan, Galician or Spanish) and must hence be independent of the position occupied by the post-verbal subject in Spanish and Galician vs. Catalan.

Evidence for difficulties with VS structures in agrammatism can also be found in Garraffa's (2008) study. MR, the Italian patient under investigation, was tested for her ability to carry out grammaticality judgment tasks involving agreement in SV vs. VS structures. Ungrammatical VS sequences were found to be harder to detect, with 31.2% errors vs. 6.2% for ungrammatical SV sequences. This effect was also observed with prepositional modifiers (*VS: 67.5% errors vs. *SV: 47.5% errors) (175). This is attributed to the fragile nature of non-local syntactic relations.

(175)   a.   L'autista dei ministri guida/*guidano con prudenza.
             'The driver of the ministers drives/*drive with caution'.

        b.   Guida/*guidano con prudenza l'autista dei ministri.
             'Drives/*drive with caution the driver of the ministers'.

                                          (Garraffa 2008: 1450)

Difficulties with inverted subjects may derive from different factors: structural position, movement, non-canonicity, interferences with agree or the presence of a preverbal *pro*[56]. Beretta, Harford, Patterson and Piñango's (1996) study involved 5 Spanish-speaking agrammatics from Venezuela who were tested for their abilities with inverted passives. The subjects manifested a random performance in the interpretation of inverted structures which the authors interpreted as evidence for movement of the subject from its base-generated position (vs. Borer 1986). If we were to take movement as crucial, since the surface position of both pre-verbal and

---

[56] I am grateful to J. Costa for his comments on the issue.

post-verbal subjects is achieved by means of a movement operation, the systematic avoidance of VS would be left unexplained.

Another possibility is that the preference for SV derives from structural considerations such as the need for more or less structure projected. As we have discussed, according to Belletti (2001, 2004) post-verbal subjects in declaratives may occupy the position of both topic and focus. Belletti and Leonini (2004) provide us with evidence from 26 adult L2 learners of Italian who suffer from problems with post-verbal subjects in focus position (analyzed through an elicitation task). The results show that most L2 subjects do not master the order VS despite their mastery of the null subject parameter[57]. There are two requirements for inversion to take place: a) a pro element and b) a right peripheral focus position located in the higher portions of the VP-field. Belletti and Leonini (2004) attribute avoidance of VS not to a deficit in licensing a null subject *pro* in preverbal position but to problems activating the clause-internal VP peripheral area. This can be interpreted in structural terms, i.e. in order to avoid the projection of the clause-internal periphery, L2 learners adopt an alternative strategy to focalize the subject. However, if we assume that the agrammatic deficit in interrogatives leads to the loss of TopP as a possible position for post-verbal subjects, we are immediately accepting that a specific projection may be deleted from the representation under requirement, in total contradiction with the TPH, which is a much more restrictive hypothesis.

Avoidance of the order VS can also be attributed to a deficit in licensing a *pro* element in preverbal position. Agrammatics may be opting for the alternative with an overt element in pre-verbal position in order to avoid the use of an expletive element. Avoidance of VS accounts for 94.54% of the correct answers with overt subjects in the data from our experimental group. Expletives (whether overt or null) do not contribute to the meaning of a sentence being susceptible to impairment in agrammatic speech. In fact, they may be seen as conceptually problematic in Minimalist terms due to their lack of phonetic content and their function as fillers. Since they have no effect either on the articulatory-perceptual system or on the

---

[57] Similar results have also been attested in the field of language acquisition with rare appearances of VS structures in early production (Adragão and Costa 2003).

conceptual-intentional system, they must be considered part of syntax-specific machinery (Chomsky 2000, 2001, Mohr 2004).

As with *why* questions, a possibility would be that patients go for the option with an overt element in pre-verbal position, thus avoiding the use of a phonetically unrealized expletive element. If this is the case, a systematic avoidance of the VS order in our experimental results naturally follows. However, if expletives are eliminated, which seems desirable on theoretical grounds, the argument disappears.

1.6.4. Some extra observations

In terms of the argument/adjunct distinction considered in our design, no observable differences were found in Ibero-Romance. This contradicts previous studies such as Thompson *et al.*'s (1996), but it is a result which is expected under the TPH in the absence of further assumptions since adjuncts and complements reside in similarly low positions in the tree.

Regarding comprehension results, according to our observations, there seems to be a clear dissociation between question production and wh-question comprehension in agrammatic Ibero-Romance which was found to be statistically consistent (Wilcoxon signed rank test: $p < 0.01$, $Z = -3.309$). Though the results presented in this dissertation are not directly comparable due to the different nature of the tasks, the observed tendency goes in agreement with Grodzinsky's (2000) claim that 'mechanisms that underlie language production are at least partially distinct from the comprehension device' (Grodzinsky 2000: 18). Thus, although both modalities have been claimed to be affected in agrammatism, according to our data, the extent of the damage is clearly different.

The comprehension task revealed very low error rates for both wh-word recognition (8/180 wh-words misinterpreted for mild agrammatics) and wh-question comprehension with animate subject and object questions (15/195 errors) – indicating spared lexical comprehension. Despite these low rates, an interesting pattern can be inferred in the case of subject and object wh-questions. The relevant contrast is illustrated in (176).

(176)   a. ¿Quién llamó a Juan?   Canonical order
                Who phoned John?

   b. ¿A quien$_i$ llamó Juan t$_i$?   Non-canonical order
      Who did John phone?

Non-canonical constructions seem to be more problematic for our agrammatic sample than canonical constructions. This distinction is consistent with Grodzinsky's (1990) TDH (see also Salis and Edwards (2005) or Zurif and Piñango (2000)). Nevertheless, the small number of errors and the need for further testing make us cautious about generalizations.

As already pointed out by Friedmann and Grodzinsky (2000), the low number of errors in comprehension together with the relatively high level of correctness in question production may be taken as evidence that the concept of question is preserved. Significant differences with the control population in production confirm the crosslinguistically observed deficit affecting this modality.

On the basis of our Ibero-Romance data, a pure structural account seems to raise some questions, as outlined in (177):

(177) If both wh- questions and yes/no questions require the projection of the CP-field:

   a. How can the dissociation observed in the results of 13 out of 15 patients be accounted for?
   b. How can *why* substitute for yes/no questions?
   c. Why is VS word order consistently avoided?

In the case of the question in (173a.), if we were to try an analysis based on movement considerations, we would be able to claim that yes/no questions are better preserved than wh-questions since they involve no movement of the interrogative operator – a null operator base-generated in INT vs. an operator moved to Foc. Agrammatic speakers, whose resources are limited, would choose this option (with no movement involved) on the basis of its less costly nature. This hypothesis would combine structural position and movement as the determining factors for the collapse of the system. The proposal would be that, even though agrammatic subjects do not have problems with the movement operation *per se*, in structures of a certain

structural complexity, its cost constitutes an extra burden which can lead to the collapse of the derivation.

In fact, the complexity of producing structures with wh-movement has already been claimed for agrammatic speakers (Berwick and Weinberg 1984, Thompson *et al.* 1996, de Roo 2001, Bastiaanse and Thompson 2003, Thompson, Shapiro, Kira and Sobecks 2003). In the field of comprehension, Broca's aphasics have also been claimed to experience difficulties in the assignment of thematic roles to moved constituents (see Grodzinsky (1990) for a detailed account based on comprehension results).

However, a deficit related to movement in production fails to account for all our empirical findings both in this section and in previous ones. For example, the avoidance of SV inversion would not be predicted since, as we saw, the subject moves in both SV and VS structures. Additionally, the tense-agreement dissociation would not be predicted either since the verb has to move all the way up in the tree structure so that uninterpretable features are eliminated. Failure of this type of approach has also been detected by, among many others, Lonzi and Luzzatti (1993) and Friedmann and Grodzinsky (2000), who claim that there are patients who can correctly apply move and that some constructions are problematic regardless of the presence vs. absence of movement (e.g. embeddings in relative clauses and sentential complementation).

Hence, going back to our Ibero-Romance results, we claim that the complexity in the case of wh- and y/n questions is marked by:

1. Structural position: since the left periphery is required for both construction types, agrammatics' failure is predicted, as is observable in the case of CM, who presents a generalized deficit in question production that affects both question types. The assumption of a structural deficit does not neccesarily entail that the clause structure is never projected up to the left peripheral portions. The results for our mild agrammatic sample show that questions are preserved to a varying extent in patients with less severe deficits.

2. The overt vs. null nature of the elements involved in the derivation: There is also an observable effect of complexity related to the overt vs. null

nature of the interrogative operators, favouring the substitution of yes/no questions with *why* questions (thus providing us with an answer to the question in (173b)).

Since yes/no questions are parallel structures to *why* interrogatives with the exception of the interrogative marker (null in the former and overt in the latter), it seems plausible that agrammatics choose the overt option in order to reduce the complexity of the task or at least suffer from an effect of random selection between full and empty interrogative markers.

With respect to question (173c), we evoke again the presence vs. the absence of a null element to justify the observed avoidance of the VS order among our Ibero-Romance agrammatics. The expletive *pro* required for these constructions seems to be avoided by our clinical population – something also noted for the object clitic/reflexive pronoun dissociation. This may acount for the dissociation between yes/no questions and wh-questions. Since inversion is compulsory in wh-questions, agrammatics adopted an available option 'yes/no questions without inversion' as the main strategy to overcome problems in wh-question formation. Though this is not the default option for control subjects, it is grammatical in the varieties under investigation. Nevertheless, syntactic representations are full of null objects. Experimental research to put this hypothesis to test is left for the future.

2. EMBEDDED SENTENCE PRODUCTION

A structural deficit predicts a general impairment in the production of complex structures. Consequently, we expect to find that the deficit will not be restricted to question production, but it will also affect subordinate structures (Menn and Obler 1990; Hagiwara 1995; Friedmann 2001). In order to test the degree of impairment of constructions involving the CP-area, an analysis of subject relatives was also carried out with both our agrammatic and our control populations.

Relative clause production provides us with a good testing ground for syntactic deficits since it involves not only high parts of the syntactic structure but also wh-movement. A structural deficit in embedding should lead to problems with

the complementizer while a problem with movement would lead to problems in the assignment of theta-roles (Novogrodsky and Friedmann 2006).

In 2.1, a characterization of relative clauses in Ibero-Romance will precede the cross-linguistic evidence from agrammatism which can be found in the literature (2.2). Section 2.3 summarizes the experimental design and introduces the results (2.4). The full findings are discussed in 2.5.

2.1. Relative clauses in Ibero-Romance

We will focus on restrictive relative constructions (178), which are usually headed by a relative pronoun and behave as modifiers of a nominal head that serves as the pronoun's antecedent (Bianchi 2002, 2004; Brucart 1999; Solà 2002).

(178) Las hojas que habían caído cubrían la acera.   (Spanish)
         The leaves that had fallen covered the pavement.

These constructions involve pied-piping of the preposition when the relative clause develops a prepositional function (Contreras 1999) as in the example in (179).

(179) El sitio [por donde$_i$ pasa el tren t$_i$]   (Spanish)
         The place through which the train passes
                              (Contreras 1999: 1957)

In the Ibero-Romance varieties under investigation the relative pronoun is a bound variable that gets interpreted from its antecedent (which may be a noun, a clause or a pronoun) and may be morphologically marked for the syntactic function that it performs, as illustrated in (180) (Solà 2002; Pusch 2006).

(180)   Ferran Adrià es un gran cocinero, a quien realmente admiro.
          FA is a great cook, whom I really admire
                              (Adapted from Pusch 2006: 89)

The relative constructions we examined in this research crucially depend on the movement of one constituent from the embedded subject or object position and its

co-indexation with a noun outside the relative clause (Chomsky 1981, 1995). Consequently, relative clauses can also be classified according to the position from which constituents are moved. Subject relatives are derived by movement from the embedded subject position (181a) while object relatives involve movement of the embedded object (181b).

    (181)   a. Subject relative: The girl$_1$ [that t$_1$ is drawing the grandmother].

            b. Object relative: The girl$_1$ [that the grandmother is drawing t$_1$].

In some languages (e.g. Hebrew or colloquial Ibero-Romance), the position of the trace can be filled by a resumptive pronoun (182) (Novogrodsky and Friedmann 2006; Pusch 2006).

    (182)   **A rapaza** que sua nai **a** peitea.   (Galician)
            the girl$_1$ that her mother her$_1$ comb-pres.3rd.sg
            The girl whose mother combs her hair.

The inventory of relative pronouns available for these constructions is similar to question words in Ibero-Romance in that it includes forms such as *que* or *qui/quen/quien* in Catalan, Galician or Spanish respectively. In addition, these pronouns share the characteristic of appearing in initial position in the embedded clause (see Zagona (2002) for Spanish). As far as the order of constituents after the relative element is concerned, the relative pronoun or adverb can be followed by the verb or some other constituent (183), possibly the subject.

    (183)   El restaurante donde trabaja Andrés/Andrés trabaja.   (Spanish)
            The restaurant where Andrés works.

Though in this kind of structure the inverted form is claimed to be the unmarked form, relative clauses also admit pre-verbal subjects (Contreras 1989). This is claimed to be due to the application of the (free) subject inversion option operative in null subject languages (Torrego 1984; Belletti 2004) (184).

(184)   a.   Xoán chegou.   (Galician)
                 X. arrive-pret. 3rd.sg

        b.   Chegou Xoán.
                 arrive-pret.3rd.sg X.
                 Xoán arrived.

More than one element can intervene between the pronoun and the verb (185). The order is more flexible than in the case of interrogative constructions (185b). Nevertheless, this flexibility varies across Ibero-Romance varieties and dialects. The Catalan counterpart of (185a) is dispreferred (186).

(185)   a. El restaurante donde ayer Andrés trabajó.   (Spanish)
           the restaurant where yesterday Andrés worked.

        b. *¿Dónde ayer Andrés trabajó?
           where yesterday Andrés worked?

(186)   ??El lloc on ahir Andrés va treballar.   (Catalan)
           the place where yesterday Andrés worked

Regarding the structural position of the complementizer in the Ibero-Romance varieties under examination, we depart from Rizzi (2001) (see (131) repeated below as (187) for convenience) and assume the structure in (188), where Demonte and Fernández-Soriano (2007) place possible complementizers for Spanish.

(187)   Force (*Top) **Int** (*Top) **Focus** (*Mod) (*Top) Fin

(188)   [$_{ForceP}$ [**que$_1$** [$_{TopP}$... [$_{FocP}$ qué $_{int/excl}$ [... [$_{FinP}$ **que$_2$** [...

The structure in (188) includes two types of *que* which are claimed to occupy the head position of two distinct functional projections: an optional *que* in FinP (189a) and the obligatory relative *que* in ForceP (189b). The two forms can co-appear in the same sentence (189c).

(189)   a.   ¡Qué de coches (**que**) tiene tu hermana!   (Spanish)
                what-an-amount of cars that have-pres.3ʳᵈ.sg your sister
                What an amount of cars your sister has!

        b.   La de sitios a los **que** habrá ido.
                the of places to the that have-fut.3ʳᵈ.sg go-past.part
                The places she must have gone to.
                                        (Bosque 1984)

        c.   Le gritó **que** qué tonterías **que** estaba diciendo.
                to-him shout-pret.3ʳᵈ.sg that what nonsenses that was saying
                He/She shouted, 'What nonsense you're speaking!'

2.2. Previous research in agrammatism

The subordination deficit in agrammatism has been documented for several languages (for English, German and Italian see Thompson, Shapiro, Schneider and Tait (1994), Thompson *et al.* (1996), Thompson, Shapiro, Ballard, Jacobs, Schneider and Tait (1997) or Bates, Friederici, Wulfeck and Juarez (1988); for Dutch, Swedish, Polish and Finnish Menn and Obler (1990); and for Japonese Sasanuma, Kamio and Kubota (1990) or Hagiwara (1995)). These studies found that agrammatic patients failed to produce certain complex constructions traditionally associated with the left periphery. This section seeks to give a comprehensive summary of some of the data on the literature which show that agrammatic deficits lead to the avoidance of embeddings or their substitution with incomplete or ungrammatical utterances in production.

2.2.1. Previous studies of Hebrew and Palestinian Arabic

Friedmann and Grodzinsky's (1997, 2000) studies include data from spontaneous speech of one Hebrew agrammatic subject. The authors found no evidence of embedded constructions. These were either avoided or, when employed, the complementizer or the embedded sentence was omitted. Under experimental conditions, the same results were attested in a repetition task where only 4 out of 23 sentences were produced correctly.

A later elicited production task with 5 Hebrew and 2 Palestinian Arabic speakers revealed the same underlying pattern. The contrast between subject relatives

(embedded sentences) and adjectival modification (non-embedded sentences) is summarized in Table 80.

	Relative clause		Adjectival modification	
	% correct	(correct/total)	% correct	(correct/total)
Hebrew	21%	(44/207)	100%	(76/76)
Arabic	28%	(10/36)	92%	(22/24)
Total	22%	(54/243)	98%	(98/100)

Table 80. Embedded and non-embedded sentences in Hebrew and Palestinian Arabic-speaking agrammatics (from Friedmann and Grodzinksy 2000)

Examples of each type of construction, taken from Friedmann and Grodzinsky (2000), are included below (190 and 191).

(190)   Zo   ha-iša   še-mesaxeket tenis.   (Hebrew)
         this the-woman that-plays tennis
         This is the woman who plays tennis.

(191)   Ze   ha-dag ha-kaxol.
         this the-fish the-blue
         This is the blue fish.

The omission of the complementizers and the inability to complete the embedded clause after it were the most frequent errors in the elicitation and repetition tasks, as illustrated in (192) and (193), taken from Friedmann and Grodzinsky (2000).

(192)   siparti la.......nir xayal   (Hebrew)
         Told-I her.....Nir (is a) soldier

(193)   dorit ba'aa...etmol... tilpena la-rofe _**e**......tor.
         *Dorit came...yesterday...called to-the-Doctor **that**...appointment.*

The errors were analyzed as derived from the failure in the integration of the complementizer in the structure, as predicted by the TPH (Friedmann and Grodzinsky 1997). Friedmann (1998) found that it was only CP embedding what was problematic

for Hebrew-speaking agrammatic subjects, while untensed clause embeddings appeared as preserved.

Friedmann (2001) provides further evidence from these two languages. Again, both spontaneous speech and structured tasks were proposed to asses the patient's preserved skills. With respect to spontaneous speech, 11 Hebrew- and 1 Palestinian Arabic-speaker were analyzed for two types of embeddings: full CP embeddings (i.e. sentential complements and full relative clauses) and untensed embeddings (i.e. infinitival complements and reduced relatives (*I saw the boy crying* – Friedmann 1998)). A repetition task with 6 Hebrew agrammatics and 6 controls was also carried out to obtain further evidence. The results are summarized in Table 81.

Spontaneous speech (n=12)	CP embedding	Untensed embedding
1950 utterances	12% (13/110)	99% (93/94)
Repetition (n=6)	CP embedding	Untensed embedding
Agrammatics	31% (50/162)	92% (130/141)
Controls	100% (120/120)	100% (120/120)

Table 81. Correct responses for CP embedding vs. untensed embeddings in Hebrew-speaking agrammatics (adapted from Friedmann 2001)

A clear deficit in the production of complex subordinated structures can be observed. While in spontaneous speech untensed embeddings were mostly unimpaired, 88% of the CP embeddings that appeared were ill-formed. In addition, agrammatics were found to avoid the production of these structures in comparison to normal speakers. Concerning the repetition task, a parallel distribution of errors was observed. The author claims that this pattern can be accounted for in terms of structural differences since untensed sentences can be analyzed without the involvement of the higher nodes of the syntactic representation (CP and TP).

Further evidence from Hebrew and Palestinian Arabic comes from two structured tasks (repetition and elicitation) performed with ten agrammatic subjects and ten controls. A summary of the results is shown in Table 82.

Repetition (n=10)	Relative clauses	Sentential complements
Agrammatics	33% (50/152)	33% (29/87)
Controls	100% (100/100)	100% (100/100)
Elicitation (n=7)	Relative clauses	Adjectival predicate
Agrammatics	22% (54/243)	98% (98/100)
Controls	99% (125/126)	99% (83/84)

Table 82. Correct responses for structured tasks in Hebrew and Arabic (adapted from Friedmann 2001)

Again, CP involvement turned out to be critical for agrammatic subjects in both spontaneous speech and structured tasks. In the repetition task, both sentential complements (*John thought that Mary sneezed*) and relative clauses (*This is the man who sneezed*) were impaired to the same degree, i.e. 67% (Friedmann 2001: 79). In the elicitation task, adjectival predicates were produced at control levels while relative clauses were poorly produced. According to the classification of errors, the use of direct instead of indirect speech together with the omission of the embedded sentence after the complementizer were the most common errors. Ungrammatical CPs (filled trace or unrelated embedded) and complementizer omissions were also detected.

Regarding comprehension of both subject and object relatives, Friedmann (2008) studied a sample of 5 Hebrew-speaking agrammatic individuals and 5 matched controls for their abilities in a binary sentence-picture matching task including subject and object relative clauses (with either a trace or a resumptive pronoun filling this position). An example of each type has been included below in (194).

(194) a. Tar'e li et ha-kof she-mexabek et ha-yeled   (Hebrew)
              show me ACC the-monkey that-hugs ACC the-boy
              Show me the monkey that hugs the boy.

        b. Tar'e li et ha-kof she-ha-yeled mexabek
              show me ACC the-monkey that-the-boy hugs
              Show me the monkey that the boy hugs.

c. Tar'e li et ha-kof she-ha-yeled mexabek oto
   show me ACC the-monkey that-the-boy hugs him
   Show me the monkey that the boy hugs.

(Friedmann 2008: 143)

The results show that, while comprension of subject relatives was above chance (85.2% correct), comprehension of object relatives with and without resumptive pronoun was at chance (58.3% and 59.1% respectively). Friedmann claims that, since the latter do not involve movement or traces, these results provide evidence against an account of agrammatism relying entirely on any of these factors (such as Grodzinsky's (1990, 1995, 2000) *Trace Deletion Hypothesis*). According to Friedmann (2008), an impairment in the construction of the tree structure up to the top or the assignment of thematic roles might be involved. Notice however that resumptive pronouns may be analyzed otherwise, depending on the assumed theory, as the result of copy.

2.2.2. Previous studies of Greek

Data from two non-fluent Greek agrammatics is provided in Stavrakaki and Kouvava (2003). The spontaneous speech of these subjects showed impaired abilities in the use of complementizers (SC – (0/8) 0% correct; VF – (2/6) 33.33% correct). SC omitted all instances of these forms while VF correctly produced *an* 'if' while omitting other complementizers. This poor production rate in the case of VF contrasted with his use of wh-questions. The fact that complementizers are realized in head position as opposed to the specifier position of wh-element is seen by the authors as responsible for this dissociation. This explanation coincides with Rispens *et al.*'s (2001) account for differences in negation results, which show higher error rates when they occupy the specifier position.

Data from designed tasks (including grammaticality judgment and a preference task) showed higher percentages of correctness than spontaneous speech in both patients. Nevertheless, the pattern of impairment could be detected across modalitites and tasks. The results appear below in table 83.

	SC	*VF*
Grammaticality judgement	(12/20) 60%	(15/20) 75%
Preference task	(5/10) 50%	(8/10) 80%

Table 83. Correct use of complementizers by two Greek-speaking non-fluent aphasics

2.2.3. Previous studies of Germanic languages

Nadeau and Rothi (1992) found up to 40% complementizer omissions in English agrammatic subjects. Ni, Shankweiler, Harris and Fulbright (1997) show a preference for relatives not involving CP in the elicitation task they used for English. The agrammatic subjects under investigation did not produce any full relative correctly, but they produced 12/32 reduced relatives.

Thompson *et al.*'s (1996) study of 7 English agrammatic subjects provide us with an analysis of discourse where the authors attest that agrammatics showed a clear tendency to produce simple constructions without 'moved sentence constituents or embeddings' (Thompson *et al.* 1996: 192). The mean number of embeddings in narrative and conversational samples ranged from 0.02 to 0.70 in contrast to 1.10 for control subjects, indicating low command of these constructions. The same patients were also tested for their subject relative comprehension skills. The results from the Philadelphia comprehension battery for aphasia [58] showed much preserved comprehension for this sentence type, which shows canonical order of constituents. Correctness was achieved for 70-100% of the tokens. Individual results are shown below in Table 84.

Subjects	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Controls*
Mean Embeddings	0.24	0.41	0.10	0.02	0.28	0.02	0.70	1.10
Comprehension Subject Relatives	85%	70%	75%	80%	100%	70%	90%	*

* No available data

Table 84. Embeddings by 7 English-speaking agrammatics in narrative samples (adapted from Thompson *et al.* 1996)

---

[58] The Philadelphia Comprehension Battery (PCB), designed by Saffran, Schwartz, Linebarger, Martin and Bochetto (1988), includes lexical and sentence comprehension, synonymy and grammaticality judgment.

Regarding other Germanic languages, Burchert *et al.* (2005) reported the production of 8 agrammatic German-speakers in spontaneous speech. The results showed that only 4 subjects produced embedded clauses. These structures represented 5% of the total number of clauses vs. 11% in the case of control subjects.

2.2.4. Previous studies of Romance languages

Previous studies characterizing the production of embeddings in Romance agrammatism are Nespoulous *et al.* (1998, 1990) for French. While the production of CP embeddings was reported to be reduced and generally ill-formed, untensed embeddings were spared.

Nespoulous *et al.* (1988) and Nespoulous *et al.* (1990) report similar results. Mr. Clermont, one of the French-speakers tested, showed a clear deficit in the nodes above tense. He produced only 2 relative clauses in a controlled situation in which the control subject produced 33 relative clauses and 49 CP embeddings of different kinds. Further evidence can be found in a 'vertical' reading of the results, whereby the same agrammatic subject substituted for the correct relative pronoun 9 out of 20 times (*'qui'* substituted for *'que'* and vice versa to an unspecified degree). Since untensed clause embeddings were found to be spared, these findings seem to restrict the deficit to limitations in the access to CP.

2.2.5. Previous studies of Ibero-Romance

Data from European Portuguese were analyzed in Ferreira (2008). In her study, the author included data from 5 agrammatic patients in a picture identification task – based on Friedmann (1998) – and a preference tasks. Starting with production, the author found dissociation between subject and object relatives, with the former better preserved for 4 of the 6 subjects. See Table 85.

Subject	Subj Rel.	Obj Rel.
L.	40% (4/10)	60% (6/10)
C.	80% (8/10)	80% (8/10)
J.L.	30% (3/10)	0% (0/10)
J.N.	40% (4/10)	0% (0/10)
M.	40% (4/10)	40% (4/10)
F.	50% (5/10)	30% (3/10)

Table 85. Correct responses in the production of relative clauses by 5 Portuguese-speaking agrammatics

Regarding error type, the omission of the complementizer was the most frequent error both for subject (mean 88.1%) and for object relatives (mean 47%).

Comprehension was found to be better preserved. However, the same pattern of deficit was replicated. The results showed that subject relatives and distractors (two infinitival constructions and two partial interrogatives) were spared in comprehension. Both agrammatics and control subjects performed 100% correctly. As for direct object relatives, the percentage decreased to an average of 77.5% correct responses (L: 100%, C: 100%, JL: 75%, JN: 63.5%, M: 50%).

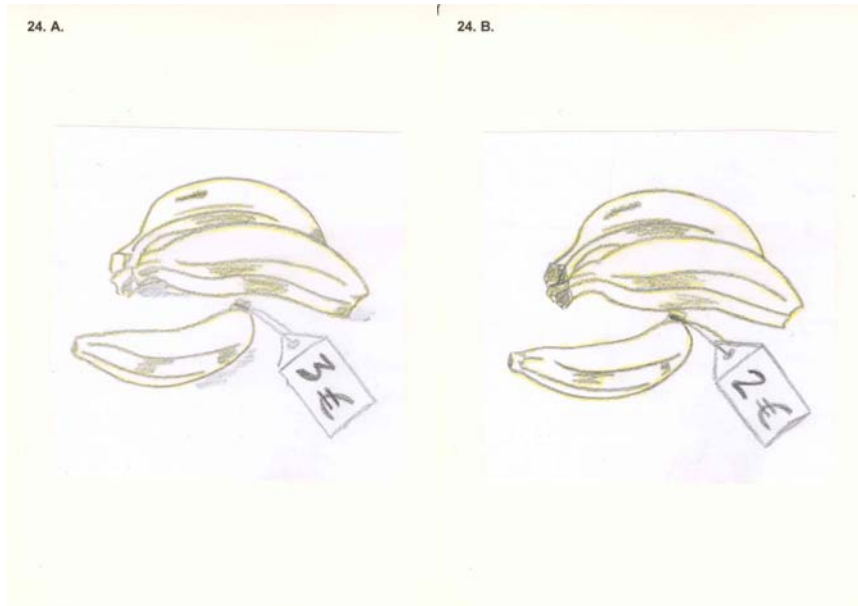## 2.3. Experimental design: Production of relative clauses.

In our experiment, to observe the production of embeddings in Ibero-Romance, an elicitation task for right-branching subject relatives, inspired by Friedmann and Grodzinsky (2000), was presented to our group of 15 mild and 1 moderate agrammatic subjects. A total number of 25 items (24 subject clauses and 1 object relative clause used as control) were designed to check the subject's ability to build subordinate constructions involving the CP-field.

The experimental procedure was as follows: for every sentence, two pictures were developed, one for the prompt sentence and the other depicting the experimental target. Subjects were expected to modify the prompt sentence, which included a relative clause, to match the new characteristics of the drawing. As far as subject relatives are concerned, the prompt items and the target answers were like those shown in (195).

(195) Éstes   son   os plátanos que   custan   tres euros.
       these be-pres.3rd.pl the bananas that cost-pres.3rd.pl three euros
       These are the bananas that cost three euros.

Target utterance: Éstes   son   os plátanos que   custan   dous euros.
       these be-pres.3rd.pl the bananas that cost-pres.3rd.pl two euros
       These are the bananas that cost two euros.
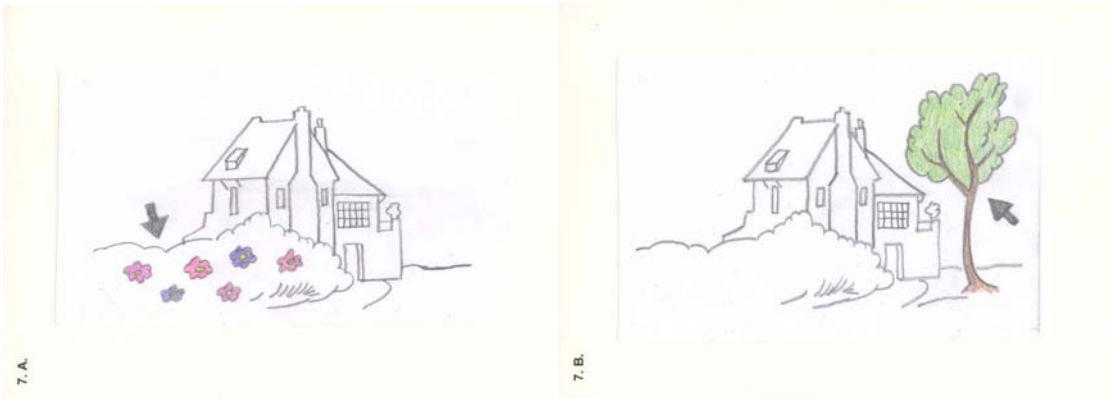
<div align="right">(Galician)</div>

One object relative (token nº7) was introduced to obtain preliminary insights into the contrast between subject and object relatives. The Catalan version of Token no. 7 can be seen in (196).

(192) Aquestes són les flors que veu en Joan des de la seva finestra.
       these be-pres.3rd.sg the flowers that see-pres.3rd.sg the J. from the his window
       These are the flowers that John sees from his window.

Target utterance: Aquest és l'arbre que veu en Joan des de la seva finestra.
       this be-pres.3rd.sg the tree that see-pres.3rd.sg the J. from the his window
       This is the tree that John sees from his window.
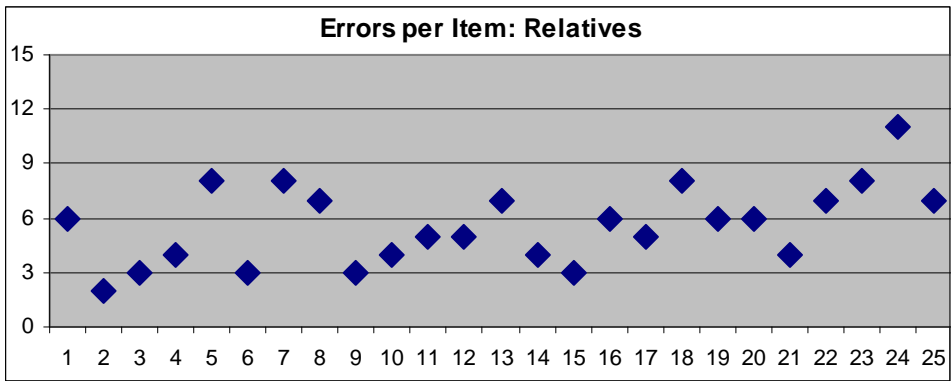
<div align="right">(Catalan)</div>

Since only one item was tested, the results only have indicative value and will be discussed separately. Further testing will be left for further research.

2.3. Results

For our 15 controls, out of the total number of responses (n = 375), only one error (D5) was detected. This was taken as confirmation of the validity of the experimental design.

Regarding the results for agrammatics, an analysis of the performance of our mild sample across items revealed a great variability among tokens. As in the case of interrogatives, there were errors associated with all the experimental tokens, ranging from 2 with token 2 to 11 with token 24. Again, no token was produced incorrectly by all subjects. Graph 47 represents the number of errors for each item.

Graph 47. Number of errors in embedding production according to item

The individual results of the elicitation task, which are summarized in Table 86, show that relative production was impaired for the three languages under investigation but to a greatly varying degree depending on the subject. Percentages of correct responses were found to range from 20% in the case of G1 to 96% in the case of S3.
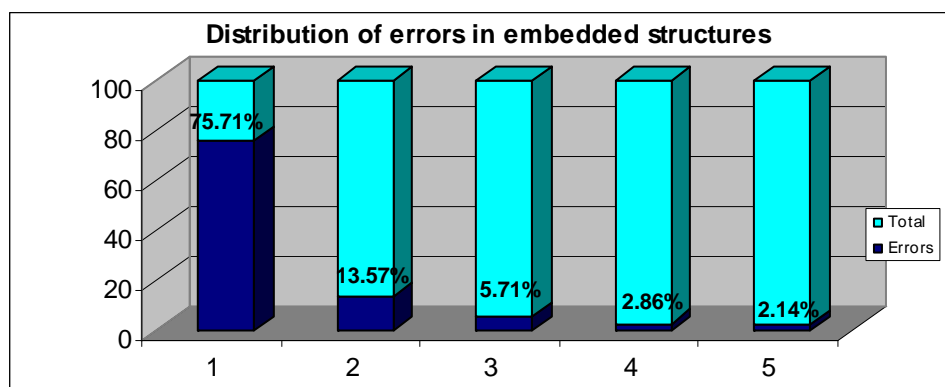
		Embedding	*production*
		% correct	(correct/total)
Catalan	C1	92%	(23/25)
	C2	56%	(14/25)
	C3	48%	(12/25)
	C4	92%	(23/25)
	C5	84%	(21/25)
Mean		74.4%	(93/125)
Galician	G1	20%	(5/25)
	G2	60%	(15/25)
	G3	72%	(18/25)
	G4	32%	(7/25)
	G5	48%	(12/25)
Mean		45.6%	(57/125)
Spanish	S1	36%	(9/25)
	S2	44%	(11/25)
	S3	96%	(24/25)
	S4	72%	(18/25)
	S5	92%	(23/25)
Mean		68%	(85/125)
Total		62.67%	(235/375)

Table 86. Individual results for relative production by Ibero-Romance agrammatics

Errors were classified as in (197) and their incidence represented in Graph 48.

(197)   *Classification of errors according to type:*

1. Relative omission: (106/140)
2. Relative omission + Verb omission (19/140)
3. Errors with the object relative (8/140)
4. 'Don't know' responses (4/140)
5. Verbless relatives (3/140)

Distribution of errors in embedded structures

100
80
60
40
20
0

75.71%
13.57%
5.71%
2.86%
2.14%

1   2   3   4   5

Total
Errors

1. Relative omission
2. Relative omission + Verb omission
3. Errors with the object relative
4. 'Don't know' responses
5. Verbless relatives

Graph 48. Distribution of errors in embedded structures

As can be seen, out of the 140 errors detected among the data from mild agrammatics, omission of the relative pronoun is by far the most frequent error (125/375 total number of responses).

(198)   Este hombre tiene   el   pelo negro.   (S2, Spanish)
        this man have-pres.3rd.sg the hair black
        This man has black hair.

Target utterance: Éste   es   el hombre que tiene   el pelo negro.
        this be-pres.3rd.sg the man that have-pres.3rd.sg the hair black
        This is the man that has black hair.

Subjects showed a clear tendency to produce a simple declarative instead of the required form. In addition to these omissions, not all subjects succeeded in the production of the declarative and 19 examples of verbless structures were detected. This structure was mainly used by G1, who produced 10/19 occurrences of verbless sentences. Three instances of complementizer production but without verb in the relative clause and four 'don't know' responses constitute the rest of the detectable errors found in subject relatives. Differences across languages turned out to be significant only in the case of Galician ($p < 0.01$) in a Mann-Whitney U test.
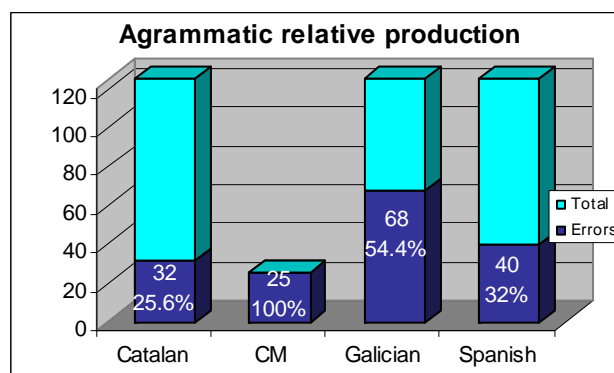
Apart from the errors listed above in (197), the behaviour of C2 (Catalan experimental subject number 2) deserves special attention. This subject produced 9 examples of copula omission in the main sentence with a correct relative (see (199)), which is the reason why these items have not been counted as problems in the production of relatives. Similar examples were produced by G4 (n = 3) and S1, S3 and S5, who only produced one example of this type each.

(199)   *Aquesta dona que   té   el   collaret. --- C2
          this woman that have-pres.3rd.sg the necklace
          *This woman that has the necklace.

Target utterance: Aquesta   és   la   dona que   porta   collaret.
                    this be-pres.3rd.sg the woman that wear-pres.3rd.sg necklace
                    This is the woman that is wearing the necklace.

As mentioned above, an example of object relative (token nº 7) was introduced to observe the contrast between subject and object relatives. In terms of errors, our results clearly seemed to indicate that object relatives are more problematic than subject relatives for agrammatic subjects. Out of the 15 responses obtained from the three languages under investigation, only 7 were correct. Therefore, the percentage of errors for object relatives reached 53.33% while for subject relatives it was 36.39%. Nevertheless, these data can only be seen as a preliminary indicator, and a specific test is needed before firm conclusions can be drawn. We reserve this issue for further research.

As we have seen, mild agrammatics produced a total number of 140/375 errors. Nevertheless, there is a clear divergence between these results and those obtained for our moderate agrammatic subject, indicating that this impairment is conditioned by the degree of severity of the agrammatic deficit. The contrast between correct vs. incorrect answers is shown in Graph 49.

Agrammatic relative production

*CM: Catalan moderate agrammatic

Graph 49. Production of relatives by agrammatic Ibero-Romance-speakers

Despite the fact that significant differences were found in the contrast between experimental and control subjects at a 1% level (Mann-Whitney U test: $p < 0.01$, $Z = -4.904$), there is an observable degree of preservation in the mild agrammatic sample. In contrast, CM failed to produce a single correct item. 23/25 responses consisted of the omission of the complementizer and 2/25 were 'don't know' responses.

2.4. Discussion

As we have shown above, data from spontaneous speech and structured tasks in Hebrew and Arabic (Friedmann 2001), as well as a retrospective review of spontaneous speech data from other languages such as English, French or Japanese, show a clear deficit in embedded clauses among agrammatics (Menn and Obler 1990; Stavrakaki and Kouvava 2003; Burchert *et al.* 2005; Thompson *et al.* 2006). Nevertheless, this deficit has been found to be restricted to certain constructions. Some studies have found that agrammatic subjects either avoid or fail to produce well-formed embedded structures only when they require the participation of the CP layer, while untensed embeddings are better preserved (Nespoulous *et al.* 1988; Ni *et al.* 1997; Friedmann 1998, 2001; Friedmann and Grodzinsky 1997, 2000).

The contrast between full relatives and sentential embeddings requiring a complementizer in C on the one hand and semi-relatives or reduced relatives (among others) on the other – with the former impaired and the latter spared, as documented by Friedmann (2001) – seems to indicate that a structural account will afford the

better explanation for these agrammatic data. The complementizer cannot be integrated into the structure due to the high structural position it occupies (Friedmann 1998, 2001, 2008; Friedmann and Grodzinsky 1997, 2000).

Our results from Catalan, Galician and Spanish indicate that the production of subject relatives was impaired in the sample under investigation (mean errors: 36.39%) though inter-subject variation was prominent (it ranged from 20% to 96% correct responses). Our data for Ibero-Romance seem to confirm the hypothesis that structures relying on the projection of the CP-field are susceptible to impairment in agrammatic subjects. Nevertheless, even though access to ForceP is restricted, mild patients may present a certain degree of preserved abilities. This is observable through the relatively high percentages of success obtained by (at least some of the patients in) the mild sample, in direct contrast with the results for our moderate agrammatic, who failed to produce a single subject embedding.

Additionally, if we take into account the contrast found between subject relatives and our object relative example, a purely structural explanation would not suffice to account for the dissociation. Since the complementizer would reside in the same functional node in both structures, which we have assumed to be ForceP in line with Demonte and Fernández-Soriano (2007), structural impairment of the CP-area would predict impairment in both structures to the same extent. Nevertheless, we have found indications of an increase in the percentage of errors with object relatives (53.33% vs. 36.39% for subject relatives). Further testing is needed to verify the behaviour of object relatives in Ibero-Romance – an issue beyond the scope of this dissertation.

If we were to approach the deficit as a problem with movement – movement, canonical vs. non canonical patterns or traces of movement – we would expect failure with embedded sentence production in agrammatism (Thompson *et al.* 1996)[59]. However, according to Friedmann (2001), there is no difference between relative clauses and sentential complements not involving movement, with both forms impaired, as is also documented for European Portuguese (Ferreira 2008). This is taken by the author as an indicator of a structural deficit in production rather than a

---

[59] Dissociation between subject and object relatives has been also reported in comprehension, with the former better preserved than the latter (Friedmann 2008; Grodzinsky 1990, 2000).

movement deficit. Problems with movement would account for the failure only in relative clauses but not in sentential complements.

With the scanty data we have to date, we can only conclude that our Ibero-Romance agrammatic subjects either avoid or fail to produce well-formed embedded structures (at the level of non-pathological subjects) when these structures require the participation of the CP layer. The deficit leads to high omission rates for complementizers. However, differences among embedded structures need to be explored to determine which factors intervene in the relative degree of impairment/unimpairment. Testing adjectival clauses without CP, e.g. *la nena pintada per l'artista* 'the girl painted by the artist' is an issue left for further research.

3. CONCLUSION

Data presented in this chapter is considered to be of great interest since they constitute the first approach to deficits in production in the CP-area in Catalan, Galician and Spanish agrammatism. As shown by our results, Ibero-Romance agrammatics suffer from a consistent syntactic deficit which affects structures crucially dependent on the left periphery. This pattern of damage is predicted under structural terms since the CP-field constitutes the left end of the syntactic representation and, is therefore expected to be the most severely impaired area. As we did for the IP-field in Chapter II, the sentential structure of Cartographical models (Belletti 2002; Cinque 1999, 2002, 2006; Rizzi 1997, 2004) has been used to account for the new evidence from Catalan, Galician and Spanish.

In order to provide a proper characterization of the pattern of impairment of the constructions examined in this chapter, a summary of the findings for our clinical population has been shown in Tables 87 and 88 and plotted in Graphs 50 and 51 (where only production data are represented).

Prod.	Category	% errors	Main error type	Task
	Wh-questions	47.69%	Substitution with yes/no	Elicited production
	Yes/No questions	32.22%	Substitution with *why*	Elicited production
	Subject relatives	37.33%	Relative Omission	Elicited production
Compr.	Category	% errors	Main error type	Task
	Wh-question comp.	9.62%		Forced-choice task
	Wh-word comp.	4.66%		Forced-choice task

Table 87. Summary of findings: Mild agrammatics, mean percentage of errors

Graph 50. Ibero-Romance agrammatic CP-field: Percentage of production errors for the mild sample

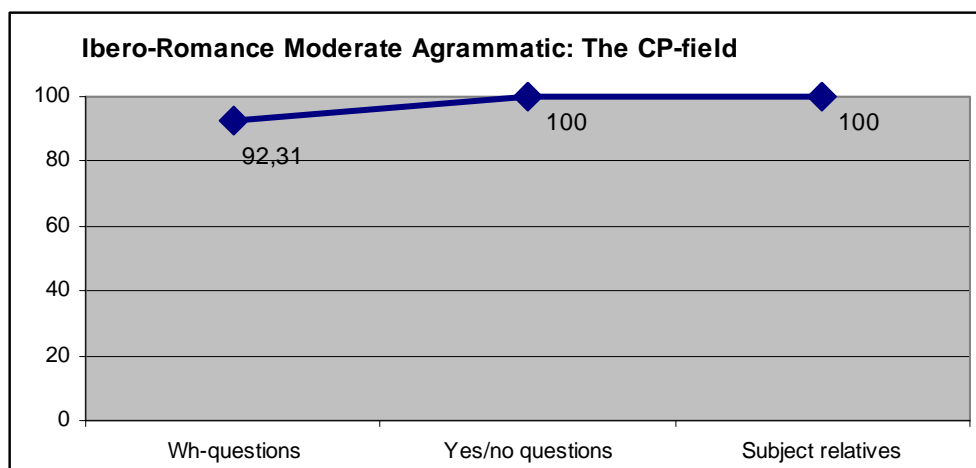| Prod.	Category	% errors	Main error type	Task
	Wh-questions	92.31%	Substitution with yes/no	Elicited production
	Yes/No questions	100%	Substitution with *why*	Elicited production
	Subject relatives	100%	Relative Omission	Elicited production
Compr.	Category	% errors	Main error type	Task
	Wh-question comp.	38.46%		Forced-choice task
	Wh-word comp.	7.69%		Forced-choice task

Table 88. Summary of findings: Moderate agrammatic, mean percentage of errors

Graph 51. Ibero-Romance agrammatic CP-field: Percentage of production errors for the moderate
       sample

Additionally, as we did in our analysis of the IP-field in Chapter II, the results
for each language have been illustrated in Graph 52. A fairly homogeneous behavior
among Ibero-Romance varieties, which is statistically confirmed, can be attested.

Graph 52. Mean percentages of Ibero-Romance mild agrammatic production errors

In agreement with previous findings for other languages, all the constructions
tested in this chapter have been found to be impaired in our agrammatic sample, i.e.
significant differences were found between agrammatics and controls in all the
experimental tasks. In order to explore the possible structural nature of the deficit, we

have assumed that the left periphery consists of an array of functional projections with the linear order shown in (200) for the relevant constructions under analysis:

(200)   Force > INT > Foc

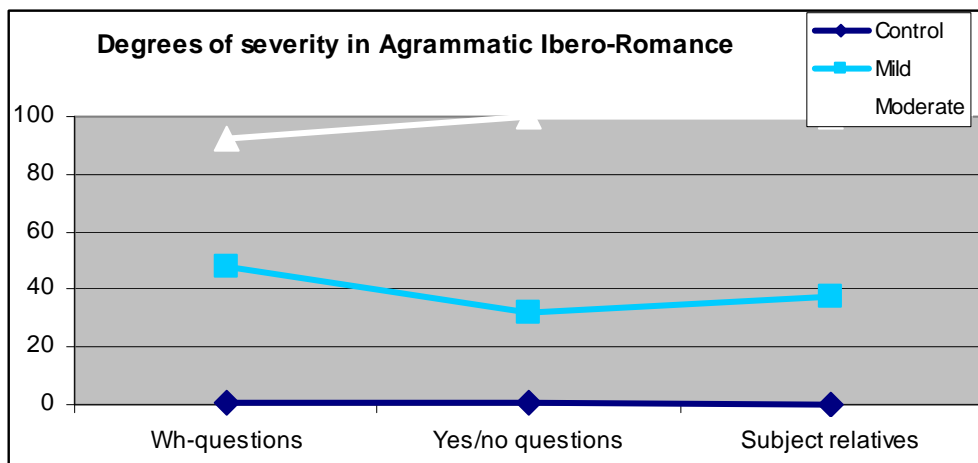The distribution of syntactic nodes in the left peripheral area would oblige us to predict subject relatives (crucially dependent on the projection of ForceP) to be the most severely impaired category, followed by yes/no questions (in INT) and wh-questions (in Foc). As can be seen in Graph 52, our data does not support this, since wh-questions were found to be the most difficult group for patients while yes/no questions were better preserved ($p < 0.05$, $Z = -1.993$).

Substitutory strategies for yes/no question production would also not be predicted by a truncation model. If *why* is base-generated in INT, together with null yes/no question operators, the TPH would lead us to infer that questions headed by *why* are harder to produce than any other wh-question. Therefore, we would expect more substitutions with wh-forms than with *why*, contrary to our observed results (31% errors in yes/no question production were substitutions with *why* questions vs. 10% substitutions with wh-). The appearance of this form may be seen as the patients' attempt to fill in the position of the null operator in yes/no questions.

In addition to the appearance of *why* as a filler, we report similar expressions of the type *com és que* 'how is it that'. Difficulties with null elements would also account for the observed systematic avoidance of VS structures (only 5.5% correct yes/no questions with SV inversion were documented vs. 64% for control subjects). However, the rate of appearance of null elements in the syntactic structure of multiple constructions makes countless predictions possible, so serious testing is still needed.

An unsolved puzzle for the TPH can be found in the contrast between subject relatives and our single object relative example (36.39% vs. 53.33% errors respectively), since the complementizer would reside in the same functional node in both structures, thus leading us to expect the same degree of impairment in both constructions.

As in the case of the IP-field, the degree of severity of the agrammatic deficit has been found to play a role in the observed results. For the CP-field, the contrast between populations is illustrated in Graph 53.

Degrees of severity in Agrammatic Ibero-Romance

◆	Control		
■	Mild		
▲	Moderate		

Graph 53. Degrees of severity of agrammatism vs. mean percentage of errors, all three languages

In this section we have also introduced some results related to the issue of comprehension. These indicate that production and comprehension skills are dissociated in our agrammatic sample, though perhaps not as sharply as either the TDH or the TPH would lead us to expect.

With the limited data available to us at this point, we can only conclude that, our Ibero-Romance agrammatic subjects either avoided or failed to produce well-formed structures (at the level of non-pathological subjects) when such structures required the participation of the CP layer. Thus, structural considerations were found to play a role in the deficit. However, a proper account for our data must consider some additional factor in order to properly predict the observed behavior of our experimental subjects.

IV. General conclusion & further research
_____

 'Two reasons (at least) render research on language disorders of
 interest for contemporary linguistics: the first derives from the need
 to identify detailed physical mechanisms of the brain that correspond
 to the various domains of grammar and its structures (...) The second
 reason is more pertinent to linguistic theory per se (...): the behavior
 of impaired language (with respect to various syntactic concepts and
 proposals) may be able to provide independent evidence of the
 concepts and their interaction and thereby contribute to current
 developments of syntactic theory' Terzi (2005: 111).

The general aim of this dissertation was to examine the production (and to a
lesser extent comprehension) skills of 15 mild agrammatic patients – native speakers
of Catalan, Galician and Spanish – further pursuing a line of research undertaken in
previous work (Martínez-Ferreiro 2003, Gavarró and Martínez-Ferreiro 2007). To
fulfil this aim, a set of experimental tasks was designed to assess patients' abilities to
project certain positions along the tree structure, namely the positions for negation,
tense, modals and aspectuals, direct object and reflexive clitics, wh- and yes/no

questions together with wh-words and embeddings, as well as subject-verb agreement. The data discussed throughout this dissertation – which in many cases constitute the only data available for these three Ibero-Romance varieties – shows that there is an undeniable relationship between structural position and agrammatic deficit. The impairment or preservation of inflectional elements is conditioned by their location in the syntactic tree. We have investigated domains (and languages) for which no work had hitherto been done, and the results show surprising homogeneity among languages when the structures targeted share essential properties. Our results are also compatible with those found for other languages, with discrepancies appearing only when cross-linguistic variation is observed in specific constructions.

All in all, our data indicate that most functional categories under investigation were not completely damaged in our agrammatic sample. In this connection, it is worth recalling that a key question for the truncation hypothesis has always been how to account for variation. In (201), we represent how we can account for both across-subject variation and within-subject variation in the following terms:

(201)

1. Non-pathological adult subjects are endowed with the resources to complete structures up to the left end of the left periphery.

2. In the case of deficit, the ultimate height they reach decreases. However, this does not necessarily entail that it descends to the same exact extent for every patient (202) or that the same patient does not display a variable behaviour across answers (203).

(202)   *Area of distribution of responses across subjects*

(203)   *Area of distribution of responses in case studies*

3. The ultimate height patients can access is more restricted in the case of more severe deficits.

In Graph 54 the experimental results for the 15 mild agrammatics are ordered according to their relative position in the syntactic tree (modals and aspectuals have been represented as a single group). For those subjects also tested in Martínez-Ferreiro (2003) and Gavarró and Martínez-Ferreiro (2007), the results for tense and agreement have been included to provide a clearer general view of the agrammatic phenomenon in Ibero-Romance.

Ibero-Romance Agrammatic Production

IP-Field   CP-Field

* 3ʳᵈ person object clitics and reflexive forms have been included together under the label
   clitics. For the sake of clarity, object clitics have also been represented in isolation.

Graph 54. Percentage of Ibero-Romance agrammatic errors in production

The general results indicate that the number of errors made by the agrammatic sample is related to the structural position of the error type, with a tendency to greater errors as one moves up from IP- to CP-field. However, this correspondence is not perfect. Elements dependent on the higher portions of the IP-field (e.g. object clitics) can be seen to be more severely damaged than some elements in the left periphery (e.g. yes/no questions). The varied nature of the experimental tasks forces us to be conservative with our conclusions; nevertheless, in the light of current research, despite the crucial involvement of structural position – which supports Grodzinsky's (2000) claim that Broca's area is involved in the construction of higher parts of the syntactic tree – some other factors need to be taken into account in order to explain the agrammatic deficit.

This need is especially manifest if we examine the results individually. Graphs 55, 56 and 57 present the results grouped per language. Variability among subjects, even though it has not been considered statistically, can be observed for the three languages under investigation. However, as we have already mentioned in the introduction (Grodzinky 1991; Grodzinsky *et al.* 1999; Miceli *et al.* 1999), this variability, which is particularly noticeable in yes/no question production, does not enter into contradiction with structural accounts.

Graph 55. Percentage of Catalan agrammatic production errors

Graph 56. Percentage of Galician agrammatic production errors

Graph 57. Percentage of Spanish agrammatic production errors

Graph 58 represents the results for CM, the Catalan moderate agrammatic, showing a significant increase in the number of errors.

Graph 58. Percentage of Catalan moderate agrammatic production errors

Albeit at a much higher rate, this moderate patient seems to replicate the pattern shown by his mild-agrammatic counterparts, thus providing evidence for the value of agrammatism as a unifying syndrome over and above individual differences.

In this dissertation, in order to account for the results under analysis, we have claimed that the syntactic deficit displayed by our Ibero-Romance sample cannot be

explained exclusively by reference to a structural deficit (even if we approach the deficit as affecting chunks of the syntactic tree rather than functional categories one by one). Major divergences from a classic structural pattern reside in the dissociation between object clitics and reflexive forms (with the latter better preserved) and the behavior of yes/no questions (better preserved than wh-questions, replaced by *why* questions or produced without SV inversion).

Our findings with clitics suggest that, at least for the population under investigation, there are two possible intervening factors: argument reduction and the presence vs. absence of phonetically unrealized elements. In both cases, object clitics are prejudiced with respect to reflexive forms. The argument reduction solution does not extend however to the appearance of *why* questions in substitution for yes/no questions, suggesting that in addition to structural considerations some other factors interact with agrammatic results.

This dissertation merely points down the path towards a truly complete characterization of agrammatic Ibero-Romance. The work begun here can be explored further across many different dimensions: population, severity of the deficit, language, modality, data collection methods or constructions investigated. This section summarizes some of these issues open for future research.

Regarding population, we have compared our findings to those we obtained from non-impaired adults doing the same tasks. Beyond this, however, research involving the observation of language acquisition (both normal and pathological), L2 learning or different forms of adult pathology would contribute to the additional enrichment of our discussion. Furthermore, a more fine-grained analysis of data from agrammatics would also be worth exploring. For example, in our mild agrammatic sample, patients suffered from subtle differences in lesion sites, with four of our tested patients – G3, S3, S4 and CM – showing impairment in basal ganglia. Since no significant differences were found in the performance of these subjects with respect to their mild counterparts, we have treated them together with the rest of our participants. However, the basal ganglia have been claimed to play a role in human language. Lieberman (2006) proposes a grammar of the basal ganglia with a generator of cognitive patterns and a space for working memory. While the latter

would be located in Broca's area, the generator would crucially depend on the basal ganglia (see Balari and Lorenzo 2007 for a discussion). In addition, according to Ullman (2001) and Pancheva and Ullman (2004), the left basal ganglia have a role in grammatical rule processing and structure building. Thus, research focusing on the specific impact of disorders in the basal ganglia in speech pathologies would undoubtedly contribute to the clarification of the role of these structures in human language.

The population tested in the present research was chosen not only on the basis of their fronto-temporal lesions with an agrammatic profile but also due to their degree of severity. We have mainly characterized the behaviour of mild agrammatic subjects. Only one moderate patient was tested. However, several constructions have been targeted which show very poor results for this patient. A more substantial number of observations would allow us to establish a clear contrast between levels of agrammatic severity which could only be tentatively glimpsed in this dissertation and therewith prove the value of linguistic tasks as diagnostic tools. The same can be said regarding the language varieties investigated, given that we have limited ourselves to Catalan, Galician and Spanish. Further analysis would greatly benefit from the inclusion of European Portuguese, an Ibero-Romance variety not included in our discussion. In this regard, various studies on verbal morphology (Cerdeira 2006; Cerdeira, Costa and Trindade 2007) and relative clauses (Ferreira 2008; Costa, Lobo, Silva and Ferreira 2008) have already been carried out.

There are also several issues specifically related to the syntactic constructions we have investigated. The experiments already conducted raise many new questions and leave others open to further exploration. In particular, the issues discussed in chapter II can be enriched by further testing. This is the case with the low frequency of use of non-finite forms in the experimental conditions resulting from our design, which raises several questions: (i) How are these results compatible with the results for Italian (Miceli *et al.* 1989; Garraffa 2003) which showed a high presence of non-finite root forms? How can linguistic variation be accounted for? (ii) Is it solely a matter of severity? (iii) Or is there also a task-dependency effect?

A task specifically designed to test the production of non-finite forms would shed some light in this respect. For example, an experiment was carried out by

Friedmann (2001) in order to account for the differences in the rate of occurrence of non-finite forms in Germanic vs. Hebrew agrammatism. In order to complete evidence from a repetition task, the author ran a specific completion task with half infinitives and half finite verbs as target forms. When performed by 12 Hebrew agrammatic patients, the test showed that only 2% of the substitutions were of infinitival forms, while the vast majority of errors were within the finite paradigm, consistent with what we have found for Ibero-Romance. The results should be also contrasted with spontaneous speech in order to get rid of the deviations caused by methodological differences. If we take Garraffa (2003) as an example, she reports 20% of non-finite forms in contexts where an inflected form was expected. Since she was documenting spontaneous speech, it may be the case that the contrast with the low-frequency use of non-finite forms documented for our Ibero-Romance population derives from the fact that the experimental setting favoured the appearance of inflection.

In section 3 (chapter III), we have discussed temporal auxiliaries, modals and aspectuals. A task including a systematic review of all modals and aspectuals with a significant number of observations per type would clarify whether there is an observable difference in the behavior of different forms in relation to their position in the IP-field; something we could not conclude due to the scarce amount of data. IP-adverbs, claimed to reside in the same area, are also seen as a valuable source of information. More fine-grained results would allow us to use results from agrammatics to check the validity of this hierarchy for impaired populations instead of just assuming it, thus providing fresh input to the Cartographic debate.

The comparison of our results with those for copular verbs would also be an interesting contribution. Particular patterns of error could be attested in the production of subject relatives in our mild agrammatic sample. This is the case of C2, who produced 9 examples of copula omission in the main sentence with a correct relative. Similar examples were also attested in the production results of G4 (omissions = 3) and S1, S3 and S5, who only produced one example of this type each. High omission rates of copulas have also been documented in different languages including Japanese (Sasanuma, Kamio, and Kubota 1990), Hebrew (Friedmann and Grodzinsky 2000),

Italian (Garraffa 2007), English (Nadeu and Rothi 1992) and French (Nespoulous *et al.* 1988).

In this connection, it is of interest to note previous results on copula omissions in children. The dropping of the copula in child language has been documented for different languages such as English (Becker 2000) or Italian (Franchi 2004). According to structural accounts, since copulas are claimed to reside in T, we would expect that agrammatics would show the same behavior as that observed for tense and temporal auxiliaries (which we found to be impaired to the same extent in the repetition tasks). A similar argument is present in Franchi (2004) for child Italian. The author assumes, in line with Becker (2004) among many others, that copulars are bearers of inflection more than proper verbs. This would inmediately imply that deviant uses of the copula are subject to the same pattern of presence/absence – impairment/unimpairment than tense morphology.

In chapter III, regarding yes/no questions, we have documented a clear avoidance of VS questions among our mild agrammatic subjects. Since the experimental condition may have favoured the omission of subjects, overt subjects only occurred in a subset of responses. We consider of special interest the design of a task including tokens with a given subject and tokens with contrastive subjects, which would provide us with further information in order to control for the position of the subject[60]. Controlling for the information structure has also been left an issue for further research. In order to complete the complex picture of the phenomena related to the CP area, the production of object relatives and exclamatives should also be considered. As structures involving the left periphery, and considering the results obtained in the present research, we would expect both constructions to be impaired in Ibero-Romance agrammatism.

In conclusion, the set of experimental tasks presented in this dissertation fully confirm that the agrammatic deficit affects funtional categories in a selective way. Our data from Catalan, Galician and Spanish show the value of syntactically oriented tasks to make predictions on the relative degree of impairment of different constructions depending on their structural requirements and to determine the severity

---

[60] I have to thank J. Costa for his comments on the issue.

of the agrammatic deficit. However, our data also indicate that the pattern of damage does not strictly correspond with the Cartographical representation of the syntactic tree. Not only were significant differences not found in the number of errors of close categories, but also clear divergences from this pattern were documented. This leads us to conclude that structure alone is insufficient to properly characterize agrammatism.

REFERENCES
_____

Aboitiz, F.; R. García, E. Brunetti and C. Bosman (2006). 'The origin of Broca's area and its connections from an ancestral working memory network.' In Y. Grodzinsky and K. Amunts (eds.) *Broca's region*, Oxford University Press, 3-16.

Adragão, M.M. and J. Costa (2003). 'On the status of preverbal subjects in null-subject languages: evidence from acquisition,' *Proceedings of GALA 2003*.

Ahlsén, E. (2006). *Introduction to Neurolinguistics*, Amsterdam/Philadelphia: Benjamins Publishing Company.

Alajouanine, T.; A. Omredane and M. Durand (1939). *Le síndrome de désintégration phonétique dans l'aphasie*, Paris: Masson.

Alboiu, G.; M. Barrie and C. Frigeni (2004). 'SE and the Unaccusative-Unergative Paradox.' In M. Coene, G. de Cuyper and Y. D'Hulst (eds.) *Current Studies in Comparative Romance Linguistics* (Antwerp Working Papers in Linguistics 107), 109-139.

Alexiadou, A. and S. Stavrakaki (2006). 'Clause structure and verb movement in a Greek-English speaking bilingual patient with Broca's aphasia: Evidence from adverb placement,' *Brain and Language* 96: 207-220.

Almagro Cardenete, Y. (2002). 'Estudio del componente léxico y morfosintáctico en pacientes afásicos bilingües del catalán y del castellano,' *Doctoral Dissertation*, Barcelona: Universitat Rovira i Virgili.

Álvarez, R.; H. Monteagudo and X.L. Regueira (1986). *Gramática Galega*, Vigo: Galaxia.

Arabatzi, M. and S. Edwards (2002). 'Tense and Syntactic Processes in Agrammatic Speech,' *Brain and Language* 80: 314-327.

Ardila, A. (2001). 'The Manifestation of Aphasic Symptoms in Spanish,' *Journal of Neurolinguistics* 14: 337-347.

Avrutin, S. (2001). 'Linguistics and agrammatism,' *GLOT International* 5: 3-11.

Badecker, W. and A. Caramazza (1985). 'On considerations of method and theory governing the use of clinical categories in neurolinguistics and cognitive neuropsychology: The case against agrammatism,' *Cognition* 20: 97-126.

Balari, S. and G. Lorenzo (2007). 'Fenotipos computacionales: Una reinterpretación de la jerarquía de Chomsky desde la perspectiva de la biología del desarrollo,' *Report de Recerca GGT-08-07*, Bellaterra, Barcelona: UAB. http://seneca.uab.es/clt/publicacions/reports/pdf/GGT-08-07.pdf

Barbosa, P. (2001). 'On inversion in wh-questions in Romance.' In A. Hulk and J-Y Pollock (eds.) *Subject Inversion in Romance and the Theory of Universal Grammar*, Oxford: Oxford University Press.

Baudouin de Courtenay, J. (1895). *Versuch einer Theorie phonetischer Alternationen*. Strassburg: Truebner [Reprinted as E. Stankiewicz (ed.) (1972). *Selected writings of Baudouin de Courtenay*, Bloomington: Indiana University Press].

Baker, M. (1985). 'The Mirror Principle and morphosyntactic explanation,' *Linguistic Inquiry* 16: 373-415.

Barbiers, Sjef and R. Sybesma (2004). 'On the different verbal behavior of auxiliaries,' *Lingua* 114: 389-398.

Barbosa, P. (2000). 'Clitics: A Window into the Null Subject Property.' In J. Costa (ed.) *Portuguese Syntax: New Comparative Studies*, New York: Oxford University Press, 31-93.

Bastiaanse, R.; J. Rispens, E. Ruigendijk, O. Juncos-Rabadán and C. K. Thompson (2002). 'Verbs: some properties and their consequences for agrammatic Broca's aphasia,' *Journal of Neurolinguistics* 15: 239-264.

Bastiaanse, R. and R. Thompson (2003). 'Verb and auxiliary movement in agrammatic Broca's aphasia,' *Brain and Language* 84: 286-305.

Bastiaanse, R. and R. van Zonneveld (2005). 'Sentence production with verbs of alternating transitivity in agrammatic Broca's aphasia,' *Journal of Neurolinguistics* 18: 59–66.

Bates, E. A.; A. D. Friederici, B. B. Wulfeck and L. A. Juarez (1988). 'On the preservation of word order in aphasia: Cross-linguistic evidence,' *Brain and Language* 33: 323-364.

Bebout, L. (1993). 'Processing of negative morphemes in aphasia: an example of the complexities of the closed class/open class concept,' *Clinical Linguistics and Phonetics* 7: 161-172.

Belletti, A. (1982). 'Morphological passive and pro-drop: The impersonal construction in Italian,' *Journal of Linguistic Research* 2: 1-34.

Belletti, A. (1988). 'The Case of Unaccusatives,' *Linguistic Inquiry* 19: 1-34.

Belletti, A. (1990). *Generalized Verb Movement*, Torino: Rosenberg and Sellier.

Belletti, A. (1994). 'Verb Positions: Evidence from Italian.' In D. Lightfoot and N. Hornstein (eds.) *Verb Movement*, Cambridge: Cambridge University Press.

Belletti, A. (1999). 'Italian/Romance clitics: Structure and derivation.' In H. van Riemsdijk (ed.) *Clitics in the languages of Europe*, Berlin, New York: Mouton de Gruyter.

Belletti, A. (2001). 'Inversion as focalization.' In A. Hulk and J. Y. Pollock (eds.) *Subject Inversion in Romance and the Theory of Universal Grammar*, New York: Oxford University Press, 60-90.

Belletti, A. (ed.) (2002). *Structures and Beyond: The Cartography of Syntactic Structures*, Vol. 3, New York: Oxford University Press.

Belletti, A. (2004). 'Aspects of the Low IP Area.' In L. Rizzi (ed.) *The Structure of CP and IP. The Cartography of Syntactic Structures* Vol. 3, Oxford/New York: Oxford University Press, 16-51.

Belletti, A. and C. Leonini (2004). 'Subject inversion in L2 Italian.' In S. Foster Cohen, M. Sharwood, A. Sorace and M. Ota (eds.) *Eurosla Yearbook*, Amsterdam: John Benjamins, 95-118.

Benedet, M.J.; J. A. Christiansen and H. Goodglass (1998). 'A cross-linguistic study of grammatical morphology in Spanish- and English- speaking agrammatic patients,' *Cortex* 34: 309-336.

Benincà, P. (2006). 'A Detailed Map of the Left Periphery of Medieval Romance.' In R. Zanuttini, H. Campos, E. Herburger and P. Portner (eds.) *Crosslinguistic Research in Syntax and Semantics*, Washington, DC: Georgetown University Press, 53-86.

Bennati, E. (2007). 'Object clitic climbing in adult L2 Italian: Some experimental evidence from L1 English and L1 Spanish near-natives,' *Nanzan Linguistics: Special Issue* 3 (1): 1-21.

Benton, A. (2000). *Exploring the history of neuropsychology*, Oxford: University Press.

Beretta, A.; C. Harford; J. Patterson and M. Piñango (1996) 'The Derivation of Postverbal Subjects: Evidence from Agrammatic Aphasia,' *Natural Language and Linguistic Theory* 14: 725-748.

Berwick, R. and A. Weinberg (1984). *The Grammatical Basis of Linguistic Performance: Language Use and Acquisition*, Cambridge, MA: MIT Press.

Bianchi, V. (2002). 'Headed relative clauses in generative syntax,' *Glot International* 6 (7): 197–204.

Bianchi, V. (2004). 'Resumptive relatives and LF chains.' In L. Rizzi (ed.) *The Structure of CP and IP*, *The Cartography of Syntactic Structures* Vol. 2 (Oxford Studies in Comparative Syntax), Oxford University Press, 76-114.

Bonet, E. (1995). 'Feature Structure of Romance Clitics,' *Natural Language and Linguistic Theory* 13: 607-647.

Bonet, E. (2002). 'Cliticització.' In J. Solà, M.R. Lloret, J. Mascaró and M. Pérez Saldanya (dirs.) *Gramàtica del català contemporani*, Vol. 1, Barcelona: Empúries, 933-989.

Borer, H. (1983). *Parametric Syntax. Case studies in Semitic and Romance languages*, Dordrecht: Foris.

Borer, H. (1986). 'I-Subjects,' *Linguistic Inquiry* 17: 375-416.

Borer, H. and B. Rohrbacher (1997). 'Features and projections: arguments for the full competence hypothesis.' In E. Hughes, M. Hughes and A. Greenhill (eds.) *Proceedings of the 21st annual Boston University Conference on Language Development* Vol. 1, 24-35.

Bosque, I. (1984). 'Sobre la sintaxis de las oraciones exclamativas,' *Hispanic Linguistics* 2: 283–304.

Bosque, I. and V. Demonte (eds.) (1999). *Gramática descriptiva de la lengua española*, 3 volumes, Madrid: Espasa, 5.351 pages.

Bresnan, J. (1970). 'On Complementizers: Towards a Syntactic Theory of Complement Types,' *Foundations of Language* 6: 297-321.

Broca, P. (1861). 'Perte de la parole,' *Bulletin de la Societé d'Anatomie de Paris* 2: 219-237.

Brodmann, K. (1909). *Vergleichende Lokalisationslehre der Grosshirnrinde in ihren Prinzipien dargestellt auf Grund des Zellenbaues*, Leipzig: Barth.

Brucart, J.M. (1993). 'Sobre la estructura de *SCOMP* en español.' In A. Viana (ed.) *Sintaxi: teoria i perspectives*, Pagés, Lleida, 59-102.

Brucart, J. M. (1999). 'La estructura del sintagma nominal: las oraciones de relativo.' In I. Bosque and V. Demonte (eds.) *Gramática descriptiva de la lengua española* Vol. 1, Madrid: Espasa, 395-522.

Brucart, J. M.; A. Gavarró and J. Solà (2009). 'Introduction.' In J. M. Brucart, A. Gavarró and J. Solà (eds.) *Merging Features: Computation, Interpretation and Acquisition*, Oxford/New York: Oxford University Press.

Burchert, F.; M. Swoboda-Moll and R. De Bleser (2005). 'The left periphery in agrammatic clausal representations: evidence from German,' *Journal of Neurolinguistics*, Vol. 18(1): 67-88.

Cabeza, R. and A. Kingstone (eds.) (2001). *Handbook of Functional Neuroimaging of Cognition*, Cambridge (MA): The MIT Press, 412 p.

Calderón González, A.M.; López Moya, A.; Rodríguez Cerdeira, C. and Romero López, J. (2001). 'La afasia y atención primaria: una realidad necesaria,' *Cadernos de Atención Primaria*, Vol. 8 (3): 181-190.

Caplan, D. (1983). 'Syntactic competence in agrammatism: a lexical hypothesis.' In M. Studdert-Kennedy (ed.) *Psychobiology of language*, Cambridge, MA: MIT press, 177-187.

Caplan, D. (1985). 'Syntactic and semantic structures in agrammatism.' In M.-L Kean (ed.) *Agrammatism*, New York: Academic Press, 125-152.

Caplan, D. (1986). 'In defense of agrammatism,' *Cognition* 24: 263–276.

Caplan, D. (1991). 'Agrammatism is a theoretically coherent aphasic category,' *Brain and Language* 40: 274–281.

Caplan, D. and J. E. Hanna (1998). 'Sentence production by aphasic patients in a constrained task,' *Brain and Language* 63(2): 184–218.

Caramazza, A. (1984). 'The logic of neuropsychological research and the problem of patient classification in aphasia,' *Brain and Language* 21: 9-20.

Caramazza, A. (1986). 'On drawing inferences about the structure of normal cognitive systems from the analysis of patterns of impaired performance: The case for single patient studies,' *Brain and Cognition* 5: 41-66.

Caramazza, A. and E. Zurif (1976). 'Dissociations of algorithmic and heuristic processes in sentence comprehension: Evidence from aphasia,' *Brain and Language* 3: 572-582.

Cardinaletti, A. (2007). 'Subjects and Wh-questions: Some new generalizations.' In J. Camacho, N. Flores-Ferrán, L. Sánchez, V. Déprez and M.J. Cabrera (eds.) *Romance Linguistics 2006 (Current Issues in Linguistic Theory 287)*, John Benjamins, 57-78.

Cardinaletti, A. and I. Roberts (2002). 'Clause Structure and X-Second.' In G. Cinque (ed.) *Functional Structure in IP and DP: The Cartography of Syntactic Structures,* Vol. 1, New York/Oxford: Oxford University Press, 123-166.

Cardinaletti, A. and M. Starke (1999). 'The typology of structural deficiency: A case study of the three classes of pronouns.' In H. van Riemsdijk (ed.) *Clitics in the Languages of Europe*, Berlin: Mouton de Gruyter, 145-233.

Cartagena, N. (1999). 'Los tiempos compuestos.' In I. Bosque and V. Demonte (eds.) *Gramática descriptiva de la lengua española*, Vol. 2, Madrid: Espasa, 2935-2976.

Centeno, J. (1996). *Use of verb inflections in the oral expression of agrammatic Spanish-speaking aphasics*. Unpublished doctoral dissertation, City University of New York Graduate School.

Cerdeira, A. M. (2006). *Flexão verbal e categorias funcionais no agramatismo*, Dissertação de Mestrado, Faculdade de Ciências Sociais e Humanas, Universidade Nova de Lisboa.

Cerdeira, A.; J. Costa and V. Trindade (2007). 'Movimento do verbo em português europeu: consequências para diferenças entre línguas em contexto de aquisição e de afasia,' *XXII Encontro Nacional da APL. Textos seleccionados*, APL Lisboa, 239-250 .

Chinellato, P. (2002). 'Agreement disorders, subject clitics and the structure of IP in dialectal Agrammatism: the Field Damage Hypothesis,' *Cortex* 38 (5): 837-840.

Chinellato, P. (2004). *Disturbi di sintassi nell'afasia non fluente: un'analisi linguistica dell'agrammatismo italiano e dialettale*, PhD. Dissertation, Università di Padova.

Chinellato, P. (2007a). *Lezioni di linguistica clinica*, Dipartimento de Scienze del Linguaggio (Strumenti 4), Librería Editirice Cafoscarina, 121 págs.

Chinellato, P. (2007b). 'Negative Markers and Bilingual Aphasia: Evidence from Italian and Northern Italian Dialects,' *2nd Cambridge Italian Dialect Syntax Meeting*, Cambridge, UK, 26th -27th January.

Chomsky, N. (1957). *Syntactic Structures*, The Hague: Mouton.

Chomsky, N. (1967). 'The Formal Nature of Language.' In E. Lennenberg (ed.) *Biological Foundations of Language*, New York: John Wiley and Sons, 397-442.

Chomsky, N. (1977). 'On Wh-Movement.' In P.W. Culicover, T. Wasow and A. Akmajian (eds.) *Formal Syntax*, New York: Academic Press.

Chomsky, N. (1981). *Lectures on government and binding*, Dordrecht: Foris Publications.

Chomsky, N. (1982). *Some Concepts and Consequences of the Theory of Government and Binding,* Cambridge, MA: The MIT Press.

Chomsky, N. (1986). *Knowledge of language language: Its nature, origin and use*, New York: Praeger.

Chomsky, N. (1991). 'Some Notes on Economy of Derivations and Representation.' In R. Freidin (ed.) *Principles and parameters in comparative grammar*, Cambridge, MA: The MIT Press, 417-454.

Chomsky, N. (1992). 'A minimalist program for linguistic theory,' *MIT Occasional Papers in Linguistics (1)*, Cambridge, MA: The MIT press.

Chomsky, N. (1993). 'A Minimalist program for linguistic theory.' In K. Hale and J. Keyser (eds.) *The View from Building 20*, Cambridge, MA: The MIT Press, 1-52.

Chomsky, N. (1995). The *Minimalist Program*, Cambridge, MA: The MIT press.

Chomsky, N. (2000). 'Minimalist Inquiries: The framework.' In R. Martin, D. Michaels and J. Uriagereka (eds.) *Step by step: Essays on minimalism in honor of Howard Lasnik*, Cambridge, MA: MIT Press, 89-155.

Chomsky, N. (2001). 'Derivation by phase.' In M. Kenstowicz (ed.) *Ken Hale: A life in language*, Cambridge, MA: MIT Press, 1-52.

Chomsky, N. (2004). 'Beyond explanatory adequacy.' In A. Belletti (ed.) *Structures and Beyond*, Oxford and New York: Oxford University Press, 104–131.

Chomsky, N. (2006). *Approaching UG from Below*, Ms. MIT.

Chomsky, N. (2008). 'On phases.' In R. Freidin, C. P. Otero, and M. L. Zubizarreta (ed.) *Foundational Issues in Linguistic Theory: Essays in Honor of Jean-Roger Vergnaud*, Cambridge, MA: The MIT Press, 133-166.

Chomsky, N. y M. Halle (1968). *The sound pattern of English*, New York: Harper and Row.

Chomsky, N. and H. Lasnik (1977). 'Filters and Control,' *Linguistic Inquiry* 8: 425-504.

Chomsky, N. and H. Lasnik (1993). 'The theory of Principles and Parameters.' In J. Jacobs *et al.* (eds.) *Syntax: An International Haddbook of Contemporary Research*, New York: Walter de Gruyter.

Christiansen, J. A., H. Goodglass and R. Gallagher (1993). 'Syntactic complexity in aphasia,' *The Academy of Aphasia*, Tucson, AZ.

Citko, B. and K. K. Grohmann (2001). 'The non-uniqueness of multiple wh-fronting: German = Bulgarian.' In S. Franks, T. Holloway King and M.Yadroff (eds.) *Formal Approaches to Slavic Linguistics: The Bloomington Meeting 2000*. Ann Arbor, MI: University of Michigan Press, 117-136.

Cinque, G. (1999). *Adverbs and Functional Heads: A Cross-linguistic Perspective*, Oxford: Oxford University Press.

Cinque, G. (ed.) (2002). *Functional Structure in DP and IP. The Cartography of Syntactic Structures*, Vol. 1, Oxford Studies in Comparative Syntax, Oxford: Oxford University Press.

Cinque, G. (ed.) (2006). *Restructuring and Functional Heads*, Oxford: Oxford University Press.

Cinque, G. and L. Rizzi (2008). 'The cartography of syntactic structures,' *STiL – Studies in Linguistics*, CISCL Working Papers, Vol. 2.

Clahsen, H. and M. Ali (2009). 'Formal features in aphasia: Tense, agreement, and mood in English agrammatism,' *Journal of Neurolinguistics* 33: 436-450.

Contreras, H. (1989). 'Closed Domains,' *Probus* 1: 163-180.

Contreras, H. (1999). 'Relaciones entre las construcciones interrogativas, exclamativas y relativas.' In I. Bosque and V. Demonte (dirs.) *Gramática Descriptiva de la Lengua Española*, Vol. 1, Madrid: Espasa, 1931-1964.

Costa, J. (2000a). 'Focus in situ: Evicende from Portuguese,' *Probus* 12.2: 187-228.

Costa, J. (2000b). 'Adverbs as adjuncts to non-universal functional categories: evidence from Portuguese.' In A. Alexiadou and P. Svenonius (eds.) *Adverbs and Adjunction*, *Linguistics in Potsdam* 6, 19–32.

Costa, J. (2004). *Subject positions and interfaces : the case of European Portuguese*, Studies in Generative Grammar 73, New York: Mouton de Gruyter.

Costa, J.; M. Lobo, C. Silva and E. Ferreira (2008). 'Produção e compreensão de orações relativas em português europeu: dados do desenvolvimento típico, de PEDL e do agramatismo,' *XXIV Encontro Nacional da APL*, Braga, 20-22 November.

Crain, S. and R. Thornton (1998). *Investigations in Universal Grammar: A Guide to Experiments in the Acquisition of Syntax and Semantics*. Cambridge, MA: The MIT Press.

Crain, S.; W. Ni and D. Shankweiler (2001). 'Grammatism,' *Brain and Language* 77: 294–304.

Cruschina, S. (2007). 'Marking yes/no questions,' *CIDSM – 2nd Cambridge Italian Dialect Syntax Meeting*, University of Cambridge, 26th-27th January.

Crysmann, B. and N. Müller (2000). 'On the non-parallelism in the acquisition of reflexive and nonreflexiveobject clitics.' In S. M. Powers and C. Hamann (eds.) *The acquisition of scramblingand cliticization*, Dordrecht: Kluwer, 207–236.

Dahl, O. (1979). 'Tipology of Sentence Negation,' *Linguistics* 17: 79-106.

Damasio, H. (1981). 'Cerebral localization of the aphasias.' In M.T. Sarno (ed.) *Acquired aphasia*, Orlando, FL: Academic Press, 21-50.

Davidson, L. and G. Legendre (2001). 'Defaults and competition in the acquisition of functional categories in Catalan and French,' *Selected Papers from the 2001 Linguistic Symposium on Romance Languages (LSRL XXVI).*

De Bleser, R. and C. Luzzatti (1994). 'Morphological processing in Italian agrammatic speakers syntactic implementation of Inflectional morphology' *Brain and Language* 46: 21-40.

De Blesser, R.; J. Bayer and C. Luzzatti (1996). 'Linguistic theory and morphosyntactic impairments in German and Italian aphasics,' *Journal of Neurolinguistics* 9: 175–185.

De Diego Balaguer, R.; A. Costa, N. Sebastián-Galles, M. Juncadella and A. Caramazza (2004). 'Regular and irregular morphology and its relationship with agrammatism: Evidence form two Spanish-Catalan bilinguals,' *Brain and Language* 91: 212-222.

Demonte, V. and O. Fernández-Soriano (2007). 'La periferia izquierda oracional y los complementantes del español.' In J. Cuartero and M. Emsel (eds.) *Vernetzungen: Kognition, Bedeutung, (kontrastive) Pragmatik*, Frankfurt: Peter Lang.

De Roo (1995). 'Articles and finite verb inflections in Dutch agrammatism,' Poster presented at RuG-SAN-VKL conference on aphasiology, Groningen.

De Roo, E. (2001). 'Root non-finite and finite utterances in child language and agrammatic speech,' *Brain and Language* 77: 398-406.

De Roo, E.; H. Kolk and B. Hofstede (2003). 'Structural properties of syntactically reduced speech: A comparison of normal speakers and Broca's aphasics,' *Brain and Language* 86: 99-115.

De Villiers, J.G. (1978). 'Fourteen grammatical morphemes in acquisition and aphasia.' In A. Caramazza and E.B. Zurif (eds.) *Language Acquisition and Language Breakdown. Parallels and Divergences*, Baltimore: Johns Hopkins University Press, 121-144.

De Vincenzi, M.; L. Rizzi, D. Portolan, R. Di Matteo, G. Spitoni and F. Di Russo (in preparation). 'Mapping the language: A reading time and a topographic ERP study on tense, agreement and Aux-V violations.'

Dickey, M. W. and C.K. Thompson (2006) 'Automatic processing of wh- and NP-movement in agrammatic aphasia,' *Brain and Language* 99: 63-64.

Dickey, M. W.; J. W. J. Choy and C. K. Thompson (2007). 'Real-time comprehension of wh-movement in aphasia: Evidence from eyetracking while listening,' *Brain and Language* 100: 1-22.

Duarte, I. and G. Matos (2000). 'Romance clitics and the minimalist program.' In J. Costa (ed.) *Portuguese syntax. New comparative studies*, Oxford: Oxford University Press, 116-42.

Edwards, S. and S. Varlokosta (2007). 'Pronominal and anaphoric reference in agrammatism,' *Journal of Neurolinguistics* 20: 423-444.

Escandell-Vidal, V. (1999). 'Los enunciados interrogativos. Aspectos semánticos y pragmáticos.' In I. Bosque and V. Demonte (eds.) *Gramática Descriptiva de la Lengua Española*, Vol. 3, Chapter 61, Madrid: Espasa, 3929–3991.

Espinal, M. T. (1991). 'Negation in Catalan. Some remarks with regard to *no pas*,' *Catalan Working Papers in Linguistics (CWPL)*, 33-63.

Espinal, M. T. (2002). 'La negació.' In J. Solà, M. R. Lloret, J. Mascaró y M. Pérez-Saldanya (eds.) *Gramàtica del Català Contemporani*, Vol. 3, Chapter 24, Barcelona: Empúries/Grup 62, 2687-2757.

Fabbro, F. (2001). 'The bilingual brain, cerebral representation of languages,' *Brain and Language* 79: 211–222.

Fabbro, F. and G. Frau (2001). 'Manifestations of aphasia in Friulian,' *Journal of Neurolinguistics* 14: 255–279.

Faroqi-Shah, Y. and C. K. Thompson (2004). 'Semantic, lexical and phonological influences on the production of verb inflections in agrammatic aphasia,' *Brain and Language* 89: 484–498.

Faroqi-Shah, Y. and C. K. Thompson (2007). 'Verb inflections in agrammatic aphasia: Encoding of tense features,' *Journal of Memory and Language* 56: 129–151.

Ferreira, Elisa (2008). *Compreensão e produção de frases relativas por crianças com perturbação específica do desenvolvimento da linguagem e por adultos com agramatismo*, MA Thesis, Faculdade de Ciências Sociais e Humanas, Universidade Nova de Lisboa

Fernández-Rubiera, F.J. (2009). *Clitics at the edge: Clitic placement in Western Iberian Romance Languages*, PhD. Dissertation, Georgetown University.

Fernández Soriano, O. (1999). 'El pronombre personal. Formas y distribuciones. Pronombres tónicos y átonos.' In I. Bosque and V. Demonte (eds.) *Gramática Descriptiva de la Lengua Española*, Vol. 1, Cap. 19, Madrid: Espasa, 1209-1273.

Ferreira, E. (2008). *Compreensão e produção de frases relativas por crianzas con PEDL e por adultos com agramatismo*, MA Thesis, Universidade Nova de Lisboa.

Friedmann, N. (1994). *Morphology in agrammatism: A dissociation between tense and agreement*. Unpublished M.A. thesis. Tel Aviv University.

Friedmann, N. (1998). *Functional categories in agrammatic production: A cross-linguistic study*. Unpublished doctoral dissertation. Tel Aviv University.

Friedmann, N. (2001). 'Agrammatism and the psychological reality of the syntactic tree,' *Journal of Psycholinguistic Research* 30 (1): 71-90.

Friedmann, N. (2002). 'Question production in agrammatism: the Tree Pruning Hypothesis,' *Brain and Language* 80: 160-187.

Friedmann, N. (2005). 'Degrees of severity and recovery in agrammatism: climbing up the syntactic tree,' *Aphasiology* 19: 1037-1051.

Friedmann, N. (2008). 'Traceless relatives: Agrammatic comprehension of relative clauses with resumptive pronouns,' *Journal of Neurolinguistics* 21: 138-149.

Friedmann, N. and Y. Grodzinsky (1997). 'Tense and agreement in agrammatic production: Pruning the syntactic tree,' *Brain and Language* 56: 397-425.

Friedmann, N. and Y. Grodzinsky (2000). 'Split inflection in neurolinguistics.' In M.A. Friedemann and L. Rizzi (eds.) *The Acquisition of Syntax: Studies in Comparative Developmental Linguistics*, New York: Longman, 84-104.

Fromkin, V. A. (2000). 'Brain, Language and Linguistics,' *Brain and Language* 71: 72-74.

Fuki, N. and M. Speas (1987). 'Specifiers and Projections,' *MIT Working Papers in Linguistics* 8: 128-172.

Fyndanis, V.; K. Tsapkini, S. Varlokosta, K. Petropoulou and I. Papathanasiou (2006). 'Negation in agrammatism: evidence from Greek,' *Brain and Language* 99 (1-2): 151-152.

Fyndanis, V; S. Varlokosta and K. Tsaplini (2008). 'The functional categories of the verbal complex in Greek agrammatism,' *2008 Annual Meeting of the Academy of Aphasia*, Spa Hotel Caribia, Turku, Finland, Oct 19-21.

Gall, F.J. (1796). *The Anatomy and Physiology of the Nervous System in General, and of the Brain in Particular*.

García-Albea, J.E.; M. L. Sánchez Bernardos and S. Del Viso (1998). *Test de Boston para el Diagnóstico de la Afasia: Adaptación española*, Madrid: Editorial Médica Panamericana.

Garraffa, M. (2003). *Linguistica e defici grammaticale: lo studiodi un caso*, BA Thesis, Università di Siena.

Garraffa, M. (2007). *Impoverishment of grammatical features in a non fluent aphasic speaker: the grammatical nature of minimal structures*, PhD Dissertation, University of Siena.

Garraffa, M. (2008). 'Minimal structures in aphasia: A study on agreement and movement in a non-fluent aphasic speaker,' *Lingua* 119 (10): 1444-1457.

Garrett, M. F. (2003). 'Language and brain.' In L. Nadel (ed.) *Encyclopedia of Cognitive Science*, Vol. 2, New York: Nature Publishing Group, 707-717.

Gavarró, Anna (2003a). 'Modals and aspectuals as functional projections: implications for acquisition and agrammatism.' In C. Pusch (ed.) *Verbal periphrases in the (Ibero-) Romance languages, Romanistik in Geschichte und Gegenwart; Beihefte* 9, Hamburgo: Buske Verlag, 231-244.

Gavarró, Anna (2003b). 'Move and Agree in Agrammatic comprehension,' *Research report GGT-03-07*, Bellaterra, Barcelona.
Available at: http://seneca.uab.es/clt/publicacions/reports/index.html

Gavarró, A. (2008). 'Binding and co-reference in Catalan agrammatism,' *The Academy of Aphasia Meeting*, Turku, 20 October.

Gavarró, A. and B. Laca (2002). 'Les perífrasis temporals, aspectuals i modals.' In J. Solà, M. R. Lloret, J. Mascaró and M. Pérez-Saldanya (eds.) *Gramàtica del català contemporani,* Vol. 3, Barcelona: Empúries, 2663-2726.

Gavarró, A. and S. Martínez-Ferreiro (2007). 'Tense and Agreement impairment in Ibero-romance,' *Journal of Psycholinguistic Research* 36 (1): 25-46.

Gavarró, A., M. Mata and E. Ribera (2006). 'L'omissió dels clítics d'objecte ipartitius en el català infantil: dades espontànies.' In C. Push (ed.) *Zeitschrift für Katalanistik*, special volume - *La gramàtica pronominal del català – Variació, evolució,funció/The grammar of Catalan pronouns – Variation, evolution, function*, Shaker, Aachen, 27–46.

Gazzaniga, M. (1970). 'The bisected brain.' In C. Lust and C. Foley (eds.) (2004). *Language Acquisition: The Essential Readings*, Blackwell Publishers,123-125.

Giorgi, A. and F. Pianesi (1997). *Tense and Aspect. From semantics to Morphology*. New York: Oxford University Press.

Goldstein, K. (1933). 'L'analyse de l'aphasie et l'etude de l'essence du langage,' *Journal de Psychologie* 30: 257-345.

Gómez-Torrego, L. (1999). 'Los verbos auxiliares. Las perífrasis verbales de infinitivo.' In I. Bosque and V. Demonte (eds.) *Gramática descriptiva de la lengua española* Vol. 2, Madrid: Espasa, 3323-3390.

González i Planas, F. (2007). 'Sintaxis de los clíticos pronominales en asturleonés,' *Ianua. Revista Philologica Romanica* 7: 15-35.

Goodall, G. (1991). 'On the status of SPEC of IP.' In D. Bates (ed.) *WCCFL X*, Stanford, California: CSLI Publications.

Goodglass, H. (1976). 'Agrammatism.' In H. Whitaker and H.A. Whitaker (eds.) *Studies in neurolinguistics*, New York: Academic Press.

Goodglass, H. and J. Berko (1960). 'Agrammatism and inflectional morphology in English,' *Journal of Speech and Hearing Research* 3: 257-267.

Goodglass, H. and E. Kaplan (1972). *The Assessment of Aphasia and Related Disorders*, Philadelphia, PA: Lea & Febiger.

Goodglass, H. and E. Kaplan (1983). *Boston Diagnostic Aphasia Examination (BDAE)*, Philadelphia, PA: Williams & Wilkins Publishers Inc.

Goodglass, H.; J. A. Christiansen and R. Gallagher (1993). 'Comparison of morphology and syntax in free narrative and structured tests: Fluent vs. non-fluent aphasics,' *Cortex* 29: 377-407.

Grimshaw, J. (1982). 'On the lexical representation of romance reflexive clitics?, In J. Bresnan (ed.) *The Mental Representation of Grammatical Relations*, Cambridge, MA/London: The MIT Press, 87-148.

Grimshaw, J. (1990). *Argument Structure*, Cambridge, Mass: MIT Press, 214.

Grinstead, J. (2000). 'Case, inflection and subject licensing in child Catalan and Spanish,' *Journal of child language* 27: 119-155.

Grodzinsky, Y. (1984). 'The syntactic characterization of agrammatism,' *Cognition* 16: 99-120.

Grodzinsky, Y. (1984b). *Language deficits and linguistic theory*, Doctoral dissertation, Brandeis University.

Grodzinsky, Y. (1986). 'Language deficits and the theory of syntax,' *Brain and Language* 27: 135-159.

Grodzinsky, Y. (1990). *Theoretical Perspectives on Language Deficits*. Cambridge, MA: The MIT Press.

Grodzinsky, Y. (1991). 'There is an entity called Agrammatic Aphasia,' *Brain and Language* 41: 555-564.

Grodzinsky, Y. (1995). 'Trace-deletion, theta-roles and cognitive strategies,' *Brain and Language* 51: 26-51.

Grodzinsky, Y. (1998). 'Comparative aphasiology: some preliminary notes.' In E. Visch-Brink and R. Bastiaanse (eds.) *Linguistic levels in aphasia*, San Diego: Singular, 175-192.

Grodzinsky, Y. (2000). 'The neurology of syntax: Language use without Broca's area,' *Behavioral and Brain Sciences* 23: 1-71.

Grodzinsky, Y. and K. Amunts (eds.) (2006). *Broca's region*, Oxford: Oxford University Press.

Grodzinsky, Y. and T. Reinhart (1993). 'The Innateness of Binding and Coreference,' *Linguistic Inquiry* 24: 69-102.

Grodzinsky, Y. and L. Finkel (1998). 'The neurology of empty categories: aphasics failure to detect ungrammaticality,' *Journal of Cognitive Neurosciences* 10: 281-292.

Grodzinsky, Y.; K. Wexler, Y. C. Chien, S. Marakovitz and J. Solomon (1993). 'The breakdown of binding relations,' *Brain and Language* 45: 396-422.

Grodzinsky, Y.; M.M. Piñango, E. Zurif and D. Drai (1999). 'The critical role of group studies in Neuropsychology: Comprehension regularities in Broca's aphasia,' *Brain and Language* 67: 134-147.

Guasti, M. T. (1993/94). 'Verb syntax in Italian child grammar: finite and non-finite verbs,' *Language Acquisition* 3: 1-40.

Guasti, M. T. (2002). *Language Acquisition. The Growth of Grammar*, Cambridge, MA: The MIT Press.

Guasti, M.T. and Rizzi, L. (2002). 'Agreement and tense as distinct syntactic projection. Evidence from acquisition.' In G. Cinque (ed.) *Functional structure in DP and IP: The Cartography of Syntactic Structures*, Vol.1, Oxford: Oxford University Press.

Guéron, J. and T. Hoekstra (1995). 'The temporal interpretation of predication.' In A. Cardinaletti and M. T. Guasti (eds.) *Small Clauses. Syntax and Semantics* 28, New York: Academic Press, 77-107.

Gutiérrez-Bravo, R. (2002). *Structural Markedness and Syntactic Structure*, Doctoral Dissertation, University of California, Santa Cruz.

Haegeman, L. (1995). *The syntax of negation. Cambridge Studies in Linguistics* 75, Cambridge: Cambridge University Press.

Hagiwara, H. (1990). 'New trends in psycholinguistics – Aphasia research.' In T. Shimaoka and Yano (eds.) *Research in Applied Linguistics*, Tokyo: Liber Publishers.

Hagiwara, H. (1995). 'The breakdown of functional categories and the economy of derivation,' *Brain and Language* 50: 92-116.

Hamann, C. (2006). 'Speculations about early syntax: The production of Wh-questions by normally developing French children and French children with SLI,' *Catalan Journal of Linguistics* 5: 143-189.

Hamann, C. and A. Belletti (2006). 'Developmental patterns in the acquisition of French clitics: comparing monolinguals, early L2/ bilingual children, and French children with specific language impairment,' Ms. University of Oldenburg and University of Siena.

Head, H. (1926). *Aphasia and Kindred Disorders of Speech*, New York: Macmillan.

Hickok, G. and S. Avrutin (1996). 'Comprehension of wh-questions in two Broca's Aphasics,' *Brain and Language* 52: 314-327.

Hofstede, B. T. M. and H. H. J. Kolk (1994). 'The effect of task variation on the production of grammatical morphology in Broca's aphasia: A multiple case study,' *Brain and Language* 46: 278–328.

Höhle, B. (1995). *Aphasie und Sprachproduktion. Sprachstörungen bei Broca- und Wernicke-Aphasikern*, Opladen: Westdeutscher Verlag.

Hornstein, N. (1999). 'Movement and Control,' *Linguistic Inquiry* 30: 69-96.

Hornstein, N. (2001). *Move! A Minimalist Theory of Construal*. Cambridge, Massachusetts: Blackwell Publishers.

Jaeggli, O. (1982). *Topics in Romance Syntax*, Dordrecht: Foris.

Jaeggli, O. (1986). 'Case, Doubled NPs, and Extraction.' In H. Borer (ed.) *The syntax of pronominal clitics. Syntax and Semantics* 19, Orlando: Academic Press, 15-42.

Jaeggli, O. and K. Safir (eds.) (1989). *The Null Subject Parameter*, Dordrecht: Kluwer.

Jäger, G. (2001). 'Indefinites and Sluicing. A type logical approach.' In R. van Rooy and M. Stokhof (eds.) *Proceedings of the 13th Amsterdam Colloquium*, 114-119.

Jakobson, R. (1941). *Kindersprache, Aphasie und allgemeine Lautgesetze*, Uppsala: Almqvist u. Wilsells. [Reprinted as *Child language, aphasia and phonological universals* (1968), The Hague: Mouton].

Jespersen, O. (1917). *Negation in English and other Languages*, Copenhagen: A. F. Høst.

Juncos-Rabadán, O. (1992). 'Comprensión de oraciones negativas en afásicos fluentes. Factores sintácticos y pragmáticos,' *Revista de Psicología General y Aplicada* 3: 309-313.

Kayne, R. (1975). *French Syntax: The transformational cycle*, Cambridge, MA: The MIT Press.

Kayne, R. (1989). 'Null subjects and clitic climbing.' In O. Jaeggli and K. Safir (eds.) *The Null Subject Parameter*, Dordrecht, 239–262.

Kayne, R. (1991). 'Romance clitics, verb movement and PRO,' *Linguistic Inquiry* 22: 647-686.

Kayne, R. (1994). *The Antisymmetry of Syntax*, Cambridge, MA: The MIT Press.

Kean, M.L. (1977). 'The linguistic interpretation of aphasia syndromes: Agrammatism in Broca's aphasia, an example,' *Cognition* 5: 9-46.

Kean, M. L. (1979). 'Agrammatism, a phonological deficit?' *Cognition* 7: 69–83.

Kemenade, Ans van (2000). 'Jespersen's cycle revisited: formal properties of grammaticalization.' In S. Pintzuk *et al.* (eds.) *Diachronic syntax. Models and mechanisms*, Oxford: Oxford University Press, 51 – 74.

Kertesz, A. (1982). *The Western Aphasia Battery (WAB)*, New York: Grune and Stratton.

Kimura, D. (1961). 'Cerebral dominance and the perception of verbal stimuli,' *Canadian Journal of Psychology* 15: 166-171.

Kolb, B. and I. Q. Whishaw (2003). *Fundamentals of Human Neuropsychology*, 5th edition, New York: Worth Publishers.

Kolk, H. H. J. (2000). 'Canonicity and inflection in agrammatic sentence production,' *Brain and Language 74*: 558-560.

Kolk, H. H. J. and C. Heeschen (1992). 'Agrammatism, paragrammatism and the management of language,' *Language and Cognitive Processes* 7: 89-129.

Kolk, H. H. J.; P. Kok, F. Zevenbergen and M. Haverkort (2003). *Agrammatic Sentence Production: An experimental Analysis*, Ms. University of Nijmegen & Boston University.

Koopman, H. and D. Sportiche (1991). 'The position of subjects,' *Lingua* 85.1: 211-258.

Laka, I. (1990). *Negation in Syntax: On the Nature of Functional Categories and Projections*, Doctoral Dissertation, MIT, Massachusetts.

Larson, R. (1988). 'On the double object construction,' *Linguistic Inquiry* 21: 589-632.

Lasnik, H. (1999). 'On feature strength. Three minimalist approaches to overt movement,' *Linguistic Inquiry* 20: 195-217.

Lee, M. (2003). 'Dissociations among functional categories in Korean agrammatism,' *Brain and Language* 84: 170-188.

Lee, M. and C. Thompson (2004). 'Agrammatic aphasic production and comprehension of unaccusative verbs in sentence contexts,' *Journal of Neurolinguistics* 17: 315-330.

Ledgeway, A. and A. Lombardi (2005). 'Verb movement, adverbs, and clitic positions in Romance,' *Probus* 17.1: 79-113.

Lema, J. and M.L. Rivero (1990). 'Long Head Movement: ECP vs. HMC,' *Cahiers linguistiques d'Ottawa* 18: 61-78.

Lema, J. and M. L. Rivero (1991). 'Types of Verbal Movement in Old Spanish: Modals, Futures, and Perfects,' *Probus* 3 (3): 237-278.

Lieberman, P. (2006). *Toward an Evolutionary Biology of Language*, Cambridge (MA): Harvard University Press.

Longa, V. M. (1994). 'The Galician Inflected Infinitive and the Theory of UG,' *Catalan Working Papers in Linguistics* 4.1: 23-44.

Lonzi, L. and C. Luzzatti (1993). 'Relevance of adverb distribution for the analysis of sentence representation in agrammatic patients,' *Brain and Language* 45: 306-317.

Luria, A. R. (1964). 'Factors and Forms of Aphasia.' In A. V. S. de Reuck and M. O'Conner (eds.) *Disorders of Language*, Boston: Little Brown, 143-161.

Luria, A. R. (1970). *Traumatic Aphasia. Its syndromes, psychology and treatment*, The Hague: Mouton.

Luria, A. R. (1973). *The Working Brain. An Introduction to Neuropsychology*, London: Penguin Press.

Madeira, A. (1992). 'On clitic placement in European Portuguese,' *UCL Working Papers in Linguistics* 4: 95-122.

Marshall, J. C. (1986). 'The description and interpretation of aphasic language disorder,' *Neuropsychologia* 24: 5-24.

Martin, R. C. (2003). 'Language processing: Functional organization and neuroanatomical basis,' *Annual Review of Psychology* 54: 55-89.

Martínez-Ferreiro, S. (2003). *Verbal Inflectional Morphology in Broca's Aphasia*. M.A. Thesis. Available at http://seneca.uab.es/ggt/tesis.htm.

Martins, A. M. (2000). 'A minimalist approach to clitic climbing.' In J. Costa (ed.) *Portuguese Syntax. New comparative studies*, Oxford: Oxford University Press, 169-190.

McCaffrey, P.; D. McColl, R. Blackmon and L. Boone (2001). *Basic and Clinical Neuroscience of Communication Disorders*, New Orleans: American Speech Language Hearing Association Conference.

McReynolds, L. V. and C. K. Thompson (1986). 'Flexibility of single-subject experimental designs,' *Journal of Speech and Hearing Disorders* 51: 194–203.

Menn, L and L. Obler (1990). *Agrammatic Aphasia: A Cross-Language Narrative Source Book*, 3 vols., Philadelphia: John Benjamins.

Miceli, G. and A. Mazzucchi (1990). 'Agrammatism in Italian: Two case studies.' In L. Menn & L. Obler (eds.) *Agrammatic Aphasia: A Cross-Language Narrative Source Book*, Philadelphia: John Benjamins.

Miceli, G.; C. Silveri, G. Villa and A. Caramazza (1984). 'On the basis for the agrammatic's difficulty in producing main verbs,' *Cortex* 20: 207–220.

Miceli, G.; C. Silveri, C. Romani and A. Caramazza (1989). 'Variation in the pattern of omissions and substitutions of grammatical morphemes in the spontaneous speech of so-called Agrammatic patients,' *Brain and Language* 36: 447-492.

Mohr, S. (2004). *Clausal Architecture and Subject Positions*, Amsterdam: John Benjamins.

Mohr J. P.; M. S. Pessin, S. Finkelstein, H. H. Funkenstein, G. W. Ducan and K. R. Davis (1978). 'Broca's aphasia: pathologic and clinical,' *Neurology* 28: 311-324.

Moore, K. L. and A. F. Dalley (1999). *Clinically oriented anatomy*, 4th Ed., Toronto: Lippincott Williams & Wilkins.

Moore, W. H. (1986). 'Hemispheric alpha asymmetries and behavioral responses on aphasic and normal subjects for recall and recognition of active, passive and negative sentences,' *Brain and Language* 29: 286-300.

Moreno-Torres Sánchez, I. (2005). 'Agrammatism as feature degradation.' Available at http://www.fe2.uma.es/personal/imoreno/imoreno.htm.

Moscati, V. (2006). *The Scope of Negation*, PhD Dissertation, University of Siena.

Müller, N.; B. Crysmann and G. A. Kaiser (1996). 'Interactions between the Acquisition of French Object Drop and the Development of the C-system,' *Language Acquisition* 5(1): 35-63.

Nadeau, S.E. and L. J. Rothi (1992). 'Morphologic agrammatism following a right hemisphere stroke in a dextral Patient,' *Brain and Language* 43: 642-667.

Nerantzini, M. (2008). *Direct Object clitics in Greek Agrammatic Production: A single case study*, Unpublished MA thesis, University of Groningen, The Netherlands.

Nespoulous, J.-L.; M. Dordain, C. Perron, D. Bub, D. Caplan, J. Mehler and A. R. Lecours (1984). 'Agrammatism in sentence production without comprehension deficits: Reduced availability of syntactic structures and/or of grammatical morphemes?' *The Academy of Aphasia*, Los Angeles.

Nespoulous, J.L.; M. Dordain, C. Perron, B. Ska, D. Bub, D. Caplan, J. Mehler and A. R. Lecours (1988). 'Agrammatism in sentence production without comprehension deficits: Reduced availability of syntactic structures and/or of grammatical morphemes? A case study,' *Brain and Language* 33: 273-295.

Nespoulous, J.L.; M. Dordain, C. Perron, G. Jarema and M. Chazal (1990). 'Agrammatism in French: Two case studies.' In L. Menn and L. Obler (eds.) *Agrammatic aphasia: A cross-language narrative sourcebook*, Vol. 1, Philadelphia: John Benjamins, 623-716.

Ni, W.; D. Shankweiler, K. S. Harris and B.K. Fulbright (1997). 'Production and comprehension of relative clause syntax in nonfluent aphasia: a coordinated study,' *The Academy of Aphasia*, Philadelphia.

Novogrodsky, R. and N. Friedmann (2006). 'The production of relative clauses in syntactic SLI: A window to the nature of the impairment,' *Advances in Speech-Language Pathology* 8(4): 364-375.

Obler, L. K. and K. Gjerlow (1999). *Language and the Brain*, Cambridge: Cambridge University Press.

Ordoñez, F. (1996). 'The Inversion construction in interrogatives in Spanish and Catalan.' In J. Lema and E. Treviño (eds.) *Theoretical Analysis on Romance Languages*, Amsterdam: John Benjamins, 329-50.

Ordoñez, F. (2007). 'Observacions sobre la posició dels subjectes postverbals en Català i Castellà,' *Caplletra* 42: 251-272.

Otero-García, M. (2002). 'The acquisition of clitic placement: A case study of Spanish L2 learners of Galician,' *Working Papers*, Vol. 7, Cambridge, UK: University of Cambridge, Research Centre for English and Applied Linguistics, 25-56.

Ouhalla, J. (1990). 'Sentential negation, relativized minimality and the aspectual status of auxiliaries,' *The Linguistic Review* 7: 183-231.

Ouhalla, J. (1993). 'Functional categories, agrammatism and language acquisition,' *Linguistische Berichte* 143: 3-36.

Ouhalla, J. (1994). 'Verb movement and word order in Arabic.' In N. Hornstein and D. Lighfoot (eds.) *Verb Movement*, Cambridge: Cambridge University Press, 41-72.

Pancheva, R. and M. Ullman (2001). 'Agrammatic Aphasia and The Hierarchy Complexity Hypothesis,' Ms. University of Southern California and Georgetown University.

Paradis, M. (1977). 'Bilingualism and aphasia.' In H. Whitaker and H. A. Whitaker (eds.) *Studies in Neurolinguistics* 3, New York: Academic Press, 65-121.

Payrató, L. (2002). 'L'enunciació i la modalitat oracional.' In J. Solà, M. R. Lloret, J. Mascaró and M. Pérez Saldanya (eds.) *Gramàtica del Català Contemporani*, Barcelona: Empúries, 1149-1220.

Penfield, W. and L. Roberts (1959). *Speech and brain mechanisms*, Princeton, NJ: Princeton University Press.

Perea, M. P. (2002). 'Flexió verbal regular.' In Solà, J.; M.R. Lloret, J. Mascaró and M. Pérez-Saldanya (eds.) *Gramàtica del Català Contemporani*, Vol. 1, Chapter 4, 583-646.

Philippaki-Warburton, I. (1973). 'Modern Greek verb conjugation: Inflectional morphology in a transformational grammar,' *Lingua* 32: 193–226.

Picallo, C. (1990). 'Modal verbs in Catalan,' *Natural Language and Linguistic Theory* 8.2, Dordrecht, 285-312.

Plann, S. (1982). 'Indirect Questions in Spanish,' *Linguistic Inquiry* 13: 297-312.

Plunkett, K. (1998). 'Language acquisition and connectionism,' *Language and Cognitive Processes* 13: 97–104.

Plunkett, B. (1999). 'Targeting Complex Structure: Periphrastic Questions in Child French.' In A. Greenhill, H. Littlefield and C. Tano (eds.) *Proceedings of the BU Conference on Language Development* 23, Cascadilla Press, 764-775.

Poletto, C. (2000). *The Higher Functional Field: Evidence from Northern Dialects*, Oxford: Oxford University Press.

Pollock, J.Y. (1989). 'Verb movement, Universal Grammar and the structure of IP,' *Linguistic Inquiry* 20: 365-424.

Pollock, J.Y. (1998). 'On the Syntax of Subnominal Clitics: Cliticization and Ellipsis,' *Syntax* 1 (3): 300–330.

Prévost, P. and L. White (1999). 'Accounting for morphological variation in second language acquisition: truncation or missing inflection?.' In M.A. Friedemann and L. Rizzi (eds.) *The Acquisition of Syntax*, London: Longman, 202-235.

Prévost, P. and L. White (2000). 'Missing surface inflection or impairment in second language acquisition? Evidence from tense and agreement,' *Second Language Research* 16: 103-133.

Pusch, C. D. (2006). *La gramàtica pronominal del català: variació – evolució – funció /The grammar of Catalan pronouns: variation – evolution – function* (BCG; 5), Aachen: Shaker.

Radford, A.; M. Atkinson, D. Britain, H. Clahsen and A. Spencer (1999). *Linguistics. An Introduction*, Cambridge, UK: Cambridge University Press.

Raposo, E. (1987). 'Case theory and Infl-to-Comp: the inflected infinitive in European Portuguese,' *Linguistic Inquiry* 18: 85-109.

Raposo, E. (2000). 'Clitic Positions and Verb Movement.' In J. Costa (ed.) *Portuguese Syntax: New Comparative Studies*, New York: Oxford University Press, 266-297.

Raposo, E. and J. Uriagereka (2005). 'Clitic Placement in Western Iberian.' In G. Cinque and R. S. Kayne (eds.) *The Oxford Handbook of Comparative Syntax*, New York: Oxford University Press, 639-697.

Reinhart, T. and T. Siloni (2004). 'Against the unaccusative analysis of reflexives.' In A. Alexiadou, E. Anagnostopoulou and M. Everaert (eds.) *Unaccusativity Puzzle: Explorations of the Syntax–Lexicon Interface*, Oxford: Oxford University Press, 159–180.

Reznik, M., S. Dubrovsky and S. Maldonado (1995). 'Agrammatism in Spanish: A Case Study,' *Brain and Language* 51: 355-368.

van Riemsdijk, H. (1999). *Clitics in the Languages of Europe*, Berlin: Mouton De Gruyter.

Rigau, G. (1998). 'La variació sintàctica: Uniformitat en la diversitat,' *Caplletra* 25: 63-82.

Rispens, J.; R. Bastiaanse and R. van Zonneveld (2001). 'Negation in agrammatism: a cross-linguistic comparison,' *Journal of Neurolinguistics* 14: 59-83.

Rivero, M.L. (1978). 'Topicalization and Wh Movement in Spanish,' *Linguistic Inquiry* 9: 513-517.

Rivero, M.L. (1986). 'Parameters in the typology of clitics in Romance and Old Spanish,' *Language* 64: 774-807.

Rivero, M.L. (1994). 'Negation, imperatives and Wackernagel effects,' *Rivista di Linguistica* 6.

Rizzi, L. (1982). *Issues on Italian Syntax*, Dordrecht: Foris.

Rizzi, L. (1986a). 'On Chain Formation.' In H. Borer (ed.) *Syntax and Semantics 19: The Syntax of Pronominal Clitics*, New York: Academic Press, 380.

Rizzi, L. (1986b). 'Null Objects in Italian and the Theory of *pro,' Linguistic Inquiry* 17: 501-557.

Rizzi, L. (1990). *Relativized Minimality*, Cambridge, MA: The MIT Press.

Rizzi, L. (1993/4). 'Some notes on linguistic theory and language development: The case of root infinitives,' *Language Acquisition* 3 (4): 371-393.

Rizzi, L. (1996). 'Residual Verb Second and the Wh-Criterion.' In A. Belletti and L. Rizzi (eds.) *Parameters and Functional Heads: Essays in Comparative Syntax*, New York and Oxford: Oxford University Press, 63-90.

Rizzi, L. (1997). 'The Fine Structure of the Left Periphery.' In L. Haegeman (ed.) *Elements of Grammar*, Dordrecht: Kluwer, 281-337.

Rizzi, L. (2001). 'On the position 'Int(errogative)' in the left periphery of the clause.' In G. Cinque and G. Salvi (eds.) *Current Studies in Italian Syntax Offered to Lorenzo Renzi*, North Holland.

Rizzi, L. (2002). 'Locality and Left Periphery.' In A. Belletti (ed.) *Structures and Beyond: The Cartography of Syntactic Structures* Vol. 2, Oxford: Oxford University Press.

Rizzi, L. (ed.) (2004). *The structure of CP and IP. The cartography of Syntactic Structures*, Vol. 2, New York: Oxford University Press.

Rizzi, L. (2005). 'On the Grammatical Basis of Language Development: A Case Study.' In G. Cinque and R. Kayne (eds.) *The Oxford Handbook of Comparative Syntax*, Oxford: Oxford University Press, 70-109.

Rizzi, L. (2006). 'On the Form of Chains: Criterial Positions and ECP Effects.' In L. L.-S. Cheng and N. Corver (eds.) *Wh-movement*: *Moving on*, Cambridge, MA: The MIT Press, 97-134.

Rosen, S. (1990). *Argument Structure and Complex Predicates*, New York: Garland.

Rooryck, J. (1994). 'On two types of underspecification: towards a feature theory shared by syntax and phonology,' *Probus* 6: 207-233.

Rossi, E. (2007). *Clitic Production in Italian Agrammatism*, PhD Dissertation, University of Groningen.

Saffran, E. M.; R. S. Berndt and M. F. Schwartz (1989). 'The quantitative analysis of agrammatic production: Procedure and data,' *Brain and Language* 37: 440-479.

Saffran, E. M.; M. F. Schwartz and O. S. Marin (1980). 'The word order problem in agrammatism,' *Brain and Language*, 10:249-280.

Saffran E. M.; M. F. Schwartz, M. C. Linebarger, N. Martin, P. Bochetto (1988). *The Philadelphia Comprehension Battery.* Unpublished.

Salis, C. and S. Edwards (2005). 'Comprehension of wh-questions in agrammatism: a single-case study,' *Reading Working Papers in Linguistics* 8: 219-233.

Sasanuma, S.; A. Kamio and M. Kubota (1990). 'Agrammatism in Japanese: Two case studies.' In L. Menn and L. Obler (eds.) *Agrammatic Aphasia: A cross-language narrative source book*, Vol. 2, Philadelphia: John Benjamins, 1225-1308.

Saussure, Ferdinand de (1879). *Mémoire sus le système primitif des voyelles dans les langues indoeuropéennes* [Reprinted as *Cours de linguistique generale* (1916), Paris : Payot].

Schütze, C. (2004). 'Synchronic and diachronic microvariation in English *do*,' *Lingua* 114(4): 495-516.

Schütze, C. (2003). 'When is a verb not a verb?.' In A. Dahl, K. Bentzen and P. Svenonius (eds.) *Proceedings of the 19th Scandinavian Conference of Linguistics. Nordlyd* 31.2: 400-425.

Solà, J. (1992). *Agreement and Subjects*, Bellaterra, Barcelona: UAB Doctoral Dissertations in Linguistics.

Solà, J. (2002). 'Modificadors temporals i aspectuals.' In J. Solà, M. R. Lloret, J. Mascaró and M. Pérez-Saldanya (eds.) *Gramàtica del català contemporani,* Vol. 3, Barcelona: Empúries, 2867-2936.

Sportiche, D. (1996). 'Clitic constructions.' In J. Rooryck and L. Zaring (eds.) *Phrase structure and the lexicon*, Dordrecht/Boston: Kluwer.

Sportiche, D. (1998). *Partitions and Atoms of Clause Structure: Subjects, Agreement, Case and Clitics*, New York: Routledge.

Stavrakaki, S. and S. Kouvava (2003). 'Functional categories in agrammatism: Evidence from Greek,' *Brain and Language* 86: 129–141.

Suñer, M. (1986). 'Lexical subject of infinitives in Caribbean Spanish.' In O. Jaeggli *et al.* (eds.) *Studies in Romance Linguistics,* Dordrecht: Foris, 189-203.

Suñer, M. (1994). 'V-Movement and the licensing of Argumental Wh-phrases in Spanish,' *Natural Language and Linguistic Theory 12: 335-372*.

Takizawa, T.; K. Asano, K. Hatano, T. Hamanaka, K. Morimune and H. Miyazaki (1993). 'A case of morphological agrammatism,' *Annual Meeting of the Japanese Association of Neuropsychology*.

Terzi, A. (2005). 'Comparative Syntax and Language Disorders.' In G. Cinque and R. Kayne (eds.) *The Oxford Handbook of Comparative Syntax*, Oxford: Oxford University Press, 110-137.

Thompson, C. K. and P. J. Doyle (1991). 'Stimulus condition effects on linguistic behavior in aphasic adults' conversational discourse,' *The Academy of Aphasia*, Rome, Italy.

Thompson, C.K. and L. V. McReynolds (1986). 'Wh-interrogative production in agrammatic aphasia: An experimental analysis of auditory-visual stimulation and direct-production treatment,' *Journal of Speech and Hearing Research* 29: 193-206.

Thompson, C.K.; L. P. Shapiro and M. Roberts (1993). 'Treatment of sentence production deficits in aphasia: A linguistic-specific approach to Wh-interrogative training and generalization,' *Aphasiology* 7: 111-133.

Thompson, C. K.; L. P. Shapiro, S. L. Schneider and M. E. Tait (1994). 'Morpho-syntactic and lexical analysis of normal and agrammatic aphasic language production,' *TENNET V*, Montreal, Canada.

Thompson, C.K.; L. P. Shapiro, M. E. Tait, B. J. Jacobs and S. L. Schneider (1996). 'Training Wh-question production in agrammatic aphasia: analysis of argument and adjunct movement,' *Brain and Language* 52: 175-228.

Thompson, C. K.; L. P. Shapiro, K. J. Ballard, B. Jacobs, S. L. Schneider and M. Tait (1997). 'Training and generalized production of wh and NP movement structures in agrammatic aphasia,' *Journal of Speech and Hearing Research* 40: 228-244.

Thompson, C. K.; L. P. Shapiro, S. Kira and J. Sobecks (2003). 'The Role of Syntactic Complexity in Treatment of Sentence Deficits in Agrammatic Aphasia: The Complexity Account of Treatment Efficacy (CATE),' *Journal of Speech, Language and Hearing Research* 46: 591-607.

Tissot, R. J.; G. Mounin and F. Lhermitte (1973). *L'agrammatisme*, Brussels: Dessart.

Todolí, J. (2002). 'Els pronoms.' In J. Solà, M.R. Lloret, J. Mascaró and M. Pérez Saldanya (dirs.) *Gramàtica del català contemporani*, Vol. 3, Barcelona: Empúries, 1341-1433.

Torrego, E. (1984). 'On inversion in Spanish and some of its effects,' *Linguistic Inquiry* 15: 103-129.

Torrens, V. (1995). 'The acquisition of syntax in Catalan and Spanish,' *MIT Working Papers in Linguistics (MITWPL)* 26: 451-471.

Torrens, V. (2002). *La adquisición del tiempo y la concordancia. La continuidad en el proceso evolutivo*, Madrid: UNED Ediciones.

Travis, L. (1984). *Parameters and effects of word order variation*, PhD dissertation, MIT.

Trousseau, A. (1864). 'De l'aphasie, maladie d'écrite recomment sous le nom impropre d'aphémie,' *Gazette des Hôpitaux Civils et Militaires* 1: 13-14.

Ullman, M.T. (2001). 'A Neurocognitive Perspective on Language: The Declarative/Procedural Model,' *Nature Reviews Neuroscience* 2: 717-726.

Uriagereka, J. (1995). 'Aspects of the syntax of clitic placement in Western Romance,' *Linguistic Inquiry* 26.1: 79-123.

Vainikka, A.; G. Legendre and M. Todorova (1999). *PLU stages: An independent measure of early syntactic development*, Tech. Rep. No. JHU–CogSci–99–10, Baltimore, MD: Johns Hopkins University.

Valeonti, N.; A. Economou, M. Kakavoulia, A. Protopapas and S. Varlokosta (2004). 'The breakdown of functional categories in Greek aphasia,' Poster presented at *Science of Aphasia V*, Potsdam.

Villalba, X. (2000). *The Syntax of Sentence Periphery*, PhD Dissertation, Universitat Autònoma de Barcelona.

Vallduví, T. (l992). 'A Preverbal landing site for quantificational operators,' *Catalan Working Papers in Linguistics* 2, Barcelona: Universitat Autònoma de Barcelona, Barcelona, 319-343.

Varlokosta, S.; N. Valeonti, M. Kakavoulia, M. Lazaridou, A. Economou and A. Protopapas (2006). 'The breakdown of functional categories in Greek aphasia: Evidence from agreement, tense, and aspect,' *Aphasiology* 20 (8): 723–743.

Veiga, A. (1991). 'Le système verbal du Galicien. Survivance d'un état proto-roman occidental ?,' *Actes du XVIII Congrès International de Linguistique et Philologie Romanes*, Vol. 3, Tubingen: Max Niemeyer, 77-96.

Wada, J. (1949). 'A new method for the determination of the side of cerebral speech dominance: a preliminary report on the intracarotid injection of sodium amytal in man,' *Medical Biology Tokyo* 14: 221-222.

Wambaugh, J.L. and C. K. Thompson (1989). 'Training and generalizations of agrammatic aphasic adults' Wh-interrogative production,' *Journal of Speech and Hearing Disorders* 54: 509-525.

Wenzlaff, M. and H. Clahsen (2004). 'Tense and agreement in German agrammatism,' *Brain and Language* 89: 57−68.

Wernicke, C. (1874). *The aphasia symptom-complex: a psychological study on an anatomical basis.* English translation in P. Eling (ed.) (1994). *Reader in the History of Aphasia,* Amsterdam: John Benjamins, 69-89.

Wexler, K. (1994). 'Optional infinitives, head movement and the economy of derivations.' In D. Lightfoot and N. Hornstein (eds.) *Verb Movement*, Cambridge: Cambridge University Press, 305-350.

Wexler, K. (1998). 'Very early parameter setting and the unique checking constraint: a new explanation of the optional infinitive stage,' *Lingua* 106: 23-79.

Wheeler, M.; A. Yates and N. Dols (1999). *Catalan. A comprehensive grammar*, London: Routledge.

Yllera, A. (1999). 'Las perífrasis verbales de gerundio y participio.' In I. Bosque and V. Demonte (eds.) *Gramática descriptiva de la lengua española* Vol. 1, Madrid: Espasa, 395-522.

Zagona, K. (2002). *The Syntax of Spanish*. Cambridge, UK: Cambridge University Press.

Zanuttini, R. (1989). *The structure of negative clauses in Romance*, Ms. University of Pennsylvania, Philadelphia.

Zanuttini, R. (1991). *Syntactic Properties of Sentential Negation: A Comparative Study of Romance Languages*, PhD dissertation, University of Pennsylvania.

Zanuttini, R. (1997). *Negation and clausal structure: A comparative study of Romance languages*, New York: Oxford University Press, 201 pages.

Zanuttini, R. (2001). 'Sentential Negation.' In M. Baltin and C. Collings (eds.) *The Handbook of Contemporary Syntactic Theory*, Blackwell, 511-535.

Zeijlstra, H. (2004). *Sentential negation and Negative Concord*. PhD dissertation. University of Amsterdam.

Zubizarreta, M. L. (1998). *Prosody, focus and word order*, Cambridge, MA: The MIT Press.

Zuckerman, S. (2001). *The Acquisition of 'Optional' Movement*, Doctoral dissertation, University of Groningen.

Zurif, E.B. (1990). 'Language and the brain.' In D. Osherson (ed.) *Invitation to Cognitive Science*, Cambridge, MA: The MIT Press, 177-198.

Zurif, E. B. and A. Caramazza (1976). 'Linguistic structures in aphasia: Studies in syntax and semantics.' In H. Whitaker and H. H. Whitaker (eds.) *Studies in neurolinguistics*, Vol. 2, San Diego: Academic Press, 261-292.

Zurif, E.B.; A. Caramazza and R. Myerson (1972). 'Grammatical judgements of agrammatic aphasics,' *Neuropsychologia* 10: 405-417.

Zurif, E. B.; H. Gardner and H. Brownell (1989). 'The case against the case against group studies,' *Brain and Cognition* 10: 237-255.

Zurif, E. B. and M. Piñango (2000). 'Combinatorial operations in sentence comprehension.' In L. Tabor Connor and L. K. Obler (eds.) *Neurobehavior of Language and Cognition. Studies of Normal Aging and Brain Damage*, New York: Springer-Verlag, 141-147.

APPENDICES

APPENDIX I

NegP & CP

Test I[61]

– **CATALAN VERSION –**

TASK 1: NEGATION

A. Tokens intended to elicit negation of main verbs.

Prompt: Aquesta dona juga a tennis.   Target: Aquesta dona <u>no</u> juga a tennis.
    This woman plays tennis.   *This woman <u>does not</u> play tennis.*

1. Demà veurem en Joan.
    Tomorrow we will see John.
2. Ells sortien d'hora.
    They were going out early.
3. Demà collirem pomes.
    Tomorrow we will pick apples.
4. Els nens actuaven dimarts.
    The kids were performing on Tuesday.
5. L'Andreu té 2 nens.
    Andrew has two kids.
6. Els nois pescaran carpes.
    The boys will catch carp.
7. L'Almodóvar dirigia aquesta pel·lícula.
    Almodóvar was directing this film.
8. En Marc vendrà el seu cotxe.
    Marc will sell his car.
9. En Jordi anava a la piscina.
    George was going to the swimming-pool.
10. La Sandra comprava flors.
    Sandra was buying flowers.
11. Avui demanem uns llibres.
    Today we are asking for some books.
12. L'Andrea ens saludarà.
    Andrea will greet us.
13. En Pere guanyarà la cursa.
    Peter will win the race.

---

[61] Only the translation and not the gloss is provided for the Test I and Test II materials. Those wishing to replicate the experiment will find a description of our methodology in the main body of this dissertation.

14. Avui naixeran pollets.
    Today chicks will hatch.
15. Aquesta llum surt del far.
    This light is coming from the lighthouse.
16. La Marta juga a futbol.
    Marta plays football.
17. Aquesta dona espera un fill.
    This woman is expecting a baby.
18. M'agrada llegir.
    I like reading.
19. En Santi evitava els problemes.
    Santi was avoiding the problems.
20. Els socis arriben a un acord.
    The associates are reaching an agreement.
21. Aquestes nenes viuen amb mi.
    These girls live with me.
22. La Sara m'explicarà la història.
    Sara will tell me the story.
23. Això em preocupa.
    This worries me.
24. En Joan plantava arbres.
    John was planting trees.
25. L'Andreu diu tonteries.
    Andrew says silly things.

B. Tokens intended to elicit negation of auxiliary verbs and periphrases.

Prompt: Avui has jugat bé.   Target: Avui <u>no</u> has jugat bé.
    Today you have played well.   *Today you have <u>not</u> played well.*

1. Jo he menjat xocolata.
   I have had chocolate.
2. Nosaltres havíem demanat una pizza.
   We had asked for pizza.
3. Els mariners havien de sortir al mar.
   The sailors had to go to sea.
4. Tu has ballat amb la Maria.
   You have danced with Mary.
5. Vosaltres heu anat a la platja.
   You have gone to the beach.
6. Jo he cantat una cançó.
   I have sung a song.
7. El nen ha tingut sort.
   The boy has been lucky.
8. Vosaltres heu de córrer un quilòmetre.
   You must run one kilometer.

9. Nosaltres arribem a saber moltes coses.
   We get to know many things.
10. Jo havia estudiat molt.
    I had studied a lot.
11. Les mares hi han d'anar.
    The mothers have to go.
12. Vosaltres heu fregat els plats.
    You have washed the dishes.
13. Els fusters han acabat la feina.
    The carpenters have finished the job.
14. Nosaltres podíem cosir la camisa.
    We were able to sew the shirt.
15. En Manel ha endevinat la sorpresa.
    Manel has guessed the surprise.
16. Tu vas tardar a arribar.
    It took you a long time to arrive.
17. En Joan havia portat menjar.
    John had brought food.
18. Les nenes van començar a plorar.
    The girls started crying.
19. La Sandra anava passant els exàmens.
    Sandra was passing her exams.
20. Les modistes havien fundat una fàbrica.
    The dressmakers had set up a factory.
21. Al matí va deixar de ploure.
    In the morning it stopped raining.
22. Ell va acabar estudiant anglès.
    He ended up studying English.
23. Nosaltres vam deixar de cantar.
    We stopped singing.
24. Tu continuaves recordant aquella festa.
    You couldn't stop remembering that party.
25. Elles han portat el sopar.
    They have brought the dinner.

TASK 2: CP

A. Tokens intended to elicit interrogatives.

Prompt: Ahir vaig anar a un lloc i tu vols saber on.
    Yesterday I went somewhere and you want to know where.

Target: <u>On vas anar ahir</u>?
    <u>*Where did you go yesterday?*</u>

1. Ahir vaig menjar una cosa molt bona i tu vols saber el que va ser.
   Yesterday I ate something very tasty and you want to know what it was.

2. Potser tu i jo jugarem a cartes, pregunta-m'ho.
   Maybe you and I can play cards together. Ask me.
3. En Joan busca una cosa i tu vols saber el què.
   John is looking for something and you want to know what.
4. Vull anar a un lloc i tu vols saber la data.
   I want to go to somewhere and you want to know what day I'm leaving..
5. Potser m'agrada el color vermell, pregunta-m'ho.
   I might like the red color. Ask me.
6. Potser els pescadors tenen fred, pregunta-m'ho.
   The fishermen might be cold. Ask me if they are.
7. Tu no saps la meva edat i la vols saber.
   You don't know how old I am and you want to find out.
8. Potser els nens estan cansats, pregunta-m'ho.
   The children might be tired. Ask me if they are.
9. Tu no saps els germans que tinc i vols saber el numero.
   You don't know how many brothers and sisters I have. Ask me..
10. Potser m'agrada viatjar, pregunta-m'ho.
    I might like travelling. Ask me.
11. Potser sóc bona cuinera, pregunta-m'ho.
    I might be a good cook. Ask me.
12. Jo dormo molt i tu vols saber el numero d'hores.
    I sleep a lot and you want to know the number of hours I sleep.
13. Potser la Maria vol vendre el seu pis, pregunta-m'ho.
    Mary might want to sell her apartment. Ask me if she does..
14. Potser aniràs de viatge, pregunta-m'ho.
    You might be going on a trip. Ask me if you are.
15. M'agrada molt llegir i tu vols saber el lloc on llegeixo.
    I like reading very much and you want to know where I read.
16. Potser l'Andreu menteix molt, pregunta-m'ho.
    Maybe Andrew lies a lot. Ask me if he does.
17. Les noies van fer un pastís i tu vols saber de quina manera.
    The girls made a cake and you want to know how.
18. Potser anirem de vacances, pregunta-m'ho.
    We might go away in vacation. Ask me.
19. Jo no sóc catalana i vols saber d'on sóc.
    I am not Catalan and you want to know where I am from.
20. Potser els meus cosins venen a Barcelona, pregunta-m'ho.
    My cousins might be coming to Barcelona. Ask me.
21. Les modistes estan enfadades i tu vols saber la raó.
    The dressmakers are angry and you want to know the reason.
22. La Sandra es va comprar una casa i tu vols saber el preu.
    Sandra bought a house and you want to know the price.
23. En Carles va vendre uns quants apartaments i tu vols saber el numero.
    Charles sold several apartments and you want to know the number.
24. Potser toco el piano, pregunta-m'ho.
    I might know how to play the piano. Ask me.
25. L'Andreu va espatllar una finestra i tu no saps de quina manera.
    Andrew broke a window and you want to know how.

B. Tokens inteded to elicit subordinate clauses[62].

Prompt: Aquesta és la persona que té els ulls marrons.
         This is the person that has brown eyes.

Target: Aquesta és la persona que té els ulls blaus.
        This is the person that has blue eyes.

1.   Aquest és l'home que té els cabells rossos.
     This is the man that has blond hair.

---

[62] Materials have been adapted from *Lecciones de dibujo artístico* by Emilio Freixas (1964) (Barcelona: Sucesor de E. Meseguer) and *Dibujo y Pintura* (1990)(Madrid: Santillana).

2. Aquest és el llapis que pinta de color vermell.
    This is the pencil that colors red.

3. Aquest és el tren que passa per la costa.
    This is the train that goes along the coast.

4. Aquest és l'home que neda a la piscina.
    This is the man that is swimming in the swimming-pool.

5. Aquesta és la dona que porta arracades.
   This is the woman that is wearing earrings.

6. Aquest és l'home que condueix el cotxe.
   This is the man that is driving the car.

7. Aquestes són les flors que veu en Joan des de la seva finestra.
   These are the flowers that John sees from his window.

8. Aquest és un peix que viu al mar.
   This is a fish that lives in the sea.

9. Aquesta és la clau que obre el camió.
   This is the key that opens the truck.

10. Aquesta és la noia que mira la flor.
    This is the girl that is looking at the flower.

11. Aquest és l'arbre que dóna flors.
    This is the tree that produces flowers.

12. Aquest és l'avió que vola alt.
    This is the plane that is flying high.

13. Aquesta és la gimnasta que fa servir la cinta.
    This is the gymnast that is using the ribbon.

14. Aquest és el cotxe que corre poc.
     This is the car that doesn't go very fast.

15. Aquest és el nen que passeja el gos.
     This is the boy that is taking the dog for a walk.

16. Aquesta és la professora que ensenya anglès.
     This is the teacher that is teaching English.

17.   Aquest és el vaixell que porta poca llum.
      This is the ship that doesn't have many lights on.

18.   Aquesta és la dona que pensa en viatjar.
      This is the woman that is thinking about traveling.

19.   Aquest és el got que té aigua.
      This is the glass that contains water.

20. Aquesta és la noia que somriu.
    This is the girl that is smiling.

21. Aquest és el rellotge que marca les dotze.
    This is the watch that shows twelve o'clock.

22. Aquest és l'home que porta barret.
    This is the man that is wearing a cap.

23.   Aquesta és la mà que aguanta la pinça.
      This is the hand that is holding the tweezers.

24.   Aquests són els plàtans que costen tres euros.
      These are the bananas that cost three euros.

25. Aquest és el nen que juga amb el monopatí.
     This is the boy that is playing with the skateboard.

– GALICIAN VERSION –

TASK 1: NEGATION

A. Tokens intended to elicit negation of main verbs.

Prompt: Esta muller xoga ó tenis.   Target: Esta muller <u>non</u> xoga ó tenis.
      This woman plays tennis.   *This woman <u>does not</u> play tennis.*

1. Maná veremos a Xoán.
   Tomorrow we will see John.
2. Eles saían cedo.
   They were leaving early.
3. Mañá recolleremos mazás.
   Tomorrow we will pick apples.
4. Os nenos actuaban o martes.
   The children were performing on Tuesday.
5. Andrés ten dous nenos.
   Andrew has two children.
6. Os nenos pescarán carpas.
   The boys will catch carp.
7. Almodóvar dirixía esta película.
   Almodóvar was directing this film.
8. Marcos venderá o seu coche.
   Mark will sell his car.
9. Xurxo ía á piscina.
   George was going to the swimming-pool.
10. Xandra mercaba flores.
    Sandra was buying flowers.
11. Hoxe pedimos uns libros.
    Today we are asking for some books.
12. Andrea saudaranos.
    Andrea will greet us.
13. Pedro gañará a carreira.
    Peter will win the race.
14. Hoxe nacerán pitos.
    Today chicks will hatch.
15. Esta luz sae do faro.
    This light is coming from the lighthouse.
16. Marta xoga ó fútbol.
    Marta plays football.
17. Esta muller espera un fillo.
    This woman is expecting a baby.
18. Gústame ler.
    I like reading.
19. Santiago evitaba o problema.
    Santiago was avoiding the problem.

20. Os socios chegan a un acordo.
    The associates are reaching an agreement.
21. Estas nenas viven comigo.
    These girls live with me.
22. Sara contarame a historia.
    Sarah will tell me the story.
23. Iso preocúpame.
    This worries me.
24. Xoán plantaba árbores.
    John was planting trees.
25. Andrés di parvadas.
    Andrew says silly things.

B. Tokens intended to elicit negation of periphrases.

Prompt: Hoxe hei de axudarlle.   Target: Hoxe <u>non</u> hei de axudarlle.
    Today I have to help him.   *Today I <u>do not</u> have to help him.*

1. Eu teño merendado chocolate.
    I have had chocolate as an afternoon snack.
2. Nós debiamos pedir pizza.
    We should ask for pizza.
3. Os mariñeiros tiñan que saír ó mar.
    The sailors had to go to sea.
4. Ti tes bailado con María.
    You have danced with Mary.
5. Vós ides ir á praia.
    You are going to go to the beach.
6. Eu botei a andar.
    I started walking.
7. O neno ten tido sorte.
    The boy has been lucky.
8. Vós debedes correr un quilómetro.
    You must run one kilometer.
9. Nós chegamos a saber moitas cousas.
    We get to know many things.
10. Eu tiña que estudiar moito.
    I had to study a lot.
11. As nais han de ir.
    The mothers have to go.
12. Vós déstes en frega-los pratos.
    You took to washing the dishes.
13. Os carpinteiros deron por rematado o traballo.
    The carpenters considered the job finished.
14. Nós podiamos cose-la chambra.
    We were able to sew the blouse.

15. Manolo houbo de adiviña-la sorpresa.
    Manuel was about to guess the surprise.
16. Ti tardaches en chegar.
    It took you a long time to arrive.
17. Xan foi traendo o xantar.
    John was bringing food.
18. As nenas botáronse a chorar.
    The girls burst into tears.
19. Xandra ía pasando os exames.
    Sandra was passing her exams.
20. As costureiras ían crear unha fábrica.
    The dressmakers were going to set up a factory
21. Pola mañá deixou de chover.
    In the morning it stopped raining.
22. El rematou estudiando inglés.
    He ended up studying English.
23. Nós deixamos de cantar.
    We stopped singing.
24. Ti seguías a lembrar aquela festa.
    You couldn't stop remembering that party.
25. Elas tiñan traído a cea.
    They had brought the dinner.

TASK 2: CP

A. Tokens intended to elicit interrogatives.

Prompt: Onte estiven nalgures e ti queres sabe-lo lugar.
     Yesterday I was somewhere and you want to know the place.

Target: <u>Ónde estiveches onte</u>?
     <u>*Where were you yesterday?*</u>

1. Onte comín unha cousa moi saborosa e ti queres sabe-lo que foi.
   Yesterday I ate something very tasty and you want to know what it was.
2. Ó mellor ti e mais eu xogamos ás cartas, pregúntamo.
   Maybe you and I can play cards together. Ask me.
3. Xoán anda na procura dunha cousa e ti queres sabe-lo qué.
   John is looking for something and you want to know what.
4. Vou ir a algures e ti queres sabe-la data.
   I am going to go to somewhere and you want to know what day I'm leaving..
5. Ó mellor gústame a cor vermella, pregúntamo.
   I might like the color red. Ask me.
6. Ó mellor os pescadores teñen frío, pregúntamo.
   The fishermen might be cold. Ask me.
7. Ti non sabe-la idade que teño e queres sabelo.
   You don't know how old I am and you want to find out.

8. Ó mellor os nenos están cansos, pregúntamo.
   The childer might be tired. Ask me if they are.
9. Ti non sabe-los irmáns que teño e queres sabe-lo número.
   You don't know how many bothers and sisters I have. Ask me.
10. Ó mellor gústame viaxar, pregúntamo.
    I might like traveling. Ask me.
11. Ó mellor son boa cociñeira, pregúntamo.
    I might be a good cook. Ask me.
12. Eu durmo moito e ti queres sabe-lo número de horas.
    I sleep a lot and you want to know the number of hours I sleep.
13. Ó mellor María vende o seu piso, pregúntamo.
    Mary might be selling her apartment. Ask me if she is..
14. Ó mellor vas de viaxe, pregúntamo.
    You might be going on a trip. Ask me if you are.
15. Gústame moito ler e ti queres sabe-lo lugar no que leo.
    I like reading very much and you want to know where I read.
16. Ó mellor Andrés minte moito, pregúntamo.
    Maybe Andrew lies a lot. Ask me if he does.
17. As mozas fixeron un pastel e ti queres saber de qué maneira.
    The girls made a cake and you want to know how.
18. Ó mellor ímos de vacacións, pregúntamo.
    We might go away on vacation. Ask me.
19. Eu non son catalana e ti queres saber de ónde son.
    I am not Catalan and you want to know where I am from.
20. Ó mellor os meus curmáns van a Barcelona, pregúntamo.
    My cousins might be going to Barcelona. Ask me.
21. As costureiras están anoxadas e ti queres sabe-la razón.
    The dressmakers are angry and you want to know the reason.
22. Xandra mercou unha casa e ti queres sabe-lo prezo.
    Sandra bought a house and you want to know the price.
23. Carlos vendeu algúns apartamentos e ti queres sabe-lo número.
    Charles sold several apartments and you want to know the number.
24. Ó mellor toco o piano, pregúntamo.
    I might know how to play the piano. Ask me.
25. Andrés rompeu unha fiestra e ti queres saber de qué maneira.
    Andrew broke a window and you want to know how.

B. Tokens intended to elicit subordinate clauses (in combination with the same picture pairs used for the Catalan version of this task)**.**

Prompt: Esta é a persoa que ten os ollos marróns.
        This is the person that has brown eyes.

Target: <u>Esta é a persoa que ten os ollos azuis</u>.
        <u>*This is the person that has blue eyes*</u>.

1. Este é o home que ten o cabelo louro.
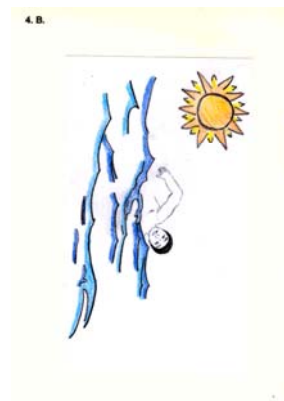   *This is the man that has blond hair.*

2. Este é o lapis que pinta de cor vermella.
    This is the pencil that colors red.
3. Este é o tren que pasa pola costa.
    This is the train that goes along the coast.
4. Este é o home que nada na piscina.
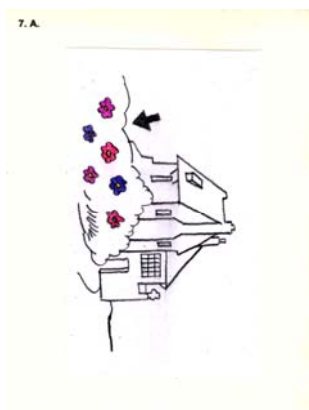   *This is the man that is swimming in the swimming-pool.*
5. Esta é a muller que leva argolas.
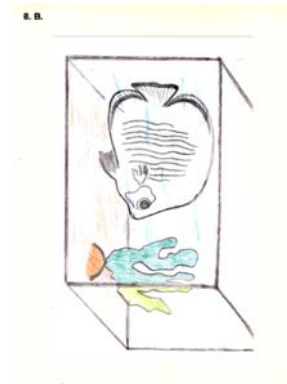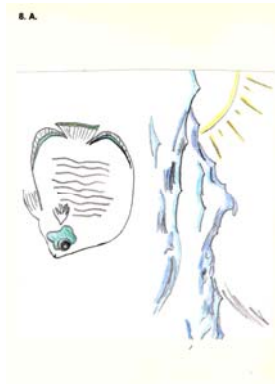   *This is the woman that is wearing earrings.*
6. Este é o home que conduce un coche.
    This is the man that is driving a car.
7. Estas son as flores que ve Xoán dende a súa fiestra.
    These are the flowers that John sees from his window.
8. Este é o peixe que vive no mar.
    This is the fish that lives in the sea.
9. Esta é a chave que abre o camión.
    This is the key that opens the truck.
10. Esta é a rapaza que mira a flor.
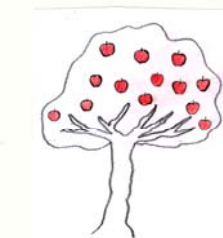   *This is the girl that is looking at the flower.*
11. Esta é a árbore que da flores.
    This is the tree that produces flowers.
12. Este é o avión que voa alto.
    This is the plane that is flying high.
13. Esta é a ximnasta que emprega a cinta.
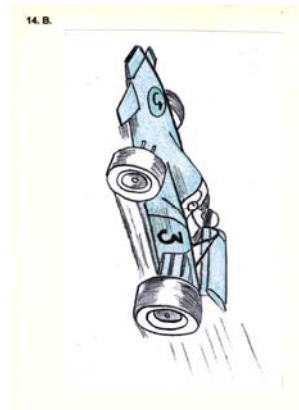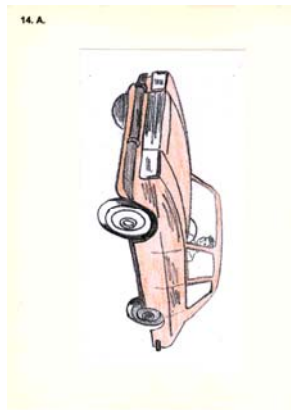   *This is the gymnast that is using the ribbon.*
14. Este é o coche que corre pouco.
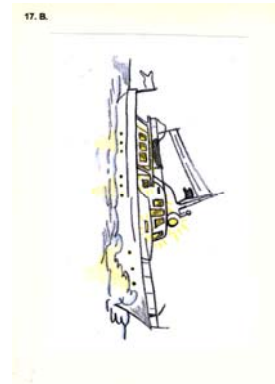   *This is the car that doen't go very fast.*
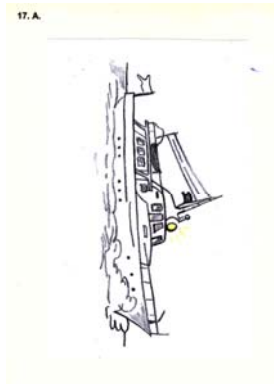15. Este é o neno que pasea ó can.
    This is the boy that is taking the dog for a walk.
16. Esta é a mestra que ensina inglés.
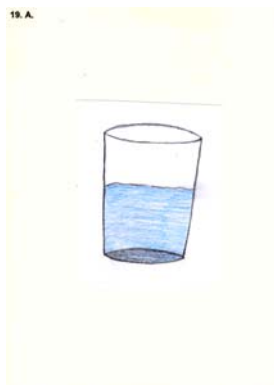   *This is the teacher that is teaching English.*
17. Este é o barco que ten pouca luz.
    This is the ship that doesn't have many lights on.
18. Esta é a muller que pensa en viaxar.
    This is the woman that is thinking about traveling.
19. Este é o vaso que ten auga.
    This is the glass that contains water.
20. Esta é a moza que sorrí.
    This is the girl that is smiling.
21. Este é o reloxo que marca as doce.
    This is the watch that shows twelve o'clock.
22. Este é o home que leva chapeo.
    This is the man that is wearing a cap.
23. Esta é a man que suxeita a pinza.
    This is the hand that is holding the tweezers.
24. Estes son os plátanos que custan tres euros.
    These are the bananas that cost three euros.
25. Este é o neno que xoga co monopatín.
    This is the boy that is playing with the skateboard.

– SPANISH VERSION –

TASK 1: NEGATION

A. Tokens intended to elicit negation of main verbs.

Prompt: Esta mujer juega al tenis.   Target: Esta mujer <u>no</u> juega al tenis.
     This woman is playing tennis.   *This woman <u>does not</u> play tennis.*

1. Mañana veremos a Juan.
   Tomorrow we will see John.
2. Ellos salían temprano.
   They were leaving early.
3. Mañana recogeremos manzanas.
   Tomorrow we will pick apples.
4. Los niños actuaban el martes.
   The children were performing on Tuesday.
5. Andrés tiene dos niños.
   Andrew has two kids.
6. Los chicos pescarán carpas.
   The boys will catch carp.
7. Almodóvar dirigía esta película.
   Almodóvar was directing this film.
8. Marcos venderá su coche.
   Mark will sell his car.
9. Jorge iba a la piscina.
   George was going to the swimming-pool.
10. Sandra compraba flores.
    Sandra was buying flowers.
11. Hoy pedimos unos libros.
    Today we are asking for some books.
12. Andrea nos saludará.
    Andrea will greet us.
13. Pedro ganará la carrera.
    Peter will win the race.
14. Hoy nacerán pollitos.
    Today chicks will hatch.
15. Esta luz sale del faro.
    This light is coming from the lighthouse.
16. Marta juega al fútbol.
    Marta plays football.
17. Esta mujer espera un hijo.
    This woman is expecting a baby.
18. Me gusta leer.
    I like reading.
19. Santiago evitaba el problema.
    Santiago was avoiding the problem.

20. Los socios llegan a un acuerdo.
    The associates are reaching an agreement.
21. Estas niñas viven conmigo.
    These girls live with me.
22. Sara me contará la historia.
    Sarah will tell me the story.
23. Eso me preocupa.
    This worries me.
24. Juan plantaba árboles.
    John was planting trees.
25. Andrés dice tonterías.
    Andrew says silly things.

B. Tokens intended at eliciting auxiliary verbs and periphrases.

Prompt: Hoy has jugado bien.   Target: Hoy <u>no</u> has jugado bien.
   Today you have played well.   *Today you have <u>not</u> played well.*

1. Yo he merendado chocolate.
    I have had chocolate as an afternoon snack.
2. Nosotros habíamos pedido pizza.
    We had asked for pizza.
3. Los marineros tenían que salir al mar.
    The sailors had to go to sea.
4. Tú has bailado con María.
    You have danced with Mary.
5. Vosotros habéis ido a la playa.
    You have gone to the beach.
6. Yo he cantado una canción.
    I have sung a song.
7. El niño ha tenido suerte.
    The boy has been lucky.
8. Vosotros debéis correr un kilómetro.
    You must run one kilometer.
9. Nosotros llegamos a saber muchas cosas.
    We get to know many things.
10. Yo había estudiado mucho.
    I had studied a lot.
11. Las madres han de ir.
    The mothers have to go.
12. Vosotros habéis fregado los platos.
    You have washed the dishes.
13. Los carpinteros han terminado el trabajo.
    The carpenters have finished the job.
14. Nosotros podíamos coser la blusa.
    We were able to sew the blouse.

15. Manuel ha adivinado la sorpresa.
    Manuel has guessed the surprise.
16. Tú tardaste en llegar.
    It took you a long time to arrive.
17. Juan había traído comida.
    John had brought food.
18. Las niñas se echaron a llorar.
    The girls burst into tears.
19. Sandra iba pasando los exámenes.
    Sandra was passing her exams.
20. Las modistas habían creado una fábrica.
    The dressmakers had set up a factory.
21. Por la mañana dejó de llover.
    In the morning it stopped raining.
22. El acabó estudiando inglés.
    He ended up studying English.
23. Nosotros dejamos de cantar.
    We stopped singing.
24. Tú seguías recordando aquella fiesta.
    You couldn't stop remembering that party.
25. Ellas han traído la cena.
    They have brought the dinner.

TASK 2: CP

A. Tokens intended to elicit interrogatives.

Prompt: Ayer estuve en un sitio y tú quieres saber el lugar.
    Yesterday I was somewhere and you want to know the place.

Target: ¿<u>Dónde estuviste ayer</u>?
    <u>*Where were you yesterday*</u>?

1. Ayer comí una cosa muy rica y tú quieres saber lo que fue.
   Yesterday I ate something very tasty and you want to know what it was.
2. A lo mejor tú y yo jugamos a las cartas, pregúntamelo.
   Maybe you and I can play cards together. Ask me.
3. Juan busca una cosa y tú quieres saber lo qué.
   John is looking for something and you want to know what.
4. Voy a ir a un sitio y tú quieres saber la fecha.
   I am going to go somewhere and you want to know what day I'm leaving..
5. A lo mejor me gusta el color rojo, pregúntamelo.
   I might like the color red. Ask me.
6. A lo mejor los pescadores tienen frío, pregúntamelo.
   The fishermen might be cold. Ask me.
7. Tú no sabes la edad que tengo y quieres saberla.
   You don't know how old I am and you want to find out.

8. A lo mejor los niños están cansados, pregúntamelo.
    The children might be tired. Ask me if they are.
9. Tú no sabes los hermanos que tengo y quieres saber el número.
    You don't know how many brothers and sisters I have. Ask me.
10. A lo mejor me gusta viajar, pregúntamelo.
    I might like traveling. Ask me.
11. A lo mejor soy buena cocinera, pregúntamelo.
    I might be a good cook. Ask me.
12. Yo duermo mucho y tú quieres saber el número de horas.
    I sleep a lot and you want to know the number of hours I sleep.
13. A lo mejor María vende su piso, pregúntamelo.
    Mary might be selling her apartment. Ask me if she is.
14. A lo mejor vas de viaje, pregúntamelo.
    You might be going on a trip. Ask me if you are.
15. Me gusta mucho leer y tú quieres saber el lugar en el que leo.
    I like reading very much and you want to know where I read.
16. A lo mejor Andrés miente mucho, pregúntamelo.
    Maybe Andrew lies a lot. Ask me if she does.
17. Las chicas hicieron un pastel y tú quieres saber de qué manera.
    The girls made a cake and you want to know how.
18. A lo mejor nos vamos de vacaciones, pregúntamelo.
    We might go away on vacation. Ask me.
19. Yo no soy catalana y tú quieres saber de dónde soy.
    I am not Catalan and you want to know where I am from.
20. A lo mejor mis primos vienen a Barcelona, pregúntamelo.
    My cousins might be coming to Barcelona. Ask me.
21. Las costureras están enfadadas y tú quieres saber la razón.
    The dressmakers are angry and you want to know the reason.
22. Sandra se compró una casa y tú quieres saber el precio.
    Sandra bought a house and you want to know the price.
23. Carlos vendió algunos apartamentos y tú quieres saber el número.
    Charles sold several apartments and you want to know the number.
24. A lo mejor toco el piano, pregúntamelo.
    I might know how to play the piano. Ask me.
25. Andrés rompió una ventana y tú quieres saber de qué manera.
    Andrew broke a window and you want to know how.

B. Tokens intended to elicit subordinate clauses (in combination with the same Picture pairs used for the Catalan version of this task)**.**

Prompt: Esta es la persona que tiene los ojos marrones.
   This is the person that has brown eyes.

Target: <u>Esta es la persona que tiene los ojos azules</u>.
   <u>*This is the person that has blue eyes.*</u>

1. Este es el hombre que tiene el pelo rubio.
    This is the man that has blond hair.

2. Este es el lápiz que pinta de color rojo.
   This is the pencil that colors red.
3. Este es el tren que pasa por la costa.
   This is the train that goes along the coast.
4. Este es el hombre que nada en la piscina.
   This is the man that is swimming in the swimming-pool.
5. Esta es la mujer que lleva pendientes.
   This is the woman that is wearing earrings.
6. Este es el hombre que conduce un coche.
   This is the man that is driving a car.
7. Estas son las flores que ve Juan desde su ventana.
   These are the flowers that John sees from his window.
8. Este es un pez que vive en el mar.
   This is a fish that lives in the sea.
9. Esta es la llave que abre el camión.
   This is the key that opens the truck.
10. Esta es la chica que mira la flor.
    This is the girl that is looking at the flower.
11. Este es el árbol que da flores.
    This is the tree that produces flowers.
12. Este es el avión que vuela alto.
    This is the plane that is flying high.
13. Esta es la gimnasta que usa la cinta.
    This is the gymnast that is using the ribbon.
14. Este es el coche que corre poco.
    This is the car that doesn't run very fast.
15. Este es el niño que pasea al perro.
    This is the boy that is taking the dog for a walk.
16. Esta es la profesora que enseña inglés.
    This is the teacher that is teaching English.
17. Este es el barco que tiene poca luz.
    This is the ship that doesn't have many lights on.
18. Esta es la mujer que piensa en viajar.
    This is the woman that is thinking about traveling.
19. Este es el vaso que tiene agua.
    This is the glass that contains water.
20. Esta es la chica que sonríe.
    This is the girl that is smiling.
21. Este es el reloj que marca las doce.
    This is the watch that shows twelve o'clock.
22. Este es el hombre que lleva sombrero.
    This is the man that is wearing a cap.
23. Esta es la mano que sujeta la pinza.
    This is the hand that is holding the tweezers.
24. Estos son los plátanos que cuestan tres euros.
    These are the bananas that cost three euros.
25. Este es el niño que juega con el monopatín.
    This is the boy that is playing with the skateboard.

APPENDIX I

Clitics & Comprehension

Test II

- CATALAN VERSION -

TASK 1: CLITICS

A. Tokens intended to elicit clitics.

Prompt: Què fa el noi amb el cotxe?   Target: (El noi) el condueix.
      What is the teenager doing with the car?   *The boy drives it.*

1. Què fa el noi amb el cotxe?
    What is the teenager doing with the car?

2. Què fa la nena amb el mocador?
   What is the girl doing with the handkerchief?

3. Què fa la dona amb el llit?
   What is the woman doing with the bed?

4. Què fa l'home amb el raspall de dents?
   What is the man doing with the toothbrush?

5. Què fa la dona amb el pastís?
   What is the woman doing with the cake?

6. Què fa la noia amb la pinta?
   What is the girl doing with the brush?

7. Què fa la noia amb la seva germana?
   What is the girl doing with her sister?

8. Què fa la nena amb el mirall?
   What is the girl doing with the mirror?

9. Què fa el noi amb la revista?
   What is the teenager doing with the magazine?

10. Què fa la nena amb la mà?
    What is the girl doing with her hand?

11. Què fa el noi amb el pa?
    What is the teenager doing with the bread?

12. Què fa la noia amb el maquillatge?
    What is the girl doing with the make-up?

13. Què fa la dona amb la roba?
    What is the woman doing with the laundry?

14. Què fa la nena amb el gronxador?
    What is the girl doing with the swing?

15. Què fa el noi amb l'arbre?
    What is the teenager doing with the tree?

16. Què fa el noi amb les sabates?
    What is the teenager doing with his shoes?

17. Què fa la noia?
What is the girl doing?

18. Què fa la nena amb la manta?
What is the girl doing with the blanket?

19. Què fa l'home amb la camisa?
What is the man doing with the shirt?

20. Què fa el noi amb la maquineta?
    What is the teenager doing with the razor?

21. Què fa la noia amb la seva germana?
    What is the girl doing with her sister?

22. Què fa la nena amb la samarreta?
    What is the girl doing with her T-shirt?

23. Què fa la noia amb la seva germana?
    What is the girl doing with her sister?

24. Què li fa la nena al seu germà?
    What is the girl doing to her brother?

25. Què fa el noi amb els pantalons?
    What is the teenager doing with his trousers?

B. Tokens intended to demonstrate comprehension of clitics.

Prompt: Les germanes s'abracen.   *The sisters are hugging each other*[63].
          La germana gran l'abraça.   *The older sister is hugging her.*

Target: Subject points to the appropriate picture.

1. La germana gran es pentina.
    The older sister is combing her own hair.

2. La germana gran la renta.
    The older sister is washing her [sister's] hands.

---

[63] Some of the reflexive and reciprocal verbs in Ibero-Romance show different characteristics in English.

3. La germana gran es maquilla.
    The older sister is putting on make-up.

4. La germana gran la cura.
    The older sister is treating her [sister's] cut.

5. La germana gran es mulla.
    The older sister is getting herself wet.

6. La germana gran la mira.
   The older sister is looking at her.

7. La germana gran es talla.
   The older sister has cut herself.

8. La germana gran l'allita/ posa al llit.
   The older sister is putting her to bed.

9. La germana gran es moca.
   The older sister is blowing her nose.

10. La germana gran la tapa.
    The older sister is covering her.

11. La germana gran es llença.
    The older sister is diving in.

12. La germana gran la puja.
    The older sister is helping her up.

13. La germana gran es vesteix.
    The older sister is getting dressed.

14. La germana gran la penja.
    The older sister is helping her hang.

15. La germana gran s'asseca.
    The older sister is drying herself.

16. La germana gran la calça.
    The older sister is putting the shoes on her.

17. La germana gran es taca/s'embruta.
    The older sister is getting herself dirty.

18. La germana gran l'asseu.
    The older sister is sitting her down.

19. La germana gran es neteja.
    The older sister is cleaning herself.

20. La germana gran la gronxa.
    The older sister is swinging her.

21. La germana gran es llença.
    The older sister is sliding down.

22. La germana gran la desperta.
    The older sister is waking her up.

23. La germana gran es munta[64].
    The older sister is riding the bike.

---

[64] Contrary to what is observed in Galician and Spanish, token number 23 is not reflexive in Central Catalan, the variety spoken by our informants. Despite this flaw in the experimental design, this construction was correctly identified by all the mild agrammatic subjects, presumably reflecting their exposure to Spanish.

24. La germana gran la balanceja.
    The older sister is pushing her up and down.

25. La germana gran s'aixeca.
    The older sister is getting up.

TASK 2: COMPREHENSION

A. Tokens intended to demonstrate comprehension of tense.

Prompt: La noia s'abrigarà.　　　*The girl is going to put on her coat.*

Target: Subject points to the appropriate picture.

1. L'home va menjar molt.
   The man ate a lot.

2. La noia es pentinarà.
   The girl is going to brush her hair.

3. La nena va beure coca-cola.
   The girl drank some Coca-Cola.

4. El noi puja al mur.
    The teenager is climbing the wall.

5. El noi es calça.
    The teenager is putting on his shoes.

6. La dona s'assecarà el cabell.
    The woman is going to dry her hair.

7. El noi va tallar el pa.
   The teenager cut the bread.

8. L'home es fumarà una cigarreta.
   The man is going to smoke a cigarette.

9. La nena dibuixa.
   The girl is drawing.

10. La nena s'aixeca.
    The girl is getting up.

11. El noi va obrir el pot.
    The teenager opened the jar.

12. La nena es renta la cara.
    The girl is washing her face.

13. L'home planxarà la camisa.
    The man is going to iron the shirt.

14. El noi es va asseure a la cadira.
    The boy sat down on the chair.

15. La noia graparà els folis.
    The girl is going to staple the sheets of paper.

16. La dona es pintarà les ungles.
    The woman is going to put on nail polish.

17. La dona va enganxar les fotos.
    The woman glued the pictures.

18. La noia es va maquillar.
    The girl put on make up.

19. El noi escriu una carta.
    The teenager is writing a letter.

20. El noi es lligarà els cordons.
    The teenager is going to tie his shoes.

21. L'home pela una poma.
    The man is peeling an apple.

22. L'home se'n va anar.
   The man left.

23. La dona penja la roba.
   The woman is hanging up the clothes.

24. L'home es traurà la jaqueta.
   The man is going to take off his jacket.

25. La nena va punxar el globus.
    The girl popped the balloon.

B. Tokens intended to demonstrate comprehension of wh-questions and wh-words.

Prompt: Qui cura la pacient?   *Who is treating the patient?*

Target 1: <u>El metge</u>.   <u>*The doctor*</u>.

Target 2: Subject points to the appropriate picture.

Prompt: Què va dibuixar la nena?   *What is the girl drawing?*

Target 1: <u>Un sol</u>.   <u>*A sun*</u>.

Target 2: Subject points to the appropriate picture.

1. Qui pentina la noia?
   Who is brushing the girl's hair?

2. Què va menjar en Joan?
   What did John eat?

3. A qui alimenta la noia?
   Who is the woman feeding?

4. Com va tallar el pa en Joan?
    How did John cut the bread?

5. Qui saluda als nens?
    Who is greeting the boys?

6. On neda la noia?
    Where does the girl swim?

7. A qui li regala flors el nen?
   Who is the boy giving flowers to?

8. Què va llegir el noi?
   What did the boy read?

9. Qui serveix als clients?
   Who is serving the customers?

10. Com va cuinar el peix en Joan?
    How did John cook the fish?

11. A qui ensenya la professora?
    Who is the teacher teaching?

12. On es conserva fresc el menjar?
    Where is the food kept cool?

13. Qui pinta la model?
    Who is painting the model?

14. Quan és el dia de Nadal?
    When is Christmas day?

15. A qui acaricia la dona?
    Who is the woman caressing?

16. Què mengen els gossos?
    What do dogs eat?

17. Qui pega al noi?
    Who is hitting the teenager?

18. Com es planxa la roba?
    How are clothes ironed?

19. A qui ajuda el policia?
    Who is the policeman helping?

20. On es compra el peix?
    Where is fish bought?

21. Qui fa massatges a la noia?
    Who is massaging the woman?

22. Quan neixen les flors?
    When do flowers grow?

23. A qui canvia els bolquers la dona?
    Whose diapers is the woman changing?

24. Què pinten els pintors?
    What do painters paint?

25. Qui vesteix a la nena?
    Who is dressing the girl?

- GALICIAN VERSION -

TASK 1: CLITICS

A. Tokens intended to elicit clitics (in combination with the same pictures used for the Catalan version of this task)**.**

Prompt: Qué fai o mozo co coche?   Target: <u>O rapaz condúceo</u>.
  What is the teenager doing with the car?   <u>*The boy drives it*</u>.
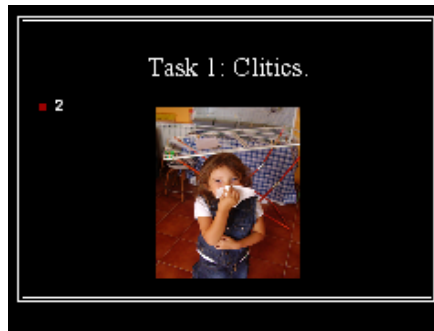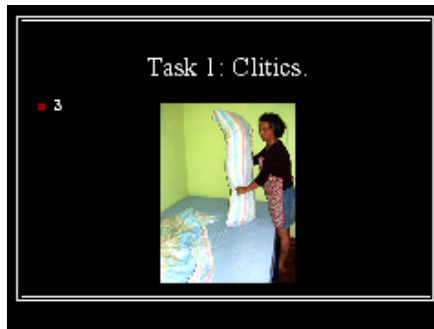
1. Qué fai o mozo co coche?
   What is the teenager doing with the car?
2. Qué fai a nena co pano de man?
   What is the girl doing with the handkerchief?
3. Qué fai a muller coa cama?
   What is the woman doing with the bed?
4. Qué fai o home co cepillo de dentes?
   What is the man doing with the toothbrush?
5. Qué fai a muller coa empanada?
   What is the woman doing with the cake?
6. Qué fai a moza co peite?
   What is the girl doing with the brush?
7. Qué fai a moza coa súa irmá?
   What is the girl doing with her sister?
8. Qué fai a nena co espello?
   What is the girl doing with the mirror?
9. Qué fai o mozo coa revista?
   What is the teenager doing with the magazine?
10. Qué fai a nena coa man?
    What is the girl doing with her hand?
11. Qué fai o mozo co pan?
    What is the teenager doing with the bread?
12. Qué fai a moza coa maquillaxe?
    What is the girl doing with the make-up?
13. Qué fai a muller coa roupa?
    What is the woman doing with the clothes?
14. Qué fai a nena co bambán?
    What is the girl doing with the swing?
15. Qué fai o mozo coa árbore?
    What is the teenager doing with the tree?
16. Qué fai o mozo cos zapatos?
    What is the teenager doing with his shoes?
17. Qué fai a rapaza?
    What is the girl doing?
18. Qué fai a nena coa manta?
    What is the girl doing with the blanket?
19. Qué fai o home coa camisa?
    What is the man doing with the shirt?

20. Qué fai o mozo coa maquinilla?
    What is the teenager doing with the razor?
21. Qué fai a moza coa súa irmá?
    What is the girl doing with her sister?
22. Qué fai a nena coa camiseta?
    What is the girl doing with her T-shirt?
23. Qué fai a moza coa súa irmá?
    What is the girl doing with her sister?
24. Qué lle fai a nena ó seu irmán?
    What is the girl doing to her brother?
25. Qué fai o mozo co pantalón?
    What is the teenager doing with his trousers?

B. Tokens intended to demonstrate comprehension of clitics (in combination with the same picture pairs used for the Catalan version of this task)**.**

Prompt: As irmás abrázanse.   *The sisters are hugging each other.*
       A irmá maior abrázaa.   *The older sister is hugging her.*

Target: Subject points to the appropriate picture.

1. A irmá maior peitéase.
   The older sister is combing her own hair.
2. A irmá maior lávaa.
   The older sister is washing her.
3. A irmá maior maquíllase.
   The older sister is putting on make-up.
4. A irmá maior cúraa.
   The older sister is treating her [sister's] cut.
5. A irmá maior móllase.
   The older sister is getting herself wet.
6. A irmá maior míraa.
   The older sister is looking at her.
7. A irmá maior córtase.
   The older sister has cut herself.
8. A irmá maior déitaa.
   The older sister is putting her to bed.
9. A irmá maior sóase.
   The older sister is blowing her nose.
10. A irmá maior tápaa.
    The older sister is covering her.
11. A irmá maior tírase.
    The older sister is diving in.
12. A irmá maior súbea.
    The older sister is helping her up.
13. A irmá maior vístese.
    The older sister is getting dressed..

14. A irmá maior cólgaa.
    The older sister is helping her hang.
15. A irmá maior sécase.
    The older sister is drying herself.
16. A irmá maior cálzaa.
    The older sister is putting the shoes on her.
17. A irmá maior mánchase.
    The older sister is getting herself dirty.
18. A irmá maior séntaa.
    The older sister is sitting her down.
19. A irmá maior límpase.
    The older sister is cleaning herself.
20. A irmá maior bambéaa.
    The older sister is swinging her.
21. A irmá maior tírase.
    The older sister is sliding down.
22. A irmá maior espértaa.
    The older sister is waking her up.
23. A irmá maior móntase.
    The older sister is riding the bike.
24. A irmá maior abanéaa.
    The older sister is pushing her up and down.
25. A irmá maior érguese.
    The older sister is getting up.

TASK 2: COMPREHENSION

A. Tokens intended to demonstrate comprehension of tense (in combination with pictures used for the Catalan version of this task)**.**

Prompt: A moza abrigarase.   *The girl is going to put on her coat.*

Target: Subject points to the appropriate picture.

1. O home comeu moito.
   The man ate a lot.
2. A moza peitearase.
   The girl is going to brush her hair.
3. A nena bebeu coca-cola.
   The girl drank some Coca-Cola.
4. O mozo sube ó valado.
   The teenager is climbing the wall.
5. O mozo cálzase.
   The teenager is putting on his shoes.
6. A muller secará os cabelos.
   The woman is going to dry her hair.
7. O mozo cortou o pan.
   The teenager cut the bread.

8. O home fumarase un cigarro.
   The man is going to smoke a cigarette.
9. A nena debuxa.
   The girl is drawing.
10. A nena érguese.
    The girl is getting up.
11. O mozo abriu o bote.
    The teenager opened the jar.
12. A nena lava a cara.
    The girl is washing her face.
13. O home pasará o ferro á camisa.
    The man is going to iron the shirt.
14. O mozo sentouse na cadeira.
    The teenager sat down on the chair.
15. A moza grampará os folios.
    The girl is going to staple the sheets of paper.
16. A muller pintarase as uñas.
    The woman is going to put on nail polish.
17. A muller pegou as fotos.
    The woman glued the pictures.
18. A moza maquillouse.
    The girl put on make-up.
19. O mozo escribe unha carta.
    The teenager is writing a letter.
20. O rapaz atarase os cordóns.
    The teenager is going to tie his shoes.
21. O mozo pela unha mazá.
    The man is peeling an apple.
22. O home foise.
    The man left.
23. A muller colga a roupa.
    The woman is hunging up the clothes.
24. O home sacarase a chaqueta.
    The man is going to take off his jacket.
25. A nena pinchou o globo.
    The girl popped the balloon.

B. Tokens intended to demonstrate comprehension of wh-questions and wh-words (in combination with the same pictures used for the Catalan version of this task)**.**

Prompt: Quén cura á paciente?   *Who is treating the patient?*

Target 1: <u>O doutor</u>.   <u>*The doctor*</u>.

Target 2: Subject points to the appropriate picture.

Prompt: Qué debuxou a nena?   *What is the girl drawing?*

Target 1: <u>Un sol</u>.   <u>*A sun*</u>.

Target 2: Subject points to the appropriate picture.

1. Quén peitea á moza?
   Who is brushing the girl's hair?
2. Qué comeu o home?
   What did the man eat?
3. A quén alimenta a moza?
   Who is the woman feeding?
4. Cómo cortou o home o pan?
   How did the man cut the bread?
5. Quén saúda ós nenos?
   Who is greeting the boys?
6. Onde nada a moza?
   Where does the girl swim?
7. A quén lle regala flores o neno?
   Who is the boy giving flowers to?
8. Qué leu o mozo?
   What did the boy read?
9. Quén sirve ós clientes?
   Who is serving the customers?
10. Cómo cociñou o home o peixe?
    How did the man cook the fish?
11. A quén ensina a mestra?
    Who is the teacher teaching?
12. Onde se conserva fresca a comida?
    Where is the food kept cool?
13. Quén pinta á modelo?
    Who is painting the model?
14. Cando é o día de Nadal?
    When is Christmas day?
15. A quén acaricia/aloumiña a muller?
    Who is the woman caressing?
16. Qué comen os cans?
    What do dogs eat?
17. Quén pega ó mozo?
    Who is hitting the teenager?
18. Cómo se pasa o ferro á roupa?
    How are clothes ironed?
19. A quén axuda o policía?
    Who is the policeman helping?
20. Ónde se merca o peixe?
    Where is fish bought?
21. Quén da masaxes á moza?
    Who is massaging the woman?

22. Cando naces as flores?
    When do flowers grow?
23. A quén cambia os cueiros a muller?
    Whose diapers is the woman changing?
24. Qué pintan os pintores?
    What do painters paint?
25. Quén viste á nena?
    Who is dressing the girl?

- SPANISH VERSION -

TASK 1: CLITICS

A. Tokens intended to elicit clitics (in combination with the same pictures used for the Catalan version of this task)**.**

Prompt: ¿Qué hace el chico con el coche?   *What is the teenager doing with the car?*

Target: [El chico] lo conduce.   *[The teenager is] driving it*.

1. ¿Qué hace el chico con el coche?
   What is the teenager doing with the car?
2. ¿Qué hace la niña con el pañuelo?
   What is the girl doing with the handkerchief?
3. ¿Qué hace la mujer con la cama?
   What is the woman doing with the bed?
4. ¿Qué hace el hombre con el cepillo de dientes?
   What is the man doing with the toothbrush?
5. ¿Qué hace la mujer con el pastel?
   What is the woman doing with the cake?
6. ¿Qué hace la chica con el peine?
   What is the girl doing with the brush?
7. ¿Qué hace la chica con su hermana?
   What is the girl doing with her sister?
8. ¿Qué hace la niña con el espejo?
   What is the girl doing with the mirror?
9. ¿Qué hace el chico con la revista?
   What is the teenager doing with the magazine?
10. ¿Qué hace la niña con la mano?
    What is the girl doing with her hand?
11. ¿Qué hace el chico con el pan?
    What is the teenager doing with the bread?
12. ¿Qué hace la chica con el maquillaje?
    What is the girl doing with the make-up?
13. ¿Qué hace la mujer con la ropa?
    What is the woman doing with the clothes?
14. ¿Qué hace la niña con el columpio?
    What is the girl doing with the swing?
15. ¿Qué hace el chico con el árbol?
    What is the teenager doing with the tree?
16. ¿Qué hace el chico con los zapatos?
    What is the teenager doing with his shoes?
17. ¿Qué hace la chica?
    What is the girl doing?
18. ¿Qué hace la niña con la manta?
    What is the girl doing with the blanket?
19. ¿Qué hace el hombre con la camisa?
    What is the man doing with the shirt?

20. ¿Qué hace el chico con la maquinilla?
    What is the teenager doing with the razor?
21. ¿Qué hace la chica con su hermana?
    What is the girl doing with her sister?
22. ¿Qué hace la niña con la camiseta?
    What is the girl doing with her T-shirt?
23. ¿Qué hace la chica con su hermana?
    What is the girl doing with her sister?
24. ¿Qué le hace la niña a su hermano?
    What is the girl doing to her brother?
25. ¿Qué hace el chico con el pantalón?
    What is the teenager doing with his trousers?

B. Tokens intended to demonstrate comprehension of clitics (in combination with the same picture pairs used for the Catalan version of this test)**.**

Prompt: Las hermanas se abrazan.   *The sisters are hugging each other.*
        La hermana mayor la abraza.   *The older sister is hugging her.*

Target: Subject points to the appropriate picture.

1. La hermana mayor se peina.
   The older sister is combing her own hair.
2. La hermana mayor la lava.
   The older sister is washing her.
3. La hermana mayor se maquilla.
   The older sister is putting on make up.
4. La hermana mayor la cura.
   The older sister is treating her [sister's] cut.
5. La hermana mayor se moja.
   The older sister is getting herself wet.
6. La hermana mayor la mira.
   The older sister is looking at her.
7. La hermana mayor se corta.
   The older sister has cut herself.
8. La hermana mayor la acuesta.
   The older sister is putting her to bed.
9. La hermana mayor se suena.
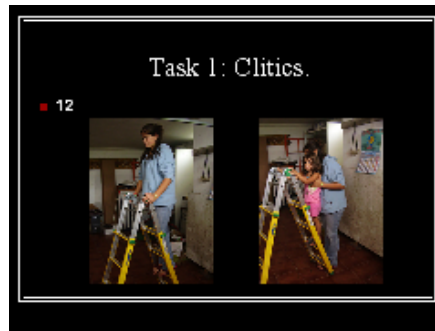   *The older sister is blowing her nose.*
10. La hermana mayor la tapa.
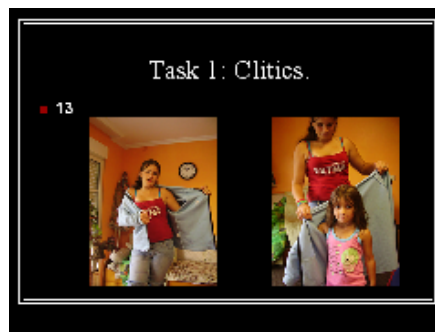   *The older sister is covering her.*
11. La hermana mayor se tira.
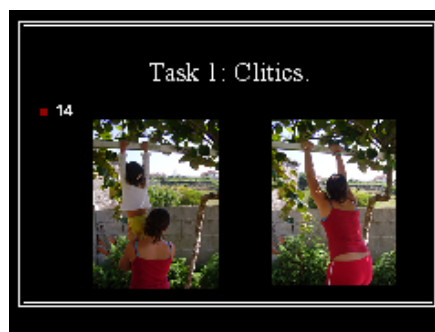   *The older sister is diving in.*
12. La hermana mayor la sube.
    The older sister is helping her up.
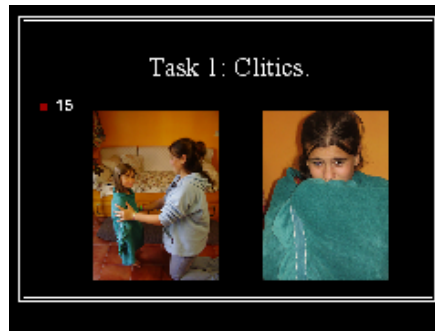13. La hermana mayor se viste.
    The older sister is getting dressed.

14. La hermana mayor la cuelga.
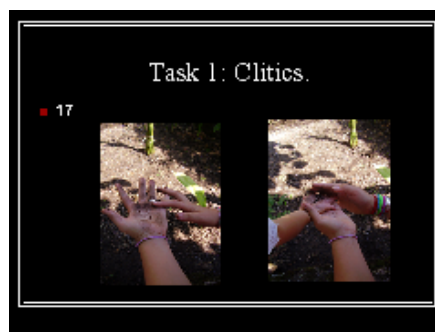   *The older sister is helping her hang.*
15. La hermana mayor se seca.
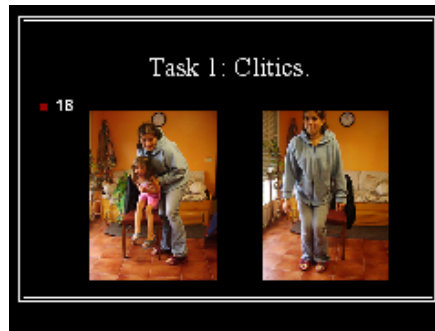   *The older sister is drying herself.*
16. La hermana mayor la calza.
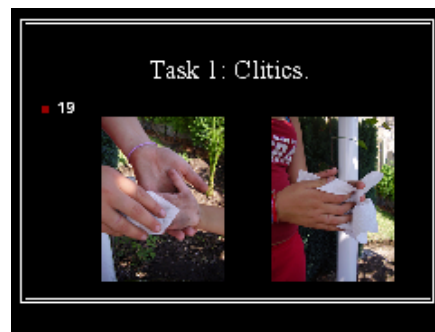   *The older sister is putting the shoes on her.*
17. La hermana mayor se mancha/ensucia.
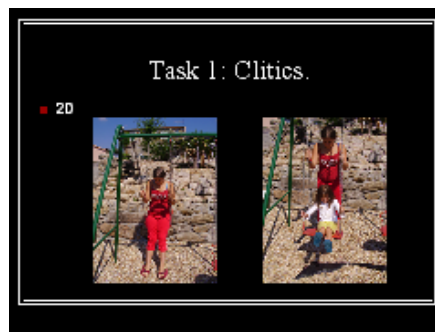   *The older sister is getting herself dirty.*
18. La hermana mayor la sienta.
    The older sister is sitting her down.
19. La hermana mayor se limpia.
    The older sister is cleaning herself.
20. La hermana mayor la columpia.
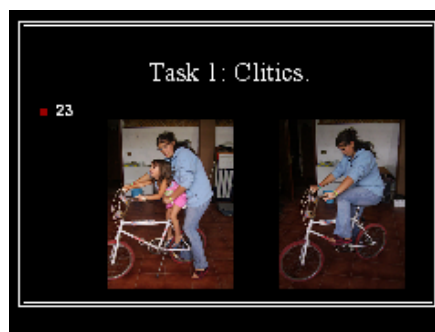   *The older sister is swinging her.*
21. La hermana mayor se tira.
    The older sister is sliding down.
22. La hermana mayor la despierta.
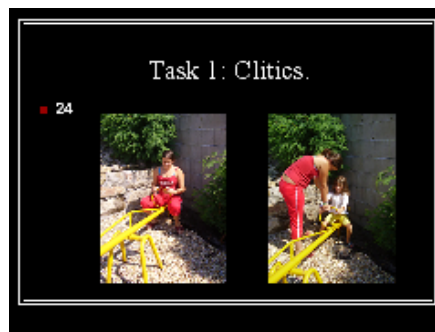   *The older sister is waking her up.*
23. La hermana mayor se monta.
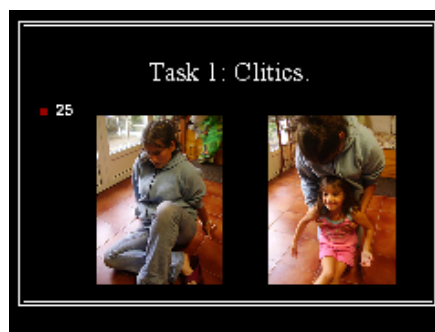   *The older sister is riding the bike.*
24. La hermana mayor la balancea.
    The older sister is pushing her up and down.
25. La hermana mayor se levanta.
    The older sister is getting up.

TASK 2: COMPREHENSION

A. Tokens intended to demonstrate comprehension of tense (in combination with pictures used for the Catalan version of this task)**.**

Prompt: La chica se abrigará.   *The girl is going to put on her coat.*

Target: Subject points to the appropriate picture.

1. El hombre comió mucho.
   The man ate a lot.
2. La chica se peinará.
   The girl is going to brush her hair.
3. La niña bebió coca-cola.
   The girl drank some Coca-Cola.
4. El chico sube al muro.
   The teenager is climbing the wall.
5. El chico se calza.
   The teenager is putting on his shoes.
6. La mujer se secará el pelo.
   The woman is going to dry her hair.
7. El chico cortó el pan.
   The teenager cut the bread.

8. El hombre se fumará un cigarro.
   The man is going to smoke a cigarette.
9. La niña dibuja.
   The girl is drawing.
10. La niña se levanta.
    The girl is getting up.
11. El chico abrió el bote.
    The teenager opened the jar.
12. La niña se lava la cara.
    The girl is washing her face.
13. El hombre planchará la camisa.
    The man is going to iron the shirt.
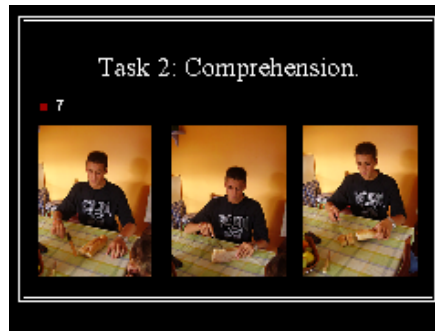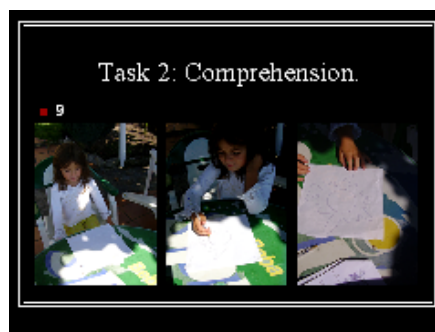14. El chico se sentó en la silla.
    The teenager sat down on the chair.
15. La chica grapará los folios.
    The girl is going to staple the sheets of paper.
16. La mujer se pintará las uñas.
    The woman is going to put on nail polish.
17. La mujer pegó las fotos.
    The woman glued the pictures.
18. La chica se maquilló.
    The girl put on make up.
19. El chico escribe una carta.
    The teenager is writing a letter.
20. El niño se atará los cordones.
    The teenager is going to tie his shoes.
21. El hombre pela una manzana.
    The man is peeling an apple.
22. El hombre se fue.
    The man left.
23. La mujer cuelga la ropa.
    The woman is hanging up the clothes.
24. El hombre se sacará la chaqueta.
    The man is going to take off his jacket.
25. La niña pinchó el globo.
    The girl popped the balloon.

B. Tokens intended to demonstrate comprehension of wh-questions and wh-words (in combination with the same pictures used for the Catalan version of this task)**.**

Prompt: ¿Quién cura a la paciente?   *Who is treating the patient?*

Target 1: El médico.   *The doctor.*

Target 2: Subject points to the appropriate picture.

Prompt: ¿Qué dibujó la niña?   *What is the girl drawing?*

Target 1: <u>Un sol</u>.   <u>*A sun*</u>.

Target 2: Subject points to the appropriate picture.

1. ¿Quién peina a la chica?
   Who is brushing the girl's hair?
2. ¿Qué comió Juan?
   What did John eat?
3. ¿A quién alimenta la chica?
   Who is the woman feeding?
4. ¿Cómo cortó Juan el pan?
   How did John cut the bread?
5. ¿Quién saluda a los niños?
   Who is greeting the boys?
6. ¿Dónde nada la chica?
   Where does the girl swim?
7. ¿A quién le regala flores el niño?
   Who is the boy giving flowers to?
8. ¿Qué leyó el chico?
   What did the boy read?
9. ¿Quién sirve a los clientes?
   Who is serving the customers?
10. ¿Cómo cocinó Juan el pescado?
    How did John cook the fish?
11. ¿A quién enseña la profesora?
    Who is the teacher teaching?
12. ¿Dónde se conserva fresca la comida?
    Where is the food kept cool?
13. ¿Quién pinta a la modelo?
    Who is painting the model?
14. ¿Cuándo es es día de Navidad?
    When is Christmas day?
15. ¿A quíén acaricia la mujer?
    Who is the woman caressing?
16. ¿Qué comen los perros?
    What do dogs eat?
17. ¿Quién pega al chico?
    Who is hitting the teenager?
18. ¿Cómo se plancha la ropa?
    How are clothes ironed?
19. ¿A quién ayuda el policía?
    Who is the policeman helping?
20. ¿Dónde se compra el pescado?
    Where is fish bought?
21. ¿Quién da masajes a la chica?
    Who is massaging the woman?

22. ¿Cuándo nacen las flores?
    When do flowers grow?
23. ¿A quién cambia los pañales la mujer?
    Whose diapers is the woman changing?
24. ¿Qué pintan los pintores?
    What do painters paint?
25. ¿Quién viste a la niña?
    Who is dressing the girl?

APPENDIX II

Corpus of data

Experimental Subjects

Test I – MILD AGRAMMATICS

CATALAN

Task 1.a

- Errors with Negation

    2.   Ells   sortien   tard. --- C5
    they leave-imp.3rd.pl late
    They were leaving late.

TARGET: Ells   no   sortien   d'hora.
    they not leave-imp.3rd.pl of'hour
    They were not leaving early.

- Tense Substitutions

    2.   *Nosaltres no juguen   d'hora. --- C3
    we   not   play-pres.3rd.pl of'hour
    *We do not play early.

    Ells   no   surten… --- C4
    they not leave-pres.3rd.pl
    They do not leave...

TARGET: Ells   no   sortien   d'hora.
    they not leave-imp.3rd.pl of'hour
    They were not leaving early.

    4.   Els   nens   no   jugaran   demà. --- C2
    the children not play-fut.3rd.pl tomorrow
    The children will not play tomorrow.

    Els   nens   no   actuaran   demà. --- C3
    the children not perform-fut.3rd.pl tomorrow
    The children will not perform tomorrow.

    Els   nens   no   actuen   dimarts. --- C5
    the children not perform-pres.3rd.pl tuesday
    The children do not perform on Tuesday.

TARGET: Els   nens   no   actuaven   dimarts.
    the children not perform-imp.3rd.pl tuesday
    The children were not performing on Tuesday.

7.   Almodóvar no   *girarà   la pel·lícula. --- C2
          A.   not turn-fut.3ʳᵈ.sg the film
          Almodóvar will not turn the film.

          L'Almodóvar no la dirigeix. --- C5
          the'A.   not it direct-pres.3ʳᵈ.sg
          Almodóvar does not direct it.

TARGET: L'Almodóvar no dirigia   aquesta pel·lícula.
          the'A.   not direct-imp.3ʳᵈ.sg this film
          Almodóvar was not directing this film.

8.   *El Marc no vendre   el cotxe. --- C4
          the M. not sell-INF the car
          *Marc not sell the car.

TARGET: En Marc no   vendrà   el seu cotxe.
          the M. not sell-fut.3ʳᵈ.sg the his car
          Marc will not sell his car.

9.   Jordi no   anirà   a la   piscina. --- C2
          J. not go-fut.3ʳᵈ.sg to the swimming-pool
          George will not go to the swimming-pool.

TARGET: En Jordi no   anava   a la piscina.
          the J. not go-imp.3ʳᵈ.sg to the swimming-pool
          George was not going to the swimming-pool.

10.   *Sandra no comprar las flors. --- C2
          S. not buy-INF the flowers
          *Sandra not buy the flowers.

TARGET: La Sandra no comprava flors.
          the S. not buy-imp.3ʳᵈ.sg flowers
          Sandra was not buying flowers.

11.   Avui no hem buscat llibres. --- C2
          today not have-pres.1ˢᵗ.pl searched books
          Today we have not looked for books.

          Avui no vendrem llibres. --- C4
          today not sell-fut.1ˢᵗ.pl books
          Today we will not sell books.

TARGET: Avui no demanem   uns llibres.
          today not ask-pres.1ˢᵗ.pl some books
          Today we are not asking for books.

12.   L'Andrea no me... saluda. --- C2
          the'Andrea not me... greet-pres.3ʳᵈ.sg
          Andrea does not greet me.

          *L'Andrea no ens… --- C4
          the'A.   not us
          *Andrea not us...

TARGET: L'Andrea no ens saludarà.
          the'Andrea not us greet-fut.3ʳᵈ.sg
          Andrea will not greet us.

20.   Els socis no han estat a un atur. --- C2
the members not have-pres.3rd.pl been to a strike
The members have not been to a strike.

TARGET: Els socis no arriben a un acord.
the members not reach-pres.3rd.pl to an agreement
The members are not reaching an agreement.

22.   La Sara no explica cap historia. --- C5
the S. not explain-pres.3rd.sg none story
Sara is not telling any story.

TARGET: La Sara no m'explicarà la història.
the S. not me'explain-fut.3rd.sg the story
Sara will not tell me the story.

24.   En Joan no planta arbres. --- C4
the J. not plant-pres.3rd.sg trees
John does not plant trees.

     No planta arbres. --- C3
not plant-pres.3rd.sg trees
He does not plant trees.

TARGET: En Joan no plantava arbres.
the J. not plant-imp.3rd.sg trees
John was not planting trees.

- Agreement Substitutions

1.   Demà no veuré en Joan. --- C3
tomorrow not see-fut.1st.sg the J.
Tomorrow I will not see John.

TARGET: Demà no veurem en Joan.
tomorrow not see-fut.1st.pl the J.
Tomorrow we will not see John.

2.   *Nosaltres no juguen d'hora. --- C3
we not play-pres.3rd.pl of'hour
*We do not play early.

TARGET: Ells no sortien d'hora.
they not leave-imp.3rd.pl of'hour
They were not leaving early.

6.   *Els nois no pescarem peixos. --- C4
the boys not fish-fut.1st.pl fishes
*The boys will not catch fishes.

TARGET: Els nois no pescaran carpes.
the boys not fish-fut.3rd.pl carps
The boys will not catch carp.

8.   *El Marc no vendre el cotxe. --- C4
the M. not sell-INF the car
*Marc not sell the car.

TARGET: En Marc no vendrà el seu cotxe.
the M. not sell-fut.3rd.sg the his car
Marc will not sell his car.

10.   *Sandra no comprar las flors.   ---   C2
            S.   not buy-INF the flowers
            *Sandra not buy the flowers.

TARGET: La Sandra no comprava flors.
            the   S.   not buy-imp.3rd.sg flowers
            Sandra was not buying flowers.

12.   *L'Andrea no ens…   ---   C4
            the'A.   not us
            *Andrea not us...

TARGET: L'Andrea no ens saludarà.
            the'A.   not us greet-fut.3rd.sg
            Andrea will not greet us.

14.   Avui   no   naixerem.   ---   C4
            today not hatch-fut.1st.pl
            *Today we will not hatch.

TARGET: Avui   no   naixeran   pollets.
            today not hatch-fut.3rd.pl chicks
            Today chicks will not hatch.

- 'Don't know' responses

19.   'Don't know' response   ---   C2

TARGET: En Santi no   evitava   els problemes.
            the S.   not avoid-imp.3rd.sg the problems
            James was not avoiding the problems.

Task 1.b

- Omissions/Errors with Negation

14.   Nosaltres podíem   no cosir la camisa.   ---   C1
            we   can-imp.1st.pl not sew-INF the shirt
            *We could not sew the shirt.

TARGET: Nosaltres no podíem   cosir la camisa.
            we   not can-imp.1st.pl sew-INF the shirt
            We could not sew the shirt.

- Tense substitutions: auxiliary verbs

2.   Nosaltres no hem agafat una pizza.   ---   C2
            we not have-pres.1st.pl taken a pizza
            We have not taken a pizza.

TARGET: Nosaltres no havíem demanat una pizza.
            we not have-imp.1st.pl asked-for a pizza
            We had not asked for a pizza.

10. Jo no he estudiat molt. --- C2
    I not have-pres.1st.sg studied much
    I have not studied a lot.

TARGET: Jo no havia estudiat molt.
    I not have-imp.1st.sg studied much
    I had not studied a lot.

17. Joan no ha agafat menjar. --- C2
    J. not have-pres.3rd.sg picked up food
    John has not picked up food.

    No ha portat menjar. --- C5
    not have-pres.3rd.sg brought food
    He has not brought food.

TARGET: En Joan no havia portat menjar.
    the J. not have-imp.3rd.sg brought food
    John had not brought food.

20. Les modistes no han fundat una fàbrica. --- C2
    the dressmakers not have-pres.3rd.pl set up a factory
    The dressmakers have not set up a factory.

TARGET: Les modistes no havien fundat una fàbrica.
    the dressmakers not have-imp.3rd.pl set up a factory
    The dressmakers had not set up a factory.

- Simplification of complex tenses

4. Tu no balles amb la Maria. --- C5
    you not dance-pres.2nd.sg with the M.
    You do not dance with Mary.

TARGET: Tu no has ballat amb la Maria.
    you not have-pres.2nd.sg danced with the M.
    You have not danced with Mary.

12. No freguem els plats. ... C5
    not wash-pres.1st.pl the dishes
    We do not wash the dishes.

TARGET: Vosaltres no heu fregat els plats.
    You not have-pres.2nd.pl washed the dishes
    You have not washed the dishes.

- Tense substitutions: verbal periphrases

14. Nosaltres no podríem cosir la camisa. --- C3
    we not can-cond.1st.pl sew-INF the shirt
    We would not be able to sew the shirt.

TARGET: Nosaltres no podíem cosir la camisa.
    we not can-imp.1st.pl sew-INF the shirt
    We could not sew the shirt.

- Simplification of complex verbal clusters

8.   *Vosaltres no heu...   un   quilòmetre. --- C2
        you   not have-pres.2nd.pl   one kilometer
        *You should not... one kilometer.

        Vosaltres no   teniu   que córrer un quilòmetre. --- C3
        you   not have to-pres.2nd.pl that run-INF one kilometer
        You do not have to run one kilometer.

TARGET: Vosaltres no heu   de córrer un quilòmetre.
        you not have-pres.2nd.pl of run-INF one kilometre
        You do not have to run one kilometre.

9.   Nosaltres no sabem   moltes coses. --- C2
        we not know-pres.1st.pl many things
        We do not know many things.

TARGET: Nosaltres no arribem   a saber moltes coses.
        we not reach-pres.1st.pl to know-INF many things
        We do not get to know many things.

16.   Tu no   vas   arribar. --- C2
        you not go-pres.2nd.sg arrive-INF
        You did not arrive.

        Tu no   vas   arribar. --- C4
        you not go-pres.2nd.sg arrive-INF
        You did not arrive.

TARGET: Tu no   vas   tardar a arribar.
        you not go-pres.2nd.sg delay to arrive-INF
        It did not take you long to arrive.

18.   Les nenes no van   *llorar. --- C2
        the girls not go-pres.3rd.pl cry-INF
        The girls did not cry.

        No   van   plorar. --- C3
        not go-pres.3rd.pl cry-INF
        They did not cry.

        No   van   plorar. --- C5
        not go-pres.3rd.pl cry-INF
        They did not cry.

TARGET: Les nenes no   van   començar a plorar.
        the girls not go-pres.3rd.pl start to cry-INF
        The girls did not start crying.

19.   Sandra no   anava   als exàmens. --- C4
        S.   not go-imp.3rd.sg to-the exams
        Sandra was not going to the exams.

TARGET: La Sandra no   anava   passant els exàmens.
        the S.   not go-imp.3rd.sg passing the exams
        Sandra was not passing her exams.

21.   No   va   ploure. --- C5
        not go-pres.3rd.sg rain-INF
        It did not rain.

TARGET: Al   matí   no   va   deixar   de ploure.
             at-the morning not go-pres.3rd.sg leave-INF of rain-INF
             In the morning it did not stop raining.

22.   Ells   no   van...   no   van...   no   van escriure en anglès. --- C2
        they not go-pres.3rd.pl   not go-pres.3rd.pl   not go-pres.3rd.pl write-INF in English
        They did not... they did not... they did not write in English.

        Ell no   va   estudiar anglès. --- C3
        he not go-pres.3rd.sg study-INF English
         He did not study English.

TARGET: Ell no   va   acabar   estudiant anglès.
           he not go-pres.3rd.sg finish-INF studying English
           He did not end up studying English.

24.   Tu   no   t'oblidaves   d'aquella festa. --- C2
        you not you'forget-imp.2nd.sg of'that party
        You were not forgetting that party.

        Tu no   recordaves   aquella festa. --- C3
        you not remember-imp.2nd.sg that party
        You were not remembering that party.

TARGET: Tu no   continuaves   recordant aquella festa.
           you not go-on-pres.2nd.sg remembering that party
           You did not continue to remember.

- Simplification of complex verbal clusters + tense substitutions

3.   Els mariners no irán a la mar.   ---   C2
        the sailors not go-fut.3rd.pl to the sea
        The sailors will not go to sea.

        Els mariners no   sortirien   al mar. --- C3
        the sailors not go-out-cond.3rd.pl to-the sea
        The sailors would not go to sea.

        Els mariners no   havien   anat al mar. --- C4
        the sailors not have-imp.3rd.pl go to-the sea
        The sailors had not gone to sea.

TARGET: Els mariners no havien   de   sortir   al mar.
           the sailors not have-imp.3rd.pl of go-out-INF to-the sea
           The sailors should not have gone to sea.

9.   No   arribarem   a cap cosa. --- C5
        not arrive-fut.1st.sg to none thing
        We will not arrive at anything.

TARGET: Nosaltres no arribem   a saber moltes coses.
           we not arrive-pres.1st.pl to know-INF many things
           We do not get to know many things.

14.   Nosaltres no hem   cosit   la camiseta. --- C2
        we   not have-pres.1st.pl sewed the shirt
        We have not sewed the shirt.

        No la cosim.   --- C5
        not it sew-pres.1st.pl
        We do not sew it.

TARGET: Nosaltres no podíem cosir la camisa.
we not can-imp.1ˢᵗ.pl sew-INF the shirt
We could not sew the shirt.

19.   La Sandra no   havia   passat els exàmens. --- C1
the S.   not have-imp.3ʳᵈ.sg passed the exams
Sandra had not passed her exams.

La Sandra no ha passat els exàmens. --- C2
the S.   not have-pres.3ʳᵈ.sg passed the exams
Sandra has not passed her exams.

TARGET: La Sandra no anava   passant els exàmens.
the S.   not go-imp.3ʳᵈ.sg passing the exams.
Sandra was not passing her exams.

21.   *Ahir   matí   no   plorarà. --- C2
yesterday morning not cry-fut.3ʳᵈ.sg
*Yesterday morning he/she will not cry.

TARGET: Al matí   no   va   deixar de ploure.
at-the morning not go-pres.3ʳᵈ.sg leave-INF of rain-INF
During the morning it did not stop raining.

22.   No   ha   estudiat. --- C5
not have-pres.3ʳᵈ.sg studied
She has not studied.

TARGET: Ell no   va   acabar   estudiant anglès.
he not go-pres.3ʳᵈ.sg finish-INF studying English
He did not end up studying English.

23.   *Nosaltres no hem   cantat cantar. --- C2
we   not have-pres.1ˢᵗ.sg sung sing-INF
We have not sung sing.

TARGET: Nosaltres no vam   deixar de cantar.
we   not go-pres.1ˢᵗ.pl leave-INF of sing-INF
We did not stop singing.

24.   Tu no la   recordes   aquesta festa. --- C5
you not it remember-pres.2ⁿᵈ.sg this party
You do not remember this party.

TARGET: Tu no   continuaves   recordant aquella festa.
you not go-on-pres.2ⁿᵈ.sg remembering that party
You did not continue to remember that party.

- Simplification of complex verbal clusters + tense/agreement substitutions

19.   No   van   fer-ho. --- C5
not go-pres.3ʳᵈ.pl do-INF-it
They did not do it.

TARGET: La Sandra no anava   passant els exàmens.
the S.   not go-imp.3ʳᵈ.sg passing the exams.
Sandra was not passing her exams.

- 'Don't know' responses

    15.   'Don't know' response --- C2

TARGET: En Manel no   ha   endevinat la sorpresa.
the M.   not have-pres.3rd.sg guessed the surprise
Manuel has not guessed the surprise.

    24.   'Don't know' response --- C4

TARGET: Tu no   continuaves   recordant aquella festa.
you not go-on-pres.2nd.sg remembering that party
You did not continue to remember that party.

Task 2.a

- WH- substituted with Y/N

    1.   Què   has   menjat un pastel? Era   un pastel? --- C2
that have-pres.2nd.sg eaten a cake   be-imp.3rd.sg a cake
Have you eaten a cake? Was it a cake?

    Sabies   el   que menjaves? --- C4
know-imp.2nd.sg it what eat-imp.2nd.sg
Did you know what you were eating?

TARGET: Què   vas   menjar ahir?
what go-pres.2nd.sg eat-inF yesterday
What did you eat yesterday?

    3.   Que busca una cosa? --- C3
that search-3rd.sg a thing
Are you looking for something?

    T'has   trobat   alguna cosa? --- C4
you'have-pres.2nd.sg found some thing
Have you found something?

TARGET: Què   busca   en Joan?
what search-pres.3rd.sg the J.
What is John looking for?

    7.   Saps   quina   és   la meva edat? --- C4
know-pres.2nd.sg which be-pres.3rd.sg the my age
Do you know how old I am?

TARGET: Quina edat   tens?
which age have-pres.2nd.sg.
How old are you?

    15.   Llegeixes   a casa teva? --- C5
read-pres.2nd.sg at house yours
Do you read at home?

TARGET: On   llegeixes?
where read-pres.2nd.sg
Where do you read?

19.   Ets   catalana? --- C3
         be-pres.2nd.sg Catalan
         Are you Catalan?

TARGET: D'on   ets   tu?
         from'where be-pres.2nd.sg you
         Where are you from?

21.   Les modistes   estan   enfadades? --- C1
         the dressmakers be-pres.3rd.pl angry
         Are the dressmakers angry?

         Sabes   si   les modistes   estan   enfadades? --- C2
         know-pres.2nd.sg if the dressmakers be-pres.3rd.sg angry
         Do you know if the dressmakers are angry?

TARGET: Per què   estan   enfadades les modistes?
         for what be-pres.3rd.pl angry the dressmakers
         Why are the dressmakers angry?

- Wrong WH-morpheme selection

1.   On   vas   menjar la cosa molt bona? --- C1
         where go-pres.2nd.sg eat-INF the thing very good
         Where did you eat the tasty thing?

TARGET: Què   vas   menjar ahir?
         what go-pres.2nd.sg eat-INF yesterday
         What did you eat yesterday?

4.   Quan   va   ser? --- C4
         when go-pres.3rd.sg be-INF
         When was it?

         Com aniràs? --- C5
         how go-fut.2nd.sg
         How will you go?

TARGET: Quin   dia hi   aniràs?
         which day CL go-fut.2nd.pl
         What day are you leaving?

7.   *Qui   és   la teva edat? --- C1
         who be-pres.3rd.sg the your age
         *Who is your age?

TARGET: Quina edat   tens?
         which age have-pres.2nd.sg
         How old are you?

15.   Què llibre estàs *lliurando? --- C2
         what book be-pres.2nd.sg lliuring
         What book are you *lliuring?

TARGET: On llegeixes?
         where read-pres.2nd.sg
         Where do you read?

22.   Quin preu té? --- C3
        which price have-pres.3rd.sg
        What price does it have?

TARGET: Quant va costar la casa de la Sandra?
        how-much go-pres.3rd.sg cost-INF the house of the S.
        How much did Sandra's house cost?

23.   Quin número va vendre en Carles del seu apartament? --- C1
        which number go-pres.3rd.sg sel-INFl the C. of-the his apartment
        What number of his apartment sold Charles?

        Quin número tenen? --- C3
        which number have-pres.3rd.pl
        What number do they have?

TARGET: Quants apartaments va vendre en Carles?
        how-many apartments go-pres.3rd.sg sell-INF the C.
        How many apartments did Charles sell?

25.   Què va fer el Carles amb la finestra? --- C1
        what go-pres.3rd.sg do-INF the C. with the window
        What did Charles do with the window?

TARGET: Com va espatllar la finestra l'Andreu?
        how go-pres.3rd.sg break-INF the window the A.
        How did Andrew break the window?

- Wrong answer

3.   Què és la cosa? --- C5
        what be-pres.3rd.sg the thing
        What is the thing?

TARGET: Què busca en Joan?
        what search-pres.3rd.sg the J.
        What is John looking for?

4.   A quin dia estem avui? --- C1
        to which day be-pres.1st.pl today
        What day is it today?

TARGET: Quin dia hi aniràs?
        which day CL go-fut.2nd.pl
        What day are you leaving?

19.   *De tu província ets? --- C2
        of you province be-pres.2nd.sg
        *Of you province are?

        On tens que anar? --- C5
        where have-pres.2nd.sg that go
        Where do you have to go?

TARGET: D'on ets tu?
        from'where be-pres.2nd.sg you
        Where are you from?

21.   Per què ho saps? --- C4
        for what it know-pres.2nd.sg
        Why do you know it?

TARGET: Per què   estan   enfadades les modistes?
          for what be-pres.3ʳᵈ.pl angry the dressmakers
          Why are the dressmakers angry?

- WH- + NP

  22.   Quin preu? --- C4
           which price
           What price?

TARGET: Quant   va   costar la casa de la Sandra?
          how-much aux-pres.3ʳᵈ.sg cost-INF the house of the S.
          How much did Sandra's house cost?

  23.   Quants   números? --- C4
           how-many numbers
           How many numbers?

TARGET: Quants   apartaments   va   vendre en Carles?
          how-many apartments go-pres.3ʳᵈ.sg sell-INF the C.
          How many apartments did Charles sell?

- WH- in situ

  1.   Jo   vull   saber   què. --- C3
           I want-pres.1ˢᵗ.sg know what
           I want to know what.

TARGET: Què   vas   menjar ahir?
          what go-pres.2ⁿᵈ.sg eat-INF yesterday
          What did you eat yesterday?

- Y/N substituted with WHY

  6.   Per què   tenen   fred els pescadors? --- C5
           for what have-pres.3ʳᵈ.pl cold the fishermen
           Why are the fishermen cold?

TARGET: Tenen   fred   els pescadors?
          have.pres.3ʳᵈ.pl cold the fishermen
          Are the fishermen cold?

  8.   Per què   han   d'estar cansats? --- C5
           for what have to-3ʳᵈ.pl of'be tired
           Why should they be tired?

TARGET: Estan   cansats els nens?
          be-pres.3ʳᵈ.pl tired the children
          Are the children tired?

  16.   Per què   menteix l'Andreu? --- C3
           for what lie-pres.3ʳᵈ.sg the'A.
           Why does Andrew lie?

           Per què   menteix l'Andreu? --- C5
           for what lie-pres.3ʳᵈ.sg the'A.
           Why does Andrew lie?

TARGET: Menteix   molt   l'Andreu?
       lie-pres.3rd.sg much the'A.
       Does Andrew lie a lot?

20.   Per què   viuen   a Barcelona? --- C5
       for what live-pres.3rd.pl at Barcelona
       Why do they live in Barcelona?

TARGET: Vindran   a Barcelona els teus cosins?
       come-fut.3rd.pl to B. the your cousins
       Are your cousins coming to Barcelona?

- Y/N substituted with WH-

18.   En què mes *iremos   de vacances? --- C2
       in what month go-fut.1st.pl of vacation
       In which month will we go on vacation?

       On   anireu   de vacances? --- C5
       where go-pres.2nd.pl of vacation
       Where will you go during your vacation?

TARGET: Anirem de vacances?
       go-fut.1st.pl of vacation
       Are we going away on vacation?

- Y/N substituted with HOW IS IT?

5.   Com   és   que   t'agrada   el color vermell? --- C5
       how be-pres.3rd.sg that you'like-pres.3rd.sg the color red
       How is it that you like the color red?

TARGET: T'agrada   el   color vermell?
       you'like-pres.3rd.sg the color red
       Do you like the color red?

10.   Com   és   que   t'agrada   viatjar? --- C5
       how be-pres.3rd.sg that you'like-pres.3rd.sg travel
       How is it that you like travelling?

TARGET: T'agrada   viatjar?
       you'like-pres.3rd.sg travel
       Do you like travelling?

11.   Com   és   que   ets   una bona cuinera? --- C5
       how be-pres.3rd.sg that be-pres.2nd.sg a good cook
       How is it that you are a good cook?

TARGET: Ets   bona cuinera?
       be-pres.2nd.sg good cook
       Are you a good cook?

13.   Com   és   que   pots   vendre el pis? --- C5
       how be-pres.3rd.sg that can-pres.2nd.sg sell the apartment
       How is it that you can sell the apartment?

TARGET: Ven   el seu pis   la Maria?
       sell-pres.3rd.sg the her apartment the M.
       Is Mary selling her apartment?

24.   Com   és   que   toques   el piano? --- C5
        how be-pres.3ʳᵈ.sg that play-pres.2ⁿᵈ.sg the piano

24.   Com   és   que   toques   el piano? --- C5
        how be-pres.3rd.sg that play-pres.2nd.sg the piano
        How is it that you play the piano?

TARGET: Toques el piano?
        play-pres.2nd.sg the piano
        Do you play the piano?

- Wrong answer

5.   T'agrada   un color diferent? --- C4
        you'like-3rd.sg a color different
        Do you like a different color?

TARGET: T'agrada   el   color vermell?
        you'like-pres.3rd.sg the color red
        Do you like the color red?

11.   T'agrada   menjar? --- C2
        you'like-pres.2nd.sg eat
        Do you like eating?

        Ets   cuinera? --- C4
        be-pres.2nd.sg cook
         Are you a cook?

TARGET: Ets bona cuinera?
        be-pres.2nd.sg good cook
        Are you a good cook?

13.   Lo pot comprar? --- C4
         it can-pres.3rd.sg buy
         Can she buy it?

TARGET: Ven   el seu pis la Maria?
        sell-pres.3rd.sg the her apartment the M.
        Is Mary selling her apartment?

- Y/N substituted with a declarative

14.   Jo   puc   anar de viatge. --- C5
        I can-pres.1st.sg go of travel
        I can go on a trip.

TARGET: Aniré   de viatge?
        go-fut.1st.sg of travel
        Am I going to go on a trip?

Task 2.b

- Omission of Relative Clauses

1.   Aquest noi   té   els cabells negres. --- C4
        this boy have-pres.3rd.sg the hair black
        This fellow has black hair.

TARGET: Aquest es   l'home que   té   els cabells negres.
this be-pres.3ʳᵈ.sg the'man that have-pres.3ʳᵈ.sg the hair black
This is the man that has black hair.

3.   Aquest porta   blau i aquest negre. --- C3
this wear-pres.3ʳᵈ.sg blue and this black
This one wears blue and this black.

TARGET: Aquest és   el tren que   passa   per la muntanya.
this be-pres.3ʳᵈ.sg the train that pass-pres.3ʳᵈ.sg by the mountain.
This is the train that goes through the mountains.

5.   Aquesta no   porta,   porta   collar. --- C3
this not wear-pres.3ʳᵈ.sg wear-pres.3ʳᵈ.sg necklace
This one does not wear, she is wearing a necklace.

      Aquesta noia no   porta,   porta   cues. --- C5
this girl not wear-pres.3ʳᵈ.sg wear-pres.3ʳᵈ.sg pony-tails
This girl does not wear, she has pony-tails.

TARGET: Aquesta   és   la dona que   porta   collaret.
this be-pres.3ʳᵈ.sg the girl that wear-pres.3ʳᵈ.sg necklace
This is the girl that is wearing a necklace.

8.   Aquest peix està   en una peixera. --- C2
this fish be-pres.3ʳᵈ.sg in a fishbowl
This fish is in a fishbowl.

TARGET: Aquest és   un peix que   viu   a la peixera.
this be-pres.3ʳᵈ.sg a fish that live-pres.3ʳᵈ.sg at the fishbowl
This is a fish that lives in a fishbowl.

10.   Aquesta mira la fulla. --- C3
this look-at-pres.3ʳᵈ.sg the leaf
This one looks at the leaf.

TARGET: Aquesta és   la   noia que   mira   la fulla.
this be-pres.3ʳᵈ.sg the girl that look-at-pres.3ʳᵈ.sg the leaf
This is the girl that looks at the leaf.

12.   Aquest passa   per sobra de les antenes aquestes. --- C3
this pass-pres.3ʳᵈ.sg by over of the antennas these
This one passes over these antennas.

TARGET: Aquest és   l'avió que   vola   baix.
this be-pres.3ʳᵈ.sg the'plane that fly-pres.3ʳᵈ.sg low
This is the plane that is flying low.

13.   Aquesta *gimnista fa   la pilota. --- C2
this gymnast do-pres.3ʳᵈ.sg the ball
This gymnast does the ball.

TARGET: Aquesta és   la gimnasta que   fa   servir   la pilota.
this be-pres.3ʳᵈ.sg the gymnast that do-pres.3ʳᵈ.sg serve-INF the ball
This is the gymnast that uses the ball.

14.   Aquest cotxe   corre   molt. --- C2
this car run-pres.3ʳᵈ.sg much
This car goes fast.

392 Appendices

TARGET: Aquest   és   el cotxe que   corre   molt.
this be-pres.3rd.sg the car that run-pres.3rd.sg much
This is the car that goes fast.

17.   Aquest porta molta llum. --- C3
this carry-pres.3rd.sg much light
This one carries a lot of light.

Aquest en   porta   molt. --- C5
this CL carry-pres.3rd.sg much
This one has a lot.

TARGET: Aquest   és   el vaixell que   porta   molta llum.
this be-pres.3rd.sg the ship that carry-pres.3rd.sg much light
This is the ship that has a lot of lights on.

18.   Aquesta noia   pensa   en roba. --- C2
this   girl think-pres.3rd.sg in clothing
This girl is thinking about clothing.

Aquesta pensa   en rentar la roba. --- C3
this think-pres.3rd.sg in wash the clothes
This one is thinking about washing the clothes.

TARGET: Aquesta   és   la dona que   pensa   en roba.
this be-pres.3rd.sg the woman that think-pres.3rd.sg in clothes
This is the woman that is thinking about clothes.

19.   Aquest és   el   got de vi. --- C4
this be-pres.3rd.sg the glass of wine
 This is the glass of wine.

TARGET: Aquest   és   el got que   té   vi.
this be-pres.3rd.sg the glass that have-pres.3rd.sg wine
This is the glass that has wine.

20.   Aquí està   plorant. --- C3
here be-pres.3rd.sg crying
Here she is crying.

TARGET: Aquesta és   la   noia que plora.
this be-pres.3rd.sg the girl that cry-pres.3rd.sg
This is the girl that is crying.

21.   Aquest marca   les tres. --- C1
this show-pres.3rd.sg the three
This one shows three o'clock.

TARGET: Aquest   és   el rellotge que   marca   les tres.
this be-pres.3rd.sg the watch that show-pres.3rd.sg the three
This is the watch that shows three o'clock.

23.   Aquesta mà   aguanta   el llapis. --- C2
this   hand hold-pres.3rd.sg the pencil
This hand is holding the pencil.

Aquesta aguanta   el llapis. --- C3
this hold-pres.3rd.sg the pencil
This is holding the pencil.

TARGET: Aquesta és la mà que aguanta el llapis.
this be-pres.3rd.sg the hand that hold-pres.3rd.sg the pencil
This is the hand that is holding the pencil.

24. Aquests plàtans valen dos euros. --- C2
these bananas cost-pres.3rd.pl two euros
These bananas cost two euros.

Aquest en costa dos. --- C3
this CL cost-pres.3rd.sg two
This costs two.

*Aquestes plàtans costen dos euros. --- C5
these bananas cost-pres.3rd.pl two euros
These bananas cost two euros.

TARGET: Aquests són els plàtans que costen dos euros.
these be-pres.3rd.pl the bananas that cost-pres.3rd.pl two euros
These are the bananas that cost two euros.

25. Aquest juga a la pilota. --- C3
this play-pres.3rd.sg to the ball
This one is playing ball.

TARGET: Aquest és el nen que juga amb la pilota.
this be-pres.3rd.sg the boy that play-pres.3rd.sg with the ball
This is the boy that is playing with the ball.

- Omission of Relative Clauses + Main verb omission

11. *Aquest fruita. --- C3
this fruit
*This one fruit.

TARGET: Aquest és l'arbre que fa pomes.
this be-pres.3rd.sg the'tree that make-pres.3rd.sg apples
This is the tree that produces apples.

13. *Aquesta la pilota. --- C3
this the ball
*This one the ball.

TARGET: Aquesta és la gimnasta que fa servir la pilota.
this be-pres.3rd.sg the gymnast that do-pres.3rd.sg serve-INF the ball
This is the gymnast that is using the ball.

16. *Aquesta professora matemàtiques. --- C2
this teacher mathematics
*This teacher mathematics.

TARGET: Aquesta és la professora que ensenya matemàtiques.
this be-pres.3rd.sg the teacher that teach-pres.3rd.sg mathematics
This is the teacher that is teaching mathematics.

- Verbless relatives

22. *Aquest l'home que gafes… ulleres. --- C2
this the'man that glasses glasses
*This the man that glasses... glasses.

TARGET: Aquest   és   l'home   que   porta   ulleres.
        this be-pres.3rd.sg the'man that wear-pres.3rd.sg glasses
        This is the man that is wearing glasses.

- Omission of copula in main sentence

  4.   *Aquest home que   *nasa   a la platja. --- C2
            this man that   swim-pres.3rd.sg at the beach
            *This man that is swimming at the beach.

TARGET: Aquest   és   l'home que   neda   al   mar.
        this be-pres.3rd.sg the'man that swim-pres.3rd.sg at-the sea
        This is the man that is swimming in the sea.

  5.   *Aquesta dona que   té   el   collaret. --- C2
            this woman that have-pres.3rd.sg the necklace
            *This woman that has the necklace.

TARGET: Aquesta   és   la   dona que   porta   collaret.
        this be-pres.3rd.sg the woman that wear-pres.3rd.sg necklace
        This is the woman that is wearing necklace.

  6.   *Aquest l'home que   continua   la moto --- C2
            this   the'man that   continue-pres.3rd.sg the motorbike
            *This one the man that continue the motorbike.

TARGET: Aquest   és   l'home que   condueix   la moto.
        this be-pres.3rd.sg the'man that drive-pres.3rd.sg the motorbike
        This is the man that is driving the motorbike.

  9.   *Aquesta la *llau que porta la porta. --- C2
            this   the key that door the door
            *This one the key that door the door.

TARGET: Aquesta   és   la   clau que   obre   la   porta.
        this be-pres.3rd.sg the key that open-pres.3rd.sg the door
        This is the key that opens the door.

  10.   *Aquesta noia que mira   la   *hoja. --- C2
            this girl   that   look-at-pres.3rd.sg the leaf
            *This girl that looks at the leaf.

TARGET: Aquesta és   la   noia que   mira   la   fulla.
        this be-pres.3rd.sg the girl that look-at-pres.3rd.sg the leaf
        This is the girl that is looking at the leaf.

  17.   *El vaixell que   porta   llums, molta llums. --- C2
            the ship that carry-pres.3rd.sg lights many lights
            *The ship that has lights, many lights.

TARGET: Aquest   és   el vaixell que   porta   molta llum.
        this be-pres.3rd.sg the ship that carry-pres.3rd.sg many light
        This is the ship that has a lot of lights on.

  19.   *Aquest got que   té   aigua vermella. --- C2
            this glass that have-pres.3rd.sg water red
            *This glass that has red water.

TARGET: Aquest és el got que té vi.
this be-pres.3rd.sg the glass that have-pres.3rd.sg wine
This is the glass that has wine.

20. *Aquesta noia que plora. --- C2
this girl that cry-pres.3rd.sg
*This girl that is crying.

TARGET: Aquesta és la noia que plora.
this be-pres.3rd.sg the girl that cry-pres.3rd.sg.
This is the girl that is crying.

21. *Aquest rellotge que marca les tres. --- C2
this watch that show-pres.3rd.sg the three
*This watch that shows three o'clock.

TARGET: Aquest és el rellotge que marca les tres.
this be-pres.3rd.sg the watch that show-pres.3rd.sg the three
This is the watch that shows three o'clock.

- 'Don't know' responses

11. *És aquest arbre que mira pomes. --- C2
be-pres.3rd.sg this tree that look-pres.3rd.sg apples
*Is that tree that looks apples.

TARGET: Aquest és l'arbre que fa pomes.
this be-pres.3rd.sg the'tree that make-pres.3rd.sg apples
This is the tree that produces apples.

25. *És aquell nen que juga amb pilota. --- C2
be-pres.3rd.sg that boy that play-pres.3rd.sg with ball
*Is that boy that is playing with ball.

TARGET: Aquest és el nen que juga amb la pilota.
this be-pres.3rd.sg the boy that play-pres.3rd.sg with the ball
This is the boy that is playing with the ball.

- Omission of the object relative

7. En Joan veu l'arbre. --- C1
the J. see-pres.3rd.sg the'tree
John sees the tree.

*Juan mira por la ventana por el árbol verde. --- C2
J. look-pres.3rd.sg for the window by the tree green
*John looks through the window by the green tree.

Aquí no hi ha flors, aquí hi ha un arbre. --- C3
here not CL be-pres.3rd.sg flowers here CL be-pres.3rd.sg one tree
Here there are no flowers, here there is a tree.

Aquest veu l'arbre. --- C5
this see-pres.3rd.sg the'tree
This one sees the tree.

TARGET: Aquest és l'arbre que veu en Joan des de la seva finestra.
this be-pres.3rd.sg the'tree that see-pres.3rd.sg the J. from the his window
This is the tree that John sees from his window.

GALICIAN

<u>**Task 1.a**</u>

- Omission of Negation

    2.   *Salían   tarde. --- G2
            leave-*imp.3rd.pl late*
            They were leaving late.

            Eles   saen   tarde. --- G4
            they leave-pres.3rd.pl late
            They leave late.

            Eles   saían   tarde. --- G5
            they leave-imp.3rd.pl late
            They were leaving late.

TARGET: Eles non   saían cedo.
        they not leave-imp.3rd.pl early
        They were not leaving early.

- Tense Substitutions

    1.   *Mañán   non   vemos   a Xoán. --- G1
            tomorrow not see-pres.1st.pl to X.
            *Tomorrow we do not see John.

TARGET: Mañá non veremos a Xoán.
        tomorrow not see-fut.1st.pl to X.
        Tomorrow we will not see John.

    2.   Eles   saen   tarde. --- G4
            they leave-pres.3rd.pl late
            They leave late.

TARGET: Eles non   saían cedo.
        they not leave-imp.3rd.pl early
        They were not leaving early.

    4.   Os nenos non   actuaron   o martes. --- G4
            the children not perform-pret.3rd.pl the tuesday
            The children did not perform on Tuesday.

            Os nenos non   actuaron   o martes. --- G5
            the children not perform-pret.3rd.pl the tuesday
            The children did not perform on Tuesday.

TARGET: Os nenos non   actuaban   o martes.
        the children not perform-imp.3rd.pl the tuesday
        The children were not performing on Tuesday.

    7.   Almodóvar non   asistiu   a esta película. --- G1
            A.   not attend-pret.3rd.sg to this film
            Almodóvar did not attend to this film.

            Non   dirixiría   a película. --- G2
            not direct-cond.3rd.sg the film
            He would not direct the film.

Almodóvar non   dirixirá   esta película. --- G3
A.   not direct-fut.3rd.sg this film
Almodóvar will not direct this film.

TARGET: Almodóvar non   dirixía   esta película.
A.   not direct-imp.3rd.sg this film
Almodóvar was not directing this film.

9.   Non... non... non, Xurxo á   piscina   non. --- G1
no   no   no X. to-the swimming-pool not
No… no… no, George to the swimming-pool not.

Non   irá   á   piscina. --- G2
not go-fut.3rd.sg to-the swimming-pool
He will not go to the swimming-pool.

Xurxo non   irá   á   piscina. --- G3
X.   not go-fut.3rd.sg to-the swimming-pool
He will not go to the swimming-pool.

TARGET: Xurxo non   ía   á   piscina.
X.   not go-imp.3rd.sg to-the swimming-pool
George was not going to the swimming-pool.

10.   Xandra non mercará flores. --- G3
X. not buy-fut.3rd.sg flowers
Sandra will not buy flowers.

TARGET: Xandra non mercaba flores.
X. not buy-imp.3rd.sg flowers
Sandra was not buying flowers.

12.   Andrea non nos   *saluda. --- G2
A.   not us greet-pres.3rd.sg
Andrea does not greet us.

TARGET: Andrea non nos saudará.
A.   not   us greet-fut.3rd.sg
Andrea will not greet us.

13.   Hoxe Pedro non   gana   a carreira. --- G5
today P.   not win-pres.3rd.sg the race
Today Peter does not win the race.

TARGET: Pedro non   gañará   a carreira.
P.   not win-fut.3rd.sg the race
Peter will not win the race.

14.   Hoxe non   poden   nacer pitos. --- G5
today not can-pres.3rd.pl hatch-INF chicks
Chicks can not hatch today.

TARGET: Hoxe non   nacerán   pitos.
today not hatch-fut.3rd.pl chicks
Today no chicks will hatch.

15.   Non   salirá   do   faro. --- G1
not come-out-fut.3rd.sg of-the lighthouse
It will not come from the lighthouse.

TARGET: Esta luz non   sae   do   faro.
    this light not come out-pres.3rd.sg of-the lighthouse
    This light is not coming from the lighthouse.

 19. Santiago non   evitará   o problema. --- G1
    S.   not avoid-fut.3rd.sg the problem
    Santiago will not avoid the problem.

TARGET: Santiago non   evitaba   o problema.
    S.   not avoid-imp.3rd.sg the problem
    Santiago was not avoiding the problem.

 22. Sara non me conta a historia.   ---   G2
    S. not me tell-pres.3rd.sg the story
    Sara does not tell me the story.

    Sara non conta ningunha historia.   ---   G5
    S. not tell-pres.3rd.sg any   story
    Sara does not tell any story.

TARGET: Sara non me contará a historia.
    S.   not me tell-fut.3rd.sg the story
    Sara will not tell me the story.

 24. Xoán non   planta   as árbores. --- G3
    X. not plant-pres.3rd.sg the trees
    John does not plant the trees.

TARGET: Xoán non plantaba árbores.
    X.   not plant-imp.3rd.sg trees
    John was not planting trees.

- Agreement substitutions

 9. Non... non... non, Xurxo á   piscina   non. --- G1
    no   no   no X. to-the swimming-pool not
    No… no… no, George to the swimming-pool not.

TARGET: Xurxo non   ía   á   piscina.
    X. not go-imp.3rd.sg to-the swimming-pool
    George was not going to the swimming-pool.

- 'Don't know' responses

 7. Pero... non me   sale. --- G4
    but   not me come-out-pres.3rd.sg
    But… I can not do it.

TARGET: Almodóvar non   dirixía   esta película.
    A.   not direct-imp.3rd.sg this film
    Almodóvar was not directing this film.

 14. Non, non   creo,   non, non. --- G1
    no   not believe-pres.1st.sg no no
    No, I do not think so, no, no.

TARGET: Hoxe non   nacerán   pitos.
    today not hatch-fut.3rd.pl chicks
    Today no chicks will hatch.

22.   Non   creo,   Sara non, non   sei. --- G1
         not believe-pres.1st.sg S. not not know-pres.1st.sg
         I do not think so, not Sara, I do not know.

TARGET: Sara non me   contará   a historia.
         S.   not me tell-fut.3rd.sg the story
         Sara will not tell me the story.

Task 1.b

- Omissions/Errors with Negation

1.   *Teño   merendado   non chocolate. --- G2
         have-pres.1st.sg had-as-an-afternoon-snack not chocolate
         *I have had as an afternoon snack not chocolate.

TARGET: Eu non   teño   merendado   chocolate.
         I not have-pres.1st.sg had-as-an afternoon-snack chocolate
         I have not had chocolate as an afternoon snack.

3.   Tiñan   que   saír   ó   mar. --- G4
         have-to-imp.3rd.pl that go-out-INF to-the sea
         They had to go to sea.

TARGET: Os mariñeiros non   tiñan   que   saír ó mar.
         the sailors   not have to-imp.3rd.pl that go-out-INF to-the sea
         The sailors did not have to go to sea.

21.   Pola   mañá   chovía. --- G3
         at-the morning rain-imp.3rd.sg
         During the morning, it was raining.

         Pola   mañá   *arraiou. --- G5
         at-the morning drizzle-pret.3rd.sg
         During the morning, it drizzled.

TARGET: Pola   mañá non   deixou   de   chover.
         at-the morning not leave-pret.3rd.sg of rain-INF.
         During the morning, it did not stop raining.

- Tense substitutions: verbal periphrases

3.   Ti   non   tiñas   bailado con María. --- G2
         you not have-imp.2nd.sg danced with M.
         You had not danced with Mary.

TARGET: Ti   non   tes   bailado con María.
         you not have-pres.2nd.sg danced with M.
         You have not danced with Mary.

10.   Eu non   teño   que estudiar nada. --- G1
         I not have-pres.1st.sg that study-INF nothing
         I do not have to study anything.

TARGET: Eu non   tiña   que estudiar nada.
         I not have-imp.1st.sg that study-INF nothing
         I did not have to study anything.

- Simplification of complex verbal clusters

1.   Non   teño   que comer chocolate. --- G5
        not have-pres.1st.sg that eat-INF chocolate
        I do not have to eat chocolate.

TARGET: Eu non   teño   merendado   chocolate.
        I   not have-pres.1st.sg had-as-an-afternoon-snack chocolate
        I have not had chocolate as an afternoon snack.

4.   Non   imos   á   praia. --- G1
        not go-pres.1st.pl to-the beach
        We do not go to the beach.

        Non *vamos   á   praia. --- G2
        not go-pres.1st.pl to-the beach
        We do not go to the beach.

        Vós non   vades   á   praia. --- G5
        you not go-pres.2nd.pl to-the beach
        You do not go to the beach.

TARGET: Vós non   ides   ir   á   praia.
        you not go-pres.2nd.pl go-INF to-the beach
        You are not going to go to the beach.

8.   Nós non corremos un quilómetro. --- G1
        we not run-pres.1st.pl one kilometer
        We do not run one kilometer.

TARGET: Vós non   debedes   correr un quilómetro.
        you not must-pres.2nd.pl run-INF one kilometer
        You must not run one kilometer.

11.   As   nais   non   deben   d'ire. --- G2
        the mothers not must-pres.3rd.pl of'go-INF-epenthetic 'e'
        The mothers must not go.

        As   nais   non   van   a ir. --- G3
        the mothers not go-pres.3rd.pl to go-INF
        The mothers are not going to go.

        As   nais   non   teñen   que ir. --- G5
        the mothers not have-pres.3rd.pl that go-INF
        The mothers do not have to go.

TARGET: As   nais   non   han   de ir.
        the mothers not have-pres.3rd.pl of go-INF
        The mothers must not go.

12.   Non, non os fregamos. --- G1
        no not them wash-pret.1st.pl
        No, we did not wash them.

TARGET: Vós non   déstes   en   frega-los pratos.
        you not give-pret.2nd.pl in wash-INF-the dishes
        You did not take to washing the dishes.

13.   Os carpinteiros non   remataron   o traballo. --- G3
        the carpenters not finish-pret.3rd.pl the job
        The carpenters did not finish the job.

Os carpinteiros non acabaron o traballo. --- G5
the carpenters not finish-pret.3rd.pl the job
The carpenters did not finish the job.

TARGET: Os carpinteiros non deron por rematado o traballo.
the carpenters not give-pret.3rd.pl for finished the job
The carpenters did not consider the job finished.

14. Nós non podiamos. --- G4
we not can-imp.1st.pl
We could not.

TARGET: Nós non podiamos cose-la chambra.
we not can-imp.1st.pl sew-INF-the shirt
We could not sew the shirt.

15. Non, non a *adivinou. --- G1
no not it guess-pret.3rd.sg
No, he did not guess it.

Manolo non deu adiviñado a sorpresa. --- G3
M. not give-pret.3rd.sg guessed the surprise
Manuel could not guess the surprise.

TARGET: Manolo non houbo de adiviña-la sorpresa.
M. not have-pret.3rd.sg of guess-INF-the surprise
Manuel was not about to guess the surprise.

16. Non chegaches pronto. --- G4
not arrive-pret.2nd.sg soon
You did not arrive soon.

TARGET: Ti non tardaches en chegar.
you not take-a-long-time-pret.2nd.sg in arrive-INF
It did not take you a long time to arrive.

17. Xan non trouxo. --- G1
X. not bring-pret.3rd.sg
John did not bring.

Xan non trouxo o xantare. --- G2
X. not bring-pret.3rd.sg the food-INF-epenthetic 'e'
John did not bring the food.

Xan non trouxo o xantar. --- G3
X. not bring-pret.3rd.sg the food
John did not bring the food.

Non trouxo o xantar. --- G4
not bring-pret.3rd.sg the food
He did not bring the food.

Non trouxo nada de comer. --- G5
not bring-pret.3rd.sg nothing of eat-INF.
He did not bring anything to eat.

TARGET: Xan non foi traendo o xantar.
X. not go-pret.3rd.sg bringing the food
John was not bringing the food.

18. As nenas non choraron. --- G5
    the girls not cry-pret.3rd.pl
    The girls did not cry.

TARGET: As nenas non se botaron a chorar.
    the girls not themselves break- into-pret.3rd.pl to cry-INF
    The girls did not burst into tears.

19. Non pasaba os ensaios. --- G2
    not pass-imp.3rd.sg the trial
    She was not passing the trials.

TARGET: Xandra non ía pasando os exames.
    X. not go-imp.3rd.sg passing the exams
    Sandra was not passing the exams.

20. As costureiras non iban creando unha *pábrica. --- G2
    the dressmakers not go-imp.3rd.sg setting-up a pactory
    The dressmakers were not setting up a *pactory.

    Non ian *desperando a fábrica. --- G4
    not go-imp.3rd.pl desperating the factory
    They were not *desperating the factory.

TARGET: As costureiras non ían crear unha fábrica.
    the dressmakers not go-imp.3rd.sg set-up-INF a factory
    The dressmakers were not going to set up a factory.

21. Pola mañá arraiou. --- G5
    at-the morning drizzle-pret.3rd.sg
    During the morning, it drizzled.

TARGET: Pola mañá non deixou de chover.
    at-the morning not leave-pret.3rd.sg of rain-INF.
    During the morning, it did not stop raining.

22. Non estudiou e rematou o inglés. --- G1
    not study-pret.3rd.sg and finish-pret.3rd.sg the English
    He studied and finished English.

    Non rematou de estudiare. --- G2
    not finish-pret.3rd.sg of study-INF-epenthetic 'e'
    He did not finish studying.

    El non rematou o inglés. --- G3
    he not finish-pret.3rd.sg the English
    He did not finish English.

TARGET: El non rematou estudiando inglés.
    he not finish-pret.3rd.sg studying English
    He did not end up studying English.

23. Que non podemos cantare. --- G2
    that not can-pres.1st.pl sing-INF-epenthetic 'e'
    That we cannot sing.

TARGET: Nós non deixamos de cantar.
    we not stop-pres.1st.pl of sing-INF
    We did not stop singing.

25.   Non a trouxeron. --- G1
      not it bring-pret.3rd.pl
      They did not bring it.

TARGET: Elas non tiñan traído a cea.
      they not have-pret.3rd.pl brought the dinner
      They had not brought the dinner.

- Simplification of complex verbal clusters + tense substitutions

2.   Non a pedimos. --- G1
      not it ask-pret.1st.sg
      We did not ask for it.

TARGET: Nós non debiamos pedir pizza.
      we not should-imp.1st.pl ask-INF pizza
      We should not ask for pizza.

3.   Pero non *salen. --- G1
      but not leave-pres.3rd.pl
      But they do not leave.

      Os mariñeiros non van ó mare. --- G3
      the sailors not go-pres.3rd.pl to-the sea-epenthetic 'e'
      The sailors do not go to the sea.

TARGET: Os mariñeiros non tiñan que sair ó mar.
      the sailors not have to-imp.3rd.pl that go-out-INF to-the sea
      The sailors did not have to go to sea.

5.   Eu non bailei con María. --- G1
      I not dance-pret.1st.sg with M.
      I did not dance with Mary.

TARGET: Ti non tes bailado con María.
      you not have-pres.2nd.sg danced with M.
      You have not danced with Mary.

7.   Non tivo *suerte. --- G1
      not have-pret.3rd.sg luck
      He was not lucky.

TARGET: O neno non ten tido sorte.
      the boy not have-pres.3rd.sg had luck
      The boy has not been lucky.

12.   Os pratos non se deben fregare. --- G2
      the dishes not them must-pres.3rd.pl wash-INF-epenthetic 'e'
      The dishes must not be washed.

      Eu non frego os pratos. --- G5
      I not wash-pres.1st.sg the dishes
      I do not wash the dishes.

TARGET: Vós non déstes en frega-los pratos.
      you not give-pret.2nd.pl in wash-INF-the dishes
      You did not take to washing the dishes.

13.   Os carpinteiros non rematan o traballo. --- G2
      the carpenters not finish-pres.3rd.pl the job
      The carpenters do not finish the job.

TARGET: Os carpinteiros non   deron   por rematado o traballo.
        the carpenters not give-pret.3rd.pl for finished   the job
        The carpenters did not consider the job finished.

    14.   Non o   *pudimos coser. --- G1
         not it can-pret.1st.pl sew-INF
         We could not sew it.

         Nós non cosémo-las chambras. --- G3
         we not sew-pret.1st.pl-the shirts
         We did not sew the shirts.

TARGET: Nós non   podiamos cose-la chambra.
        we not can-imp.1st.pl sew-INF-the shirt
        We could not sew the shirt.

    15.   Non   adiviña   a sorpresa. --- G2
         not guess-pres.3rd.sg the surprise
         He does not guess the surprise.

         Non   tiña   ningunha sorpresa. --- G5
         not have-imp.3rd.sg none surprise
         He was not having any surprise.

TARGET: Manolo non   houbo   de adiviña-la sorpresa.
        M.   not have-pret.3rd.sg of guess-INF-the surprise
        Manuel was not about to guess the surprise.

    19.   Xandra non   pasa   os exames. --- G5
         X.   not pass-pres.3rd.sg the exams
         She does not pass the exams.

TARGET: Xandra non   ía   pasando os exames.
        X.   not go-imp.3rd.sg passing the exams
        Sandra was not passing the exams.

    21.   Pola   mañá   chovía. --- G3
         at-the morning rain-imp.3rd.sg
         During the morning, it was raining.

TARGET: Pola   mañá non   deixou   de chover.
        at-the morning not leave-pret.3rd.sg of rain-INF.
        During the morning, it did not stop raining.

- 'Don't know' responses

    1.   Non, chocolate non. --- G1
         no   chocolate not
         No, not chocolate.

TARGET: Eu non   teño   merendado   chocolate.
        I not have-pres.3rd.sg having-as-an-afternoon-snack chocolate
        I have not had chocolate as an afternoon snack.

    4.   *Non Maria, con Maria. --- G4
         not Mary   with Mary
         Not Mary, with Mary.

TARGET: Ti non   tes   bailado con María.
        you not have-pres.2nd.sg danced with M.
        You have not danced with Mary.

9.   Vós… non… Nós non… para… *bueno non. Non   sei. --- G4
          you   not   we not   for   well   not not know-pres.1st.sg
          You… no… we no… for… well, no. I do not know.

TARGET: Nós non chegamos   a saber moitas cousas.
          we not arrive-pres.1st.sg to know-INF many things
          We do not get to know many things.

11.   Eu non   creo   que   vaian. --- G1
          I not believe-pres.1st.sg that go-pres. subj.3rd.pl
          I do not think they will go.

          As   nais… bueno… non… nada. --- G4
          the mothers well   no   nothing
          The mothers... well... no... nothing.

TARGET: As   nais non   han   de ir.
          the mothers not have-pres.3rd.pl of go-INF
          The mothers must not go.

18.   As nenas… non sei. --- G2
          the girls   not know-pres.3rd.sg
          The girls… I do not know.

TARGET: As nenas non se   botaron   a chorar.
          the girls not them start-pret.3rd.pl to cry-INF
          The girls did not burst into tears.

24.   Que non… pero non o   sei   dicir. --- G2
          that not   but not it know-pres.1st.sg say-INF
          That not… but I do not know how to say it.

TARGET: Ti non   seguías   a lembrar aquela festa.
          you not go-on-imp.2nd.sg to remember-INF that party
          You did not continue to remember that party.

Task 2.a

- WH- substituted with Y/N

4.   Ti   queres   ir a un sitio? --- G2
          you want-pres.2nd.sg go-INF to a place
          Do you want to go to a place?

TARGET: Cándo   vas   ir?
          when go-pres.2nd.sg go-INF
          When are you going to go?

9.   *Qué   tens   uns irmáns? --- G2
          that have-pres.2nd.sg some siblings
          Do you have any siblings?

TARGET: Cántos   irmáns   tes?
          how-many siblings have-pres.2nd.sg
          How many siblings do you have?

12.   Dormes   moitas horas? --- G1
sleep-pres.2nd.sg many hours
Do you sleep many hours?

Hasta as catro? Hasta as doce? --- G3
until the four   until the twelve
Until four? Until twelve?

TARGET: Cántas   horas   dormes?
how-many hours sleep-pres.2nd.sg
How many hours do you sleep?

15.   Pode   ser   no   diario? --- G2
can-pres.3rd.sg be-INF in-the newspaper
Might it be in the newspaper?

Na casa? Na escola? --- G3
in-the house   in-the school
At home? At school?

TARGET: Ónde   les?
where read-pres.2nd.sg
Where do you read?

17.   Fixérono   as rapazas solas? --- G1
make-pret.3rd.pl-it the girls alone
Did the girls make it by themselves?

TARGET: Cómo   fixeron   o   pastel as mozas?
how make-pret.3rd.pl the cake the girls
How did the girls make the cake?

19.   Es   española   de Vigo?, ¿de Ourense? --- G1
be-pres.3rd.sg Spanish of Vigo   of   Orense
Are you Spanish from Vigo? from Ourense?

Es   da Coruña?, de Lugo?, de Ourense ou de Pontevedra? --- G4
be-pres.2nd.sg of-the Coruña of Lugo of Orense or of   Pontevedra
Are you from A Coruña? from Lugo? from Ourense or from Pontevedra?

*Eres galega? --- G5
be-pres.3rd.sg Galician
Are you Galician?

TARGET: De ónde es?
of where be-pres.2nd.sg
Where are you from?

23.   Dous ou un? --- G1
two   or one
Two or one?

TARGET: Cántos apartamentos   vendeu Carlos?
how-many apartments sell-pret.3rd.sg C.
How many apartments did Charles sell?

25.   Rompeu   unha fiestra? --- G4
break-pret.3rd.sg a window
Did he break a window?

TARGET: Cómo   rompeu   a fiestra Andrés?
how break-pret.3rd.sg the window A.
How did Andrew break the window?

- Wrong WH-morpheme selection

1.   Ónde   fuches   onte?   ---   G5
     where go-pret.2nd.sg yesterday
     Where did you go yesterday?

TARGET: Qué   comiches   onte?
what eat-pret.2nd.sg yesterday
What did you eat yesterday?

4.   Qué día   é?   ---   G5
     what day be-pres.3rd.sg
     What day is it?

TARGET: Cándo   vas   ir?
when go-pres.2nd.sg go
When are you going to go?

7.   Qué día cumples   os   anos?   ---   G3
     what day complete-pres.2nd.sg the years
     What day do you complete years?

TARGET: Cántos   anos   tes?
how-many years have-pres.2nd.sg
How old are you?

15.   En qué   leo?   ---   G4
     in what read-pres.1st.sg
     In what do I read?

TARGET: Ónde   les?
where read-pres.2nd.sg
Where do you read?

22.   *Cómo me   saleu   o prezo?   ---   G2
     how me come-out-pret.3rd.sg the price
     *How did the price come out for me?

TARGET: Cánto   custou   a casa   que   mercou   Xandra?
how-much cost-pret.3rd.sg the house that buy-pret.3rd.sg X.
How much did the house that Sandra bought cost?

23.   *Cómo lle   saleu   o número?   ---   G2
     how him come-out-pret.3rd.sg the number
     *How did the number come out for him?

     Qué   número   é?   ---   G3
     what number be-pres.3rd.sg
     What number is it?

TARGET: Cántos   apartamentos   vendeu   Carlos?
how-many apartments sell-pret.3rd.sg C.
How many apartments did Charles sell?

- Wrong answer

3.   Qué é? --- G3
     what be-pres.3rd.sg
     What is it?

     En qué   andará   metido *Juan? --- G5
     in what walk-fut.3rd.sg involved J.
     What will be John involved in?

TARGET: Qué   anda   a procurar Xoán?
     what walk-pres.3rd.sg at search-INF X.
     What is John looking for?

25.   Cómo lle   rompeu   a perna? --- G2
     how   him break-pret.3rd.sg the leg
     How did the leg break?

TARGET: Cómo   rompeu   a fiestra Andrés?
     how break-pret.3rd.sg the window A.
     How did Andrew break the window?

- WH- substituted with a declarative

1.   *Ésto… se lle   gustara   ben. --- G1
     this   if it like-plusc.3rd.sg well
     *This… if you liked it well.

TARGET: Qué   comiches   onte?
     what eat-pret.2nd.sg yesterday
     What did you eat yesterday?

3.   Preguntándoche qué   fai   Xoán. --- G1
     asking-you   what do-pres.3rd.sg X.
     Asking you what John does.

TARGET: Qué   anda   a procurar Xoán?
     what walk-pres.3rd.sg at search-INF X.
     What is John looking for?

4.   Eu non, non… *E se preguntándocho a ti   --- G1
     I not   not   and if asking-you-it to you
     I do not, I do not… *And if asking you.

TARGET: Cándo   vas   ir?
     when go-pres.2nd.sg go
     When are you going to go?

7.   Preguntándocho, *ay dios mío!... --- G1
     asking-you-it ouch God my
     Asking it to you, oh goodness me!

TARGET: Cántos   anos   tés?
     how-many years have-pres.2nd.sg
     How old are you?

9.   Preguntándocho a ti. --- G1
     asking-you-it to you
     Asking you.

TARGET: Cántos   irmáns   tés?
   how-many siblings have-pres.2nd.sg
   How many siblings do you have?

12.   Quero   saber se   dormes   pouco ou   dormes   moito. --- G2
       want-pres.1st.sg know if sleep-pres.2nd.sg little or sleep-pres.2nd.sg much
       I want to know if you sleep a little or a lot.

TARGET: Cántas   horas   dormes?
   how-many hours sleep-pres.2nd.sg
   How many hours do you sleep?

21.   Porque   discutiron   a xefa   e mais elas. Porque... [+ reasons]. --- G1
       because argue-pret.3rd.pl the boss and more they   because [+ reasons]
       Because the boss and them had an argument. Because… [+ reasons].
       Preguntándollo a elas.
       asking-them-it to them
       Asking them.

TARGET: Por qué   están   anoxadas as costureiras?
   for what be-pres.3rd.pl angry the dressmakers
   Why are the dressmakers angry?

22.   *Preguntara   a ver   canto   lle custara. --- G1
       ask-plusc.1st.sg to see how-much it cost-plusc.3rd.sg
       *Asked to see how much it cost her.

TARGET: Cánto custou a casa que mercou Sandra?
   how-much cost-pret.3rd.sg the house that buy-pret.3rd.sg S.
   How much did the house that Sandra bought cost?

25.   *Rompeu   dun puñetazo. --- G1
       break-pret.3rd.sg of-one punch
       *He smashed with his fist.

TARGET: Cómo rompeu   a fiestra Andrés?
   how break-pret.3rd.sg the window A.
   How did Andrew break the window?

- WH- substituted with WHY

23.   Por qué   vendeu   os apartamentos Carlos? --- G5
       for what sell-pret.3rd.sg the apartments C.
       Why did Charles sell the apartments?

TARGET: Cántos   apartamentos vendeu Carlos?
   how-many apartments sell-pret.3rd.sg C.
   How many apartments did Charles sell?

- 'Don't know' responses with WH-tokens

4.   *Bueno... se as... se o, se o... nada. --- G4
      well if the-fem.pl if the-masc.sg if the-masc.sg nothing
      *Well… if the… if the, if the… nothing.

TARGET: Cándo   vas   ir?
   when go-pres.2nd.sg go
   When are you going to go?

15.   Un libro, un periódico… Unha mesa… Non sei. --- G1
        a book   a newspaper   a   table   not know-pres.1st.sg
        A book, a newspaper… A table… I do not know.

TARGET: Ónde   les?
        where read-pres.2nd.sg
        Where do you read?

21.   Non están   anoxadas. Non, non sei.   --- G4
        not be-pres.3rd.pl angry   no not know-pres.1st.sg
        They are not angry. No, I do not know.

TARGET: Por qué   están   anoxadas as costureiras?
        for what be-pres.3rd.pl angry the dressmakers
        Why are the dressmakers angry?

22.   O precio ou… Pregunta   o mismo que Xandra. non, non lembro.   --- G4
        the price or   ask-pres.3rd.sg the same that X.   no   not remember-pres.1st.sg
        The price or… (He/She) asks the same as Sandra. No, I do not remember.

TARGET: Cánto custou a casa que mercou Sandra?
        how-much cost-pret.3rd.sg the house that buy-pret.3rd.sg S.
        How much did the house that Sandra bought cost?

- Y/N substituted with WHY

2.   Por qué   xogamos   ás cartas ti e máis eu? --- G5
        for what play-pres.1st.pl to-the cards you and also I
        Why do you and I play cards?

TARGET: Xogamos ás cartas?
        play-pres.1st.pl to-the cards
        Shall we play cards?

2.   Por qué   é   que   teñen   frío? --- G2
        for what be-pres.3rd.sg that have-pres.3rd.pl cold
        Why is it that you are cold?

        Por qué   teñen   frío? --- G3
        for what have-pres.3rd.pl cold
        Why are they cold?

TARGET: Teñen   frío os pescadores?
        have-pres.3rd.pl cold the sailors
        Are the sailors cold?

8.   Por qué   están cansos? --- G2
        for what be-pres.3rd.sg tired
        Why are they tired?

        Por qué   están cansos? --- G3
        for what be-pres.3rd.sg tired
        Why are they tired?

TARGET: Están   cansos os nenos?
        be-pres.3rd.pl tired the children
        Are the children tired?

10.   Por qué che   gusta   viaxare? --- G2
         for what you like-pres.3rd.sg travel-INF-epenthetic 'e'
         Why do you like travelling?

TARGET: Gústache   viaxar?
         like-pres.3rd.sg-you travel
         Do you like travelling?

11.   Por qué   es   boa cociñeira? --- G2
         for what be-pres.3rd.sg good cook
         Why you are a good cook?

TARGET: Es   boa   cociñeira?
         be-pres.3rd.sg good cook
         Are you a good cook?

13.   Por qué   quere   vende-lo piso? --- G2
         for what want-pres.3rd.sg sell-INF-the apartment
         Why does she want to sell the apartment?

TARGET: Vende   María o seu piso?
         sell-pres.3rd.sg M. the her apartment
         Is Mary selling her apartment?

14.   Por qué   teño   que ir de viaxe? --- G2
         for what have-pres.1st.sg that go-INF of trip
         Why do I have to go on a trip?

TARGET: Vou   de viaxe?
         go-pres.1st.sg of trip
         Am I going on a trip?

16.   Por qué   minte   moito? --- G2
         for what lie-pres.3rd.sg much
         Why does he lie a lot?

TARGET: Minte   moito Andrés?
         lie-pres.3rd.sg much A.
         Does Andrew lie a lot?

18.   Por qué   imos   de vacacións? --- G2
         for what go-pres.1st.pl of vacation
         Why are we going away on vacation?

TARGET: Irémos   de vacacións?
         go-fut.1st.pl of vacation
         Are we going away on vacation?

20.   Por qué   van   a Barcelona? --- G2
         for what go-pres.3rd.pl to B.
         Why are they going to Barcelona?

TARGET: Irán   a Barcelona os teus curmáns?
         go-fut.3rd.pl to B.   the your cousins
         Are your cousins going to go to Barcelona?

24.   Por qué   tóca-lo   piano? --- G2
         for what play-pres.2nd.sg-the piano
         Why do you play the piano?

TARGET: Tóca-lo piano?
    play-pres.2nd.sg-the piano
    Do you play the piano?

- Y/N substituted with WH-

5. Qué che gusta a ti? --- G5
    what you like-pres.3rd.sg to you
    What do you like?

TARGET: Gústache   a cor vermella?
    like-pres.3rd.sg-you the color red
    Do you like the color red?

13. *Cántos pisos dorme María? --- G4
    how-many apartments sleep-pres.3rd.sg M.
    *How many apartments does Mary sleep?

TARGET: Vende María o seu piso?
    sell-pres.3rd.sg M. the her apartment
    Is Mary selling her apartment?

18. E ti onde vas as vacacións? --- G1
    and you where go-pres.2nd.sg the vacation
    And you where do you go on vacation?

TARGET: Irémonos de vacacións?
    go-fut.1st.pl-us of vacation
    Are we going away on vacation?

- Y/N substituted with a declarative

2. Eu non *voy ganar... se xogamos... pois si, xogamos. --- G1
    I not go-pres.1st.sg win-INF... if play-pres.1st.pl... then yes play-pres.1st.pl
    I am not going to win… if we play… well yes, let's play.

TARGET: Xogamos ás cartas?
    play-pres.1st.pl to-the cards
    Shall we play cards?

5. A color vermella --- G4
    the color red
    The color red.

TARGET: Gústache   a cor vermella?
    like-pres.3rd.sg-you the color red
    Do you like the color red?

6. Os mariñeiros que teñen frio. --- G1
    the sailors that have-pres.3rd.pl cold
    The sailors that are cold.

TARGET: Teñen frío os pescadores?
    have-pres.3rd.pl cold the sailors
    Are the sailors cold?

8. Porque están... e este... cansados de xogar. --- G1
    because be-pres.3rd.pl and this tired of play
    Because they are… I mean… tired of playing.

TARGET: Están   cansos os nenos?
            be-pres.3ʳᵈ.pl tired the children
            Are the children tired?

14.   Non me   voy   de viaxe. E ti   vas   de viaxe. --- G1
            not me go-pres.1ˢᵗ.sg of trip and you go-pres.2ⁿᵈ.sg of trip
            I am not going on a trip. And you are going on a trip.

TARGET: Vou de viaxe?
            go-pres.1ˢᵗ.sg of trip
            Am I going on a trip?

16.   Non   sei   se me   di   mentiras ou non, ou verdades. --- G1
            not know-pres.1ˢᵗ.sg if me say-pres.3ʳᵈ.sg lies   or not   or truths
            I do not know if he lies or not, or if he tells the truth.

TARGET: Minte   moito Andrés?
            lie-pres.3ʳᵈ.sg much A.
            Does Andrew lie a lot?

- 'Don't know' responses with Y/N tokens

2.   'Don't know' response --- G2

            Non   sei   facer, non o   sei   facer. --- G4
            not know-pres.1ˢᵗ.sg do-INF not it know-pres.1ˢᵗ.sg do-INF
            I do not know how to do; I do not know how to do it.

TARGET: Xogamos ás cartas?
            play-pres.1ˢᵗ.pl to-the cards
            Shall we play cards?

5.   'Don't know' response --- G2
TARGET: Gústache   a   cor vermella?
            like-pres.3ʳᵈ.sg-you the color red
            Do you like the color red?

6.   'Don't know' response --- G5
TARGET: Teñen   frío os pescadores?
            have-pres.3ʳᵈ.pl cold the sailors
            Are the sailors cold?

11.   Preguntándollo á   xente. --- G1
            asking-them-it to-the people
            Asking the people.
            Eu   penso   que   es   boa cociñeira. Non sei.
            I think-pres.1ˢᵗ.sg that be-pres.2ⁿᵈ.sg good cook. not know-pres.1ˢᵗ.sg
            I think you are a good cook. I do not know.

TARGET: Es   boa cociñeira?
            be-pres.2ⁿᵈ.sg good cook
            Are you a good cook?

14.   Non sei.   --- G4
            not know-pres.1ˢᵗ.sg
            I do not know.

TARGET: Vou de viaxe?
          go-pres.1ˢᵗ.sg of trip
          Am I going on a trip?

   18.   Pode   ser...   Nada, non. --- G4
          can-pres.3ʳᵈ.sg be-INF nothing no
          Maybe… Nothing, no.

TARGET: Irémos   de vacacións?
          go-fut.1ˢᵗ.pl of vacation
          Are we going to go away on vacation?

Task 2.b

- Omission of Relative Clauses

   1.   Este   teno   negro. --- G1
          this have-pres.3ʳᵈ.sg-it black
          This one has it black.

          Este home   ten   o cabelo negro. --- G3
          this man have-pres.3ʳᵈ.sg the hair black
          This man has black hair.

          Este   ten   o cabelo gris. --- G4
          this have-pres.3ʳᵈ.sg the hair grey
          This one has grey hair.

TARGET: Este   é   o home que   ten   o cabelo negro.
          this be-pres.3ʳᵈ.sg the man that have-pres.3ʳᵈ.sg the hair black
          This is the man that has black hair.

   3.   *E este   temos   marrón. --- G2
          and this have-pres.1ˢᵗ.pl brown
          *And this one we have brown.

TARGET: Este   é   o tren que   pasa   pola montaña.
          this be-pres.3ʳᵈ.sg the train that pass-pres.3ʳᵈ.sg by-the mountain
          This is the train that goes through the mountains.

   4.   Este   é   o home. --- G1
          this be-pres.3ʳᵈ.sg the man
          This one is the man.

          Este   nada   fora. --- G4
          this swim-pres.3ʳᵈ.sg outside
          This one is swimming outside.

TARGET: Este   é   o home que   nada   no mar.
          this be-pres.3ʳᵈ.sg the man that swim-pres.3ʳᵈ.sg in-the sea
          This is the man that is swimming in the sea.

   5.   *Esta   é   un *collar. --- G1
          this-fem be-pres.3ʳᵈ.sg a necklace-masc
          *This one is a necklace.

          E este   é   o collare. --- G2
          and this be-pres.3ʳᵈ.sg the necklace
          And this one is the necklace.

        Esta muller de pelo negro   leva   argolas. --- G3
this woman of hair black wear-pres.3rd.sg earrings
This woman with black hair is wearing earrings.

        Esta   é   a muller…   Ten   argolas tamén. --- G5
this be-pres.3rd.sg the woman   have-pres.3rd.sg earrings also
This is the woman… She also has earrings.

TARGET: Esta   é   a   muller que   leva   colar.
this be-pres.3rd.sg the woman that wear-pres.3rd.sg necklace
This is the woman that is wearing a necklace.

6.   Este   é   unha moto. --- G4
this be-pres.3rd.sg a motorbike
This one is a motorbike.

TARGET: Este   é   o   home que   conduce   unha moto.
this be-pres.3rd.sg the man that drive-pres.3rd.sg a motorbike
This is the man that is driving a motorbike.

8.   Este non   vive   no mar. --- G1
this not live-pres.3rd.sg in-the sea
This one does not live in the sea.

        Este peixe vive   na peixeira. --- G3
this fish live-pres.3rd.sg in-the fishbowl
This fish lives in the fishbowl.

        Este   é   unha peixeira. --- G4
this be-pres.3rd.sg a fishbowl
This one is a fishbowl.

TARGET: Este   é   o peixe que   vive   na peixeira.
this be-pres.3rd.sg the fish that live-pres.3rd.sg in-the fishbowl
This is the fish that lives in the fishbowl.

9.   Esta chave abre   a porta. --- G5
this key open-pres.3rd.sg the door
This key opens the door.

TARGET: Esta   é   a chave que   abre   a porta.
this be-pres.3rd.sg the key that open-pres.3rd.sg the door
This is the key that opens the door.

10.   Esta   mira   o *lupo. --- G4
this look-pres.3rd.sg the lupo
This one looks the *lupo.

TARGET: Esta   é   a rapaza que   mira   a folla.
this be-pres.3rd.sg the girl that look-pres.3rd.sg the leaf
This is the girl that is looking at the leaf.

11.   Este   da   cereixas. --- G2
this give-pres.3rd.sg cherries
This one produces cherries.

        Este *árbol   da   mazáns. --- G5
this tree give-pres.3rd.sg apples
This tree produces apples.

TARGET: Esta   é   a árbore que   da   mazás.
        this be-pres.3rd.sg the tree that give-pres.3rd.sg apples
        This is the tree that produces apples.

12.   Este   é   máis baixo. --- G4
        this be-pres.3rd.sg more low
        This one is lower.

        Este avión   voa   baixo. --- G5
        this plane fly-pres.3rd.sg low
        This plane is flying low.

TARGET: Este   é   o avión   que   voa   baixo.
        this be-pres.3rd.sg the plane that fly-pres.3rd.sg low
        This is the plane that is flying low.

13.   E   esta   é   unha pelota. --- G2
        and this be-pres.3rd.sg a ball
        And this one is a ball.

        Esa   xoga   á ximnasia. --- G3
        this play-pres.3rd.sg to-the gymnastics
        This one is doing gymnastics.

        E esta... emprega... Non. --- G4
        and this   use-pres.3rd.sg no
        And this one… uses… No.

TARGET: Esta   é   a ximnasta   que   emprega o balón.
        this be-pres.3rd.sg the gymnast that use-pres.3rd.sg the ball
        This is the gymnast that is using the ball.

16.   E esta non   enseña   inglés. --- G4
        and this not teach-pres.3rd.sg English
        And this one is not teaching English.

        Esta *enseña   as *cuentas de sumar e as de restar e de multiplicar. --- G5
        this teach-pres.3rd.sg the calculations of add-INF and the of subtract-INF and of multiply-INF
        This is teaching the calculations of adding and subtracting and multiplying.

TARGET: Esta é a mestra que ensina matemáticas.
        this be-pres.3rd.sg the teacher that teach-pres.3rd.sg mathematics
        This is the teacher that is teaching mathematics.

17.   Este   ten   moita luz. --- G4
        this have-pres.3rd.sg much light
        This one has a lot of light.

        Este barco   ten   moita luz. --- G5
        this ship have-pres.3rd.sg much light
        This ship has a lot of light.

TARGET: Este   é   o barco que   ten   moita luz.
        this be-pres.3rd.sg the ship that have-pres.3rd.sg much light
        This is the ship that has a lot of lights on.

18.   E esta non   viaxa. --- G2
        and this not travel-pres.3rd.sg
        And this one does not travel.

Vólveselle   tola a *imaginación. --- G5
turn-pres.3rd.sg-it-to-her mad the imagination
Her imagination is turning mad.

TARGET: Esta   é   a   muller que   pensa   en roupa.
this be-pres.3rd.sg the woman that think-pres.3rd.sg in clothes
This is the woman that is thinking about clothes.

    19.   E   o viño   é   tinto. --- G4
and the wine be-pres.3rd.sg red
And the wine is red.

Este   é   o vaso *rojo,   ten   un líquido *rojo. --- G5
this be-pres.3rd.sg the glass red have-pres.3rd.sg a liquid red
This is a red glass, it has a red liquid.

TARGET: Este   é   o vaso que   ten   viño.
this be-pres.3rd.sg the glass that have-pres.3rd.sg wine
This is the glass that has wine.

    20.   Esta está seria. --- G1
this be-pres.3rd.sg serious
This one is serious.

Esta está   triste. --- G4
this be-pres.3rd.sg sad
This one is sad.

Esta moza   está   chorando. --- G5
this girl be-pres.3rd.sg crying
This girl is crying.

TARGET: Esta é a moza que chora.
this be-pres.3rd.sg the girl that cry-pres.3rd.sg
This is the girl that is crying.

    21.   Ese   ten   unha. --- G4
this have-pres.3rd.sg one
This one has one.

Este reloj   marca   as doce e cuarto. --- G5
this watch show-pres.3rd.sg the twelve and quarter
This watch shows a quarter past twelve.

TARGET: Este   é   o reloxo que   marca   as tres.
this be-pres.3rd.sg the watch that shows-pres.3rd.sg the three
This is the watch that shows three o'clock.

    22.   Este non o   leva. --- G1
this not it wear-pres.3rd.sg
This one is not wearing it.

Este home non   leva   nada. --- G3
this man not wear-pres.3rd.sg nothing
This man is not wearing anything.

Este home non   leva   sombreiro,   ten   gafas. --- G5
this man not wear-pres.3rd.sg hat have-pres.3rd.sg glasses
This man is not wearing a hat, he has glasses.

TARGET: Este   é   o home que   leva   gafas.
this be-pres.3rd.sg the man that wear-pres.3rd.sg glasses
This is the man that is wearing glasses.

23.   Esta man   suxeita   a pinza. --- G3
         this hand hold-pres.3ʳᵈ.sg the tweezers
         This hand is holding the tweezers.

         Esta   suxeita   a pinza. --- G4
         this hold-pres.3ʳᵈ.sg the tweezers
         This one is holding the tweezers.

         Este   é   un lápiz verde. --- G5
         this be-pres.3ʳᵈ.sg a pencil green
         This is a green pencil.

TARGET: Esta   é   a man que   suxeita   o lapis.
        this be-pres.3ʳᵈ.sg the hand that hold-pres.3ʳᵈ.sg the pencil
        This is the hand that is holding the pencil.

24.   Estes   son   a dous euros. --- G1
         these be-pres.3ʳᵈ.pl at two euros
         These ones cost two euros.

         E   estes   son   máis baratos. --- G2
         and these be-pres.3ʳᵈ.pl more cheap
         And these ones are cheaper.

         Estes plátanos   custan   dous euros. --- G3
         these bananas cost-pres.3ʳᵈ.pl two euros
         These bananas cost two euros.

TARGET: Estes   son   os plátanos que   custan   dous euros.
        these be-pres.3ʳᵈ.pl the bananas that cost-pres.3ʳᵈ.pl two euros
        These are the bananas that cost two euros.

- Omission of Relative Clauses + Main verb omission

2.   Este verde. --- G1
         this green
         This one green.

         E   este azul. --- G2
         and this blue
         And this one blue.

TARGET: Este   é   o lapis que   pinta   de cor verde.
        this be-pres.3ʳᵈ.sg the pencil that paint-pres.3ʳᵈ.sg of color green
        This is the pencil that colors green.

3.   Pero a montaña non. --- G1
         but the mountain not
         But not the mountain.

TARGET: Este   é   o tren que   pasa   pola montaña.
        this be-pres.3ʳᵈ.sg the train that pass-pres.3ʳᵈ.sg by-the mountain
        This is the train that goes through the mountains.

6.   Este unha moto. --- G1
         this a motorbike
         This one a motorbike.

TARGET: Este   é   o home que   conduce   unha moto.
        this be-pres.3ʳᵈ.sg the man that drive-pres.3ʳᵈ.sg a motorbike
        This is the man that is driving a motorbike.

9.   E este a   porta do camión. --- G2
       and this the door of-the truck
       And this one the door of the truck.

TARGET: Esta   é   a chave que   abre   a porta.
       this be-pres.3rd.sg the key that open-pres.3rd.sg the door
       This is the key that opens the door.

10.   E esta... outra non. --- G1
       and this other not
       And this one... another one... no

TARGET: Esta   é   a rapaza que   mira   a folla.
       this be-pres.3rd.sg the girl that look-pres.3rd.sg the leaf
       This is the girl that is looking at the leaf.

11.   Esta mazás. --- G1
       this apples
       This one apples.

TARGET: Esta   é   a árbore que   da   mazás.
       this be-pres.3rd.sg the tree that give-pres.3rd.sg apples
       This is the tree that produces apples.

12.   Este moi baixo. --- G1
       this very low
       This one very low.

TARGET: Este   é   o avión que   voa   baixo.
       this be-pres.3rd.sg the plane that fly-pres.3rd.sg low
       This is the plane that is flying low.

15.   *Este o gato. --- G1
       this the cat
       *This one the cat.

TARGET: Este   é   o neno que   pasea   o gato.
       this be-pres.3rd.sg the boy that walk-pres.3rd.sg the cat
       This is the boy that is taking the cat for a walk.

16.   *Esta a sumar. --- G1
       this to add-up-INF
       *This one to add up.

TARGET: Esta é a mestra que ensina matemáticas.
       this be-pres.3rd.sg the teacher that teach-pres.3rd.sg mathematics
       This is the teacher that is teaching mathematics.

18.   E esta... non, non, en *ballar ou... --- G1
       and this no   no   in dance-INF or
       And this one… no, no, in dancing or…

       Esta en quedarse. --- G4
       this in stay-herself
       This one in staying.

TARGET: Esta   é   a muller que   pensa   en roupa.
       this be-pres.3rd.sg the woman that think-pres.3rd.sg in clothes
       This is the woman that is thinking about clothes.

24.   E este dous e medio. --- G4
and this two and half
And this one two and a half.

Estes dous. --- G5
these two
These ones two.

TARGET: Estes   son   os plátanos que   custan   dous euros.
these be-pres.3rd.pl the bananas that cost-pres.3rd.pl two euros
These are the bananas that cost two euros.

25.   *Este coa pelota. --- G1
this with-the ball
*This one with the ball.

Bueno pois... non... non... o porteiro. --- G4
well then no no the goal-keeper
Well then… no… no… the goal-keeper.

TARGET: Este   é   o neno que   xoga   co balón.
this be-pres.3rd.sg the boy that play-pres.3rd.sg with-the ball
This is the boy that is playing with the ball.

- Verbless Relatives

14.   Este   é   o coche que moito. --- G4
this be-pres.3rd.sg the car that much
This is the car that a lot.

TARGET: Este   é   o coche que   corre   moito.
this be-pres.3rd.sg the car that run-pres.3rd.sg much
This is the car that goes fast.

23.   *Este unha man que... un lapis. --- G1
this a hand that a pencil
*This one a hand that... a pencil.

TARGET: Esta   é   a man que   suxeita   o lapis.
this be-pres.3rd.sg the hand that hold-pres.3rd.sg the pencil
This is the hand that is holding the pencil.

- Omission of copula in main sentence

9.   Esta a que   abre   a corda. --- G4
this the that open-pres.3rd.sg the string
This the one that opens the string.

TARGET: Esta   é   a chave que   abre   a porta.
this be-pres.3rd.sg the key that open-pres.3rd.sg the door
This is the key that opens the door.

11.   E esta que non   da   flores. --- G4
and this that not give-pres.3rd.sg flowers
And this one that does not produce flowers.

TARGET: Esta   é   a árbore que   da   mazás.
this be-pres.3rd.sg the tree that give-pres.3rd.sg apples
This is the tree that produces apples.

22.　　　E　　ese que　　　leva　　　gafas. --- G4
　　　　and that that wear-pres.3rd.sg glasses
　　　　And that one that is wearing glasses.

TARGET: Este　　é　　　o　home que　　leva　　　gafas.
　　　　this be-pres.3rd.sg the man that wear-pres.3rd.sg glasses
　　　　This is the man that is wearing glasses.

- 'Don't know' responses

8.　　　'Don't know' response　---　G2

TARGET: Este　　é　　　o　peixe que　　　vive　　　na peixeira.
　　　　this be-pres.3rd.sg the fish that live-pres.3rd.sg in-the fishbowl
　　　　This is the fish that lives in the fishbowl.

13.　　　Non, non, non... E esta... Non.　---　G1
　　　　no　no　no　and this　no
　　　　No, no, no… And this one… no.

TARGET: Esta　　é　　　a ximnasta que　　emprega o balón.
　　　　this be-pres.3rd.sg the gymnast that use-pres.3rd.sg the ball
　　　　This is the gymnast that is using the ball.

- Omission of the object relative

7.　　　Este é　　　un árbol. --- G1
　　　　this be-pres.3rd.sg a tree
　　　　This is a tree.

　　　　Estes　　son　　os árbores. --- G2
　　　　these be-pres.3rd.pl the trees
　　　　These are the trees.

　　　　E　este… o… ese… a pista… non　　sei. --- G4
　　　　and this　the　that　the road　not know-pres.1st.sg
　　　　And this one… the… that one… the road… I do not know.

TARGET: Esta　　é　　　a árbore que　　　ve　　Xoán dende a súa fiestra.
　　　　this be-pres.3rd.sg the tree that see-pres.3rd.sg X. from the his window
　　　　This is the tree that John sees from his window.

SPANISH

<u>Task 1.a</u>

- Omission of Negation

  19.   Santiago evitaba   el   problema. --- S3
           S.   avoid-imp.3rd.sg the problem
           Santiago was avoiding the problem.

TARGET: Santiago no evitaba   el problema.
        S.   not avoid-imp.3rd.sg the problem
        Santiago was not avoiding the problem.

  20.   Los   socios   llegan   a *ningún acuerdo. --- S3
           the members reach-pres.3rd.pl to no agreement
           The members reach *any agreement.

TARGET: Los socios no llegan a un acuerdo.
        the members not reach-pres.3rd.pl to an agreement
        The members do not reach an agreement.

- Tense Substitutions

  1.   Mañana   no   juego   al golf. --- S4
           tomorrow not play-pres.1st.sg to-the golf
           *Tomorrow I do not play golf.

TARGET: Mañana no veremos a Juan.
        tomorrow not see-fut.1st.pl to J.
        Tomorrow we will not see John.

  2.   Ellos no   salen   temprano. --- S2
           they not leave-pres.3rd.pl early
           They do not leave early.

TARGET: Ellos no   salían   temprano.
        they not leave-imp.3rd.pl early
        They were not leaving early.

  4.   Nosotros no actuamos el martes. --- S2
           we not perform-pres.1st.pl the tuesday
           We do not perform on Tuesday.

           Los niños no actuarían   el martes. --- S3
           the children not perform-cond.3rd.pl the tuesday
           The children would not perform on Tuesday.

TARGET: Los niños no actuaban el martes.
        the children not perform-imp.3rd.pl the tuesday
        The children were not performing on Tuesday.

  6.   Los chicos no   pescan   carpas. --- S1
           the boys not fish-pres.3rd.sg carps
           They boys do not catch carp.

TARGET: Los chicos no pescarán carpas.
        the boys not fish-fut.3rd.sg carps
        They boys will not catch carp.

7.   *Almodóvar no dirigí esta película. --- S1
       A.   not direct-pret.1st.sg this film
       *Almodóvar did not direct this film.

       Almodóvar no necesita esa película. --- S2
       A.   not need-pres.3rd.sg that film
       Almodóvar does not need that film.

TARGET: Almodóvar no dirigía esta película.
       A.   not direct-imp.3rd.sg this film
       Almodóvar was not directing this film.

8.   Marcos no vende su coche. --- S2
       M. not sell-pres.3rd.sg his car
       Marc is not selling his car.

       Marcos no vende su coche. --- S4
       M. not sell-pres.3rd.sg his car
       Marc is not selling his car.

TARGET: Marcos no venderá su coche.
       M. not sell-fut.3rd.sg his car
       Marc will not sell his car.

9.   Jorge no irá a la piscina. --- S3
       J. not go-fut.3rd.sg to the swimming-pool
       George will not go to the swimming-pool.

       Jorge no va a la piscina. --- S4
       J. not go-pres.3rd.sg to the swimming-pool
       George does not go to the swimming-pool.

       Jorge no va a la piscina. --- S5
       J. not go-pres.3rd.sg to the swimming-pool
       George does not go to the swimming-pool.

TARGET: Jorge no iba a la piscina.
       J. not go-imp.3rd.sg to the swimming-pool
       George was not going to the swimming-pool.

11.   Hoy no pedí unos libros. --- S1
       today not ask-for-pret.1st.sg some books
       Today I did not ask for books.

TARGET: Hoy no pedimos unos libros.
       today not ask-for-pres.1st.pl some books
       Today we are not asking for books.

13.   Pedro no gana la carrera. --- S1
       P. not win-pres.3rd.sg the race
       Peter does not win the race.

TARGET: Pedro no ganará la carrera.
       P. not win-fut.3rd.sg the race
       Peter will not win the race.

14.   Hoy no nacieron pollitos. --- S2
       today not hatch-pret.3rd.pl chicks
       Today chicks did not hatch.

TARGET: Hoy   no   nacerán   pollitos.
    today not hatch-fut.3rd.pl chicks
    Today no chicks will hatch.

19.   Santiago no evita   el problema. --- S2
    S. not avoid-pres.3rd.sg the problem
    Santiago does not avoid the problem.

TARGET: Santiago no evitaba el problema.
    S. not avoid-imp.3rd.sg the problem
    Santiago was not avoiding the problem.

22.   Sara no me   cuenta   la historia. --- S1
    S. not me tell-pres.3rd.sg the story
    Sarah does not tell me the story.

TARGET: Sara no me   contará   la historia.
    S. not me tell-fut.3rd.sg the story
    Sarah will not tell me the story.

- Agreement substitutions

7.   *Almodóvar no dirigí esta película. --- S1
    A.   not direct-pret.1st.sg this film
    *Almodóvar did not direct this film.

TARGET: Almodóvar no   dirigía   esta película.
    A.   not direct-imp.3rd.sg this film
    Almodóvar was not directing this film.

Task 1.b

- Omissions/Errors with Negation

3.   *Ningunos marineros pudieron salir al mar. --- S3
    none   sailors can-pret.3rd.pl go-out-INF to-the sea
    *Any sailor could go to sea.

TARGET: Los marineros no   tenían   que salir   al   mar.
    the sailors   not have-to-imp.3rd.pl that go-out-INF to-the sea
    The sailors did not have to go to sea.

4.   Ninguno ha bailado con María. --- S3
    no-one   have-pres.3rd.sg danced with M.
    No one has danced with Mary.

TARGET: Tú no   has   bailado con María.
    you not have-pres.2nd.sg danced with M.
    You have not danced with Mary.

8.   Nosotros debemos   de correr *ningún kilómetro. --- S3
    we   must-pres.1st.pl of run-INF none kilometer
    We must run *any kilometer.

TARGET: Vosotros no   debéis   correr un kilómetro.
    you   not must-pres.2nd.pl run-INF one kilometer
    You must not run one kilometer.

10.   Yo   he   estudiado poco. --- S2
I have-pres.1ˢᵗ.sg studied little
I have studied very little.

Yo   había   estudiado poco. --- S4
I have-imp.1ˢᵗ.sg studied little
I had studied very little.

TARGET: Yo no   había estudiado mucho.
I not have-imp.1ˢᵗ.sg studied much
I had not studied much.

13.   Los carpinteros   tienen   que terminar el trabajo. --- S3
the carpenters have-pres.3ʳᵈ.pl that finish-INF the job
The carpenters have to finish the job.

TARGET: Los carpinteros no   han   terminado el trabajo.
the carpenters not have-pres.3ʳᵈ.pl finished the job
The carpenters have not finished the job.

14.   Nosotros podíamos coser la blusa. --- S3
we can-imp.1ˢᵗ.pl sew-INF the blouse
We were able to sew the blouse.

TARGET: Nosotros no podíamos coser la blusa.
we not can-imp.1ˢᵗ.pl sew-INF the shirt
We could not sew the shirt.

16.   Tú   has   venido   rápido. --- S4
you have-pres.2ⁿᵈ.sg come-PART fast
You have come fast.

TARGET: Tú   no   tardaste   en llegar.
you not take-a-long-time-pret.2ⁿᵈ.sg in arrive
It did not take you a long time to arrive.

- Tense substitutions: auxiliary verbs

4.   Tú no   habías   bailado con María. --- S5
you not have-imp.2ⁿᵈ.sg danced with M.
You had not danced with Mary.

TARGET: Tú no   has   bailado con María.
you not have-pres.2ⁿᵈ.sg danced with M.
You have not danced with Mary.

5.   Vosotros no   habíais   ido a la playa. --- S5
you   not have-imp.2ⁿᵈ.pl gone to the beach.
You had not gone to the beach.

TARGET: Vosotros no   habéis   ido a la playa.
you   not have-pres.2ⁿᵈ.pl gone to the beach.
You have not gone to the beach.

10.   Yo   he   estudiado poco. --- S2
I have-pres.1ˢᵗ.sg studied little
I have studied very little.

TARGET: Yo no   había estudiado mucho.
I not have-imp.1ˢᵗ.sg studied much
I had not studied much.

12.   Vosotros no   habíais   fregado los platos. --- S5
         you   not have-imp.2nd.pl washed the dishes
         You had not washed the dishes.

TARGET: Vosotros no   habéis   fregado los platos.
         you   not have-pres.2nd.pl washed the dishes
         You have not washed the dishes.

20.   Las modistas   no   han   creado una fábrica. --- S2
         the dressmakers not have-pres.3rd.pl set-up a factory
         The dressmakers have not set up a factory.

TARGET: Las modistas no habían creado una fábrica.
         the dressmakers not have-imp.3rd.pl set-up a factory
         The dressmakers had not set up a factory.

25.   Ellas no   trajeron   la cena. --- S1
         they not bring-pret.3rd.pl the dinner
         They did not bring the dinner.

TARGET: Ellas no   han   traído la cena.
         they not have-pres.3rd.pl brought the dinner
         They have not brought the dinner.

- Simplification of complex tenses

7.   El niño no   hace   dos veces. --- S2
         the boy not make-pres.3rd.sg two times
         They boy does not do twice.

TARGET: El niño no   ha   tenido suerte.
         the boy not have-pres.3rd.sg had luck
         The boy has not been lucky.

13.   Los carpinteros   tienen   que terminar el trabajo. --- S3
         the carpenters have-pres.3rd.pl that finish-INF the job
         The carpenters have to finish the job.

TARGET: Los carpinteros no   han   terminado el trabajo.
         the carpenters not have-pres.3rd.pl finished the job
         The carpenters have not finished the job.

15.   Manuel no   adivina   la sorpresa. --- S1
         M.   not guess-pres.3rd.sg the surprise
         Manuel does not guess the surprise.

TARGET: Manuel no   ha   adivinado la sorpresa.
         M.   not have-pres.3rd.sg guessed the surprise
         Manuel has not guessed the surprise.

17.   Juan no   traía   comida. --- S4
         J. not bring-imp.3rd.sg food
         John was not bringing food.

TARGET: Juan no   había   traído comida.
         J. not have-imp.3rd.sg brought food
         John had not brought food.

- Simplification of complex tenses + tense substitutions

1.   No   merendé   chocolate. --- S1
not have-as-an-afternoon-snack-pret.1st.sg chocolate
I did not have chocolate as an afternoon snack.

TARGET: Yo no   he   merendado   chocolate.
I not have-pres.1st.sg had-as-an-afternoon-snack chocolate
I have not had chocolate as an afternoon snack.

2.   No   comí ninguna pizza. --- S1
not eat-pret.1st.sg none pizza
I did not eat any pizza.

    *Nosotros no hablamos pescado pizza. --- S2
we   not speak-pres.1st.pl fished pizza
*We do not speak fished pizza.

    Nosotros no   pedimos   pizza. --- S4
we   not ask-for-pret.1st.pl pizza
We did not ask for pizza.

TARGET: Nosotros no   habíamos   pedido pizza.
we   not have-imp.1st.pl asked-for pizza
We had not asked for pizza.

4.   Yo no   bailé   con María. --- S1
I not dance-pret.1st.sg with Mary
I did not dance with Mary.

TARGET: Tú   no   has   bailado con María.
you not have-pres.2nd.sg danced with M.
You have not danced with Mary.

6.   Yo no   canté ninguna canción. --- S1
I not sing-pret.1st.sg none song
I did not sing any songs.

TARGET: Yo no   he   cantado una canción.
I not have-pres.1st.sg sung a song
I have not sung a song.

- Tense substitutions: verbal periphrases

3.   *Ningunos marineros pudieron salir al mar. --- S3
none   sailors can-pret.3rd.pl go-out-INF to-the sea
*None sailor could go to the sea.

TARGET: Los marineros no   tenían   que salir   al mar.
the sailors   not have-to-imp.3rd.pl that go-out-INF to-the sea
The sailors did not have to go to the sea.

- Tense/agreement substitutions: verbal periphrases

9.   *Nosotros no   dejareis   de saber ciertas cosas. --- S5
we   not leave-fut.2nd.pl of know-INF certain things
*We will not stop knowing certain things.

TARGET: Nosotros no   llegamos   a saber muchas cosas.
we   not arrive-pres.1st.pl to know-INF many things
We do not get to know many things.

- Simplification of complex verbal clusters

  3.   No   podían   salir   al   mar. --- S1
  not can-imp.3rd.pl go-out-INF to-the sea
  They could not go to sea.

        Los marineros no salían.   --- S4
  The sailors not go-out-imp.3rd.pl
  The sailors were not going out.

TARGET: Los marineros no   tenían   que salir   al   mar.
the sailors   not have-to-imp.3rd.pl that go-out-INF to-the sea
The sailors did not have to go to sea.

  8.   Vosotros no habéis corrido. --- S4
  you not have-pres.2nd.pl run-PART
  You have not run.

TARGET: Vosotros no   debéis   correr un kilómetro.
you   not must-pres.2nd.pl run-INF one kilometer
You must not run one kilometer.

  9.   Nosotros no   sabemos ningunas cosas. --- S1
  we   not know-pres.1st.pl no things
  We do not know anything.

TARGET: Nosotros no   llegamos   a saber muchas cosas.
we   not arrive-pres.1st.pl to know-INF many things
We do not get to know many things.

  11.   Las   madres   non   van. --- S4
  the mothers not go-pres.3rd.pl
  The mothers are not going.

TARGET: Las   madres no   han   de ir.
the mothers not aux-pres.3rd.pl of go-INF
The mothers must not go.

  19.   Sandra no   iba   a los exámenes. --- S4
  S.   not go-imp.3rd.sg to the exams
  Sandra was not going to the exams.

TARGET: Sandra no   iba   pasando los exámenes.
S.   not go-imp.3rd.sg passing the exams
Sandra was not passing her exams.

  21.   Por la   mañana no llovió. --- S4
  at the morning not rain-pret.3rd.sg
  During the morning, it did not rain.

TARGET: Por la   mañana no   dejó   de   llover.
a*t the morning not leave-pret.3rd.sg of rain-INF.*
During the morning, it did not stop raining.

22.   El no   acabó   el inglés. --- S3
         he not finish-pret.3rd.sg the English
         He did not finish English.

TARGET: El no   acabó   estudiando inglés.
         he not finish-pret.3rd.sg studying English
         He did not end up studying English.

23.   No   cantamos. --- S1
         not sing-pres.1st.pl
         We do not sing.

TARGET: Nosotros no   dejamos   de cantar.
         we   not stop-pret.1st.pl of sing-INF
         We did not stop singing.

24.   Tú no   recordabas   ninguna fiesta. --- S3
         you not remember-imp.2nd.sg no party
         You did not remember any party.

TARGET: Tú no   seguías   recordando aquella fiesta.
         you not go-on-imp.2nd.sg   remembering that party
         You did not continue to remember that party.

- Simplification of complex verbal clusters + tense substitutions

3.   *Ningunos marineros pudieron salir al mar. --- S3
         none   sailors can-pret.3rd.pl go-out-INF to-the sea
         *None sailor could go to sea.

TARGET: Los marineros no   tenían   que   salir   al   mar.
         the sailors   not have-to-imp.3rd.pl that go-out-INF to-the sea
         The sailors did not have to go to sea.

14.   Nosotros no cosemos.   --- S4
         we not sew-pres.1st.pl
         We do not sew.

TARGET: Nosotros no podíamos coser la blusa.
         we not can-imp.1st.pl sew-INF the blouse
         We could not sew the blouse.

16.   Tú   has   venido   rápido. --- S4
         you have-pres.2nd.sg come-PART   fast
         You have come quickly.

         Tú   no   tardabas   en llegar. --- S5
         you not take-a-long-time-imp.2nd.sg in arrive-INF
         It did not take you a long time to arrive.

TARGET: Tú no   tardaste   en llegar.
         you not take-a-long-time-pret.2nd.sg in arrive-INF
         It did not take you a long time to arrive.

18.   Las niñas no   estaban llorando.   --- S2
         the girls not be-imp.3rd.pl crying
         The girls were not crying.

TARGET: Las niñas no   se   echaron   a llorar.
        the girls not themselves throw-pret.3rd.pl to cry-INF
        The girls did not burst into tears.

19.   Sandra no   había   pasado los exámenes.   --- S1
        S.   not have-imp.3rd.sg passed the exams
        Sandra had not passed the exams.

        Sandra no   pasó   los exámenes.   --- S3
        S.   not pass-pret.3rd.sg the exams
        Sandra did not pass the exams.

        Sandra no   había   pasado los exámenes.   --- S5
        S.   not have-imp.3rd.sg passed the exams
        Sandra had not passed the exams.

TARGET: Sandra no   iba   pasando los exámenes.
        S.   not go-imp.3rd.sg passing the exams
        Sandra was not passing her exams.

24.   Yo no   recordaría   aquella fiesta.   --- S2
        I not remember-cond.1st.sg that party
        I would not remember that party.

TARGET: Tú no   seguías   recordando aquella fiesta.
        you not go-on-imp.2nd.sg remembering that party
        You did not continue to remember that party.

- 'Don't know' responses

8.   Vosotros no...   --- S5
        you   not
        You not…

TARGET: Vosotros no   debéis   correr un kilómetro.
        you   not must-pres.2nd.pl run-INF one kilometer
        You must not run one kilometer.

Task 2.a

- WH- substituted with Y/N

1.   ¿Carne? ¿Pescado?   --- S2
        meat   fish
        Meat? Fish?

        ¿Tú   comiste   ayer?   --- S5
        you eat-pret.2nd.sg yesterday
        Did you eat yesterday?

TARGET: ¿Qué   comiste   ayer?
        what eat-pret.2nd.sg yesterday
        What did you eat yesterday?

3.   ¿Una pelota? ¿Un libro?   --- S2
        a ball   a book
        A ball? A book?

TARGET: ¿Qué   busca   Juan?
what look-for-pres.3rd.sg J.
What is John looking for?

4.   ¿Vas   a   saber   dónde   vas   a ir? --- S3
go-pres.2nd.sg to know-INF where go-pres.2nd.sg to go
Are you going to know where you are going to go?

TARGET: ¿Cuándo   vas   a ir?
when   go-pres.2nd.sg to go-INF
When are you going to go?

7.   ¿Usted   sabe   la   edad? ---   S2
you know-pres.3rd.sg the age
Do you know the age?

TARGET: ¿Cuántos   años   tienes?
how-many years have-pres.2nd.sg
How old are you?

9.   ¿Tienes   unos cuantos   hermanos? ---   S3
have-pres.2nd.sg a   few siblings
Do you have a few siblings?

           ¿Tienes seis? ---   S4
have-pres.2nd.sg six
Do you have six?

TARGET: ¿Cuántos hermanos tienes?
how-many siblings have-pres.2nd.sg
How many siblings do you have?

12.   ¿Son diez horas? ---   S4
be-pres.3rd.pl ten hours
Is it ten hours?

TARGET: ¿Cuántas   horas   duermes?
how-many hours sleep-pres.2nd.sg
How many hours do you sleep?

15.   ¿En la biblioteca? ---   S2
in   the library
In the library?

           ¿Lees en la biblioteca? ---   S4
read-pres.2nd.sg in the library
Do you read in the library?

           Este libro tan bonito… ¿estás por aquí? ---   S3
this book so beautiful   be-pres.2nd.sg for here
This book so beautiful… are you in here?

TARGET: ¿Dónde lees?
where read-pres.2nd.sg
Where do you read?

19.   ¿Tú   eres   catalana? ---   S1
you be-pres.2nd.sg Catalan
Are you Catalan?

¿Eres catalana?, ¿andaluza?, ¿alemana? --- S3
be-pres.2nd.sg Catalan Andalusian German
Are you Catalan? Andalusian? German?

TARGET: ¿De dónde eres?
of where be-pres.2nd.sg
Where are you from?

22.   ¿Me   puedes   decir el piso de la casa de Sandra? --- S5
me can-pres.2nd.sg say-INF the apartment of the house of S.
Can you tell me the apartment of Sandra's house?

TARGET: ¿Cuánto   costó   la casa de Sandra?
how-much cost-pret.3rd.sg the house of S.
How much did Sandra's house cost?

23.   ¿Están   todos vendidos? --- S2
be-pres.3rd.pl all sold
Are they all sold?

TARGET: ¿Cuántos   apartamentos   vendió Carlos?
how-many apartments sell-pret.3rd.sg C.
How many apartments did Charles sell?

- Wrong WH-morpheme selection

4.   *¿Qué fecha   vas   a ese sitio? --- S1
what date go-pres.2nd.sg to that place
*What date do you go to that place?

*¿Qué fecha vas? --- S5
what date go-pres.2nd.sg
*What date do you go?

TARGET: ¿Cuándo   vas   a ir?
when go-pres.2nd.sg to go
When are you going to go?

7.   ¿Cuánta edad   tienes   tú? --- S1
how-much age have-pres.2nd.sg you
How much age do you have?

TARGET: ¿Qué edad   tienes   tú?
what age have-pres.2nd.sg you
How old are you?

17.   ¿Qué clase de pastel hicieron? --- S2
what kind of cake make-pret.3rd.pl
What kind of cake did they make?

TARGET: ¿Cómo   hicieron   el pastel las chicas?
how make-pret.3rd.pl the cake the girls
How did the girls make the cake?

22.   *¿Qué precio las   compró? --- S1
what price them buy-pret.3rd.sg
*What price did he/she buy them?

*¿Cómo te costaría la casa? --- S4
how to-you cost-cond.3rd.sg the house
*How would the house cost you?

TARGET: ¿Cuánto   costó   la casa de Sandra?
how-much cost-pret.3rd.sg the house of S.
How much did Sandra's house cost?

23.   ¿A quién se   los   vendió? --- S4
to whom CL them sell-pret.3rd.sg
To whom did he sell them?

TARGET: ¿Cuántos apartamentos vendió   Carlos?
how-many apartments sell-pret.3rd.sg C.
How many apartments did Charles sell?

25.   *¿Qué manera rompió   Andrés la ventana? --- S5
what   way break-pret.3rd.sg A.   the window
*What way did Andrew break the window?

TARGET: ¿Cómo   rompió   Andrés la ventana?
how break-pret.3rd.sg A. the window
How did Andrew break the window?

- Wrong answer

12.   ¿Cuántas veces duermes? --- S3
how-many times sleep-pres.2nd.sg
How many times do you sleep?

TARGET: ¿Cuántas   horas   duermes?
how-many hours sleep-pres.2nd.sg
How many hours do you sleep?

25.   ¿Cómo cogió ésta? --- S3
how catch-pret.3rd.sg this
How did he take this one?

TARGET: ¿Cómo   rompió   Andrés la ventana?
how break-pret.3rd.sg A. the window
How did Andrew break the window?

- WH- substituted with a declarative

1.   En un restaurante, en un club. --- S3
in a restaurant in a club
In a restaurant, in a club.

TARGET: ¿Qué   comiste   ayer?
what eat-pret.2nd.sg yesterday
What did you eat yesterday?

3.   Juan tiene   una cosa que me   pertenece   a mí. --- S3
J. have-pres.3rd.sg a thing that me belong-pres.3rd.sg to me
John has something that belongs to me.

TARGET: ¿Qué   busca   Juan?
what look-for-pres.3rd.sg J.
What is John looking for?

21.   Las costureras   están   enfadadas porque… --- S1
   the dressmakers be-pres.3rd.pl angry because
   The dressmakers are angry because…

   Las costureras   están   enfadadas por lo tanto voy   a darles un premio. --- S3
   the dressmakers be-pres.3rd.pl angry therefore go-pres.1st.sg to give-them a prize
   The dressmakers are angry, so I am going to give them a prize.

TARGET: ¿Por qué están enfadadas las costureras?
   for what be-pres.3rd.pl angry the dressmakers
   Why are the dressmakers angry?

- WH- + NP

4.   ¿Qué día o qué hora? --- S2
   what day or what hour
   What day or what time?

TARGET: ¿Cuándo vas   a ir?
   when go-pres.2nd.sg to go
   When are you going to go?

- 'Don't know' responses with WH-tokens

17.   'Don't know' response --- S5
TARGET: ¿Cómo   hicieron   el pastel las chicas?
   how make-pret.3rd.pl the cake the girls
   How did the girls make the cake?

- Y/N substituted with WH-

2.   *¿Cómo fuiste   que jugamos? --- S4
   how be-pret.2nd.sg that play-pres.1st.pl
   *How were you that we play?

TARGET: ¿Jugamos a las cartas?
   play-pres.1st.pl to-the cards
   Shall we play cards?

- Wrong answer

2.   ¿Sabes   jugar a las cartas? --- S1
   know-pres.2nd.sg play to the cards
   Do you know how to play cards?

   ¿Tuvimos   cartas? --- S3
   have-pret.1st.pl cards
   Did we have cards?

TARGET: ¿Jugamos   a las cartas?
   play-pres.1st.pl to the cards
   Shall we play cards?

6.   ¿Ha   tocado   el agua? --- S3
   have-pres.3rd.sg touched the water
   Has he/she/it touched the water?

TARGET: ¿Tienen   frío los pescadores?
       have-pres.3rd.pl cold the sailors
       Are the sailors cold?

- Y/N substituted with a declarative

5.   *El rojo   es   pregunta. --- S3
    the red be-pres.3rd.sg question
    *Red is question.

    No   te   va   a gustar el color rojo. --- S4
    not to-you go-pres.3rd.sg to like the color red
    You are not going to like the color red.

TARGET: ¿Te   gusta   el color rojo?
       you like-pres.3rd.sg the color red
       Do you like the color red?

11.   Tú   eres   buena cocinera. --- S3
    you be-pres.2nd.sg good cook
    You are a good cook.

TARGET: ¿Eres   buena cocinera?
       be-pres.2nd.sg good cook
       Are you a good cook?

14.   *Yo también quería viaje. --- S3
    I also want-imp.1st.sg travel
    *I also wanted travel.

TARGET: ¿Iré   de viaje?
       go-fut.1st.sg of trip
       Am I going to go on a trip?

18.   A lo mejor nos vamos de vacaciones. --- S3
    at the best us go-pres.1st.pl of vacation
    Maybe we are going away on vacation.

TARGET: ¿Iremos   de vacaciones?
       go-fut.1st.pl-us of vacation
       Are we going to go away on vacation?

20.   Los primos primogénitos y ya   está. --- S3
    the cousins first-born and already be-pres.3rd.sg
    The first-born cousins and that's it.

TARGET: ¿Vendrán   a Barcelona tus   primos?
       come-fut.3rd.pl to B.   your cousins
       Are your cousins going to come to Barcelona?

24.   Tú   podrás   tocar el piano. --- S3
    you can-fut.2nd.sg play the piano
    You will be able to play the piano.

TARGET: ¿Tocas   el piano?
       play-pres.2nd.sg the piano
       Do you play the piano?

- 'Don't know' responses

    6.　　'Don't know' response --- S4

TARGET: ¿Tienen　　　frío los pescadores?
have-pres.3rd.pl cold the sailors
Are the sailors cold?

Task 2.b

- Relative Omission

    1.　　Éste　　tiene　　el pelo marrón. --- S1
    this have-pres.3rd.sg the hair brown
    This one has brown hair.

    Este hombre tiene　　el pelo negro. --- S2
    this man have-pres.3rd.sg the hair black
    This man has black hair.

TARGET: Éste　　es　　el hombre que tiene　　el pelo negro.
this be-pres.3rd.sg the man that have-pres.3rd.sg the hair black
This is the man that has black hair.

    4.　　Ese hombre nada　　en la playa. --- S1
    that man swim-pres.3rd.sg in the beach
    That man is swimming at the beach.

    Este hombre nada　　en el amanecer. --- S2
    this man swim-pres.3rd.sg in the sunshine
    This man is swimming in the sunshine.

TARGET: Éste　　es　　el hombre que　nada　　en el mar.
this be-pres.3rd.sg the man that swim-pres.3rd.sg in the sea
This is the man that is swimming in the sea.

    5.　　Esta chica morena lleva　　un collar. --- S1
    this girl dark-haired wear-pres.3rd.sg a necklace
    This dark-haired girl is wearing a necklace.

    Esta mujer no　　lleva　　pendientes. --- S2
    this woman not wear-pres.3rd.sg earrings
    This woman is not wearing earrings.

TARGET: Ésta　　es　　la mujer que　　lleva　　collar.
this be-pres.3rd.sg the woman that wear-pres.3rd.sg necklace
This is the woman that is not wearing a necklace.

    6.　　Este chico　conduce　una moto. --- S1
    this boy drive-pres.3rd.sg a motorbike
    This boy is driving a motorbike.

TARGET: Éste　　es　　el hombre que　conduce　una moto.
this be-pres.3rd.sg the man that drive-pres.3rd.sg a motorbike
This is the man that is driving a motorbike.

    8.　　Este pez　　vive　　en la piscina. --- S1
    this fish live-pres.3rd.sg in the swimming-pool
    This fish lives in the swimming-pool.

Éste no vive en el mar. --- S4
this not live-pres.3rd.sg in the sea
This one does not live in the sea.

TARGET: Éste es el pez que vive en la pecera.
this be-pres.3rd.sg the fish that live-pres.3rd.sg in the fishbowl
This is the fish that lives in the fishbowl.

9. Esa llave abre la puerta de madera. --- S1
this key open-pres.3rd.sg the door of wood
This key opens the wooden door.

TARGET: Ésta es la llave que abre la puerta.
this be-pres.3rd.sg the key that open-pres.3rd.sg the door
This is the key that opens the door.

10. Esta chica mira la hoja. --- S2
this girl look-pres.3rd.sg the leaf
This girl is looking at the leaf.

TARGET: Ésta es la chica que mira la hoja.
this be-pres.3rd.sg the girl that look-pres.3rd.sg the leaf
This is the girl that is looking at the leaf.

12. El avión está despegando. --- S1
the plane be-pres.3rd.sg taking-off
The plane is taking off.

TARGET: Éste es el avión que vuela bajo.
this be-pres.3rd.sg the plane that fly-pres.3rd.sg low
This is the plane that is flying low.

13. Ésta juega al tenis. --- S2
this play-pres.3rd.sg to-the tennis
This one is playing tennis.

TARGET: Ésta es la gimnasta que usa la pelota.
this be-pres.3rd.sg the gymnast that use-pres.3rd.sg the ball
This is the gymnast that is using the ball.

14. Ese coche corre mucho. --- S1
this car run-pres.3rd.sg much
This car goes very fast.

Éste es el coche deportivo. --- S2
this be-pres.3rd.sg the car sportive
This is the sports car.

TARGET: Éste es el coche que corre mucho.
this be-pres.3rd.sg the car that run-pres.3rd.sg much
This is the car that goes very fast.

15. Ese niño pasea el gato. --- S1
that boy walk-pres.3rd.sg the cat
That boy is taking the cat for a walk.

*Ese niño pasea gato. --- S5
that boy walk-pres.3rd.sg cat
*That boy is taking cat for a walk.

TARGET: Éste es el niño que pasea al gato.
this be-pres.3rd.sg the boy that walk-pres.3rd.sg to-the cat
This is the boy that is taking the cat for a walk.

16. Ésa es la profesora de matemáticas. --- S1
this be-pres.3rd.sg the teacher of mathematics
This is the mathematics teacher.

Ésta no es la profesora. --- S4
this not be-pres.3rd.sg the teacher
This is not the teacher.

TARGET: Ésta es la profesora que enseña matemáticas.
this be-pres.3rd.sg the teacher that teach-pres.3rd.sg mathematics
This is the teacher that is teaching mathematics.

17. Éste tiene mucha luz. --- S4
this have-pres.3rd.sg much light
This one has a lot of light.

TARGET: Éste es el barco que tiene mucha luz.
this be-pres.3rd.sg the ship that have-pres.3rd.sg much light
This is the ship that has a lot of lights on.

18. Esta mujer no piensa en viajar. --- S2
this woman not think-pres.3rd.sg in travelling
This woman is not thinking about travelling.

Ésta no piensa en viajar. --- S4
this not think-pres.3rd.sg in travelling
This one is not thinking about travelling.

TARGET: Ésta es la mujer que piensa en ropa.
this be-pres.3rd.sg the woman that think-pres.3rd.sg in clothes
This is the woman that is thinking about clothes.

19. Ese vaso tiene vino. --- S1
that glass have-pres.3rd.sg wine
That glass contains wine.

Este vaso tiene coca-cola. --- S2
that glass have-pres.3rd.sg oca-cola
That glass contains Coca-Cola.

Aquí está libre. --- S4
here be-pres.3rd.sg free
Here it is free.

TARGET: Éste es el vaso que tiene vino.
this be-pres.3rd.sg the glass that have-pres.3rd.sg wine
This is the glass that has wine.

20. La chica morena está llorando. --- S1
the girl dark-haired be-pres.3rd.sg crying
The dark-haired girl is crying.

Esta chica no sonríe. --- S2
this girl not smile-pres.3rd.sg
This girl is not smiling.

TARGET: Ésta es la chica que llora.
this be-pres.3rd.sg the girl that cry-pres.3rd.sg
This is the girl that is crying.

21. Este reloj marca las tres. --- S2
this watch show-pres.3rd.sg the three
This watch shows three o'clock.

TARGET: Éste es el reloj que marca las tres.
this be-pres.3rd.sg the watch that show-pres.3rd.sg the three
This is the watch that shows three o'clock.

22. Este chico lleva gafas. --- S1
this boy wear-pres.3rd.sg glasses
This boy is wearing glasses.

Este hombre no lleva sombrero. --- S2
this man not wear-pres.3rd.sg hat
This man is not wearing a hat.

Éste es el de gafas. --- S3
this be-pres.3rd.sg the of glasses
This one is the one with glasses.

TARGET: Éste es el hombre que lleva gafas.
this be-pres.3rd.sg the man that wear-pres.3rd.sg glasses
This is the man that is wearing glasses.

23. Esa mano sujeta un lápiz verde. --- S1
that hand hold-pres.3rd.sg a pencil green
That hand is holding a green pencil.

Ésta es la mano del lapicero. --- S2
this be-pres.3rd.sg the hand of-the pencil
This is the hand of the pencil.

TARGET: Ésta es la mano que sujeta el lápiz.
this be-pres.3rd.sg the hand that hold-pres.3rd.sg the pencil
This is the hand that is holding the pencil.

24. Éstos cuestan dos euros. --- S2
these cost-pres.3rd.pl two euros
These ones cost two euros.

Éstos son más pequeños. --- S4
these be-pres.3rd.pl more small
These ones are smaller.

Éstos cuestan dos euros. --- S5
these cost-pres.3rd.pl two euros
These ones cost two euros.

TARGET: Éstos son los plátanos que cuestan dos euros.
these be-pres.3rd.pl the bananas that cost-pres.3rd.pl two euros
These ones are the bananas that cost two euros.

25. Este niño juega con el balón. --- S1
this boy play-pres.3rd.sg with the ball
This boy is playing with the ball.

Este niño   juega   con balón. --- S2
this boy play-pres.3rd.sg with ball
This boy is playing with ball.

Éste   es   un fenómeno. --- S4
this be-pres.3rd.sg a phenomenon
This one is a phenomenon.

TARGET: Éste   es   el niño que   juega   con la pelota.
this be-pres.3rd.sg the boy that play-pres.3rd.sg with the ball
This is the boy that is playing with the ball.

- Omission of copula in main sentence

    13.   Ésta es la gimnasia que… --- S3
            this is the gymnastics that
            This is the gymnastics that…

TARGET: Ésta   es   la gimnasta que   usa   la pelota.
        this be-pres.3rd.sg the gymnast that use-pres.3rd.sg the ball
        This is the gymnast that is using the ball.

    17.   Éste el barco que   tiene   mucha luz. --- S5
            this the ship that have-pres.3rd.sg much light
            This one the ship that has a lot of light.

TARGET: Éste   es   el barco que   tiene   mucha luz.
        this be-pres.3rd.sg the ship that have-pres.3rd.sg much light
        This is the ship that has a lot of lights on.

    21.   Ése que   marca   las tres. --- S1
            that that show-pres.3rd.sg the three
            That one that shows three o'clock.

TARGET: Éste   es   el reloj que   marca   las tres.
        this be-pres.3rd.sg the watch that show-pres.3rd.sg the three
        This is the watch that shows three o'clock.

- Omission of the object relative

    7.   Juan ve   un árbol. --- S1
            J. see-pres.3rd.sg a tree
            John sees a tree.

TARGET: Éste   es   el árbol que   ve   Juan desde su ventana.
        this be-pres.3rd.sg the tree that see-pres.3rd.sg J. from his window
        This is the tree that John sees from his window.

APPENDIX II

Corpus of data

Experimental Subjects

Test I – CATALAN MODERATE AGRAMMATIC

<u>Task 1.a</u>

- Errors with Negation

    18.   M'agrada   no llegir.
             me'like-pres.3rd.sg not read-INF
             *I like not read.

TARGET: No   m'agrada   llegir.
             not me'like-pres.3rd.sg read-INF
             I do not like reading.

- Tense Substitutions

    4.   Els nens no actuaran   dimarts.
             the children not perform-fut.3rd.pl tuesday
             The children will not perform on Tuesday.

TARGET: Els nens no   actuaven dimarts.
             the children not perform-imp.3rd.pl tuesday
             The children were not performing on Tuesday.

- Non-finite forms

    1.   *Demà   no   mirar Joan.
             tomorrow not see-INF J.
             *Tomorrow we not look John.

TARGET: Demà   no   veurem en Joan.
             tomorrow not see-fut.1st.pl the J.
             Tomorrow we will not see John.

- Sentences without verb

    2.   *Ells no d'hora.
             they not of'hour
             *They not early.

TARGET: Ells no   sortien   d'hora.
             they not leave-imp.3rd.pl of'hour
             They were not leaving early.

3.   *Demà no pomes.
          tomorrow not apples
          *Tomorrow not apples.

TARGET: Demà   no   recollirem pomes.
          tomorrow not pick-fut.1st.pl apples
          Tomorrow we will not pick apples.

5.   *L'Andreu no dos nens.
          the'A. not two babies.
          *Andrew not two babies.

TARGET: L'Andreu no té dos nens.
          the'A not have-pres.3rd.sg two babies
          Andrew does not have two babies.

6.   *Els nois no carpes.
          the boys not carps
          *The boys not carps.

TARGET: Els nois no   pescaran carpes.
           the boys not fish-fut.3rd.pl carps
           The boys will not catch carp.

8.   *En Marc no cotxe.
          the M.   not   car
          *Marc not car.

TARGET: En Marc no   vendrà   el seu cotxe.
          the M. not sell-fut.3rd.sg the his car
          Marc will not sell his car.

9.   *En Jordi no piscina.
          the J. not swimming-pool
          *George not swimming-pool.

TARGET: En Jordi no   anava   a la piscina.
          the J. not go-imp.3rd.sg to the swimming-pool
          George was not going to the swimming-pool.

10.   *La Sandra no flors.
          the   S.   not flowers
          *Sandra not flowers.

TARGET: La Sandra no comprava flors.
          the S. not buy-imp.3rd.sg flowers
          Sandra was not buying flowers.

11.   *Avui no llibres.
          today not books
          *Today not books.

TARGET: Avui no demanem   uns llibres.
          today not ask-pres.1st.pl some books
          Today we are not asking for books.

13.   *En Pere no cursa.
          the P. not race
          *Peter not race.

TARGET: En Pere no   guanyarà   la cursa.
      the P. not win-fut.3rd.sg the race
      Peter will not win the race.

14.   *Avui   no pollets.
      today   not chicks
      *Today not chicks.

TARGET: Avui   no   naixeran   pollets.
      today not hatch-fut.3rd.pl chicks
      Today no chicks will hatch.

15.   *Aquesta no del far.
      this not of-the lighthouse
      *This one not from the lighthouse.

TARGET: Aquesta llum no   surt   del   far.
      this   light not leave-pres.3rd.sg of-the lighthouse
      This light does not come from the lighthouse.

16.   *La Marta no futbol.
      the M. not football
      *Marta not football.

TARGET: La Marta no   juga   a   futbol.
      the M. not play-pres.3rd.sg to football
      Marta does not play football.

- 'Don't know' response

7.   *Almodóvar no...
      A.   not
      *Almodóvar doesn't…

TARGET: L'Almodóvar no   dirigia   aquesta pel·lícula.
      the'A.   not direct-imp.3rd.sg this film
      Almodóvar was not directing this film.

17.   'Don't know' response.

TARGET: Aquesta dona no   espera   cap fill.
      This   woman not expect-pres.3rd.sg none baby
      This woman is not expecting any babies.

19.   En Santi no… verb… no sé.
      the S. not   verb not know-pres.1st.sg
      James not… verb… I do not know.

TARGET: En Santi no   evitava   els problemes.
      the S.   not avoid-imp.3rd.sg the problems
      James was not avoiding the problems.

21.   *Aquestes nenes no verb.
      these   girls not verb
      *These girls not verb.

TARGET: Aquestes nenes no   viuen   amb mi.
      These   girls not live-pres.3rd.pl with me
      These girls do not live with me.

22.   *La Sara no verb.
        the S. not verb
        *Sara not verb.

TARGET: La Sara no   m'explicarà   la història.
        the S. not me'explain-fut.3rd.sg the story
        Sarah will not tell me the story.

23.   *Això no i un verb.
        that not and a verb
        * That not and a verb.

TARGET: Això no em preocupa.
        that not me worry-pres.3rd.sg
        That does not worry me.

24.   En Joan no... no   sé   verb...   és   difícil.
        the J. not   not know-pres.1st.sg verb be-pres.3rd.sg difficult
        John not… I do not know verb… It is difficult.

TARGET: En Joan no   plantava   arbres.
        the J.   not plant-imp.3rd.sg trees
        John was not planting trees.

25.   *L'Andreu no…
        the'A. not
        *Andrew doesn't…

TARGET: L'Andreu no   diu   tonteries.
        the'A.   not say-pres.3rd.sg silly-things
        Andrew does not say silly things.

Task 1.b

- Omissions/Errors with Negation

6.   Jo   he   cantat.
        I have-pres.1st.sg sung
        I have sung.

TARGET: Jo no   he   cantat cap cançó.
        I not have-pres.1st.sg sung none song
        I have not sung any songs.

- Tense substitutions

17.   En Joan no   menjar.
        the J.   not aux-pres.3rd.sg eat
        John did not eat.

TARGET: En Joan no   havia   portat   menjar.
        the J. not have-imp.3rd.sg brought food
        John had not brought food.

23.   *Vosaltres no canten.
        You   not sing-pres.3rd.pl
        *You do not sing.

TARGET: Nosaltres no vam   deixar de cantar.
we   not   go-pres.1st.pl leave of sing
We did not stop singing.

- Agreement substitutions

   23.   *Vosaltres no canten.
          You   not sing-pres.3rd.pl
          *You do not sing.

TARGET: Nosaltres no vam   deixar de cantar.
we   not   go-pres.1st.pl leave-INF of sing-INF
We did not stop singing.

- Simplification or substitution of periphrasis

   23.   *Vosaltres no canten.
          You   not sing-pres.3rd.pl
          *You do not sing.

TARGET: Nosaltres no vam   deixar de cantar.
we   not   go-pres.1st.pl leave-INF of sing-INF
We did not stop singing.

- Non-finite verb forms

   11.   *Les mares no anar.
          the mothers not go-INF
          *The mothers not go.

TARGET: Les mares no hi   han   d'anar.
the mothers not CL have-pres.3rd.pl of go
The mothers do not have to go.

   13.   *Els fusters   no   acabat.
          the carpenters not finished
          *The carpenters not finished.

TARGET: Els fusters   no   han   acabat la feina.
the carpenters not have-pres.3rd.pl finished the job
The carpenters have not finished the job.

   16.   *Tu   no arribar.
          you not arrive-INF
          *You not arrive.

TARGET: Tu no   vas   tardar a arribar.
you not go-pres.2nd.sg delay to arrive
It did not take you a long time to arrive.

   18.   *Les nenes no plorar.
          the girls not cry-INF
          *The girls not cry.

TARGET: Les nenes no   van   començar a plorar.
the girls not go-pres.3rd.pl start to cry
The girls did not start crying.

21.　　*Al　　matí　　no　baixant.
　　　　at-the　morning not descending
　　　　*In the morning not going down.

TARGET: Al matí　　　no　　va　　　　deixar　de ploure.
　　　　at-the morning not go-pres.3rd.sg leave-INF of rain-INF
　　　　During the morning it did not stop raining.

- Sentences without verb

5.　　　*Vosaltres no a la platja.
　　　　you　　not to the beach
　　　　*You not to the beach.

TARGET: Vosaltres no heu anat a la platja.
　　　　you　not have-pres.2nd.pl gone to the beach
　　　　You have not gone to the beach.

7.　　　*El nen no sort.
　　　　the boy not luck
　　　　*The boy not luck.

TARGET: El　nen no　　　ha　　　tingut sort.
　　　　the boy not have-pres.3rd.sg had luck
　　　　The boy has not been lucky.

14.　　　*Vosaltres no camisa.
　　　　you　　not shirt
　　　　*You not shirt.

TARGET: Nosaltres no podíem cosir la camisa.
　　　　we not can-imp.1st.pl sew the shirt
　　　　We could not sew the shirt.

15.　　　*En Manel no sorpresa.
　　　　the　M.　not surprise
　　　　*Manuel not surprise.

TARGET: En Manel no　　　ha　　　endevinat la sorpresa.
　　　　the M.　not have-pres.3rd.sg guessed the surprise
　　　　Manuel has not guessed the surprise.

22.　　　*Ell no anglès.
　　　　he not English
　　　　*He not English.

TARGET: Ell no　　va　　　acabar　　estudiant anglès.
　　　　he not go-pres.3rd.sg finish studying English
　　　　He did not end up studying English.

24.　　　*Tu　no festa.
　　　　you not party
　　　　*You not party.

TARGET: Tu no　　continuaves　　recordant aquella festa.
　　　　you not go-on-pres.2nd.sg remembering that party
　　　　You did not continue to remember that party.

25.   *Elles no sopar.
         they not dinner
         *They not dinner.

TARGET: Elles no han portat el sopar.
         they not have-pres.3rd.sg brought the dinner
         They have not brought the dinner.

- 'Don't know' responses

1.   Jo no... No se.
         I not   not know-pres.1st.sg
         I don't... I don't know.

TARGET: Jo no he menjat xocolata.
         I not have-pres.1st.sg eaten chocolate
         I have not eaten chocolate.

2.   Nosaltres no... No se.
         we not   not know-pres.1st.sg
         We don't… I do not know.

TARGET: Nosaltres no havíem demanat una pizza.
         we not have-imp.1st.pl asked for a pizza
         We had not asked for pizza.

3.   Els mariners no... Es difícil.
         the sailors not   be-pres.3rd.sg difficult
         The sailors don't… It is difficult.

TARGET: Els mariners no havien   de sortir al mar.
         the sailors not have-imp.3rd.pl of go-INF to-the sea
         The sailors should not have gone to sea.

4.   Tu   no...
         you not
         You don't…

TARGET: Tu no   has   ballat   amb la Maria.
         you not have-pres.2nd.sg danced with the M.
         You have not danced with Mary.

8.   Vosaltres no...
         you   not
         You don't...

TARGET: Vosaltres no   heu   de córrer un quilòmetre.
         you not have-pres.2nd.pl of run-INF one kilometer
         You do not have to run one kilometer.

9.   *Nosaltres no verb.
         we   not verb
         *We not verb.

TARGET: Nosaltres no arribem   a saber moltes coses.
         we not arrive-pres.1st.pl to know many things
         We do not get to know many things.

10. Jo no...
    I not
    I don't…

TARGET: Jo no havia   estudiat   molt.
        I not have-imp.1st.sg studied much
        I had not studied much.

19. 'Don't know' response.

TARGET: La Sandra no anava   passant els exàmens.
        the S.   not go-imp.3rd.sg passing the exams.
        Sandra was not passing her exams.

20. 'Don't know' response.

TARGET: Les modistes no havien   fundat una fàbrica.
        the dressmakers not have-imp.3rd.pl set-up a factory
        The dressmakers had not set up a factory.

Task 2.a

- WH- questions

1. Què   és   menjar?
   what be-pres.3rd.sg eat
   What is eating?

TARGET: Què   vas   menjar ahir?
        what go-pres.2nd.sg eat yesterday
        What did you eat yesterday?

3. 'Don't know' response.

TARGET: Què   busca   en Joan?
        what search-pres.3rd.sg the J.
        What is John looking for?

4. *Jo la data.
   I the date
    *I the date.

TARGET: Quin   dia hi   aniràs?
        which day CL go-fut.2nd.pl
        What day are you leaving?

7. Què edat?
   what age
   What age?

TARGET: Quina edat   tens?
        which age have-pres.2nd.sg.
        How old are you?

12. *Dormidera?
    sleepy
    *Sleepy?

TARGET: Quantes hores dorms?
how-many hours sleep-pres.2nd.sg
How many hours do you sleep?

15. 'Don't know' response.

TARGET: On llegeixes?
where read-pres.2nd.sg
Where do you read?

17. Què és pastís?
what be-pres.3rd.sg cake
What is cake?

TARGET: Com han fet el pastís?
how have-pres.3rd.pl made the cake
How did they make the cake?

19. Què ets?
what be-pres.2nd.sg
What are you?

TARGET: D'on ets tu?
from'where be-pres.2nd.sg you
Where are you from?

21. Criticar.
Criticize-INF
Criticize.

TARGET: Per què estan enfadades les modistes?
for what be-pres.3rd.pl angry the dressmakers
Why are the dressmakers angry?

22. Quants euros?
how-many euros
How many euros?

TARGET: Quant va costar la casa de la Sandra?
how-much aux-pres.3rd.sg cost the house of the S.
How much did Sandra's house cost?

23. *Quins euro?
which-plur euro-sing
*Which euro?

TARGET: Quants apartaments va vendre en Carles?
how-many apartments go-pres.3rd.sg sell the C.
How many apartments did Charles sell?

25. *Qui és l'Andreu *finistro?
who be-pres.3rd.sg the'A. window
Who is Andrew *window?

TARGET: Com va espatllar la finestra l'Andreu?
how go-pres.3rd.sg break the window the'A.
How did Andrew break the window?

- Y/N questions

    2.   *Potser què carta?
                maybe what letter
                *Maybe what letter?

TARGET: Vols   jugar   a cartes?
                want-pres.2nd.sg play-INF to cards
                Do you want to play cards?

    5.   Qui   és   vermell?
                who be-pres.3rd.sg red
                Who is red?

TARGET: T'agrada   el   color vermell?
                you'like-pres.3rd.sg the color red
                Do you like the color red?

    6.   *Qui   és   fred?
                who be-pres.3rd.sg cold
                *Who is cold?

TARGET: Tenen   fred   els pescadors?
                have.pres.3rd.pl cold the fishermen
                Are the fishermen cold?

    8.   Cansats?
                tired
                Tired?

TARGET: Estan   cansats els nens?
                be-pres.3rd.pl tired the children
                Are the children tired?

    10.   M'encanta.
                me'charm-pres.3rd.sg
                I am delighted.

TARGET: T'agrada   viatjar?
                you'like-pres.3rd.sg travel
                Do you like travelling?

    11.   *Vols   cuinera cuinera?
                want-pres.2nd.sg cook cook
                *Do you want cook cook?

TARGET: Ets   bona   cuinera?
                be-pres.2nd.sg good cook
                Are you a good cook?

    13.   *Vols pis?
                want-pres.2nd.sg apartment
                *Do you want apartment?

TARGET: Ven   la Maria el seu pis?
                sell-pres.3rd.sg the M. the her apartment
                Does Mary sell her apartment?

14.   *Vols   anem?
         want-pres.2nd.sg go-pres.1st.pl
         *Do you want we go?

TARGET: Aniré   de viatje?
         go-fut.1st.sg of trip
         Am I going to go on a trip?

16.   'Don't know' response.

TARGET: Menteix   molt   l'Andreu?
         lie-pres.3rd.sg much the'A.
         Does Andrew lie a lot?

18.   *Vols anar viatge?
         want-pres.2nd.sg go trip
         *Do you want go trip?

TARGET: Anirem de vacances?
         go-fut.1st.pl of vacation
         Are we going to go away on vacation?

20.   *Vols   anar Barcelona?
         want-pres.2nd.sg go Barcelona
         *Do you want go Barcelona?

TARGET: Vindran   els   teus   cosins a Barcelona?
         come-fut.3rd.pl the your cousins at Barcelona
         Are your cousins coming to Barcelona?

24.   *Vols piano?
         want-pres.2nd.sg piano
         *Do you want piano?

TARGET: Toques el piano?
         play-pres.2nd.sg the piano
         Do you play the piano?

Task 2.b

- Omission of Relative Clauses

1.   Aquesta   és   negre.
         this-fem be-pres.3rd.sg black-masc
         *This one is black.

TARGET: Aquest es   l'home   que   té   els cabells negres.
         this be-pres.3rd.sg the'man that have-pres.3rd.sg the hair black
         This is the man that has black hair.

4.   *Aquest   és   sol.
         this be-pres.3rd.sg sun
         *This is sun.

TARGET: Aquest   és   l'home que   neda   al   mar.
         this be-pres.3rd.sg the'man that swim-pres.3rd.sg to-the sea
         This is the man that is swimming in the sea.

12.   *Aquesta   és   mes baix.
           t*his-fem be-pres.3rd.sg more low-masc.*
           *This one is lower.

TARGET: Aquest   és   l'avió   que   vola   baix.
           this be-pres.3rd.sg the'plane that fly-pres.3rd.sg low
           This is the plane that is flying low.

14.   *Aquest   és   molt, cotxe   molt.
           this be-pres.3rd.sg much   car   much
           *This one is a lot, car a lot.

TARGET: Aquest   és   el cotxe que   corre   molt.
           this be-pres.3rd.sg the car that run-pres.3rd.sg much
           This is the car that goes fast.

19.   Aquesta és vermella.
           this be-pres.3rd.sg red
            This one is red.

TARGET: Aquest   és   el   got   que   té   vi.
           this be-pres.3rd.sg the glass that have-pres.3rd.sg wine
           This is the glass that has wine.

20.   Aquesta *pluga.
           this   cry-pres.3rd.sg
           This one *cries.

TARGET: Aquesta és   la   noia   que   plora.
           this be-pres.3rd.sg the girl that cry-pres.3rd.sg
           This is the girl that is crying.

22.   *Aquesta és   ulleres.
           this   be-pres.3rd.sg glasses
           *This one is glasses.

TARGET: Aquest és   l'home   que   porta   ulleres.
           this be-pres.3rd.sg the'man that wear-pres.3rd.sg glasses
           This is the man that is wearing glasses.

- Omission of Relative + Verb omission

2.   *Aquesta verd.
           this-fem.   green-masc
           *This one green.

TARGET: Aquest   és   el   llapis   que   pinta   de color verd.
           this be-pres.3rd.sg the pencil that paint-pres.3rd.sg of color green
           This is the pencil that colors green.

3.   *Aquesta tren muntanya.
           this   train mountain
           *This one train mountain.

TARGET: Aquest és   el   tren   que   passa   per la muntanya.
           this be-pres.3rd.sg the train that pass-pres.3rd.sg by the mountain.
           This is the train that goes through the mountains.

6.　　　*Aquesta moto.
　　　　　this   motorbike
　　　　　*This one motorbike.

TARGET: Aquest　　és　　l'home que　　condueix　　la moto.
　　　　　this be-pres.3rd.sg the'man that drive-pres.3rd.sg the motorbike
　　　　　This is the man that is driving the motorbike.

9.　　　*Aquesta la taula i la clau.
　　　　　this   the table and the key
　　　　　*This one the table and the key.

TARGET: Aquesta　　és　　la clau　que　　obre　　la porta.
　　　　　this be-pres.3rd.sg the key that open-pres.3rd.sg the door
　　　　　This is the key that opens the door.

10.　　　*Aquesta arbre.
　　　　　this tree
　　　　　*This one tree.

TARGET: Aquesta és　　la　　noia　que　　mira　　la　　fulla.
　　　　　this be-pres.3rd.sg the girl that look-pres.3rd.sg the leaf
　　　　　This is the girl that is looking at the leaf.

11.　　　*Aquesta pomes.
　　　　　this   apples
　　　　　*This one apples.

TARGET: Aquest　　és　　l'arbre que　　dóna　pomes.
　　　　　this be-pres.3rd.sg the'tree that give-pres.3rd.sg apples
　　　　　This is the tree that produces apples.

13.　　　*Aquesta pilota.
　　　　　this   ball
　　　　　*This one ball.

TARGET: Aquesta　　és　　la gimnasta que　　fa　　servir　la pilota.
　　　　　this be-pres.3rd.sg the gymnast that do-pres.3rd.sg serve-INF the ball
　　　　　This is the gymnast that is using the ball.

15.　　　*Aquesta gat.
　　　　　this   cat
　　　　　*This one cat.

TARGET: Aquest　　és　　el nen que　　passeja　el gat.
　　　　　this be-pres.3rd.sg the boy that walk-pres.3rd.sg the cat
　　　　　This is the boy that is taking the cat for a walk.

16.　　　*Aquesta *sumuns.
　　　　　this   additions
　　　　　*This *additions.

TARGET: Aquesta　　és　　la professora que　　ensenya　matemàtiques.
　　　　　this be-pres.3rd.sg the teacher that teach-pres.3rd.sg mathematics
　　　　　This is the teacher that is teaching mathematics.

17.　　　*Aquesta molt llum.
　　　　　this much-masc. light-fem.
　　　　　*This one a lot of light.

TARGET: Aquest   és   el vaixell que   porta   molta llum.
         this be-pres.3rd.sg the ship that carry-pres.3rd.sg much light
         This is the ship that has a lot of lights on.

   18.   *Aquesta texans.
         this   jeans
         *This one jeans.

TARGET: Aquesta   és   la dona que   pensa   en roba.
         this be-pres.3rd.sg the woman that think-pres.3rd.sg in clothing
         This is the woman that is thinking about clothes.

   21.   *Aquesta un, dos, tres.
         this   one two three
         *This one one, two, three.

TARGET: Aquest   és   el rellotge que   marca   les tres.
         this be-pres.3rd.sg the watch that show-pres.3rd.sg the three
         This is the watch that shows three o'clock.

   23.   *Aquesta *pizarra.
         this blackboard
         This one *blackboard.

TARGET: Aquesta   és   la   mà que   aguanta   el llapis.
         this be-pres.3rd.sg the hand that hold-pres.3rd.sg the pencil
         This is the hand that is holding the pencil.

   24.   Aquesta dos euros.
         this   two euros
         This one two euros.

TARGET: Aquests   són   els plàtans que   costen   dos euros.
         these be-pres.3rd.pl the bananas that cost-pres.3rd.pl two euros
         These are the bananas that cost two euros.

   25.   *Aquesta pilota.
         this   ball
         *This one ball.

TARGET: Aquest   és   el nen que   juga   amb   la pilota.
         this be-pres.3rd.sg the boy that play-pres.3rd.sg with the ball
         This is the boy that is playing with the ball.

- 'Don't know' responses

   5.   I aquesta...
         and this
         And this one…

TARGET: Aquesta   és   la dona que   porta   collaret.
         this be-pres.3rd.sg the girl that wear-pres.3rd.sg necklace
         This is the girl that is wearing a necklace.

   8.   Aquesta...
         this
         This one…

TARGET: Aquest és un peix que viu a la peixera.
this be-pres.3rd.sg a fish that live-pres.3rd.sg at the fishbowl
This is a fish that lives in a fishbowl.

- Object relative

  7. I aquesta...
     and this
     And this one…

TARGET: Aquest és l'arbre que veu en Joan des de la seva finestra.
this be-pres.3rd.sg the'tree that see-pres.3rd.sg the J. from the his window
This is the tree that John sees from his window.

APPENDIX II

Corpus of data

Experimental Subjects

Test II – MILD AGRAMMATICS

CATALAN

Task 1.a

- Clitic Omissions

  1.   Està   *limpiando. --- C2
         aux-pres.3rd.sg washing
         He is washing.

         Renta. --- C3
         wash-pres.3rd.sg
         He washes.

TARGET: El noi el renta.
         the teenager it wash-pres.3rd.sg
         The teenager is washing it.

  2.   *Sona. --- C1
         blow-pres.3rd.sg
         *She blows *(her nose)*.

         La nena està   netejant els mocs. --- C4
         the girl aux-pres.3rd.sg cleaning the mucus
         The girl is cleaning the mucus.

TARGET: La nena es moca.
         the girl herself blow -pres.3rd.sg
         The girl is blowing her nose.

  4.   Renta   *les dents. --- C1
         wash-pres.3rd.sg the teeth
         He is brushing his teeth.

         Renta   els dents. --- C3
         wash-pres.3rd.sg the teeth
         He is brushing the teeth.

         Està   netejant els dents. --- C4
         aux-pres.3rd.sg cleaning the teeth
         He is washing the teeth.

TARGET: L'home s'està   rentant   els dents.
         the'man himself'aux -pres.3rd.sg washing the teeth
         The man is brushing his teeth.

5. Menja. --- C3
   eat-pres.3rd.sg
   She is eating.

TARGET: La dona se'l menja.
   the woman herself'it eat -pres.3rd.sg
   The woman is eating it.

7. *Fa una abraçada. --- C1
   make-pres.3rd.sg a hug
   She makes a hug.

TARGET: La noia l'abraça.
   the girl her'hug -pres.3rd.sg
   The girl is hugging her.

9. Està llegint. --- C1
   aux-pres.3rd.sg reading
   He is reading.

   El noi està llegint. --- C3
   the teenager aux -pres.3rd.sg reading
   The teenager is reading.

   Està llegint. --- C4
   aux-pres.3rd.sg reading
   He is reading.

TARGET: El noi l'està llegint.
   the teenager it'aux -pres.3rd.sg reading
   The teenager is reading it.

10. Rascant la cara. --- C3
   scratching the face
   Scratching her face.

TARGET: La nena s'està rascant la cara.
   the girl herself'aux -pres.3rd.sg scratching the face
   The girl is scratching her face.

15. Està regant. --- C1
   aux-pres.3rd.sg watering
   He is watering.

   *La noi està regant. --- C3
   the-fem teenager-masc aux-pres.3rd.sg watering
   The teenager is watering.

TARGET: El noi l'està regant.
   the teenager it'aux -pres.3rd.sg watering
   The teenager is watering it.

16. *El noi està posant les sabates. --- C4
   the teenager aux-pres.3rd.sg putting-on the shoes
   The teenager is putting on his shoes.

TARGET: El noi se'ls està posant.
   the teenager himself'them aux -pres.3rd.sg putting-on
   The teenager is putting them on.

- Repetition of the NP

1.   Va   rentant   el cotxe. --- C1
         aux-pres.3rd.sg washing the car
         He is washing the car.

         Està   netejant el cotxe. --- C4
         aux-pres.3rd.sg cleaning the car
         He is cleaning the car.

TARGET: El noi el renta.
         the teenager it clean-pres.3rd.sg
         The teenager is washing it.

3.   *La llit   està   fent   el llit. --- C2
         t*he-fem bed-masc aux-pres.3rd.sg making the bed*
         *The bed is making the bed.

         Fer   el   llit. --- C3
         make-INF the bed
         Make the bed.

         Està   canviant   el llit. --- C4
          aux-pres.3rd.sg changing the bed
         She is changing the bed.

TARGET: La dona   el fa.
         the woman it make-pres.3rd.sg
         The woman is making it.

5.   Està   menjant el pastís. --- C4
         aux-pres.3rd.sg eating the cake
         She is eating the cake.

TARGET: La dona   se'l   menja.
         the woman herself'it eat -pres.3rd.sg
         The woman is eating it.

7.   Està   abraçant   a la nena. --- C4
         aux-pres.3rd.sg hugging to the girl
         She is hugging the girl.

TARGET: La noia l'abraça.
         the girl her'hug -pres.3rd.sg
         The girl is hugging her.

13.   La dona està   estenent la roba. --- C3
         the woman aux-pres.3rd.sg hanging the clothes
         The woman is hanging up the clothes.

         Està   mirant   si la roba   està   seca. --- C4
         aux-pres.3rd.sg looking if the clothes be-pres.3rd.sg dry
         She is seeing if the clothes are dry.

TARGET: La dona l'estén.
         the woman it'hang -pres.3rd.sg
         The woman is hanging it up.

15.   Està   regant   el arbre. --- C4
         aux-pres.3rd.sg watering the tree
         He is watering the tree.

TARGET: El   noi   l'està   regant.
     the teenager it'aux -pres.3rd.sg watering
     The teenager is watering it.

16.   S'està   *sacando les sabates. --- C2
     himself'aux-pres.3rd.sg taking-out the shoes
     He is taking off his shoes.

TARGET: El   noi   se'ls   està   posant.
     the teenager himself'them aux -pres.3rd.sg putting-on
     The teenager is putting them on.

19.   S'està   planxant la roba. --- C2
     himself'aux-pres.3rd.sg ironing the clothes
     He is ironing the clothes.

TARGET: L'home l'està   planxant.
     the'man it'aux -pres.3rd.sg ironing
     The man is ironing it.

21.   La   mare   està   pintant   la cara de la nena. --- C4
     the mother aux-pres.3rd.sg making up the face of the girl
     The mother is putting make-up on the girl's face.

TARGET: La noia la   pinta.
     the girl her make up -pres.3rd.sg
     The girl is putting make-up on her.

22.   S'està   vestint la *camiseta. --- C2
     herself' aux-pres.3rd.sg dressing the T-shirt
     She is dressing the T-shirt.

TARGET: La nena se la posa.
     the girl herself it put in-pres.3rd.sg
     The girl is putting it on.

25.   Està   agafant la roba d'estendre. --- C3
     aux-pres.3rd.sg picking up the clothes to'hang-up.
     She is picking up the clothes to hang up.

TARGET: La   dona l'estén.
     the woman it'hang-up-pres.3rd.sg
     The woman is hanging it up.

- Wrong answer

7.   *La germana jugant al   que li sembla. --- C3
     the sister playing to-the what her think-pres.3rd.sg
     *The sister playing what she thinks.

TARGET: La   noia l'abraça.
     the girl her'hug -pres.3rd.sg
     The girl is hugging her.

8.   Fent monigotes. --- C3
     making faces
     Making faces.

TARGET: La nena es mira.
    the girl herself look -pres.3rd.sg
    The girl is looking at herself.

    11.   Va   a   esmorzar. --- C2
    aux-pres.3rd.sg to have breakfast
    He is going to have breakfast.

               El noi   prepara   el   esmorzar. --- C3
    the teenager prepare-pres.3rd.sg the breakfast
    The teenager is preparing breakfast.

               Està   passant *mantequilla sobre el pa. --- C4
    aux-pres.3rd.sg passing butter on the bread
    He is spreading butter on the bread.

TARGET: El noi el talla.
    the teenager it cut -pres.3rd.sg
    The teenager is cutting it.

    21.   *Està   per veure si queda bé. --- C1
    aux-pres.3rd.sg to see if come-off-pres.3rd.sg well
    *She is to see if it comes off well.

TARGET: La noia la   pinta.
    the girl her make-up -pres.3rd.sg
    The girl is putting make-up on her.

    23.   La nena   està   sortint   del   bany. --- C3
    the girl aux-pres.3rd.sg leaving of-the bathroom
    The girl is leaving the bathroom.

TARGET: La noia l'asseca.
    the girl her dry -pres.3rd.sg
    The girl is drying her.

- Wrong clitic selection

    5.   *S'està   esmorzant. --- C2
    herself'aux-pres.3rd.sg having breakfast
    She is having herself breakfast.

TARGET: La dona   se'l   menja.
    the woman herself'it eat -pres.3rd.sg
    The woman is eating it.

    13.   *S'està   penjant   aquí per veure si s'asseca. --- C1
    herself'aux-pres.3rd.sg hanging here to see if herself'dry-pres.3rd.sg
    *She is hanging herself up here to see if it dries herself.

TARGET: La dona l'estén.
    the woman it'hang-pres.3rd.sg
    The woman is hanging it up.

    19.   *S'està   planxant. --- C1
    himself'aux-pres.3rd.sg ironing
    *He is ironing himself.

TARGET: L'home l'està   planxant.
the'man it'aux -pres.3rd.sg ironing
The man is ironing it.

23.   S'està   secant. --- C2
herself' aux-pres.3rd.sg drying
She is drying herself.

TARGET: La noia l'asseca.
the girl her dry -pres.3rd.sg
The girl is drying her.

- Clitic duplication

12.   *S'està   maquillant-se. --- C2
herself'be-pres.3rd.sg making up-herself
*She is herself putting on make-up.

TARGET: La noia   s'està   maquillant.
the girl herself'aux-pres.3rd.sg making up
The girl is putting on make up.

21.   *S'està   maquillant-se. --- C2
herself'be-pres.3rd.sg making up-herself
*She is herself putting on make-up.

TARGET: La noia la   pinta.
the girl her make up -pres.3rd.sg
The girl is putting on make up on her.

24.   *S'està   empenyent-la. --- C2
herself'be-pres.3rd.sg pushing-her
*She is herself pushing her.

TARGET: La nena el toca.
the girl him touch -pres.3rd.sg
The girl is touching him.

- Clitic Doubling

3.   *El   canvia   el llit. --- C5
it change-3rd.sg the bed
*She is changing it the bed.

TARGET: La dona   el fa.
the woman it make-pres.3rd.sg
The woman is making it.

9.   S'està   mirant un llibre. --- C2
himself'aux-pres.3rd.sg looking a book
*He is himself looking at a book.

TARGET: El noi l'està   llegint.
the teenager it'aux -pres.3rd.sg reading
The teenager is reading it.

13.   *S'està   estenent la roba. --- C2
       herself'aux-pres.3rd.sg hanging the clothes
       *She is herself hanging up the clothes.

TARGET: La   dona   l'estén.
       the woman it'hang -pres.3rd.sg
       The woman is hanging it up.

15.   S'està   *regando   les *flores. --- C2
       himself'aux-pres.3rd.sg watering the flowers
       He is himself watering the flowers.

TARGET: El   noi l'està   regant.
       the teenager it'aux -pres.3rd.sg watering
       The teenager is watering it.

GALICIAN

Task 1.a

- Clitic omission

  1.   *A lavar.   ---   G9
         at wash-INF
         *Washing.

TARGET: O mozo lávao.
         the teenager wash-pres.3rd.sg-it
         The teenager is washing it.

  2.   Está a limpar.   ---   G6
         be-pres.3rd.sg to clean-INF
         She is cleaning.

         *Sona.   ---   G8
         blow-pres.3rd.sg
         She is blowing.

         *Sonar.   ---   G9
         blow-INF
         Blow.

TARGET: A rapaza sóase.
         the girl blow -pres.3rd.sg-herself
         The girl is blowing her nose.

  5.   Está a comer.   ---   G6
         be-pres.3rd.sg to eat
         She is eating.

TARGET: A muller cómea.
         the woman eat -pres.3rd.sg-it
         The woman is eating it.

  6.   Peinar.   ---   G9
         brush-INF
         Brush.

TARGET: A rapaza peitéase.
         the girl brush-pres.3rd.sg-herself
         The girl is brushing her hair.

  7.   *Fai un abrazo.   ---   G8
         make-pres.3rd.sg a hug
         *She makes a hug.

         *Collendo no colo. --- G9
         holding in-the lap
         *Holding in her arms.

TARGET: A rapaza abrázaa.
         the girl hug-pres.3rd.sg-her
         The girl is hugging her.

8.   Está a limpare. --- G6
        be-pres.3rd.sg to clean-INF-epenthetic 'e'
        She is cleaning.

TARGET: A rapaza mírase.
        the girl look -pres.3rd.sg-herself
        The girl is looking at herself.

9.   Está a ler. --- G6
        be-pres.3rd.sg to read.
        He is reading.

        *Levendo. --- G9
        reading
        *Reading.

TARGET: O mozo leea.
        the teenager read -pres.3rd.sg-it
        The teenager is reading it.

11.   *Está partindo. --- G6
        be-pres.3rd.sg splitting
        He is splitting.

        Cortare. --- G8
        cut-INF-epenthetic 'e'
        Cut.

TARGET: O mozo córtao.
        the teenager cut -pres.3rd.sg-it
        The teenager is cutting it.

12.   Está a limpar. --- G6
        be-pres.3rd.sg to clean-INF
        She is cleaning.

TARGET: A moza maquíllase.
        the girl make up-pres.3rd.sg-herself
        The girl is putting on make-up.

13.   Colgar. --- G9
        Hang-INF
        Hang up.

TARGET: A muller téndea.
        the woman hang -pres.3rd.sg-it
        The woman is hanging it up.

15.   Está a regar. --- G6
        be-pres.3rd.sg to water
        *He is watering.

        Regare. --- G8
        water-INF-epenthetic 'e'
        Water.

TARGET: O mozo régao.
        the teenager water -pres.3rd.sg-it
        The teenager is watering it.

16.   *Calzar. --- G9
        put-on-INF
        *Put on (one's shoes).

TARGET: O mozo cálzase.
        the teenager put-on -pres.3rd.sg-himself
        The teenager is putting his shoes on.

24.   Empurra. --- G10
        push- pres.3rd.sg
        She is pushing.

TARGET: A nena empúrrao.
        the girl push-pres.3rd.sg-him
        The girl is pushing him.

- Repetition of the NP

1.   Ese mozo está lavando o coche coa mangueira. --- G7
        that teenager be-pres.3rd.sg washing the car with-the hose
        That teenager is washing the car with the hose.

TARGET: O mozo   límpao.
        the teenager wash-pres.3rd.sg-it
        The teenager is washing it.

3.   A muller está   facendo   a cama. --- G7
        the woman be-pres.3rd.sg making the bed
        The woman is making the bed.

        Fai as sábanas. --- G8
        make-pres.3rd.sg the sheets
        She is making the sheets.

TARGET: A muller faina.
        the woman make-pres.3rd.sg-it
        The woman is making it.

5.   Está a comer a empanada. --- G7
        be-pres.3rd.sg to eat the pie
        She is eating the pie.

TARGET: A muller cómea.
        the woman eat -pres.3rd.sg-it
        The woman is eating it.

7.   A moza está collendo á súa irmán en brazos. --- G7
        the girl be-pres.3rd.sg picking-up to her sister in arms
        The girl is picking up her sister in her arms.

TARGET: A rapaza abrázaa.
        the girl hug-pres.3rd.sg-her
        The girl is hugging her.

9.   O mozo está lendo unha revista sentado na cama. --- G7
        the teenager be-pres.3rd.sg reading a magazine sitting on-the bed
        The teenager is reading a magazine sitting on the bed.

Lee unha revista.   ---   G8
read-pres.3rd.sg a magazine
He reads a magazine.

TARGET: O mozo leea.
the teenager read -pres.3rd.sg-it
The teenager is reading it.

11.   *Partindo o pan.   ---   G9
splitting the bread
Splitting the bread.

TARGET: O mozo córtao.
the teenager cut -pres.3rd.sg-it
The teenager is cutting it.

13.   A muller está tendendo a roupa.   ---   G7
the woman be-pres.3rd.sg hanging the clothes
She is hanging up the clothes.

TARGET: A muller téndea.
the woman hang -pres.3rd.sg-it
The woman is hanging it up.

15.   O mozo está regando o árbol.   ---   G7
the teenager be-pres.3rd.sg watering the tree
The teenager is watering the tree.

TARGET: O mozo régao.
the teenager water -pres.3rd.sg-it
The teenager is watering it.

25.   O mozo está dobrando o pantalón.   ---   G7
the teenager be-pres.3rd.sg folding the trouser
The teenager is folding his trousers.

TARGET: O mozo dóbrao.
the teenager fold-pres.3rd.sg-it
The teenager is folding them.

- Wrong clitic selection

6.   Peitealo.   ---   G10
brush-INF-it
Comb it.

TARGET: A rapaza peitéase.
the girl brush-pres.3rd.sg-herself
The girl is brushing her hair.

8.   Mirámonos.   ---   G8
look at-pres.1st.pl-us
We look at us.

TARGET: A rapaza mírase.
the girl look -pres.3rd.sg-herself
The girl is looking at herself.

13.   Tendelas.   --- G10
        hang-INF-them
        Hang them up.

TARGET: A muller téndea.
        the woman hang -pres.3rd.sg-it
        The woman is hanging it up.

19.   *Plancharse.   --- G10
        iron-INF-himself
        *Iron himself.

TARGET: O home plánchaa.
        the man iron-pres.3rd.sg-it
        The man is ironing it.

21.   *A moza estase maquillando á pequena.   --- G7
        the girl be-pres.3rd.sg-herself making up to-the small
        * The girl is putting on herself make-up on the little girl.

        Estase pintando.   --- G9
        be-pres.3rd.sg-herself making-up
        She is putting on make-up.

TARGET: A moza maquillaa.
        the girl make-up-pres.3rd.sg-her
        The girl is putting make-up on her.

22.   *Ponéndose.   --- G9
        putting-on-herself
        *Putting on herself.

TARGET: A nena pona.
        the girl put-on-pres.3rd.sg-it
        The girl is putting it on.

23.   *Secándose.   --- G9
        drying-herself
        *Drying herself.

TARGET: A moza sécaa.
        the girl dry-pres.3rd.sg-her
        The girl is drying her.

- Wrong answer

17.   Desfai esa cama.   --- G8
        strip-pres.3rd.sg that bed
        She is messing up that bed.

TARGET: A moza espertase.
        the girl wake up-pres.3rd.sg-herself
        The girl is waking up herself.

- 'Don't know' responses

23.   Don't know response   --- G8

TARGET: A moza sécaa.

        the girl dry -pres.3rd.sg-her

        The girl is drying her.

SPANISH

<u>**Task 1.a**</u>

- Repetition of the NP

1.   El chico está lavando el coche.   ---   S7
    the teenager be-pres.3rd.sg washing the car
    The teenager is washing the car.

    Está lavando el coche.   ---   S8
    be-pres.3rd.sg washing the car
    He is washing the car.

TARGET: El chico lo lava.
    the teenager it wash-pres.3rd.sg
    The teenager is washing it.

3.   La mujer está haciendo la cama.   ---   S3
    the woman be-pres.3rd.sg making the bed
    The woman is making the bed.

    La mujer está haciendo la cama.   ---   S5
    the woman be-pres.3rd.sg making the bed
    The woman is making the bed.

TARGET: La mujer la hace.
    the woman it make-pres.3rd.sg
    The woman is making it.

5.   Prueba el pastel.   ---   S3
    taste-pres.3rd.sg the cake
    She is tasting the cake.

    La mujer come tarta.   ---   S5
    the woman eat-pres.3rd.sg cake
    The woman is eating cake.

TARGET: La mujer lo come.
    the woman it eat -pres.3rd.sg
    The woman is eating it.

9.   Está leyendo el periódico.   ---   S3
    be-pres.3rd.sg reading the newspaper
    He is reading the newpaper.

    El chico lee con la revista.   ---   S5
    the teenager read-pres.3rd.sg with the magazine
    The teenager is reading with the magazine.

TARGET: El chico la lee.
    the teenager it read -pres.3rd.sg
    The teenager is reading it.

11.   El chico corta el pan.   ---   S5
    the teenager cut -pres.3rd.sg the bread
    The teenager is cutting the bread.

    Éste está haciendo el pan. --- S7
    this be-pres.3rd.sg making the bread
    This one is making the bread.

TARGET: El chico lo corta.
the teenager it cut -pres.3rd.sg
The teenager is cutting it.

13.   Mirando cómo le ha quedado la ropa.   ---   S3
looking how to-him remain-presperf.3rd.sg the clothes
Seeing how the laundry turned out.

La mujer está tendiendo la ropa.   ---   S5
the woman be-pres.3rd.sg hanging the clothes
The woman is hanging up the clothes.

Está extendiendo la ropa en el extendedor.   ---   S6
be-pres.3rd.sg spreading-out the clothes in the drying-rack
She is hanging up the laundry on the drying rack.

TARGET: La   mujer la cuelga.
the woman it hang -pres.3rd.sg
The woman is hanging it up.

15.   El chico está regando el árbol.   ---   S5
the teenager be-pres.3rd.sg watering the tree
The teenager is watering the tree.

Está regando las plantas.   ---   S6
be-pres.3rd.sg watering the plants
He is watering the plants.

TARGET: El chico lo riega.
the teenager it water -pres.3rd.sg
The teenager is watering it.

16.   El chico se está poniendo los zapatos.   ---   S3
the teenager himself aux-pres.3rd.sg putting on the shoes
The teenager is putting his shoes on.

Se está poniendo las zapatillas en el pie.   ---   S6
himself aux-pres.3rd.sg putting on the sneakers in the foot
He is putting the sneakers on his foot.

Ponerse los zapatos.   ---   S7
Put-on-INF-himself the shoes
Put the shoes on.

TARGET: El   chico se los está poniendo.
the teenager himself them aux -pres.3rd.sg putting on
The teenager is putting them on.

18.   La chica se está poniendo la manta.   ---   S3
the girl herself be-pres.3rd.sg putting on the blanket
The girl is putting the blanket on.

TARGET: La niña se tapa.
the girl herself cover-pres.3rd.sg
The girl is covering herself.

19.   Plancha la camisa.   ---   S8
iron-pres.3rd.sg the shirt
He is ironing the shirt.

TARGET: El hombre la está planchando.
        the man it aux -pres.3rd.sg ironing
        The man is ironing it.

20.   Se afeita con la maquinilla. --- S8
      himself shave-pres.3rd.sg with the razor
      He is shaving with the razor.

TARGET: El chico se afeita.
        the teenager himself shave -pres.3rd.sg
        The teenager is shaving.

21.   La   chica está maquillando a su hermana. --- S5
      the girl be-pres.3rd.sg making up to her sister
      The girl is putting make-up on her sister.

TARGET: La chica la maquilla.
        the girl her make up -pres.3rd.sg
        The girl is putting make-up on her.

23.   La chica está secando a la hermana. --- S5
      the girl be -pres.3rd.sg drying to the sister
      The girl is drying her sister.

TARGET: La chica la   seca.
        the girl her dry -pres.3rd.sg
        The girl is drying her.

24.   La niña está haciendo cosquillas a su hermano. --- S5
      the girl be-pres.3rd.sg tickling to her brother
      The girl is tickling her brother.

TARGET: La niña lo empuja/lo está empujando.
        the girl him push-pres.3rd.sg/him aux -pres.3rd.sg pushing
        The girl is pushing him.

25.   *El chico doblega su pantalón. --- S3
      the teenager crease-pres.3rd.sg his trouser
      *The teenager is creasing his trousers.

      El chico dobla el pantalón. --- S5
      the teenager fold-pres.3rd.sg the trouser
      The teenager is folding his trousers.

      El chico está doblando el pantalón. --- S6
      the teenager be-pres.3rd.sg folding the trouser
      The teenager is folding his trousers.

TARGET: El chico lo dobla.
        the teenager it fold-pres.3rd.sg
        The teenager is folding them.

- Clitic omission

7.   *La chica está abrazando con la hermana. --- S5
      the girl be-pres.3rd.sg hugging with the sister
      *The girl is hugging with her sister.

TARGET: La   chica la abraza.
        the girl her hug-pres.3rd.sg
        The girl is hugging her.

9.   Está mirando y estudiando.   ---   S6
          be-pres.3rd.sg looking and studying
          He is looking and studying.

TARGET: El chico la lee.
          the teenager it read -pres.3rd.sg
          The teenager is reading it.

10.   *Rascando la carita.   ---   S6
          scratching the face-little
          *Scratching her little face.

TARGET: La niña se está rascando la cara.
          the girl herself aux -pres.3rd.sg scratching the face
          The girl is scratching her face.

11.   Corta.   ---   S8
          cut -pres.3rd.sg
          He is cutting.

TARGET: El chico lo corta.
          the teenager it cut -pres.3rd.sg
          The teenager is cutting it.

12.   Lo pone en la cara.   ---   S7
          it put-pres.3rd.sg on the face
          She is putting it on her face.

TARGET: La chica se maquilla.
          the girl herself make up-pres.3rd.sg
          The girl is putting on make up.

15.   Está limpiando las hojas.   ---   S3
          be-pres.3rd.sg cleaning the leaves
          He is cleaning up the leaves.

          Está regando.   ---   S8
          be-pres.3rd.sg watering
          He is watering.

TARGET: Lo está regando.
          it be-pres.3rd.sg watering
          He is watering it.

18.   Tapa.   ---   S8
          cover-pres.3rd.sg
          She is covering.

TARGET: La niña se tapa.
          the girl herself cover-pres.3rd.sg
          The girl is covering herself.

19.   El hombre está planchando.   ---   S5
          the man be-pres.3rd.sg ironing
          The man is ironing.

          Está planchando.   ---   S6
          be-pres.3rd.sg ironing
          He is ironing.

TARGET: El hombre la está planchando.
the man it aux -pres.3rd.sg ironing
The man is ironing it.

24.   La niña está cogiendo la camiseta. --- S3
the girl be-pres.3rd.sg taking the T-shirt
The girl is holding her T-shirt.

TARGET: La niña lo empuja.
the girl him push -pres.3rd.sg
The girl is pushing him.

- Wrong answer

3.   Está subiendo la almohada.   ---   S6
be-pres.3rd.sg raising the pillow
She is raising the pillow.

TARGET: La mujer la hace.
the woman it make-pres.3rd.sg
The woman is making it.

11.   Está haciendo cortes con el cuchillo.   ---   S6
be-pres.3rd.sg making cuts with the knife
He is making cuts with the knife.

TARGET: El chico lo corta.
the teenager it cut -pres.3rd.sg
The teenager is cutting it.

14.   Está sentada encima del asiento.   ---   S6
be-pres.3rd.sg sitting on-top of the seat
She is sitting on the seat.

TARGET: La chica se columpia.
the girl herself swing -pres.3rd.sg
The girl is swinging herself.

17.   Está estirando los brazos.   ---   S6
be-pres.3rd.sg stretching the arms
She is stretching her arms.

Bostezar.   ---   S8
yawn-INF
Yawn.

TARGET: La chica se despierta.
the girl herself wake up-pres.3rd.sg
The girl is waking up.

24.   La niña está apuntando las letras en la camisa. --- S8
the girl be-pres.3rd.sg pointing the letters in the T-shirt
The girl is pointing at the letters on the T-shirt.

TARGET: La niña lo está empujando.
the girl him aux -pres.3rd.sg pushing
The girl is pushing him.

- Wrong clitic selection

11.   Se está partiendo.   ---   S3
          himself be-pres.3rd.sg splitting
          He is splitting himself.

TARGET: El chico lo corta.
          the teenager it cut -pres.3rd.sg
          The teenager is cutting it.

19.   *Se está planchando.   ---   S3
          himself aux-pres.3rd.sg ironing
          *He is ironing himself.

TARGET: El hombre la está planchando.
          the man it aux -pres.3rd.sg ironing
          The man is ironing it.

21.   Pintarse.   ---   S7
          make-up-INF-herself
          Put on make-up.

TARGET: La chica la   maquilla.
          the girl her make up -pres.3rd.sg
          The girl is putting make-up on her.

22.   Se pone eso para no tener frío.   ---   S3
          herself put on-pres.3rd.sg that for not have-INF cold
          She is putting that on to not be cold.

TARGET: La niña se la pone.
          the girl herself it put in-pres.3rd.sg
          The girl is putting it on.

23.   *Limpiándose el cuerpo.   ---   S3
          cleaning herself the body
          *Cleaning her body.

TARGET: La chica la   seca.
          the girl her dry -pres.3rd.sg
          The girl is drying her.

- Clitic duplication

8.   *Se está mirándose.   ---   S7
          herself be-pres.3rd.sg looking-at-herself
          *She is herself looking at herself.

TARGET: La niña se mira.
          the girl herself look at-pres.3rd.sg
          The girl is looking at herself.

- Clitic Doubling

3.   *La hace la cama.   ---   S7
          it make-3rd.sg the bed
          *She is making it the bed.

TARGET: La mujer la hace.
   the woman it make-pres.3rd.sg
   The woman is making it.

- 'Don't know' responses

 9. Don't know response --- S7
TARGET: El chico la lee.
   the teenager it read -pres.3rd.sg
   The teenager is reading it.

APPENDIX II

Corpus of data

Experimental Subjects

Test II – CATALAN MODERATE AGRAMMATIC

CATALAN

Task 1.a

- Clitic Omissions

    1.   *El noi rentar.
            the teenager wash-INF
            *The teenager wash.

TARGET: El noi el renta.
            the teenager it wash-pres.3rd.sg
            The teenager is washing it.

    2.   *La nena mocador.
            the girl handkerchief
            *The girl handkerchief.

TARGET: La nena es moca.
            the girl herself blow -pres.3rd.sg
            The girl is blowing her nose.

    3.   *La noia els llençols.
            the girl the sheets
            *The girl the sheets.

TARGET: La dona el fa.
            the woman it make-pres.3rd.sg
            The woman is making it.

    4.   *El home raspall de dents.
            the man toothbrush
            *The man toothbrush.

TARGET: L'home s'està   rentant   els dents.
            the'man himself'aux -pres.3rd.sg washing the teeth
            The man is brushing his teeth.

    5.   La noia fa… *La noia pastís.
            the girl make-pres.3rd.sg   the girl cake
            The girl makes... *The girl cake.

TARGET: La dona se'l menja.
            the woman herself'it eat -pres.3rd.sg
            The woman is eating it.

6.   *La noia pinta.
        the girl brush
        *The girl brush.

TARGET: La   noia es pentina.
        the girl herself brush-pres.3rd.sg
        The girl is brushing her hair.

7.   *La noia fa... nen i...
        the girl make-pres.3rd.sg   boy and
        *The girl makes.... boy and...

TARGET: La   noia   l'abraça.
        the girl her'hug-pres.3rd.sg
        The girl is hugging her.

8.   La nena fa… *La nena mirall.
        the girl make- pres.3rd.sg the girl mirror
        The girl makes... *the girl mirror.

TARGET: La nena es mira.
        the girl herself look -pres.3rd.sg
        The girl is looking at herself.

9.   *La noi fa revista.
        the-fem teenager-masc do-pres.3rd.sg magazine
        *The teenager is doing magazine.

TARGET: El   noi   l'està   llegint.
        the teenager it'aux -pres.3rd.sg reading
        The teenager is reading it.

10.   La nena fa… La nena riu.
        the girl make- pres.3rd.sg the girl laugh-pres.3rd.sg
        The girl is making... the girl is laughing.

TARGET: La nena   s'està   rascant   la cara.
        the girl herself'aux -pres.3rd.sg scratching the face
        The girl is scratching her face.

11.   *La noi fa… La noi tallar el pa.
        the-fem teenager-masc do-pres.3rd.sg the-fem teenager-masc cut-INF the bread
        *The teenager is doing... the teenager is cutting the bread.

TARGET: El   noi   el   talla.
        the teenager it cut -pres.3rd.sg
        The teenager is cutting it.

12.   *La noi fa… La noi maquilla.
        the-fem teenager-masc do-pres.3rd.sg the-fem teenager-masc make-up-pres.3rd.sg
        *The boy is doing... the boy is putting on make-up.

TARGET: La noia   s'està   maquillant.
        the girl herself'aux-pres.3rd.sg making up
        The girl is putting on make-up.

13.   *La noi fa… posar… estendre…
        the-fem boy do-pres.3rd.sg   put-INF   spread-INF
        *The boy is doing... put... spread...

TARGET: La   dona   l'estén.
the woman it'hang -pres.3rd.sg
The woman is hanging it up.

14.   *La nena gronxa.
the girl swing-pres.3rd.sg
The girl is swinging.

TARGET: La nena es groxa.
the girl herself swing-pres.3rd.sg
The girl is swinging herself.

15.   *La home dutxa.
the-fem man shower
*The man shower.

TARGET: El   noi   l'està   regant.
the teenager it'aux -pres.3rd.sg watering
The teenager is watering it.

16.   *La noi posa sabates.
the-fem teenager-masc put-on-pres.3rd.sg shoes
*The teenager is putting shoes on.

TARGET: El   noi   se'ls   està   posant.
the teenager himself'them aux -pres.3rd.sg putting on
The teenager is putting them on.

17.   Dormir.
sleep-INF
Sleep.

TARGET: La noia es desperta.
the girl herself wake-up -pres.3rd.sg
The girl is waking up.

18.   La nena posa… té fred.
the girl put-on-pres.3rd.sg   have-pres.3rd.sg cold
The girl is putting on.... She is cold.

TARGET: La nena es tapa.
the girl herself cover-pres.3rd.sg
The girl is covering herself.

19.   *L'home planxa.
the man iron.
*The man iron.

TARGET: L'home l'està   planxant.
the'man it'aux -pres.3rd.sg ironing
The man is ironing it.

20.   *La noi *feitar, *cremar.
*the-fem teenager-masc *shave-INF *soap-INF.*
*The teenager shave, soap.

TARGET: El noi s'afeita.
the teenager himself'shave-pres.3rd.sg
The teenager is shaving.

21.   *La noia… nen… pinta.
        the girl   boy make-up-pres.3rd.sg
        *The girl... boy... puts on make up.

TARGET: La noia la   pinta.
        the girl her make up -pres.3rd.sg
        The girl is putting make-up on her.

22.   *La nena posar bé
        the girl put-INF well
        *The girl put well.

TARGET: La nena se la posa.
        the girl herself it put in-pres.3rd.sg
        The girl is putting it on.

23.   *La nena fa… la nena i dutxa… nena posa dutxa
        the girl do-pres.3rd.sg   the girl and shower   girl put- pres.3rd.sg shower
        *The girl is doing... the girl and shower... girl puts shower.

TARGET: La noia l'asseca.
        the girl her dry -pres.3rd.sg
        The girl is drying her.

24.   *La nena... jove... puny.
        the girl   young   fist
        *The girl... young... fist.

TARGET: La nena el toca.
        the girl him touch -pres.3rd.sg
        The girl is touching him.

25.   *La noi posa pantalons.
        the-fem boy put- pres.3rd.sg trousers
        *The boy is putting on trousers.

TARGET: La   dona l'estén.
        the woman it'hung-pres.3rd.sg
        The woman is hanging it up.

APPENDIX III

Corpus of data

Control Subjects

Test I

CATALAN

<u>**Task 1.a**</u>

- Tense Substitutions

4. Els   nens   no   van   actuar dimarts. --- A3
   the children not go-pres.3rd.pl perform-INF tuesday
   The children did not perform on Tuesday.

TARGET: Els   nens   no   actuaven dimarts.
   the children not perform-imp.3rd.pl tuesday
   The children were not performing on Tuesday.

7. L' Almodóvar no va   dirigir aquesta pel·lícula. --- A1
   the. Almodóvar not go-pret.3rd.sg direct-INF this film
   Almodóvar did not direct this film.

TARGET: Almodóvar no dirigia   aquesta pel·lícula.
   A.   not direct-imp.3rd.sg this film
   Almodóvar was not directing this film.

<u>**Task 1.b**</u>

- Simplification or substitution of periphrasis

18. Les nenes no van   plorar. --- A1
   the girls not go-pret.3rd.pl cry-INF
   The girls did not cry.

TARGET: Les nenes no   van   començar a plorar.
   the girls   not go-pret.3rd.pl start-INF   to cry-INF
   The girls did not start crying.

24. Tu   no   recordaves   aquella festa. --- A2
   you not remember-imp.2nd.sg that party
   You did not remember that party.

TARGET: Tu no   continuaves   recordant aquella festa.
   you not go on-pres.2nd.sg remembering that party
   You did not continue to remember that party.

Task 2.b

- Omission of Relative Clauses

14.   Aquest   és   el cotxe de carreres. --- A4
         this   be-pres.3rd.sg the car of races
         This is the racing car.

TARGET: Aquest   és   el cotxe que   corre   molt.
        this be-pres.3rd.sg the car that run-pres.3rd.sg much
        This is the car that goes fast.

GALICIAN

Task 1.a

- Tense Substitutions

4.   Os nenos non actuarán   o martes. --- B2
the children not perform-fut.3rd.pl the tuesday
The children will not perform on Tuesday.

TARGET: Os nenos   non actuaban   o martes.
the children not perform-imp.3rd.pl the tuesday
The children were not performing on Tuesday.

9.   Xurxo non irá   á   piscina. --- B3
X. not go-fut.3rd.sg to the swimming-pool
George will not go to the swimming-pool.

TARGET: Xurxo non ía   á   piscina.
X.   not go-imp.3rd.sg to-the swimming-pool
George was not going to the swimming-pool.

Task 1.b

- Tense Substitutions

2.   Nós non deberíamos   pedir pizza. --- B4
we not can-cond.1st.pl ask-INF pizza
We shouldn't ask for pizza.

TARGET: Nós non debiamos pedir pizza.
we not must-imp.1st.pl ask-INF pizza
We must not ask for pizza.

- Simplification or substitution of periphrasis

17.   Xan non trouxo   o xantar. --- B2
X. not bring-pret.3rd.sg the food
John did not bring the food.

TARGET: Xan non   foi   traendo o xantar.
X.   not go-pret.3rd.sg bringing the food
John was not bringing the food.

Task 2.a

- WH- substituted with WH-

3.   ¿Cómo   é   a   cousa de Xoán? --- B3
how be-pres.3rd.sg the thing of X.
What does John's thing look like?

TARGET: ¿Qué   anda   a procurar Xoán?
        what walk-pres.3ʳᵈ.sg to search X.
        What is John looking for?

SPANISH

Task 1.a

- Tense Substitutions

  4. Los niños   no actuarán   el martes. --- D3
      the children not perform-fut.3rd.pl the tuesday
      The children will not perform on Tuesday.

TARGET: Los niños   no actuaban   el martes.
       the children not perform-imp.3rd.pl the tuesday
       The children were not performing on Tuesday.

  6. Los niños no pescan   carpas. --- D5
      the children not fish-pres.3rd.pl carps
      The children do not catch carp.

TARGET: Los niños no   pescarán carpas.
       the children not fish-fut.3rd.pl carps
       The children will not catch carp.

Task 2.a

- WH- substituted with Y/N

  15. ¿Lees   en la biblioteca? --- D5
       read-pres.2nd.sg in the library
       Do you read in the library?

TARGET: ¿Dónde lees?
       where   read-pres-2nd.sg
       Where do you read?

- Y/N substituted with WH-

  11. ¿Qué tal cocinas? --- D4
       how cook-pres.2nd.sg
       How well do you cook?

TARGET: ¿Eres   buena   cocinera?
       be-pres.2nd.sg good cook
       Are you a good cook?

Task 2.b

- Omission of Relative Clause

  14. Éste   es   el   coche de carreras. --- D5
       this be-pres.3rd.sg the car   of races
       This is the racing car.

TARGET: Éste   es   el coche que corre   mucho.
        this be-3rd.sg the car that run-3rd-sg. much
        This is the car that goes fast.

APPENDIX III

Corpus of data

Control Subjects

Test II

CATALAN

Task 1.a

- Clitic Doubling

1.   El renta el cotxe.   ---   A1
        it wash-pres.3rd.sg the car
        He is washing it the car.

TARGET: El noi el   renta.
        the teenager it washing-pres.3rd.sg
        The teenager is washing it.