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# THE PAST TENSE IN GREEK AND ITALIAN NON- FLUENT APHASIC PATIENTS

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# 1 Introduction

The study of the linguistic deficits in aphasia during the last decades is constantly gaining ground. An increasing number of researchers from several scientific domains, such as neurology, psychology, linguistics and speech- language pathology are investigating aphasic syndromes with a dual purpose: first of all, to understand the nature of the linguistic impairments manifested in aphasia from a theoretical viewpoint and, thus, to propose methods for patients' rehabilitation, and second to comprehend, with the aid of the pathologic data, the normal function of language.

The aim of the present study is to investigate the capacity of non-fluent aphasic patients to produce and comprehend the past tense. More concretely, acknowledging the importance of cross-linguistic data, this study compares the results of two languages, Modern Greek and Italian, both highly inflected, in an effort to bring some evidence about the cognitive and the neuropsychological nature of the past tense.

**Chapter 2** presents the basic notions of Noam Chomsky's theory of language, from his earlier work to the more recent Minimalist Program (Chomsky 1995). It also analyses the notions of *language*, *competence* and *performance*, and the notion of the *ideal speaker* in Chomsky's framework. Another important topic discussed in this chapter is '*the faculty of language*', i.e. the innate, biological capacity that human being possess, which allows them during childhood to acquire all possible natural languages without any explicit instruction.

**Chapter 3** describes *aphasia*, mentioning the various aphasic syndromes, their causes and their symptoms. Particular reference will be made to agrammatism (from the Greek *αγραμματισμός*, i.e. absence of grammar), a syndrome caused usually by a lesion to the left cerebral hemisphere,

situated mainly in the left inferior frontal lobe, that frequently provokes alterations in language production and comprehension. Agrammatism usually compromises the use of *function words* (like articles, pronouns, prepositions, auxiliaries and copulas), whereas lexical categories remain intact. Agrammatic speech is known as “*telegraphic*” for the substitution or omission of grammatical words and inflectional morphology, for the absence of syntactic complexity and, of course, for its paucity in quantitative terms. Furthermore, chapter 3 provides an overview of the current theories that try to account for the agrammatic deficit, divided in three categories: accounts regarding *the phonological, the syntactic and the morphological level* of language. Chapter 3 also focuses on the *Tense* issue, especially on the performance of agrammatic subjects in the *Past Tense*, and examines whether *regularity* or *irregularity* of the inflectional tense morphology can influence its production and comprehension.

**Chapter 4** briefly presents the grammatical systems of Modern Greek and Italian. It also deals with the formation and the function of the past tense in these two languages. In the case of Italian, where the two past tenses- the simple (*passato remoto*) and the compound (*passato prossimo*) one - have a particular geographical distribution and their use depends mainly on the speaker’s origin, a special mention is made.

**Chapter 5** presents the experiment, based on a research conducted by Kehayia (1990). It introduces the hypotheses tested, along with the subjects and the methodology, and discusses the results of the experiments conducted in both languages. Lastly, chapter 5 compares the results of our experiment to those of Kehayia, as well as to previous literature on the past tense.

**Chapter 6** summarizes the most important results yielded by the study and considers their theoretical implications for aphasiology and for linguistic theory in general.

## 2 Chomsky's theory of language

### 2.1 Introduction

Nowadays, it is quite impossible to write about modern linguistics, without referring to the Chomskyan theory of language. As the present study aims at being both modern and linguistic, it has been inevitable to use the theoretical instruments and notions that Chomsky's theory offers. For this reason, in this chapter we are going to present the most important and relevant aspects of Chomsky's linguistic theory in general, and more specifically of his theory of syntax.

Chomsky adopts the classical definition of linguistic theory as formulated by the founders of modern general linguistics. Thus, in Chomsky's view "linguistic theory is concerned primarily with an ideal speaker-listener, in a completely homogeneous speech community, who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of the language in actual performance" (Chomsky 1965:3). Of course, this last part is not the case of the subjects that form the core of interest of the present study. It is, however, of extreme importance, as it explicitly describes the situation from which aphasic patients deviate and thus the way in which they differ from what is conceived to be "normal" language. And, what is language, according to Chomsky? *Language* is a (finite or infinite) complex of sentences, which have a finite length and are constructed by concatenation of a finite group of elements (Chomsky 1969:121). A language is "a system of discrete infinity, a procedure that enumerates an infinite class of expressions, each of them has a structured complex of properties of sound and meaning" (Chomsky, 2000: 19). The

main characteristic of all languages is the possibility they give to whoever may speak them to express "indefinitely many thoughts" and to react "appropriately in an indefinite range of new situations", an aspect characterized by Chomsky as *creative* (1965:6) or *recursive*.

A fundamental distinction Chomsky makes about a speaker's language is between *competence* and *performance*. A speaker's (or hearer's) linguistic competence is the knowledge of their language, while the term performance refers to the use of language in particular situations (1965:4). In this view (and, of course, in *normal* situations) linguistic performance directly reflects linguistic competence. Of course, linguistic competence and performance are not totally congruent. Performance involves many extralinguistic factors as well, such as "beliefs concerning the speaker and the situation", "principles of cognitive structure (e.g. memory restrictions) (Chomsky 1972:116). The linguist's goal consists in conceiving and describing the system of rules a speaker possesses, based on the speaker's performance. In other words, the linguist has to provide an account of the abstract internalized set of rules that the speaker's linguistic behavior reflects, i.e. the language's *grammar*. In Chomsky's terms, a language's grammar represents the finite group of rules that specify this particular language (Chomsky 1969: 123). As Chomsky precises, the term "specify" corresponds to his conception of *generation*, which leads us to introduce one of the cardinal conceptions of the entire Chomskyan theory, the *generative grammar*. In Chomsky's framework, a generative grammar is "a system of rules that in some explicit and well-defined way assigns structural descriptions to sentences" (1965:8), "each structural description being an abstract object of some sort that determines a particular sound, a particular meaning, and whatever formal properties and configurations serve to mediate the relation between sound

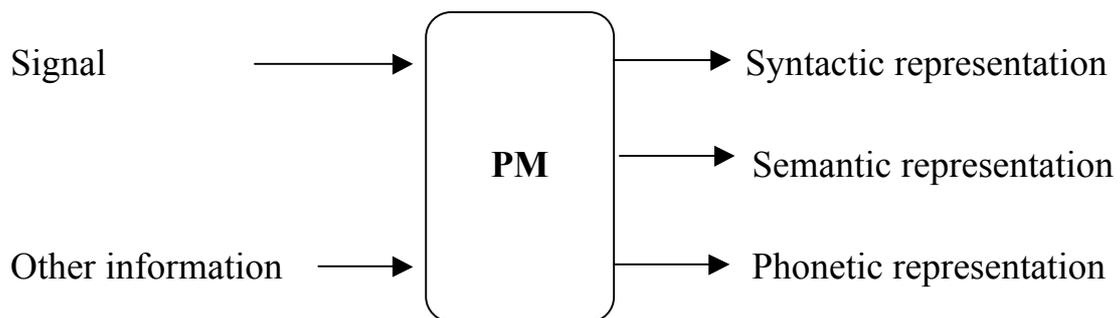
and meaning" (Chomsky 1972:104). Hence, the purpose of a generative grammar is to express explicitly the speaker's implicit knowledge about a language (Ronat 1977:102).

## 2.2 Organization of a generative grammar

As said above, a generative grammar is a set of rules capable of *generating* an infinite number of structures in a specific language. At the basis of a generative grammar there is the speaker's competence, which reflects their capacity to produce and to understand an infinite number of sentences.

Chomsky postulates the existence of three major components of a generative grammar: the *syntactic*, the *phonological* and the *semantic* component.

In this view, a *perceptual model*, PM, is described by Chomsky (Language and Mind, 117) "as a device that accepts a signal as input (along much else) and assigns various grammatical representations as 'output' ". The following scheme represents this model:



The syntactic component in Chomsky's words "specifies an infinite set of abstract formal objects, each of which incorporates all information relevant to a single interpretation of a particular sentence". The phonological component of a given generative grammar assigns a phonetic form to a sentence generated by the syntactic rules, i.e. how the

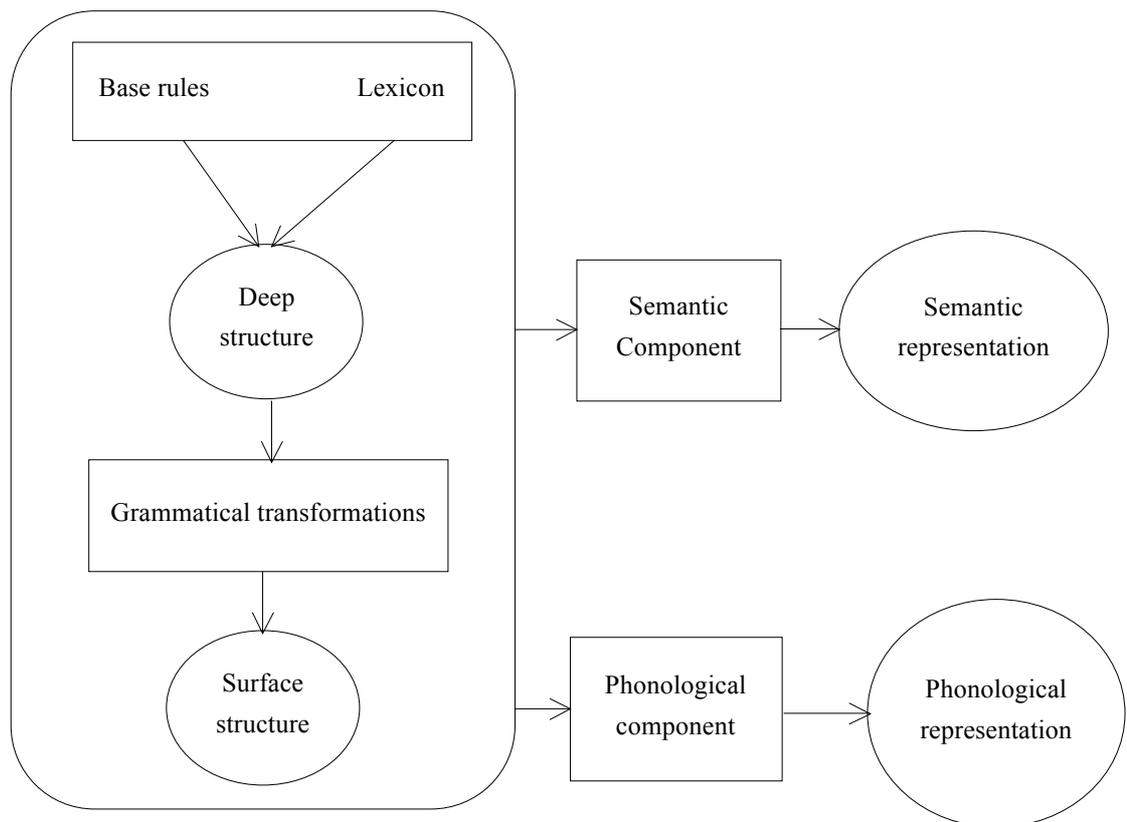
sentence is pronounced. In this way, a sentence generated by the syntactic component using certain syntactic rules corresponds to a phonetic representation, is a phonetic entity. The semantic component assigns a semantic representation, i.e. a meaning, to the sentence generated by the syntactic rules. Thus, a syntactically generated sentence is also a semantic entity, as it corresponds to a semantic representation as well (1965:16).

According to Chomsky, only the syntactic component is creative, while both the phonological and semantic component are *purely interpretative*. The phonological representation corresponds to a sentence's *surface structure*, while the semantic representation corresponds to its *deep structure*. The former is interpreted by the phonological component, whereas the latter by the semantic component of the grammar.

Chomsky stresses the fact that the deep and the surface structure are, in general, distinct, even if they appear to be the same (1965:16). The central idea is that the surface structure is generated "by repeated application of certain formal operations called *grammatical transformations* to objects of a more elementary sort" (1965:16). Hence, according to Chomsky, the syntactic component generates deep and surface structures by applying transformational operations and is responsible for their interrelation. Of course, it is necessary to assume the existence of such a *transformational subcomponent* within the syntactic component of a generative grammar. In other words, the grammatical transformations reflect the rules that express relations between deep and surface structure (1972:106).

The aforementioned claims about the organization of language, known as the Standard Model (Chomsky, 1965) can be assumed as following (from: "Dalla teoria standard alla teoria standard estesa", Sergio Scalise, Introduction to the Italian edition "Riflessioni sul linguaggio", 1981:

pp.XI- XIII of Chomsky's "Reflections on language" 1975).



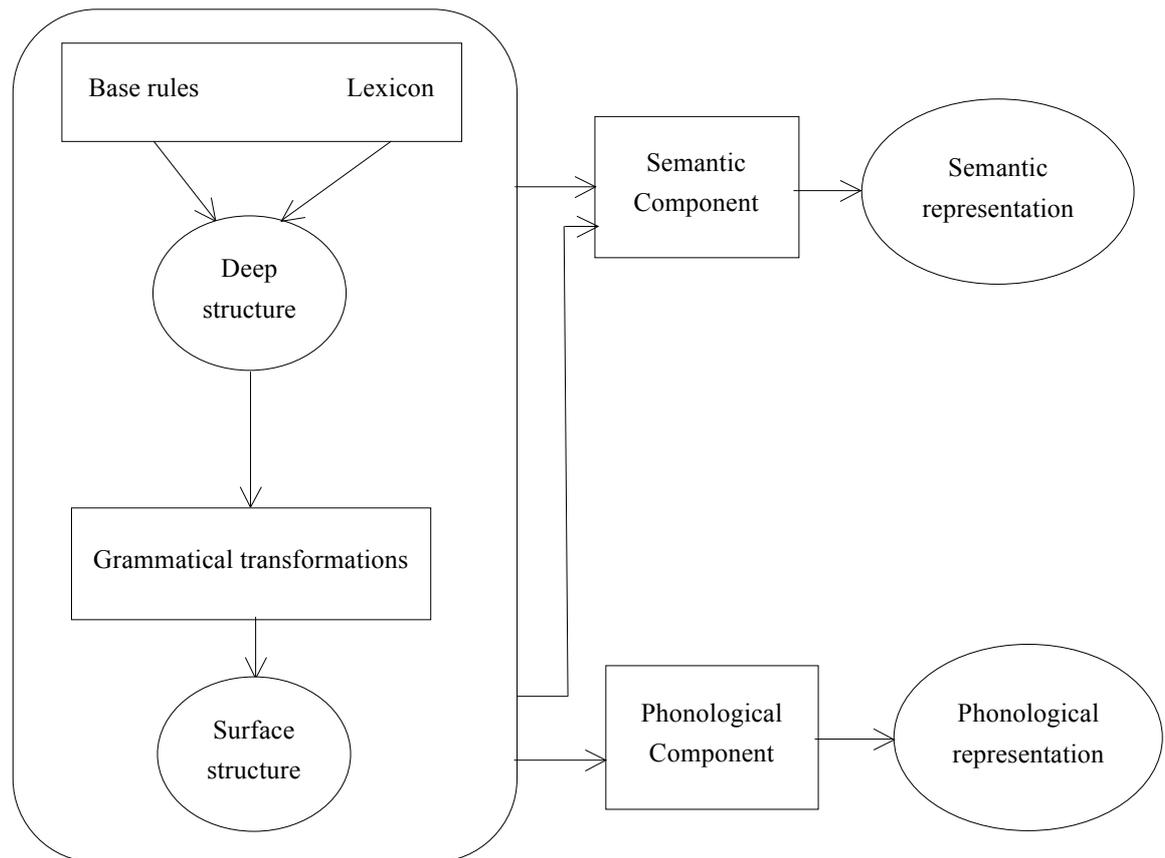
As Scalise points out, if we accept the above scheme, it follows that grammatical transformations should not change the meaning of the sentences as semantic interpretation takes place only at the deep structure.

Nevertheless, it has been shown (Chomsky, 1968b) that a transformation can and does change the meaning of a sentence. Consider the following sentences, transformed from active in passive (examples by Scalise, translated in English by me):

- 1) All my students speak two languages.
- 2) Two languages are spoken by all my students.
- 3) Everybody loves somebody.
- 4) Somebody is loved by everybody.

It is evident that the active sentences (1 and 3) and the passive sentences (2 and 4) do not have the same meaning. Observations like this led to the

conclusion that the surface structure as well is relevant for the semantic interpretation. The surface structure determines interpretation, even if partially, also in case of focus and presupposition, topic and comment, scope of logical elements and pronominal reference (1972:111). This theoretical modification can be schematically represented as follows:



According to Scalise, the model above is known as "interpretative semantics". The assumption that the semantic component is *purely interpretative* - and not generative - remains unchanged. This model, however, acknowledges the fact that the deep structure alone cannot account for all the cases of semantic interpretation and, thus, the incoming structures of the semantic component should also contain the surface structures.

As far as *transformational grammar* is concerned, an important

assumption is that a speaker may produce an infinite number of sentences based on finite set of elements using a finite set of rules. This set of rules, called *rewriting rules*, have the following form:  $X \rightarrow Y$ . Following this rule, X can be *rewritten* as Y. In other words, X can be substituted by Y. In order to explain rewriting rules, we use an example from Chomsky (L'analisi formale del linguaggio, 1969:56). A sentence (in English) may consist of an NP (Noun Phrase) and a VP (Verb Phrase). This claim may be rewritten as:

**1)  $S \rightarrow NP + VP$ .** (the arrow corresponds to the rule "rewrite as")

Supposing that in the very basis of a language there are several lists, intended as inventories of the language's fundamental elements, there could be a list containing elements as *that* plus another sentence (e.g. "that the man came- was unfortunate"), an article and a noun (e.g. "the man"), to plus a VP ("to err is human") etc., that could be the possible constituents of an NP. This information could also be expressed in the following way:

**2)  $NP \rightarrow that + S$**

**3)  $NP \rightarrow to + VP$**

**4)  $NP \rightarrow Article + N$**

As Chomsky says, we could go on expressing all the other information about a structure consisting of Immediate Constituents (i.e. the constituents, which directly form a construction. Chomsky 1969:129) using rules like  $X \rightarrow Y$ . In this way, we obtain derivations like the following:

**5)**

1. **S**

2. **NP VP** (Formed by application of rule **1**) at line 1)

3. **that S VP** (Formed by application of rule **2**) at line 2)

4. *that* NP VP VP (Formed by application of rule 1) at line3)

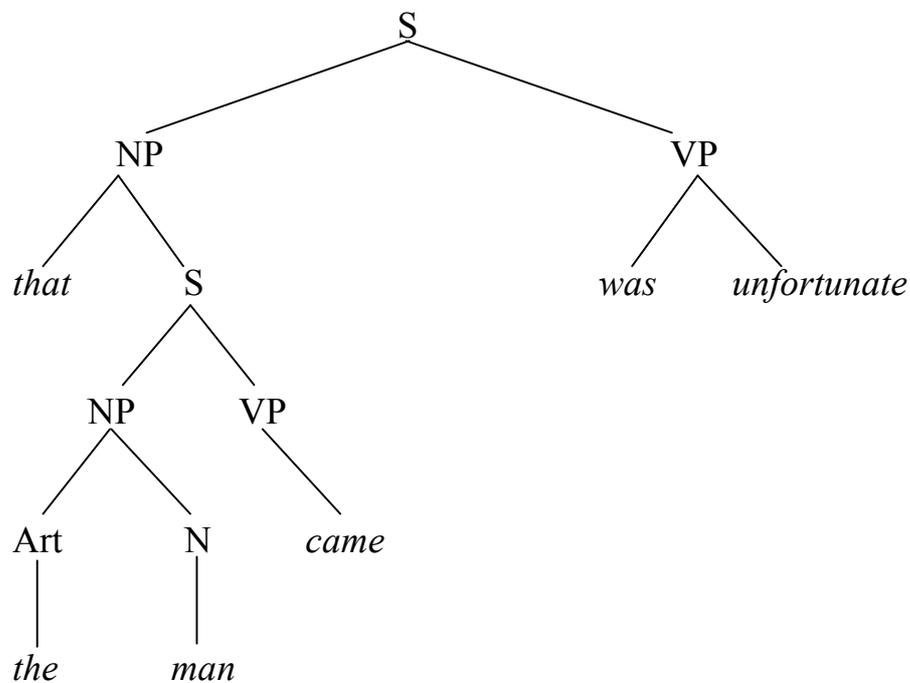
5. *that* Article N VP VP (Formed by application of rule 4) at line 4).

In this way we obtain the sentence:

6) that the man came was unfortunate.

By applying similar rules, we should be able to arrive at the sequence of morphemes that represent the sentence in 6).

Of course, 6) could be represented in a tree - diagram, which would represent graphically the *syntagmatic structure* of this sentence.



At this point, it is obvious how a finite set of rules can generate an infinite number of phrases. This possibility is given by the recursive character of certain rules. Of course, there are some *selective rules* that determine which elements can co-occur in a specific construction. These rules, however, will not be further analyzed here.

A more recent approach to the theory of language, which constitutes a development of Chomsky's previous work in generative grammar, is the

Minimalist Program (henceforth MP, Chomsky, 1995). The reason the MP was proposed was to eliminate points of previous work that seemed complex or problematic. The MP shares various assumptions with Chomsky's former work. First of all, it assumes the existence of the language faculty as a component of the human mind, which is dedicated to language and interacts with other systems. The human faculty consists of at least two components, a cognitive system, which stores information, and performance systems, which use information in several ways. The two components interact with each other. There are two "external" systems interacting with the cognitive system, namely the articulatory-perceptual and the conceptual-intentional system (see also section 2.3). Each system corresponds to an interface level, the Phonetic Form (PF) for the articulatory - perceptual interface and the Logical Form (LF) for the conceptual - intentional interface (1995:2).

However, the core concept of the MP is 'economy', to which derivations and representations that constitute linguistic competence have to conform. For this reason, in the MP the distinction between Deep and Surface structure has been eliminated. As Lasnik says, in the MP "given the traces (see section 2.6 below), the role of D- structure in determining thematic relations becomes insignificant, as derived structure includes the relevant D- structure information".

### **2.3 Universal Grammar**

As Chomsky states, when studying human language, linguists approach the "*human essence*", this means "the distinctive qualities of mind that are unique to man and [that are] inseparable from any critical phase of human existence, personal or social". What distinguishes human language from all known systems of animal communication is its creative aspect, already mentioned above. Human beings, unlike apes or primates, once

having mastered a language, are able to understand and produce “an indefinite number of expressions that are new to one's experience, that bear no physical resemblance and are in no simple way analogous to the expressions that constitute one's linguistic experience” (1972:101). Nowak (2000) sustains that the remarkable characteristic of human language is syntax, insofar as it is quite unlimited. While the lexicon of a language “cannot exceed the total number of chances an individual has to learn a new word”, syntax goes far over the sentences that speakers of a language have ever elaborated in their lives. In this view, language has been the most important event in the whole evolutionary history of the human beings.

According to Chomsky, at the basis of language use, there are some principles that reflect *universal properties of mind*. These properties, present at all human beings with normal capacities of using language, will be briefly exposed in this chapter.

The generative grammar, as introduced by Chomsky, generates deep structures related to surface structures by transformation rules. Moreover, it contains the rules that relate deep and surface structures to representations of sound and meaning. All these rules and representations correspond to the knowledge of language, every aspect of language that a person has mastered and internalized in order to speak.

A pretty curious characteristic of human language is that people possess it, despite its complexity, without being aware of it and, as Chomsky stresses, without even having the possibility of being aware of it (1972:104). Acquisition of a language, of course, does not mean repetition of phrases that are part of one's experience. Nor does it imply the existence of a ‘verbal repertoire’, i.e. a limited resource of utterances produced by habit on appropriate occasions - apart from some greetings

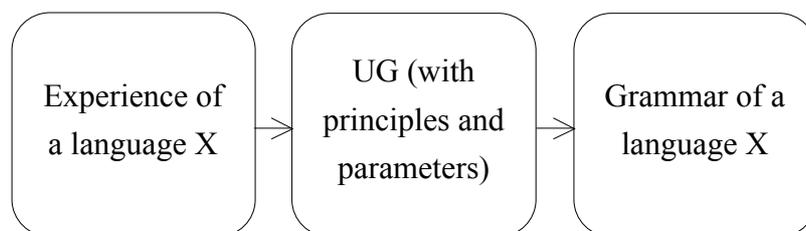
and clichés (1972:118). A language, as we have already illustrated, gives the possibility to elaborate an infinite set of phrases of indefinite length and complexity. The question is how do human beings acquire a language like this without even knowing it?

Furthermore, another intriguing aspect of language is what is known as the “poverty of stimulus”, i.e. the fact that children acquire language through very limited linguistic data and in a very short period of time. In fact, children have to construct the grammar of the language they are exposed to, by deducing its rules based only on the linguistic samples they hear basically from their parents. Citing Chomsky, “the data available to the child is quite limited- the number of seconds in his lifetime is trivially small as compared with the range of sentences that he can immediately understand and can produce in appropriate manner”. As Nowak (2000) claims, four-year olds know how to avoid 95 per cent of the mistakes they could possibly make. They achieve this, we add, without any explicit instruction- if we assume that the medium schooling age is 5 to 6 years- and with minimum correction from the adult speakers. Haegeman (2000:8) highlights three ways in which linguistic data is inadequate and poor. First of all, our linguistic experience is not made only of grammatically correct sentences. Second, linguistic experience is finite, compared to the capacity a speaker has to produce and understand infinitely many sentences of their language. Last, we do not have positive evidence of our knowledge of language, at least not before receiving grammar lessons at school.

The above considerations lead to the assumption that there must be a mechanism in the human brain that supports in some way the acquisition of language. This mechanism has been named “*the language faculty*”, conceived as a particular component of human mind. This innate

linguistic faculty is genetically determined and generated probably by neuronal circuitry in our brain (Nowak, 2000). From this point of view, the theory of generative grammar can be also labeled as "Universal Grammar" (henceforth abbreviated UG), meaning that it seeks the nature of the language faculty which characterizes every human being (except, of course, pathological cases) and the set of principles common to all human languages. For Chomsky, the UG is an innate component of the human mind that produces a specific language by means of the interaction with the data available. This particular mechanism converts experience into a system of acquired knowledge, that is, the knowledge of one or another language (Chomsky 1989:11, my translation).

This framework assumes that UG, which, as said above, is present at all human beings, contains principles that are common for all human languages. These universal principles allow children to learn whatever language they happen to be exposed to. Following the above assumptions, acquisition of a language X can be represented as follows:



The importance of UG, along with universal principles, for language acquisition is hilariously put by Chomsky (from Chomsky, 1981b:8 in Haegeman 2000:14): “Endowed with these principles, a system provided with adequate experience will develop a grammar of the peculiar and specific sort characteristic of the human language... Lacking these principles, a system will develop no grammar or some different system. The telephone exchange, for example, has ‘heard’ much more English than any of us, but lacking the principles of universal grammar...it

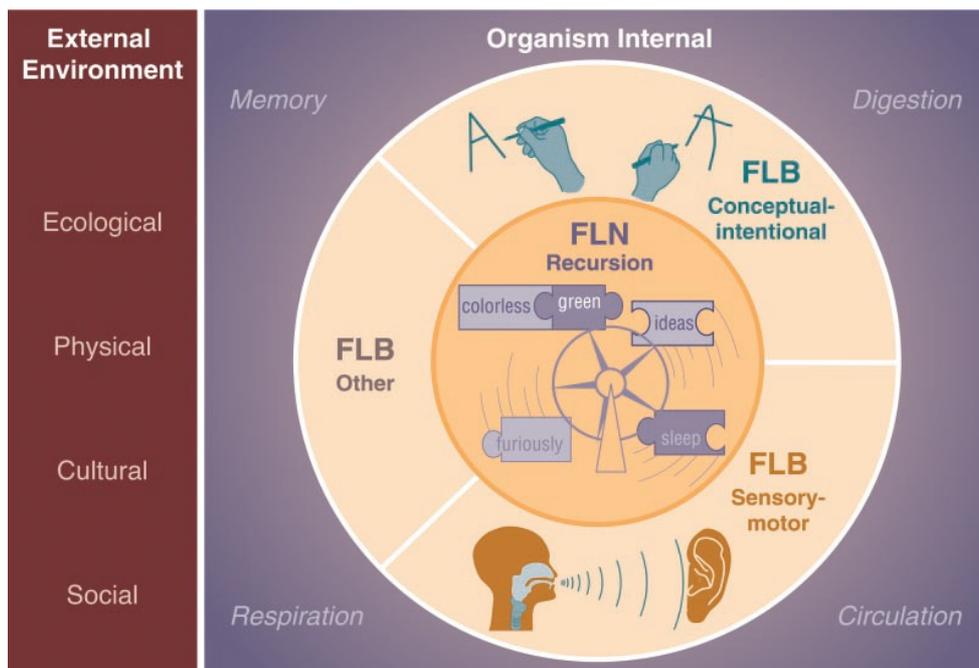
develops no grammar of English as part of its internal structure”.

Hauser, Chomsky and Fitch (2002) argue that there is a basic distinction concerning the faculty of language. Namely, the faculty of language can be viewed both in a *broad* and in a *narrow sense*, thus assuming the existence of an FLB (faculty of language in the broad sense) and an FLN (faculty of language in the narrow sense). According to Hauser et al., FLB contains at least two organism- internal systems labeled “*conceptual- intentional*” and “*sensory- motor*” (the authors also assume the existence of a third component of FLB under the label “other”, not made precise in the paper). Whether these systems are present in all species or specific of the human capacity to speak, the authors presume that there is a certain biological capacity that allows human beings (but not animals) to acquire any human language without explicit instruction. FLB includes this capacity, but does not contain other necessary but not sufficient organism- internal systems, such as memory, respiration, digestion, and circulation.

At the core of FLB the authors posit the computational mechanisms responsible for recursion, which constitute FLN. Citing their words, “FLN is the abstract linguistic computational system alone, independent of the other systems with which it interacts and interfaces. FLN is a component of FLB, and the mechanisms underlying it are some subset of those underlying FLB” (p. 1571). In other words, FLN is constituted by the core grammatical computations on the basis of recursion, which, as said above, is responsible for the creative aspect of human language.

The “computational system” that according to the authors forms the key component of FLN is “*narrow syntax*”, which generates internal representations. These representations assume a phonological form by the phonological system, a component of the sensory-motor system, and a

semantic interpretation by the semantic system, part of the conceptual-intentional system. Hence, the recursive property (outlined in a more detailed way in section 2.2) of FLN exists due the narrow syntax, which is capable of producing an infinite number of sentences based on a finite set of elements combining them in appropriate ways. These syntactic representations are then elaborated by the sensory-motor and the conceptual- intentional system, which ascribe them a phonological and a semantic representation respectively, i.e. a sound and a meaning. Of course, organism- internal systems do impose certain practical limits to the infinite linguistic capacity humans possess, some of them provided in section 2.1. However, at least at some extent, FLN comprises the recursive capacity, specific of the human species.



**Fig.1** A schematic representation of Hauser et al’s conception of the Faculty of Language, divided in narrow and broad. (From “The Faculty of Language: What Is It, Who Has It, and How Did It Evolve?” Hauser M. D., Chomsky N., and Fitch W. T.)

Hauser et al. also examine the evolution of the faculty of language illustrating three possible hypotheses. According to the first hypothesis (Hauser 1996, Cheney and Seyfarth 1990, Kluender, Lotto and Holt

2005) human language is homologous to the various communication systems that characterize non-human species. From this point of view, FLB, including FLN, as conceived for human language compose non-human communication systems as well.

The second hypothesis (Jackendoff 1999, Pinker 1990, Pinker and Jackendoff 2005) accepts that human FLB, including FLN, although potentially present in animal species as well, constitute a genetically determined, uniquely human adaptation targeted specifically at communication, which has taken place due to natural selection.

The third hypothesis (among others Chomsky 1980, Hauser 2001, Enard et al. 2002), embraced by Hauser et al., assumes that, while FLB is present both in human and non-human species, FLN is a species-specific characteristic of human beings evolved only recently (in the circa 6 million years that have passed since the human species diverged from our primate ancestors). Furthermore, the authors assume that certain specific aspect of the faculty of language are “by-products of preexisting constraints” and exclude the possibility that they have been formed by natural selection with the purpose to serve communication. In other words, for Hauser et al. FLN, which constitutes the core property of human language, has probably evolved for reasons other than language (such as navigation, numbers or social relationships).

This rather strong hypothesis of Hauser et al. has been criticized by Pinker and Jackendoff (2005) who claim that the faculty of language has evolved in order to communicate complex propositions as a result of adaption. The authors claim that Hauser et al.’s hypothesis is strongly influenced by Chomsky's Minimalist Program (1995), which “chooses to ignore” phenomena like: phonology, derivational and inflectional

morphology, phrase and word order etc<sup>1</sup>. Pinker and Jackendoff agree with Hauser et al. that recursion is not unique to language as it serves the necessity to express recursive thoughts and intentions. They, however, refute the assumption that recursion is the only characteristic of language unique to human species.

Whatever the specific nature of language is, it is very interesting to understand how human beings passed from non-syntactic to syntactic communication. Nowak, Plotkin and Jansen (2000) suggest that there is a certain limit of the messages that can be conveyed without syntax, called “threshold”. According to the authors, when humanity exceeded the number of possible communication topics that could be learnt, natural selection began to favor syntactic communication, giving thus the possibility to human beings to communicate by generating messages that did not have to be learned beforehand.

## **2.4 Acceptability and Grammaticality**

It has already been said that the goal of a generative linguist is to describe the grammar of one or another language, based on the native speakers’ performance of their mother tongue. In order to do this, a linguist is led by the speakers’ intuitions about the sentences that can or cannot be produced in that precise language. The ability to intuitively discern between what is, or better, what “sounds” correct and what wrong, introduces the notion of “acceptability”. According to Lyons “an acceptable utterance is one that has been, or might be, produced by a native speaker in some appropriate context and is, or would be, accepted by other native speakers as belonging to the language in question” (Lyons

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<sup>1</sup> The writer is strictly and deliberately limited to outline the basic notions of Chomsky's work, without taking position about its potential advantages or disadvantages.

1968:137 - 138). “Acceptability” is a technical term, a practical instrument that does not depend upon any theoretical conceptions.

On the contrary, when we talk about “grammaticality”, we refer to a theoretical notion. A sentence in a specific language is grammatical if formed according to the grammar of that language, in the way that it has been formulated by the linguist (Haegeman 2000:5). When a sentence does not comply with the rules of a certain language’s grammar, it is labeled as “ungrammatical”, but this does not mean that it is also unacceptable (Lyons 1968:155). The contrary is also possible: unacceptable sentences can still be grammatical, but characterized as such for reasons independent from grammar (Haegeman 2000:6) (e.g.: a sentence can be unacceptable because it sounds complicated and, thus, difficult to understand).

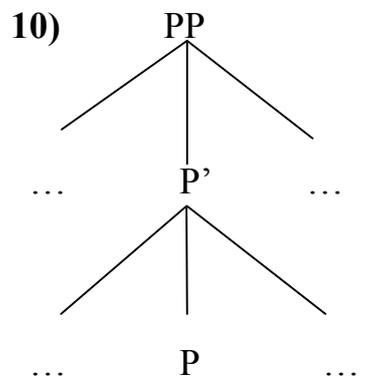
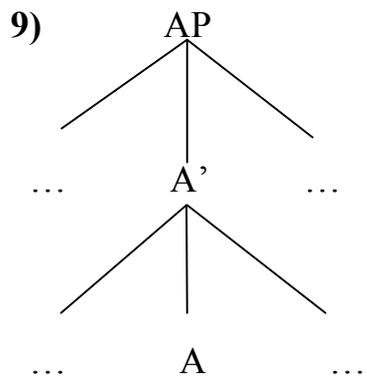
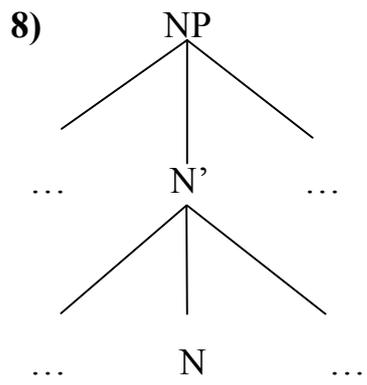
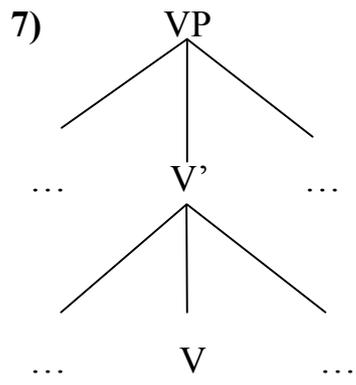
## **2.5 The X - bar Theory**

X - bar or X’(henceforth) theory is, according to MIT Encyclopedia of the Cognitive Sciences (2001:898), the module of grammar that regulates the structure of constituents. The goal of this theory is to describe all possible syntactic configurations. Taking also into account other principles of the grammar, the X’ theory determines representations of a language’s structures.

The X’ theory is applied to all lexical categories, i.e. Verb, Noun, Adjective and Preposition, and the phrases they form (Verb Phrase or VP, Noun Phrase or NP, Adjective Phrase or AP, and Prepositional Phrase or PP). As Haegeman states, the structure of the syntagmatic projection of every lexical category can be represented in levels. In this way, we obtain the following representations<sup>2</sup>:

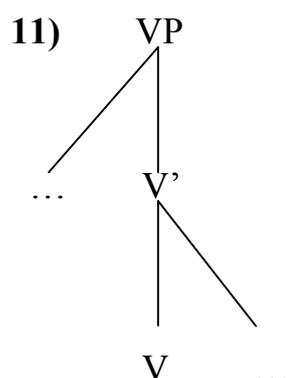
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<sup>2</sup> The ... stand for complements.



The double ramification (right and left) accounts for the parametric variation of the word order in the various languages (SVO, like Greek, Italian and English; and SOV, like Japanese, respectively). The nature of this phenomenon is not clear yet. Word order variation could be an example of parametric variation, determined by a UG parameter.

In this way, UG would provide both (S) VO and (S) OV word orders. Children, during language acquisition, would select the parameter that determines the word order of the language they are exposed to. Another possible explanation, proposed by Kayne (1993, in Haegeman, 2000:83), claims that the word order given by UG is only V - Compl(ement) and Spec(ifier) - V, giving place only to the following representation:

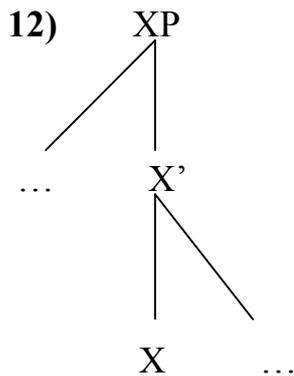


According to this hypothesis, OV word order would derive from a movement of the object towards left. In this way, the moved object climbs over the verb. Accepting Kayne's hypothesis, we would assume that the parameter distinguishing (S) OV from (S) VO depends on the application (or not) of the rule of movement towards left.

The four syntagmatic structures 7) - 10), even if apparently different, can be represented as follows<sup>3</sup>:

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<sup>3</sup> As both languages under investigation in the present paper follow the (S) VO word order parameter, I have chosen to represent only right ramification.



In this way, according to Haegeman (2000:89), our grammar does not necessarily have to contain a syntagmatic representation, a “scheme” for each lexical category, but it can reduce them to only one.

According to the X' theory, constituents are *endocentric*, i.e. they are projections of *heads*. Heads of projections are of zero- level (X<sup>0</sup>), they are terminal nodes. This means that they dominate over words.

Heads (X<sup>0</sup>) combine with complements, which are maximal projections, in order to form projections of intermediate level, X- bar or X'. X', then, attached to another maximal projection, its specifier, forms XP or X''.

Apart from the four lexical categories already mentioned (V, N, A and P), the X' theory is also applied to functional categories as I (Inflection, e.g. tense and agreement) and C (Complementiser, e.g. determiners and conjunctions).

More specifically, in the Principles and Parameters approach (Chomsky 1986), the X' scheme is extended to all syntactic categories, lexical, as well as functional, such as CP (Complementiser phrase) and IP (Inflection phrase). In this way, the whole syntactic structure is constructed with and can be represented by the X' scheme we have seen above. In other words, main clauses, as well as subordinate and interrogative clauses can be attributed to one and only scheme. An

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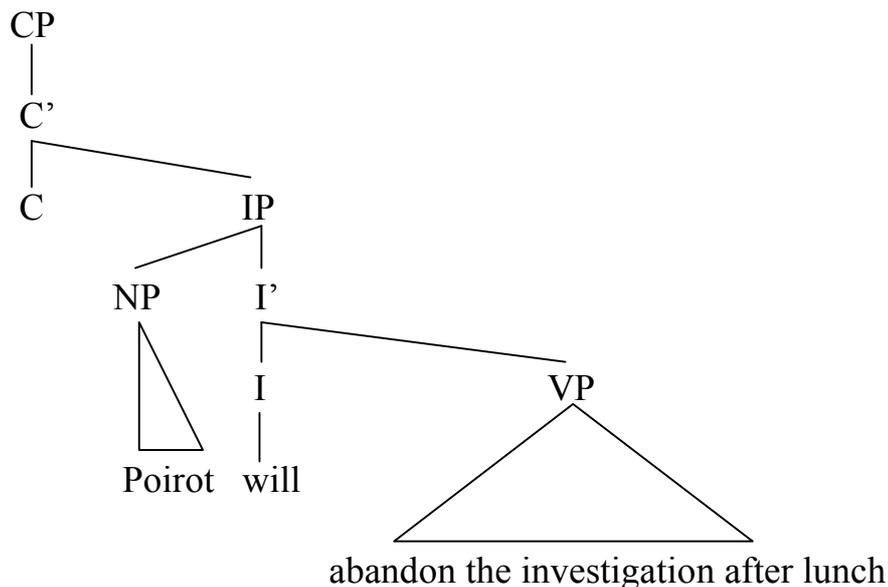
important implication of this theoretical extension is that children acquiring their language should only access the X' scheme (with the appropriate parameterization, according to the linguistic environment they are emerged in), in order to be able to assign a syntagmatic structure to any sentence that belongs to the language they are acquiring. (Haegeman, 2000:104).

## 2.6 Movement

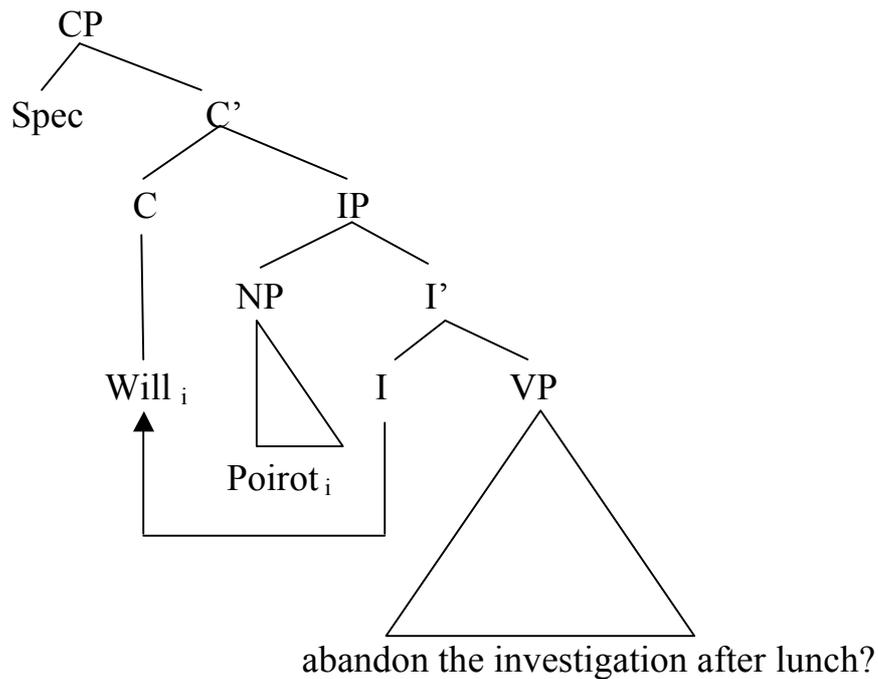
A very important aspect of the X' theory is *movement*; constituents move within the sentence in order to form different structures. Passive sentences and wh - questions, for example, derive from base- structures that are transformed via movement. Consider the following examples, taken from Haegeman (2000:101).

- 13) Poirot will abandon the investigation after lunch.
- 14) Will Poirot abandon the investigation after lunch?
- 15) When will Poirot abandon the investigation?

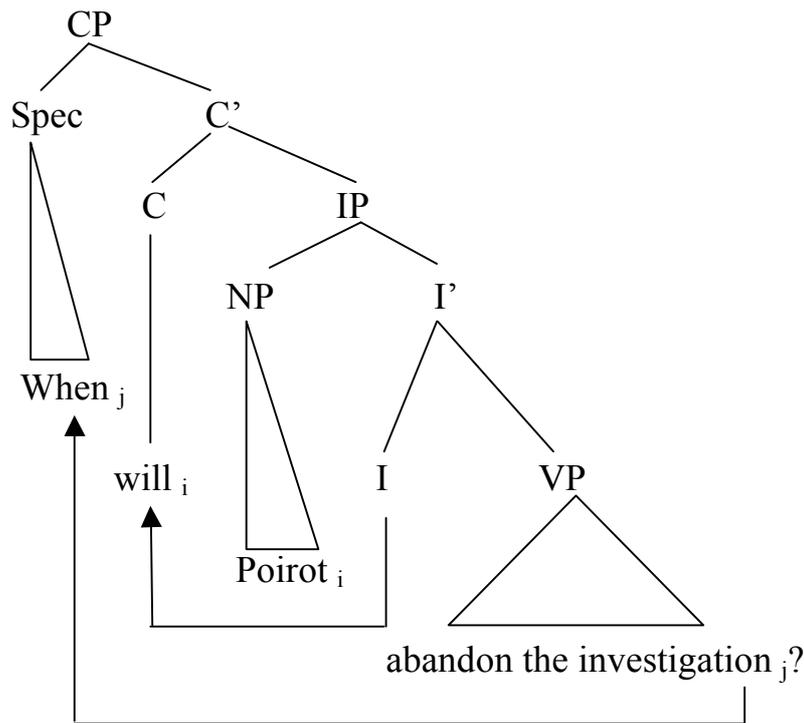
13) is an affirmative sentence with the following structural representation:



14) is an simple (Yes / No) interrogative sentence. As we all know, in English, in order to form interrogative sentences, it is necessary to invert the normal order Subject - Verb. This inversion is made clear in the following representation:



We assume that the modal verb *will* moves from the position where it is generated (head of Inflection) to a *landing site* (in this case, the head of Complementiser) leaving a trace *i*. 13) is a wh- question that can be represented as following:



The wh-question in **15**), as well, is formed via movement. The wh - word *when* moves from the position usually occupied by temporal adverbs (like ‘after *lunch*’ in sentences **13**) and **14**)) to the Specifier of CP leaving behind a trace *j*. *Will* moves in the same way described in **15**).

## 2.7 Conclusions

In this first chapter we have tried to expose the Chomskyan theory of language as a prerequisite to the rest of the research.

We have seen what ‘language’ is in Chomsky’s terms, making the fundamental distinction between *competence* and *performance* (section 2.1). We have also explained the term ‘Generative Grammar’ with its several components (section 2.2) and examined the important notion of the ‘recursive’ character of all human languages, the one that gives to human beings the possibility to express infinitely many thoughts using finite ‘material’, such as the lexical items. Moreover, we have discussed the possibility of the existence of a ‘Universal Grammar’, as an innate

ability that makes language acquisition possible, despite the ‘poverty of stimulus’ (section 2.3)

Two other concepts exposed in this chapter are ‘acceptability’ and ‘grammaticality’, terms that deal with the well- formedness of the sentences (section 2.4).

Moreover, we have introduced the X’ theory and the X’ scheme, according to which all possible syntactic structures can be attributed to one and only representation (section 2.5). Possible variations can be explained by the notion of ‘movement’ of the constituents (section 2.6).

## 3 Aphasia and agrammatism

### 3.1 What is aphasia?

The term “aphasia” is related to several acquired disorders of language (Lesser, 1978), which cause a more or less important alteration of the productive and comprehensive linguistic capacities of a subject (Aglioti and Fabbro, 2006). In fact, aphasia can influence one, some or even all linguistic modalities, i.e. oral and written production and comprehension (Harley, 2001). These linguistic disorders usually appear after a focal lesion mainly in the left hemisphere of the brain, and are to be considered separately from impairments manifested in pathologies like dementia and schizophrenia, which are due to a generalized brain damage (Lesser, 1978).

The most common cause of aphasia is a cerebro-vascular accident (CVA) or stroke<sup>4</sup>, either hemorrhagic (i.e. caused by a blood loss) or ischemic (i.e. caused by lack of blood flow in the brain). Other possible causes are cerebral trauma and tumor. According to Capitani and Luzzatti (2003, from the “Neurologia. Principi di diagnostica e terapia” by Pinelli & Poloni) what does not belong to the concept of aphasia can be listed as follows: all the impairments that follow alterations of consciousness or attention, those provoked by deficits of spatiotemporal orientation (confused state of mind) or by motor deficits of the mouth, tongue, larynx and pharynx like dysarthria. Excluded from the definition of aphasia are also all the evolutionary disorders of language, communication disorders of psychogenic origin and some of the linguistic deficits that can be found in subjects with diffused cerebral suffering.

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<sup>4</sup> A stroke is defined as the rapid loss of brain function(s) due to disturbance in the blood supply to the brain. As a result, the affected area of the brain cannot function properly (definition by <http://en.wikipedia.org/wiki/Stroke>).

The several symptoms that tend to appear after a brain lesion constitute an “*aphasic syndrome*”. According to Denes (2009:46), the concept of aphasic syndrome has a double character: *anatomical* and *functional*. The anatomical aspect relates the association of deficits manifested in aphasia to the anatomical proximity and to the same vascularization of areas with different functions. According to the functional aspect, on the other hand, an aphasic syndrome reflects the effects of a lesion to a mechanism that supports apparently different functions. As Denes emphasizes, in the former view, variation of cerebral vascularization or of extension of the lesion may produce dissociated deficits, while in the latter one, aphasic symptoms will be, by definition, associated.

A set of deficits is characterized as “*associated*” when manifested at the same time by one patient. On the contrary, deficits are said to be “*dissociated*”, when present only partially in a patient. In other words, there is a dissociation of deficits when the patient shows “preserved performance in one cognitive domain and impaired performance in another” (Encyclopedia of the Human Brain, 2002, Vol.2:631).

Moreover, in Levy and Kavé (1999) we find a “strong” and a “weak” notion of a syndrome. According to the authors, an aphasic syndrome in its strong sense corresponds to “a way of grouping individuals” in the way their cognitive mechanism differs from the normal due to a brain lesion. On the other hand, as the authors claim, a syndrome viewed in its weak sense, can still serve clinical purposes, even if it does not refer to the underlying cognitive mechanisms, but rather to co- occurrence of symptoms.

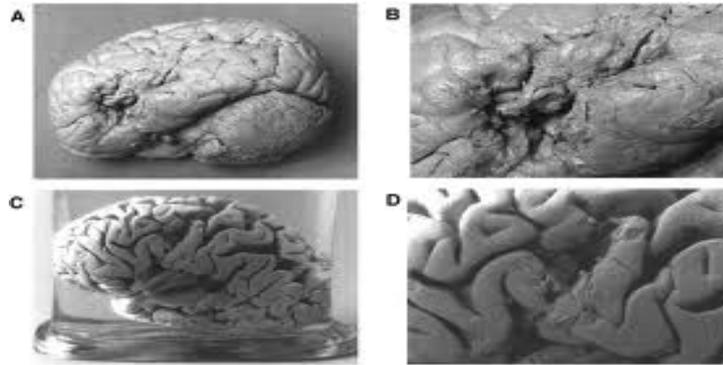
An intriguing aspect of aphasia is whose interest it should really be: is or should aphasia be a linguistic or a medical problem? Roman Jakobson’s position was, of course, that aphasia should be a linguistic matter. In fact,

Jakobson - cited by Lesser, 1978 - claimed that “aphasia is first and foremost a disintegration of language and as linguists deal with language, it is linguists who have to tell us what the exact nature of this disintegration is”. Nevertheless, as Lesser correctly claims, a brain lesion also produces other neurological symptoms besides aphasia, such as *hemiplegia* and *hemianaesthesia* (paralysis and loss of sensation of the limbs on one side of the body) or *hemianopia* (defect at the visual field). For this reason, Lesser concludes that “although aphasia maybe a linguistic problem, the aphasic patient is a medical problem”.

### **3.2 The beginning of aphasiology- Historical references**

Modern neuropsychology is supposed to have started with Paul Broca, who, in 1861, presented his work at the Anthropological Society of Paris. His data came from an autopsy he carried out on a patient named Monsieur Leborgne at the Bicêtre Hospital, where he was a surgeon. Broca’s patient, also known as “*Tan*” because of the only syllable (“tan”) he was able to produce, had been hospitalized for twenty-one years and died of generalized sepsis at the age of fifty- seven. Despite his apparent mutism, Leborgne was able to communicate with gestures and/ or altering the intonation of the monosyllable (Denes, 2009:20). Furthermore, his repetition ability was impaired, but he seemed to understand what was said to him.

The brain examination after Leborgne’s death showed a vast cerebral lesion, centered mainly in the frontal lobe and particularly at the foot of the third frontal convolution. These results were confirmed by the autopsy on a second patient, Le Long, who could pronounce only five words: oui, non, toujours, tois (for trois) and Lelo (for his name Le Long).



**Fig. 2** Photographs of the brains of Leborgne and Le Long.

- (A) Lateral view of the brain of the first patient, Leborgne. The external lesion is clearly visible in the inferior frontal lobe. The softening in the area superior and posterior to the lesion suggests further cortical and subcortical involvement.
- (B) Close-up of the visible lesion in Leborgne's brain.
- (C) Lateral view of Broca's second patient, Lelong. The frontal, temporal and parietal lobes have retracted due to severe atrophy, exposing the insula.
- (D) Close-up of the visible lesion in Lelong's brain. Note that only the most posterior part of what is currently called Broca's area is infarcted; the anterior portion is completely spared.

From: <http://brain.oxfordjournals.org/content/130/5/1432/F3.expansion>

Broca had adopted the localizationist approach, according to which every human faculty, including the language faculty, is located in specific areas of the human brain. The results of the autopsy examination of Leborgne led Broca to affirm that certain brain lesions destroy the ability to speak, without affecting intelligence. Following the theories of Jean- Baptiste Bouillaud<sup>5</sup>, he located these lesions in the anterior lobes of the left hemisphere of the brain.

In his article “*Remarques sur le Siége de la Faculté du Langage Articulé, Suivies d’ une Observation d’ aphemia (Perte de la Parole)*”<sup>6</sup> in

<sup>5</sup> French physician, 1796-1881, maintained that loss of articulate speech is connected with lesions in the anterior lobe of the brain, from [http://en.wikipedia.org/wiki/Jean-Baptiste\\_Bouillaud](http://en.wikipedia.org/wiki/Jean-Baptiste_Bouillaud).

<sup>6</sup> Translation of Paul Broca’s article by Simran Karir, in Broca’s Region, edited by Katrin Amunts and Yosef Grodzinsky, 2006.

*Bulletin de la Société Anatomique de Paris* we find an obsolete, yet accurate description of aphasia or, as resulting from the title, *aphemia* (from Greek *α*, without, deprived of and *φημι*, to speak, to pronounce). Aphasic subjects, according to Broca, can produce only a reduced number of sounds, even if they are “fully intelligent” and able to “move their tongues and lips”. Broca also brings up the aspect of stereotypicality of the aphasic speech production when he mentions a “word of choice” or even a “vulgar swear word” that aphasic patients usually produce. In order to explain these deficits, he makes a distinction between the faculty of language in general and the faculty of spoken language (*faculté du langage articulé*). In aphasia, the former faculty would remain intact, whether the latter would be impaired and therefore responsible for the loss of speech.

Thirteen years later, in 1874, Karl Wernicke, a young neurologist, published his paper “*Der aphasische Symptomenkomplex*” (“The symptom complex of aphasia: a psychological study on a neurological basis”), led by two cases of patients who were much different from Broca’s assumptions of aphasia. Indeed, in contrast with Broca’s patients, Wernicke’s first two patients presented the opposite clinical image. They presented a highly impaired comprehension ability. However, both of them had a fluent oral production with relatively normal syntax and intonation. The main characteristic of their spontaneous speech was that it was meaningless. Furthermore, their speech was characterized by errors of *paraphasia*<sup>7</sup>. Instead of pronouncing a word, the patients produced

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<sup>7</sup> The term paraphasia is referred to a set of aphasic symptoms and consists in the “production of unintended syllables, words or phrases during the effort to speak” (definition by Goodglass and Kaplan, 1983, found in [http://en.wikipedia.org/wiki/Paraphasia#cite\\_note-goodglass-1](http://en.wikipedia.org/wiki/Paraphasia#cite_note-goodglass-1)). Paraphasic errors might be phonological/ phonemic (omission, substitution, transposition of one or more phonemes in a word), semantic (production of a word other than the intended

another word phonologically or semantically similar to the target. Sometimes, the word produced was that different from words in German that it was described as a *neologism*, i.e. a word that did not exist.

The autoptic examination of one of the two patients showed a cerebral infarct in the region of the first temporal gyrus (which is now called Wernicke's area), occupying approximately the middle third of the gyrus and extending posteriorly toward the parietal lobe. This area was directly juxtaposed to the cortical area which receives the final connections of the auditory system and it was neither a primary sensory nor a primary motor area (Caplan, 1987:49 - 64). Wernicke made a distinction between primary and secondary or association areas. The primary areas, which are specific for every sensory modality, perceive the information sent by the sensory system and analyze it. The result of this analysis is then sent forward to the association areas, where it is stored. The various association areas are interconnected, so that a stimulus elaborated in a specific sensory modality can activate an image that is stored in another sensory modality (Denes, 2009:22 - 23<sup>8</sup>).

Based on the autoptic results and following the ideas of Theodor H. Meynert about the functional and anatomical organization of the cerebral cortex, Wernicke proposed a model of cognitive and neurological architecture of language, which was later modified by Norman Geschwind. In this model, Wernicke not only tried to associate the various aspects of language to different areas of the brain, but he also tried to predict a type of language disorder that hadn't been manifested yet.

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one, but semantically close to it), or verbal (production of a real, but inappropriate word) (Aglioti and Fabbro, 2006; Denes, 2009).

<sup>8</sup> Translated and simplified by me.

First of all, Wernicke assumed that the lesion he had found in the first temporal gyrus was responsible for the comprehension deficits of his patients and that, therefore, the same area in normal conditions was responsible for understanding spoken language. This area, according to him, had this precise function, as it contained auditory memories of words.

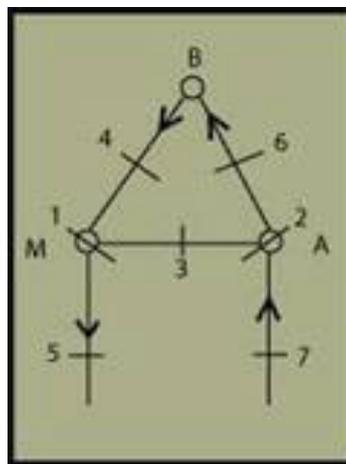
Excluding a lesion in the Broca's area, Wernicke hypothesized that the expressive deficit manifested by his patients was also to be ascribed at the lesion that caused the comprehension impairment. In order to explain this, he introduced the notion of *information flow*. In order to speak, the brain would install a flow of information between the area where the auditory forms of words are stored and the area where the motor sequences responsible for the articulation of these words are. The area in which the auditory images of words are memorized would be, as already said above, Wernicke's region, whereas Broca's region is, according to this model, the area of the cortex where the motor images of words are stored.

As mentioned above, besides the two already known types of aphasia - Broca's aphasia with productive deficits and Wernicke's aphasia with both productive and receptive language deficits- Wernicke postulated the existence of a third type, designated by him as "*Leitungsaphasie*", conduction aphasia. This third type of aphasia would arise by a lesion in the pathway between Broca's and Wernicke's area.

Wernicke's model became known as "*connectionist*", because it bases the function of the human brain onto the connections between its simple components and met immediate success.

Ten years later, Ludwig Lichtheim published his paper "*On Aphasia*" (1884 in German, 1885 in English) based on Wernicke's connectionist assumptions. Lichtheim elaborates his model and predicts seven possible

kinds of aphasia, four more compared to those proposed by Wernicke. He, as well, uses in his model the notions of auditory and motor word representations ascribing them in his schema the labels A and M, respectively. Area A corresponds with Wernicke's area and area M with Broca's area. B would represent, according to his writings, the place where concepts are elaborated ("*Begriffe*"). The seven interruption points in Lichtheim's diagram represent the seven possible types of aphasia, arising from a disconnection between "centers" caused by a brain lesion.



**Fig. 3** Lichtheim's Model

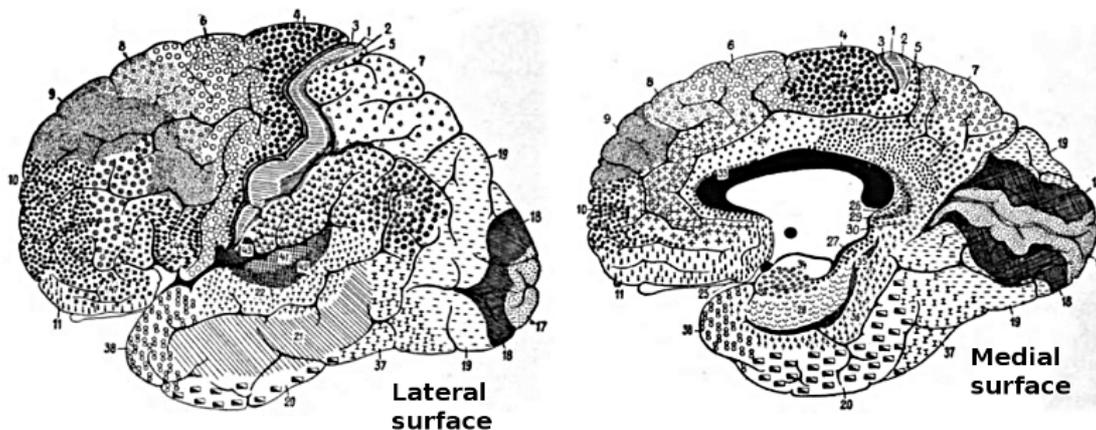
Types of aphasia that correspond to Lichtheim's Model:

- 1) **Motor aphasia** (Broca's aphasia)
- 2) **Sensory aphasia** (Wernicke's aphasia)
- 3) **Conduction aphasia**
- 4) **Transcortical sensory aphasia**
- 5) **Transcortical motor aphasia**
- 6) **Subcortical motor aphasia** (Apraxia or dysarthria)
- 7) **Subcortical sensory aphasia** ("*speech deafness*")

The representations of language described above constitute a unified model that is often called the Wernicke- Lichtheim model of language, found in the literature also as the Broca – Wernicke - Lichtheim model (BWL). The BWL model not only provided a way to classify the various aphasic symptoms, but has also been the first scientific account of the cerebral organization of language (Ingram, 2007:50 -55).

Almost a hundred years later, Benson and Geschwind (1971) added three more types of aphasia to the seven types described by Lichtheim. The first was *anomic aphasia*, with a severe deficit in recalling objects' names; *isolation of the speech area*, with preserved repetition, but impaired production and comprehension; and *global aphasia* with severe deficits in all linguistic components (predicted by Lichtheim in his paper "On Aphasia" under the label of "*total aphasia*", with "complete incapacity to speak" accompanied by "word deafness"). In order to support the classical taxonomy proposed by Lichtheim, Benson and Geschwind sustain that all researchers recognize the same basic pattern of aphasic impairments, despite using different terms (The MIT Encyclopedia of Communication Disorders, Chapter 'Aphasic syndromes; Connectionist models, p.263 found in <http://books.google.it>).

An important accomplishment of neurology that has had a direct influence on aphasiology has been the “*topographic parcellation of the cerebral cortex*” by the German neurologist Korbinian Brodmann (1908). Brodmann provided in his article “Contributions to a Histological Localization of the Cerebral Cortex- VI Communication: The Division of the Human Cortex”<sup>9</sup> a map of the human brain divided in 52 regions based on their cytoarchitectonic differences. Broca’s region occupies areas 44 and 45, whereas Wernicke’s region corresponds to area 22 in Brodmann’s taxonomy.



**Fig. 4** Lateral (left) and medial (right) views of Brodmann’s cytoarchitectonic localization of the cortical areas

An approach that rejected the aforementioned connectionist and localizationist theories was proposed by the English neurologist J. Hughlings- Jackson, who published his paper “*On Affections of Speech from Disease of the Brain*”. Jackson’s major distinction was founded on “*volitional*” versus “*automatic*” behavior. He observed that many aphasic patients (he sometimes uses the term aphasia and aphasic, even though he expresses his preference for the term “*Affections of speech*” given in the paper’s title) have a highly impaired “speech”, but are in the same time

<sup>9</sup> “*Beiträge zur histologischen Lokalisation der Grosshirnrinde. VI Mitteilung: Die Cortexgliederung des Menschen*”, excerpts translated by Simran Karir and Katrin Amunts, in Broca’s Region, edited by Katrin Amunts and Yosef Grodzinsky, 2006

able to pronounce single words like “yes” and “no”, often swear and have recurring utterances. His basic observation is that “*to speak is to propositionise*”, i.e. to deliberately arrange words into phrases according to the message we want to convey and to the occasion. In other words, for Jackson, aphasic deficits do not impede the capacity to speak, but the capacity to speak *willingly* (my stress).

### 3.3 Aphasic syndromes and deficits

As said above, a brain lesion can cause a disconnection between brain areas and thus provoke language impairments that influence the patient’s linguistic production and comprehension. These acquired deficits can be manifested with several symptoms, such as articulation problems, syntactic or repetition deficits, reading and writing disorders etc. Along the years scientists have proposed various classifications for the aphasic syndromes. Some of them have already been mentioned above. In this paragraph we will provide a closer examination of eight aphasic syndromes and their symptoms. Conventionally, aphasic syndromes are distinguished in two major groups following a quantitative criterion, fluent and non- fluent (Fabbro and Aglioti, 2006). Fluent aphasias are characterized by fluent speech, relatively preserved articulation but impaired comprehension, while non-fluent aphasias are mainly distinguished by oral production impairments, laborious speech but preserved comprehension. Description of aphasic syndromes and symptoms is based on Aglioti and Fabbro (2006), and Spreen and Risser (2003).

- 1) **Anomic (amnesic) aphasia** presents with fluent spontaneous speech and preserved comprehension and repetition capacities. The main deficit of this type of aphasia consists in word- finding difficulties (anomia). In order to overcome them, the patient

frequently produces filler words or circumlocutions. According to Harley (2001), there exist two types of anomia, namely *semantic anomia* and *phonological anomia*. The first type consists in “an inability to use the semantic representation to select the correct lemma”, whether the latter is marked by a “difficulty in retrieving the phonological form of a word after having accessed its lemma”.

- 2) **Conduction aphasia** is characterized by fluent speech production with many phonemic paraphasias. Patients with conduction aphasia are aware of their errors and strive to correct themselves. Auditory comprehension is relatively preserved, whether repetition results highly impaired. Lesions that provoke conduction aphasia are frequently located at the arcuate fasciculus isolating frontal from temporal areas of language.
- 3) **Transcortical sensory aphasia** consists in fluent spontaneous speech with phonemic and semantic deficits and word finding difficulties. Auditory comprehension is poor, but repetition is preserved (without understanding what has been repeated).
- 4) **Wernicke’s aphasia** is characterized with fluent, sometimes logorrheic speech with various phonemic or even neologistic paraphasias, which render the patient’s speech production incomprehensible. Comprehension and repetition are significantly poor, with denomination resulting also impaired. The interested cerebral area is Wernicke’s area, situated in the left temporal lobe.
- 5) **Transcortical motor aphasia (TMA)** is a very rare form of aphasia. It is presented with reduced, non fluent spontaneous speech and characterized by blocks in initiating phrases. Although Aglioti and Fabbro sustain that in case of TMA repetition of phrases is impaired, Spreen reports “adequate ability to comprehend and repeat even complex sentences”. The lesions that

cause TMA are located in the frontal parts of the brain, and are responsible for the disconnection between these areas and Broca's region. The frequency of such a type of aphasia is minor to 5%.

- 6) **Broca's aphasia** consists in a very poor speech production. Patients affected by Broca's aphasia can have significant problems with articulation and its basic characteristic is agrammatism (which will be discussed later). Comprehension is relatively good, but it can deteriorate with syntactically complex phrases. Word or phrase repetition is limited. These patients usually present a lesion in the Broca's area, situated in the frontal lobe of the left hemisphere.
- 7) **Mixed transcortical aphasia** results from lesions combining those of transcortical motor (non-fluent) and transcortical sensory (fluent) aphasia and is the least common of the three types of transcortical aphasia. It is characterized by severely impaired language production and comprehension, but repetition is well - preserved.
- 8) **Global aphasia** represents the most severe type of aphasia. It consists in the total loss of both production and comprehension of language. The lesion that causes it involves a great part of the language areas of the left hemisphere, more specifically the fronto - temporal - parietal areas.

<b>Syndromes</b>	<b>Language deficits</b>	<b>Key language errors</b>
<b>Fluent aphasias</b>		
<b>Anomic</b>	Normal fluency; good auditory comprehension and repetition	Anomia; may resolve to minimal word-finding difficulties
<b>Conduction</b>	Normal fluency; good auditory comprehension	Phonemic paraphasias; poor repetition
<b>Transcortical sensory aphasia</b>	Normal fluency; preserved repetition; poor comprehension	Verbal paraphasias; anomia
<b>Wernicke</b>	Normal fluency; poor comprehension; poor repetition	Jargon; logorrhea; anomia
<b>Non-fluent aphasias</b>		
<b>Transcortical motor aphasia</b>	Reduced fluency; good auditory comprehension; good repetition	Reduced spontaneous speech; better naming than spontaneous speech
<b>Broca</b>	Reduced fluency; relatively good comprehension; poor repetition; agrammatism	Slow, halting speech production; phonetic and phonemic paraphasias; anomia; recurring utterances; articulatory

		impairment
<b>Mixed transcortical aphasia</b>	Reduced fluency; preserved repetition; markedly impaired auditory comprehension	Severely impaired verbal expression; anomia
<b>Global</b>	Severe reduction of fluency; severe comprehension deficit; poor repetition	Slow, halting speech production or mutism; articulatory impairment; severe anomia

Classification of the aphasic syndromes and their symptoms after Beeson and Rapcsak (2006), as found in the Handbook of the Neuroscience of Language, edited by Brigitte Stemmer and Harry A. Whitaker, 2008.

### 3.4 Agrammatism

Agrammatism, term initially coined by Pick (1913, quoted in Grodzinsky, 1990) in order to describe a pattern of language production lacking grammatical structure (Levy and Kavé, 1999), is a language deficit traditionally thought to affect the linguistic structure of sentence production (Bastiaanse and Thompson in “Perspectives on Agrammatism). Kolk (in the MIT Encyclopedia of Communication Disorders) stresses that the disorders caused by agrammatism are to be found mainly at the sentence level, as word production and comprehension are relatively spared. Agrammatic speech is frequently characterized as “telegraphic speech” (Clahsen, 2008:166) because of the following four characteristics proposed in 1973 by Tissot, Mounin and Lhermitte as summarized in Bastiaanse and Thompson (2012):

- a) Deletion of function words, i.e. deletion of pronouns, articles, prepositions, conjunctions etc.
- b) Production of a predominance of nouns, at the expense of verbs.
- c) Loss of verbal inflection, with substitution of the infinitive for finite verb forms.
- d) Loss of agreement for person, number and gender.

An alternative classification of agrammatic characteristics in spontaneous speech production is given by Kolk (2006), who divides them in three categories: syntactic, morphological and quantitative symptoms. The first category refers to the reduced variety of grammatical forms. In fact, agrammatic patients avoid subordinate clauses and produce syntactically simple sentences. In the second category Kolk posits the omission of function words such as articles, pronouns, auxiliaries, copulas, prepositions etc., and inflection. Last, the third category concerns the non-fluency, which is characteristic in agrammatic language.

However, it has been demonstrated that agrammatism does not have the same repercussions in all languages. The manifestations of agrammatism depend on the characteristics, i.e. the parameters<sup>10</sup>, of the language in question. In many languages- and this is also the case of Modern Greek and Italian- agrammatic patients do not omit function words, but tend to substitute them with others. For example, in Italian, a free stem \*vol-

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<sup>10</sup> In Chomsky's Minimalist Program, Universal Grammar (UG), the genetically determined innate capacity that allows human beings to learn a language, has two basic properties: a) UG contains a series of universal notions that are the same for all languages. These notions are called **principles** and do not have to be learned. b) There are some specific properties of each language that are not determined by UG, but vary between languages. These properties are called **parameters** and have to be "*fixed*" by the child who is starting to speak their mother tongue (Haegeman 2000: 10- 13)

from the verb *volare, to fly*, cannot constitute a word. Producing it would be a violation of the very basic principles of Italian language. Thus, agrammatic patients do not simply omit the verbal suffix, but substitute it (frequently with the infinitive form). In English, on the contrary, a free stem talk- can be either a word's stem or a word. As Scholes and Willis (1984) observe, there are some aspects of language which are notable for their resistance to disruption. These characteristics are: a) morpheme structure rules are never violated and b) sequential relationships of stems and affixes, discontinuous elements and 'parts-of-speech' are not altered.

More recent research has examined the comprehensive deficit associated with agrammatism, enlarging the classical, unilateral view of a production deficit. Caramazza and Zurif (1976) showed that agrammatic aphasics suffered from selective impairments in comprehension, changing the view that comprehension in agrammatism was unimpaired. Clahsen (2008) suggests that agrammatic patients have difficulties not only in producing language, but also in understanding it, as function words are important for interpretation as well. Kolk (2006) distinguishes between impaired comprehension of sentences with non canonical word order and preserved comprehension of canonical sentences, whereas Miceli (2003) mentions problems in semantically reversible phrases.

Agrammatism is mainly associated with Broca's aphasia. However, agrammatic comprehension is also observed in Wernicke's aphasia, both for production and for comprehension. Moreover, agrammatic comprehension has been observed in Parkinson's disease, Alzheimer's disease and children's specific language impairments (SLI). Last, it has been demonstrated even in normal subjects processing under stressful conditions (the MIT Encyclopedia of Communication Disorders).

### **3.5 Current issues on agrammatism**

Researchers have proposed numerous approaches in order to explain agrammatism. As Menn and Obler (1988) observe, the “continuum of focus” expands from linguistic and psychological to aphasiological and neuroanatomical theories. Pure linguistic approaches, on the one hand, try to specify the structure of language based on agrammatic data. Neuropsychological and aphasiological approaches, on the other hand, refer to the brain bases of agrammatism in order to understand the function of the anatomical structures that support language. In between these two limits of the theoretical continuum, we find psychological approaches of agrammatism, based on purely psychological notions like “processing resources”, “working memory” etc.

In this paper we will examine only the linguistic perspectives that concern agrammatism, leaving out psychological and neurological viewpoints, for reasons of unity and, above all, space.

With regard to linguistic approaches, the theoretical span varies depending on the levels of linguistic analysis. In this perspective, there exist phonological, morphological and syntactic theoretical approaches to agrammatism. Moreover, the various approaches can be divided in “procedural” postulating the linguistic deficit at a breakdown of the processing system or “structural”/ “representational” hypothesizing an impaired linguistic representation which leads to abnormal production and erroneous comprehension (Grodzinsky, 1986).

#### **3.5.1 Approaches regarding the phonological level**

As said above, agrammatic aphasics experience problems both in language production and in comprehension. Their spontaneous speech is often characterized as "telegraphic", for the absence of function words

and inflection morphology, and the predominance of content words. Furthermore, agrammatic speech results poor in quantitative terms and dysprosodic, i.e. without sentence rhythm, without intonation ('prosody'). Comprehension of complex sentences is also impaired.

In order to account for the agrammatic production, Kean (1977;1979, revised by Lapointe in 1983) proposed a phonological deficit hypothesis, as the "only uniform and systematic interpretation", based on Chomsky and Halle's (1968, in the "Sound Pattern of English") model of generative phonology.

Kean's theory is based on the distinction between two classes of items, "clitics" and "non clitics", also defined as "phonological words". According to Kean, agrammatic aphasics tend to omit the items that do not constitute "phonological words", that is "clitics". In Kean's conception, a "phonological word" corresponds to a string of "segments", a string of phonemes in nowadays' terms, where the assignment of stress takes place. The basic notion in this account is "phonological saliency"; elements of language that are not phonological words, are not phonologically salient, as they do not bear stress and, thus, are omitted by agrammatic aphasics. Kean also supports that "agrammatic aphasics tend to reduce the structure of a sentence to the minimal string of elements which can be lexically construed as phonological words in their language". According to this assumption, in agrammatism there is neither a grammatical (morphological), nor a syntactic deficit, but a phonological deficit which leads to the production of a "minimal string of elements", mentioned above. This means that, for Kean, the sentences that agrammatic aphasics produce are grammatically and syntactically well-formed, but result only apparently ill formed, because of the phonological impairment of the speakers. Moreover, the dysprosody that usually

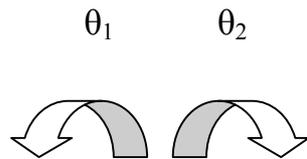
characterizes agrammatic speech production is, in Kean's terms, a consequence of the difficulty an agrammatic patient experiences when trying to cope with the phonological structure of language.

### **3.5.2 Approaches regarding the syntactic level**

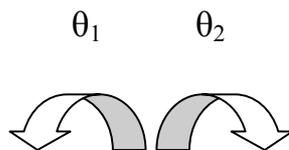
A well-known structural approach that accounts for the receptive deficits observed in agrammatism has been proposed by Grodzinsky (1984, 1986, 1995, 2000), in the Generative Grammar framework, based especially the Government and Binding Theory (GB) proposed by Chomsky (1981).

Grodzinsky's theory is based upon the assumption that the core of the receptive deficit of agrammatic patients regards sentences that contain determined syntactic movement (passive sentences, semantically reversible relative sentences etc.). Syntactic movement, in Chomskyan terms, is an operation that changes the position of elements in a sentence. From this point of view, an element may have two positions, an original position and a "landing site". A syntactic movement may be "overt", and thus affect the visible or audible nature of the sentence, or "covert", i.e. invisible. According to Grodzinsky, elements that undergo overt movement have a "split existence"; their semantic interpretation is located at the original position, which is apparently empty, but thematically active, while their phonetic realization is at the "landing site". To sum up, a syntactic movement constitutes a relation between two positions.

An example given by Grodzinsky regards the distinction between a declarative sentence and a wh-question.



16) a) The horse kicked the rider.



b) Which rider did the horse kick<sub>t</sub>?



In the Generative Grammar framework, each verb assigns to its arguments a **thematic ( $\theta$ -/  $\theta$ -) role**. In this viewpoint, every predicate has a **thematic structure**. As Haegeman sustains, there is no general consensus, neither on the thematic roles proposed, nor on their denominations. The thematic roles mainly accepted are: **agent, patient, theme, experiencer, beneficiary, goal, source and location**.<sup>11</sup>

<sup>11</sup> The eight thematic roles proposed by Haegeman, *Manuale di Grammatica Generativa*, 2000:41- 42.

Agent: the one that intentionally initiates the action expressed by the predicate.

Patient: the person or object that undergoes the action expressed by the predicate.

Theme: the person or subject affected by the action expressed by the predicate.

Experiencer: the entity that experiences a (psychological) state expressed by the predicate.

Beneficiary/ beneficial: the entity that benefits from the action expressed by the predicate.

Goal: the entity towards which the action/ activity expressed by the predicate is directed.

In the declarative sentence **16) a)** the verb *kick* assigns two thematic roles  $\theta_1$  and  $\theta_2$  to the noun phrases *the horse* and *the rider* respectively. (In this case,  $\theta_1$  = agent and  $\theta_2$  = patient.) Yet, in the corresponding wh- question the arguments result inverted, with the patient *which rider* occurring in the first position. However, as the verb *kick* remains the same, the thematic roles ascribed to its arguments also remain the same. In order to “maintain  $\theta$ - constancy despite the sequential change, a transmission mechanism is posited”. *Which rider* moves to the beginning of the phrase, and its original position is occupied by a *trace* that builds a *chain* between the original position and the landing site of the moved argument. In this way, interpretation of the phrase is carried out properly.

According to Grodzinsky’s Trace- Deletion Hypothesis, the receptive deficit manifested in agrammatism depends on the inability of agrammatic patients to “represent traces of movement in syntactic representations”. With traces of syntactic movement being deleted from the representation, agrammatics are unable to comprehend the meaning of the sentences and perform at chance level. Of course, Grodzinsky observes that Broca’s aphasics do understand correctly (at a level above chance) some sentences containing syntactic movement. This happens because agrammatics follow a *default strategy* which proves to be efficient only in sentences where movement is in the same direction as  $\theta$ -assignment and when there is no thematically relevant intervener between the trace and the antecedent. Whenever the default strategy proves to be unsuccessful for structural reasons, patients guess randomly, yielding chance level results.

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Source: the entity from which something moves, as a consequence of the action expressed by the predicate.

Location: the place, in which the action or state expressed by the predicate are situated.

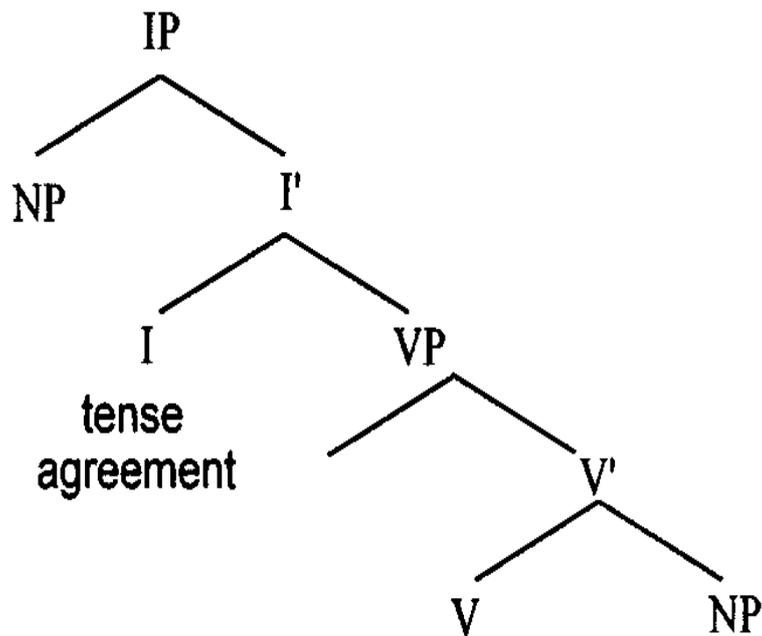
The default strategy that agrammatic patients would activate, according to Grodzinsky, in order to understand oral speech has been contrasted by Mauner et al. (1993). The authors doubt that all agrammatic patients make use of the same compensatory strategy, since such a fact is “outside general principles of linguistic organization” (Levy and Kavé, 1999). Instead, they propose a Double Dependency Hypothesis, according to which the deficit that causes agrammatic, and thus asyntactic comprehension, affects the processing of syntactic referential dependencies. According to Mauner et al., traces do exist and are not eliminated from the representation, as Grodzinsky’s TDH claims. The receptive deficit of agrammatics arises due to a deficient coindexation process. In sentences where there is only one dependency relation, i.e. the verb assigns only one  $\theta$ - role, interpretation is successful. Yet, in case of sentences with two dependency relations, agrammatics fail to assign the right  $\theta$ - role to the right NP and the sentence results ambiguous. Such a semantic ambiguity leads agrammatic patients to interpret randomly, i.e., to guess the meaning of the sentence (Beretta, 2006).

A structural account seeking the explanation of the productive deficit at the syntactic level is the Tree- Pruning Hypothesis (TPH), proposed by Friedmann and Grodzinsky (1997, 2000).

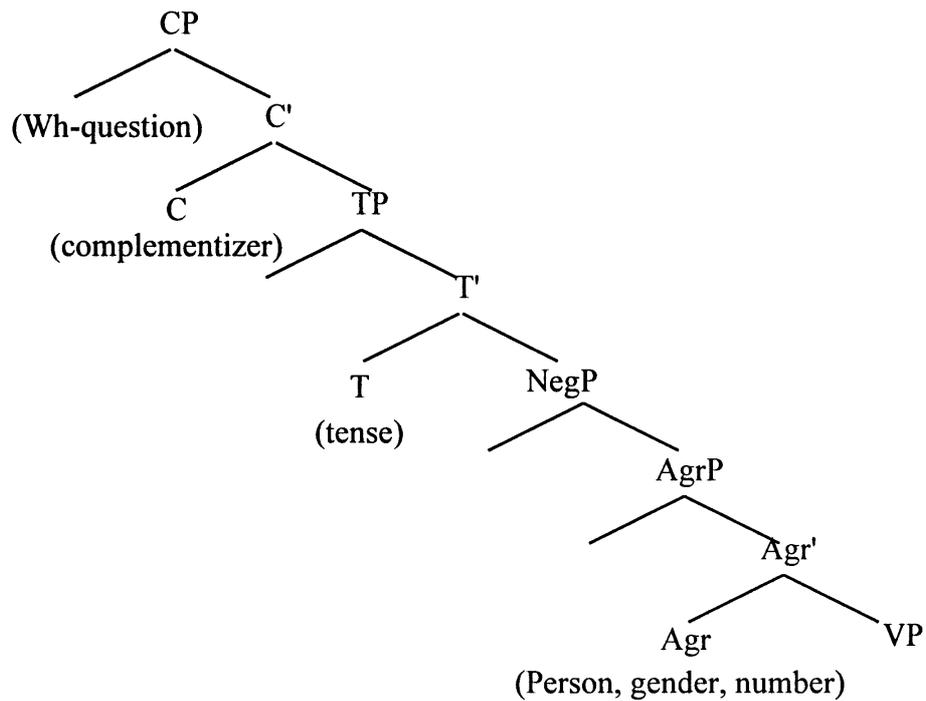
The two authors examine the empirical findings yielded by testing the capacities of a Hebrew speaking patient affected by Broca’s aphasia. Their data revealed a rather complex production deficit, which included impaired verbal tense, frequent substitutions or omissions of the copula, omission of wh- words and complementisers, inability to handle embedded structures and wh-questions and word order impairment. Interestingly, despite the patient’s impaired tense morphology, verbal, adjectival and nominal agreement (gender, person and number) was

shown to be preserved. Based on these results, the Friedmann and Grodzinsky exclude both a morphological and a lexical- semantic deficit.

In order to accommodate their results, they propose an interruption at some point of the syntactic representation adopting Pollock's (1989) *split- Inflection hypothesis*, according to which the category of *I (nfl)* needs to be split into two separate projections *Tense* and *Agreement*. Pollock also postulates the existence of another category, *Negation*, between the categories of *Tense* and *Agreement*. For Pollock the verb is initially uninflected and acquires inflection through an affixation process, which forces the verb to move upwards.

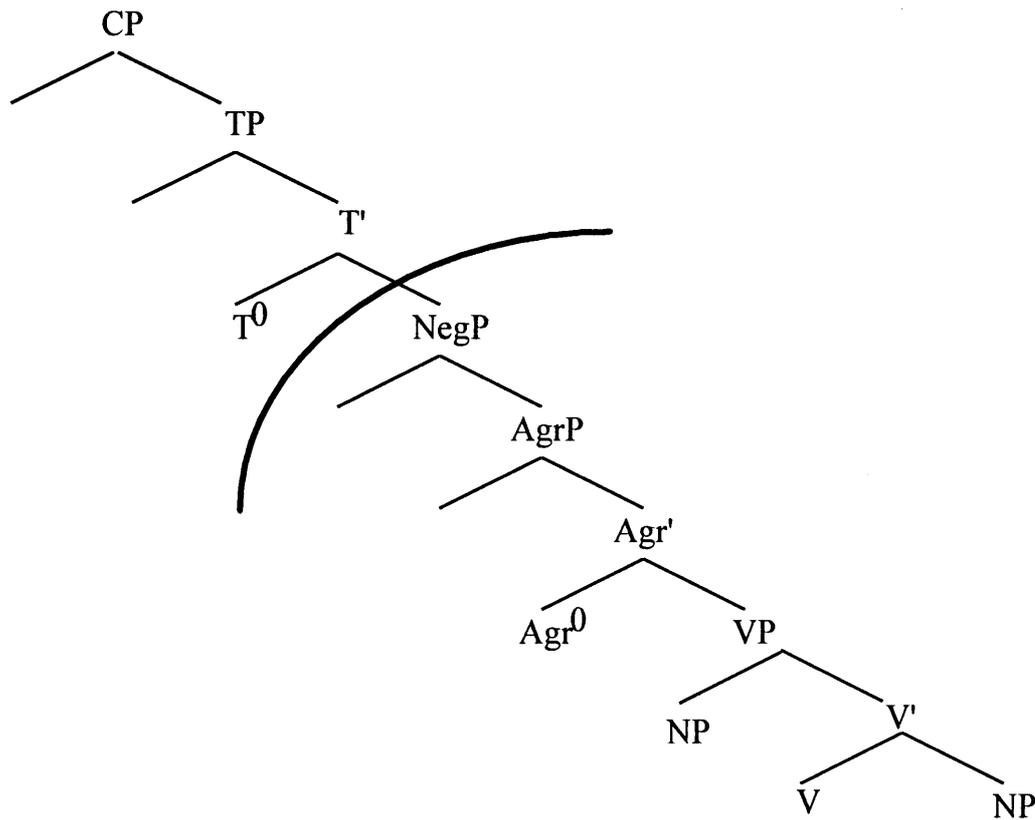


**Fig. 5** Inflection represented in the phrase marker (from Friedmann and Grodzinsky, 1997).



**Fig. 6** Inflection according Pollock- Split Inflection (from Friedmann and Grodzinsky, 1997).

According to Friedmann and Grodzinsky, the agrammatic deficit is manifested because of an interruption between the *Tense* and the *Agreement* node. In agrammatism, *Agreement* results preserved because it is still accessible, while *tense*, which is located higher, is *underspecified* and thus impaired. The same concept applies to the node located higher than *Tense*, i.e. the node of the *Complementiser C*. As already mentioned, Friedmann and Grodzinsky's patient was also impaired as far as complementisers, embedded structures and wh- words were concerned.



**Fig. 7** Pruned syntactic tree. Arch indicates the locus of deficit. (From Friedmann and Grodzinsky, 1997)

To sum up, for Friedmann and Grodzinsky, the syntactic tree in agrammatism is *pruned* above *Agreement*, i.e. at the *Tense* level. This interruption causes impairment in all projections above *Agreement*, but leaves intact those under it.

An interesting aspect of the TPH is the predictions the authors make about the variability of the agrammatic deficit's manifestations. In fact, the authors predict the existence of three subgroups of impairment: a) a mild impairment, with only the C node impaired b) a severe impairment, with C and T nodes impaired and c) a very severe impairment, with C, T and Agr nodes impaired.

Following the Minimalist Program (Chomsky, 1993), Hagiwara (1995) proposed another syntactic account based on the notion of "accessibility" (The Hierarchical Breakdown of Functional Categories). The data that

support this account come from several Japanese agrammatic patients, who, according to Hagiwara, did not omit negations or postpositions, located at the inferior part of the syntactic hierarchy. On the other hand, the same patients omitted complementisers and case markers quite frequently. Hagiwara considers also cross-linguistic data from Italian (Lonzi and Luzzatti, 1993) and French (Nespoulous et al., 1990) patients. The former were shown to retain the capacity to place adverbs correctly around finite and non finite verbs, while the latter conserved intact negation.

For Hagiwara, “the lower the position of a functional head and its projection in the sentence structure hierarchy is, the more accessible they are to an agrammatic aphasic.” In this perspective, *Negation* is more accessible than *Tense*, which in turn is more available than *C*. Hagiwara also makes an interesting prediction, according to which there must not be any patient who can cope well with the elements in *C* (complementiser), but not those in *Tense* or *Negation*. It follows that the more severe the impairment is, the less the categories accessible to the patient will be. The variability of the agrammatic deficit is related to the accessibility of the several projections of the syntactic tree and, thus, to the level in which the projections are located. Following this principle, Hagiwara predicts that for moderately to mildly impaired patients some functional categories are still available, whereas more severe patients will perform more or less badly with all functional categories.

Hagiwara’s explanation of the agrammatic deficit is based on the principle of *Merge* (Chomsky 1995), an operation that produces new categories by combining two syntactic elements. For an agrammatic patient, the operation of *Merge* is effortful and, thus, not economic in terms of computational cost. On the contrary, “the fewer number of times

the operation of Merge takes place”, the more economical and, thus, the more accessible the resulting structures are”.

### **3.5.3 Approaches regarding the morphological level**

The agrammatic deficit often consists in errors regarding substitution or omission of both free and bound morphemes. In the present chapter, we present part of the literature that examines the problem of morphology, concentrating on papers that deal with verbal inflection, and specifically with the phenomenon of regularity and irregularity dissociation.

Ullman et al. (1997) conducted a research on regular and irregular verb forms testing patients<sup>12</sup> with different cerebral lesions, such as patients suffering Alzheimer’s disease, agrammatic aphasics<sup>13</sup> (with frontal/anterior lesion), patients with Parkinson’s disease and posterior aphasics (with parietal lesion).

The authors asked from the patient to fill in the blank corresponding to the verb form in a series of sentences, transforming present to past tense. The tests yielded a better performance on inflecting irregular verbs rather than regular and novel verbs (e.g. wug- wugged). According to Ullman et al. the agrammatic patient did not over-regularize (e.g. take- took instead of took). The authors also proposed a reading task to five agrammatic patients, which revealed that these patients not only have a production deficit as long as regular forms are concerned, but they also have pronunciation problems when reading words formed by rules, such as regularly spelled and novel words.

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<sup>12</sup> The patients’ number was pretty much unequal: 24 Alzheimer and 28 Parkinson patients versus 1 posterior (raised to 5 with test replication) and 1 anterior aphasic patient.

<sup>13</sup> We take only data of the agrammatic patient to be relevant to the present study. Hence we present only these specific results, omitting other patients’ data.

Ullman et al. explained their results based on the assumption that regular forms are processed by a “procedural” system located at the frontal cortex and the basal ganglia, while irregular forms are retrieved from the lexicon, which is part of a “declarative memory” system, located at the temporo- parietal and medial- parietal lobe. According to Ullman et al., as agrammatic aphasia is often connected to frontal lesions, it is inevitable that agrammatic patients will have problems with manipulating grammar and, thus, with producing regular verb forms<sup>14</sup>.

The opposite pattern has been described by Kehayia (1990). Kehayia examined the general performance of Greek and English- speaking agrammatic patients on tasks that concerned morphological aspects of the two languages. Patients were presented with a task of repetition and comprehension, and two tasks on production. The tasks contained visual stimuli (pictures) that tested both nominal and verbal inflection. As far as nominal inflection is concerned, Kehayia examined the distinction between singular and plural number, while verbal inflection involved the distinction between past, present and future tense. The total number of

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<sup>14</sup> In Pancheva and Ullman (Agrammatic Aphasia and the Hierarchy Complexity Hypothesis, 2001 from the site: <http://www-bcf.usc.edu/~pancheva/PanchevaUllman.pdf>) the authors propose a more ‘syntactic’ nature of the agrammatic deficit. Their ‘Hierarchy Complexity Hypothesis’, pretty near to Friedman and Grodzinsky’s Tree Pruning Hypothesis and to Hagiwara’s Hierarchical Breakdown of Functional Categories, claims that higher functional categories are more complex, due to the greater number of categories found below them. Being more complex than lower categories makes them difficult to be computed. Moreover, the authors sustain (recalling Hagiwara) that the operation of Merge is impaired in agrammatic aphasia, so that patients are less probable to successfully form structures with higher functional projections that require numerous Merge- operations. On the contrary, simpler structures with less combination operations are more likely to be produced. The authors distinguish their Hierarchical Complexity Hypothesis from similar theories by giving to it a “probabilistic”, rather than a “categorical” character. In their view, this means that higher functional categories are less probable to be produced, but this does not make them completely inaccessible.

her patients was four, two Greek- speaking males and two English speaking patients- one male and one female.

The observations of Kehayia confirm the assumption of Miceli (2003) that patients respect the rules of well- formedness of words in their language. Greek- speaking patients tended to substitute inflectional affixes marking the plural, while English- speaking patients mainly omitted them.

Testing of nominal categories revealed that accessing inflected lexical items might be problematic for agrammatic patients at two separate levels. The problem can be localized either at the level of accessing the lexical item from the mental lexicon and/ or at the post- lexical level of application of phonological rules to the retrieved item. However, as Kehayia supports, principles of morphology do exist in aphasic patients.

Tasks on tense inflection revealed an almost fully successful performance in the present, while past and future tense were more problematic. Moreover, according to Kehayia, problems in both languages mostly arose when the past tense of irregular verbs was elicited. In order to account for this observation, Kehayia proposed a different storage in the mental lexicon of the two types of verbs- regular and irregular ('Storage Hypothesis'). Thus, paradigms of regular verbs would be stored together in the lexicon, "in a common storage unit". Irregular verbs, on the other hand, are supposedly stored separately, as different units<sup>15</sup>.

Kehayia also observed a relevance of the internal structure of the verbs. Specifically for Greek- speaking patients, even apparently regular verbs were shown to be problematic (e.g. 'mètrisa'- I counted, 'xtenistika' -I

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<sup>15</sup> Hence, for the regular verb 'chase' there would be only one mental unit containing all possible inflected forms, like 'chases', 'chasing', 'chased' etc., while for the irregular verb 'throw', there would be three separate units 'throw', 'threw' and 'thrown', one for each different form.

combed myself, my hair). These verbs, according to Kehayia, have a different, more complex internal structure consisting of two (and not one) inflectional affixes. Kehayia claims that the deficit found in these two regular verb categories suggests the existence of a hierarchical organization within storage units. This means that, even if verbs are stored in the same unit because regular and, thus, morphologically transparent, they are also hierarchically organized according to their internal structure. Part of Kehayia's test, namely the one that examines present and past tense, has been used for the present work and will be discussed in chapter 4 below.

Regular and irregular morphology is also crucial for the study of De Diego Balaguer et al. (2004) on two Spanish aphasic patients. Both patients were Spanish- Catalan bilingual speakers diagnosed with agrammatic aphasia and tested on both languages.

More specifically, De Diego Balaguer et al. examined regular and irregular inflectional morphology in both languages using a test that required morphological transformations concerning present and past tense. As far as irregular verb formation is concerned, the authors provide the information that in both Spanish and Catalan language, two mechanisms are necessary. The first mechanism is responsible for the retrieval of the irregular stem from the lexicon, while the second attaches to the irregular stem inflectional affixes generated via rule-based processing. In this way, formation of an irregular verb in the two languages examined requires both regular and irregular morphology.

The research conducted in both languages revealed a significantly better performance on regular rather than on irregular verbs. Based on these results, the authors refute the assumption that lesion in the left frontal cortex and the basal ganglia (typical for Broca's aphasia) is responsible

for problems with rule- based language processing<sup>16</sup>. Instead, they propose that this part of the cortex is involved in morphosyntactic processing in general, independently of the regularity or irregularity of the morphological transformations performed.

Faroqi- Shah (1997) conducted a meta- analysis collecting material about the dissociation between regular and irregular inflection through various electronic databases. The total number of patients was 75, all described by the authors as non- fluent, agrammatic or Broca's aphasics.

This research produced all three possible kinds of patterns: no dissociation between regular and irregular verbs, poorer performance on irregulars than on regulars and, the reverse, poorer performance on regulars. The most significant pattern (65 datasets in a total of 110) was the one of no difference between regulars and irregulars.

From this viewpoint, the author accepts the "two- stage verb generation model" (mentioned also in the case of Spanish and Catalan language) proposed by De Diego Balaguer, Rodriguez- Fornells, Rotte, Bahlmann, Heinze and Munte (2006). This model assumes two stages of verb processing, the first being verb type specific and, thus, distinct for regulars and irregulars, and the second being common for both types of verbs.

Moreover, Faroqi- Shah and Thompson (2003, 2007, and 2010) contradict Ullman's results and sustain that irregular verbs are more impaired than regulars in languages (unlike English) where irregulars are affixed, like in Greek, Italian and Spanish. They claim that, in agrammatism, tense marking is impaired irrespective of inflectional

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<sup>16</sup> It has initially been proposed that regular verbs are processed in the left frontal cortex, while irregular verbs are retrieved as wholes from the mental lexicon and thus from the declarative memory, localized at the left temporo- parietal cortex, see Faroqi- Shah, 1997.

regularity. Their results yielded low accuracy for both regular and irregular past tense and for the third person of the present tense. More specifically, according to Faroqi- Shah and Thompson, it is the temporal, and not the immediate syntactic context (given in their tests by an auxiliary that preceded the main verb) that determines poor verb inflection performance. This means that agrammatic patients are unable to select either the appropriate verb form, when a specific temporal context is given, or the appropriate inflectional affix, using tense information. Moreover, they affirm that morphological complexity plays little, if any, role in agrammatic aphasia. A possible explanation for the verb inflection errors manifested in agrammatism could rather be given by difficulties with “tense related Diacritical Encoding and Retrieval” (‘DER’) operations.

Miceli and Caramazza (1988) suggest that inflectional and derivational processes are dissociated in the mental lexicon. The authors accept the ‘Strong Lexicalist Hypothesis’, which states that both derivational and inflectional morphology are located in the lexicon<sup>17</sup>. However, based on the performance (substitutions of inflectional affixes, errors in verbal inflection for tense, aspect and mood but less errors in repetition of derived words and almost no errors for non- derived words) of their agrammatic patient, they enlarge it by assuming the existence of three distinct subcomponents of the lexicon: 1) a Root Morpheme Component 2) a Derivational Process Component and 3) an Inflectional Process Component.

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<sup>17</sup> They refer to Lapointe, 1979.

In a similar line, Shapiro and Caramazza (2003a, b) notice a dissociation between verbs and nouns<sup>18</sup>, with both patients having more problems with verbs than with nouns. Their results are interpreted by assuming that the various grammatical categories are processed by separate neural substrates, i.e. by a number of “related but functionally discrete neural systems” located probably in the left frontal cortex. The authors claim that morphosyntactic information about verbs, being an autonomous component, can be spared or impaired independently of relative semantic or form information. Moreover, specification of a word’s syntactic properties, which are reflected by the inflectional morphemes attached to the word root, would be based on the information about the grammatical category. This kind of information is retrieved, according to the authors, after the retrieval of the word’s semantic information, “at some stage subsequent to the retrieval of its meaning”.

Shapiro and Caramazza also refute Ullman’s assumption that regular verbs are expected to be impaired in agrammatism, as both patients performed better on regular than on irregular verbs. According to the authors, the sparing of the regular inflection is in agreement with their assumption that knowledge of verb- specific operations is retained. Bad performance with irregular verbs is explained by assuming a deficit in retrieving idiosyncratic words from the lexicon<sup>19</sup>.

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<sup>18</sup> For further discussion about noun/ verb dissociation see Laiacona and Caramazza 2004; for specific verb inflection impairment and complexity of verb inflection see Finocchiaro et al. 2008 and 2010; and for regularity/ irregularity in healthy subjects see Tsapkini, Jarema and Kehayia 2002 and 2004.

<sup>19</sup> The authors agree in this with Ullman et al. 1997.

### **3.6 The issue of Tense in agrammatism**

In many of the researches presented so far, we have seen that the grammatical category of Tense, and in particular the Past Tense, constitutes an issue of particular interest. In this section, we are going to present a series of works that focus on the problem of Tense in agrammatism in various languages. Some of them are more generic, examining the category of tense in agrammatism, while others concentrate on the past tense. The order of presentation is chronological.

Stavrakaki and Kouvava (2003) tested two agrammatic subjects diagnosed with non-fluent aphasia. Among various grammatical structures, they also tested past tense with four tasks: spontaneous speech, picture description, grammaticality judgment and preference between grammaticality and ungrammaticality. With respect to tense, Stavrakaki and Kouvava observed that present tense resulted intact, whereas past tense in their aphasic subjects was impaired. The authors also reported that the perfective stem, i.e. the stem used for the formation of the Greek aorist, was problematic for both subjects.

The authors report a different performance in the four tasks. This difference was manifested with a high level of grammatical sensitivity in the grammaticality judgment and the preference task, even for high nodes of the syntactic tree, such as CP. In spontaneous production, however, the authors observed some difficulties with the same projection. Based on this performance, they conclude that their findings are incompatible with structural accounts like the TPH (Friedmann & Grodzinsky, 1997), which claims that agrammatic subjects are unable to project higher nodes of the syntactic tree. According to Stavrakaki and Kouvava, the higher nodes are not absent from the syntactic representation in agrammatism, but they are simply more difficult to be accessed. This means that the agrammatic

deficit, according to the authors, can be attributed to impaired access to grammatical representations and not to impaired grammatical representations.

Valeonti et al. (2004) examined the performance in production and comprehension of eight agrammatic subjects. The authors observed that production was more problematic than comprehension for their Greek-speaking subjects. Moreover, in relation to production of the past tense, they showed that agreement tended to be least impaired, while both tense and aspect resulted problematic for their agrammatic participants. Moreover, as the authors stress, tense was highly impaired for subjects with a severe agrammatic deficit.

Furthermore, Varlokosta et al. (2005) and Varlokosta et al. (2006) found that inflectional morphology in aphasia is not equally impaired. Varlokosta et al. (2005) examined the performance of 7 Greek-speaking subjects (fluent, as well as non-fluent). Their results revealed a more severe impairment of tense and aspect, while agreement was relatively spared. The same results emerged from the research of Varlokosta et al. (2006). Also in this case, agreement was less impaired than tense and aspect.

Nanousi et al. (2006) tested the capacity of six Greek-speaking agrammatic subjects to produce tense, agreement and aspect in single word and in sentential tasks. The authors also administered a grammaticality judgment task in order to test the same inflectional markers within sentences. Nanousi et al. observed a dissociation regarding inflectional morphology between the production of single words and the production of sentences. In the production of single words, all three inflectional categories tested were equally impaired, while at a

sentence level, both in production and in grammaticality judgment tasks, tense and aspect were more impaired than agreement.

Nanousi et al. refute Friedmann and Grodzinsky's TPH (1997), as it cannot account for the results in Greek. Rather, the authors adopt a minimalistic distinction (Chomsky 2001) between interpretable and non-interpretable features and the associated operations responsible for their phonological valuation. Nominal features, like gender, person and number are interpretable, because semantically meaningful. Tense and aspect would also be interpretable features for their precise and transparent meaning (distinction between present/ past/ future regarding tense and perfective/ imperfective regarding aspect). On the contrary, verb features and structural cases of nouns (nominative and accusative) are uninterpretable, i.e. they are not interpretably significant. The authors propose that agrammatic patients have a 'preference' for uninterpretable features, which correspond to the operation of Agree. Interpretable features, on the other hand, result problematic, contrary to the intuitive expectation that they should be better preserved, because of their semantic meaning. From this point of view, agreement between verb and subject, being an uninterpretable feature, results spared in agrammatic aphasia. On the contrary, tense and aspect, which are interpretable, are impaired.

Another research which reported the difficulty that agrammatic subjects have in coping with tense inflection is the one by Kok, Kolk and Havercort (2006). More precisely, according to the authors, tense inflection seemed to be harder for the Dutch-speaking agrammatic subjects to produce than agreement inflection. However, this difference did not reach statistical significance in their research. Therefore, the authors suggested that further investigation was necessary.

In a more recent article, Kok, van Doorn and Kolk (2007) re-examined the tense vs. agreement question in Dutch agrammatism. They concluded that tense inflection was indeed more difficult to produce than agreement inflection, but error rate in both types of inflection increased significantly with computational load. This means that error rate was higher when agrammatic subjects had to cope with the inflectional category under investigation as long as with word order. Whenever subjects had to produce only the inflectional morphology required, i.e. tense or agreement, without having to pay attention to word order, error rate was lower.

Kok, van Doorn and Kolk found that production of the present tense was more difficult for their subjects. They reported a 55% error rate produced when present tense was required and a 45% error rate when past tense was required. In this research, the authors also tested the issue of morphological regularity with respect to the production of the past tense. From this point of view, they observed a slightly higher impairment in producing the past tense morphology of irregular verbs.

Chinellato (2007) also examined the category of Tense in an Italian-speaking agrammatic subject. The tenses tested were four: present, imperfect, compound past<sup>20</sup> and future. Chinellato's results showed a pattern of tense substitution, mostly regarding the compound past tense form. More precisely, the compound past reached an 86,36% of substitution, while tenses produced instead of it were present and imperfect. The present tense was substituted least frequently (3,03%), while imperfect and future did not exceed 24%.

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<sup>20</sup> Chinellato's research was conducted in the region of Veneto, located in the North of Italy. As Chinellato stresses, the compound past tense form ('passato prossimo') is the only past that northern speakers of Italian possess.

Furthermore, in this research Chinellato tested the category of Agreement, which was shown to be much less impaired than tense in general. In fact, Chinellato's results report an 87,96% correct agreement performance, while tense was correct only at a 13,64%.

An interesting point of view regarding the past tense in agrammatism is the one of Yarbay Duman and Bastiaanse (2009). The authors investigated the production of tensed finite verbs and participles referring to past and future in Turkish-speaking agrammatic subjects. According to the authors, the agrammatic deficit does not concern only the production of tense inflection, as their subjects had difficulties also with the production of the participles, which in Turkish are not inflected for tense. In the light of these results, Yarbay Duman and Bastiaanse conclude that the main problem in agrammatism is time reference, and more precisely reference to the past, and not tense in general. In order to account for these results, they adopt Aygen's theory (2004), which, following Lyons (1977), suggests that tense is a specific kind of epistemic modality that bears the features [+/- past] and [+/- remoteness]. This means that present, past, and future are defined in terms of remoteness from the speech time and of factivity, i.e. whether a situation is close to reality. According to this approach, present tense would be [-remote] and [+factive], whereas past tense would be [+remote] and [+factive]. Lastly, future tense, referring to events not yet realized, would be [-remote] and [-factive].

Yarbay Duman and Bastiaanse suggest that agrammatic subjects have specific problems with structures that bear the feature [+remote], i.e., with the past. On the other hand, according to the authors, non-remote structures, like present and future, result easier to agrammatic patients. Yarbay Duman and Bastiaanse's investigation did not contain testing of

the present tense. However, they cite, among others, Stavrakaki and Kouvava (2003), whose patients, as we have seen above, had less problems with the production of the present tense.

### **3.7 Conclusions**

In the present chapter we have introduced the term aphasia, talking about its causes and its manifestations (section 3.1). We have followed the development of the science of aphasiology, from its beginning with Paul Broca and Karl Wernicke up to more recent years (section 3.2). We have also presented the various aphasic syndromes (section 3.3) and discussed the term ‘agrammatism’ (section 3.4), which is the deficit that characterizes all the participants of this study. Last, we have presented the current approaches that try to account for the agrammatic deficit (section 3.5) and we have provided an overview of the literature treating the issue of the past tense in agrammatism (section 3.6).

## 4 The past tense in Modern Greek and in Italian

### 4.1 The Modern Greek verbal system: an introduction

Modern Greek is a highly inflected synthetic language with a rich verbal system. Verbs in Modern Greek are marked for voice, mood, tense, aspect, person and number.

Verbs are divided in four subgroups with respect to their diathesis: active, passive, middle and neutral (Triandafyllidis 1976: 140-141). In Modern Greek, it is important not to confuse the diathesis of a verb with the verb's voice, as they express two different concepts.

Verbs with active diathesis show that the subject does something or acts in some way. E.g.: *Τα παιδιά **παίζουν**.* ('The children play/ are playing.')

Verbs with passive diathesis express that the subject of the sentence undergoes an action and, thus, it is the patient of the action. E.g.: *Αυτό το βιβλίο **γράφτηκε** από ένα διάσημο συγγραφέα.* ('This book was written by a famous writer.')

Verbs with middle diathesis show that the subject acts in a certain way and the effects of this action return to it (reflexive sense). E.g.: *Κάθε πρωί **σηκώνομαι** στις 8.* ('Every morning I get up at 8.')

Last, verbs with neutral diathesis show that the subject neither acts nor receives the results of an action; it rather is in a certain condition. E.g.: *Το μωρό **κοιμάται**.* ('The baby is sleeping.')

Furthermore, Modern Greek has two **voices**: active and passive. The two voices differ as to the inflectional affixes. Verbs in the active voice end in –ώ/-ω, [o], whereas verbs in the passive in –μαι, [me].

Usually, verbs with active diathesis are in active voice. E.g.: *παίζ-ω* ‘I play’, *τρέχ-ω* ‘I run’, *αγαπ-ώ* ‘I love’. On the other hand, verbs in passive voice can have either passive or middle diathesis. E.g.: *αγαπιέ-μαι* ‘I am loved’ has passive diathesis, while *λούζ-ομαι* ‘I wash my hair’, *χτενίζ-ομαι* ‘I comb my hair’ belong to the middle diathesis. Neutral verbs can be either in active or in passive voice. E.g.: *πειν-άω* ‘I am hungry’, *διψ-άω* ‘I am thirsty’ etc. follow active inflection, while *κοιμ-άμαι* ‘I sleep’, *χαίρ-ομαι* ‘I am happy’ have passive affixes.

Many verbs form both voices. E.g.: *γράφ-ω* ‘I write’/ *γράφ-ομαι* ‘I am written’. There are, however, some verbs that exist only in one of the two voices. E.g.: *ζ-ω* ‘I live’, *γερν-ώ* ‘I get old’, *τρέχ-ω* ‘I run’ exist only in active, while *έρχ-ομαι* ‘I come’, *φαίν-ομαι* ‘I seem’ are only passive.

Modern Greek verbs have three **moods**: indicative, subjunctive and imperative. Conditional mood does exist, but it is formed periphrastically. There are also two indefinite moods, namely the infinitive and the participle, which will not be further discussed here.

In the indicative mood, which is the only one examined in the present research, verbs form eight **tenses**: present, imperfect, future simple, future continuous, aorist (simple past), perfect (compound past), pluperfect and future perfect.

Traditionally, tenses are divided into three categories: present, past and future (Triandafyllidis, 1976:146-148). However, Holton, Mackridge and Philippaki- Warburton (1997:109) only distinguish between past and non-

past tenses, disregarding future and perfect tenses, which are built periphrastically.

An important functional category for the Greek language is **aspect**, which is morphologically connected with the category of tense. As Holton et al. claim, the categories of tense and aspect in Modern Greek are linked inextricably (1997:109). Modern Greek possesses two kinds of aspect: perfective and imperfective. The perfective aspect expresses an action viewed as a complete whole or in a neutral way. The imperfective aspect, on the other hand, expresses a durative, habitual or repeated action (1997:110).

Modern Greek verbs have two groups of stems, a present and an aoristic one, which reflect the two aspects mentioned above. In this way, the present stem is used in order to form tenses with imperfective aspect, while the aoristic stem is used with tenses that express perfective aspect.

An important characteristic of the past tenses (precisely, active imperfect and active aorist) is the **augment**, realized by the prefix  $-\epsilon$ , [e].<sup>21</sup> However, the augment is realized only when stressed.

Furthermore, verbs in Modern Greek have distinct endings in all tenses which mark **person** and **number**. There are three persons (first, second and third) and two numbers, singular and plural. This characteristic renders Modern Greek a pro-drop or null-subject language. This means that the subject of a sentence, irrespective of it being a noun or a pronoun, can be omitted, as it can be recovered on the basis of the inflectional ending of the verb.

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<sup>21</sup> The augment can be realized by the prefix  $\eta$ - depending on phonological factors, which will not be further discussed here. In compound verbs the augment can also be internal, i.e. between the affix and the verb stem.

## 4.2 The aorist

In the present study, we have tried to examine the performance of Greek-speaking non-fluent aphasic patients with regard to the aorist tense. For this reason, in this paragraph, we are going to discuss more thoroughly the formation of this past tense in Modern Greek.

The aorist in Greek is a perfective past tense, formed by the augment (see section 4.1), the aoristic (perfective) stem and the appropriate verb endings.

In Modern Greek, the main distinction regarding the aorist in active voice is between **sigmatic** and **non-sigmatic** forms. Sigmatic forms have the **character -σ-** [s] in the verb stem, i.e. -σ- is the last phoneme of their stem. Examples of sigmatic forms are: *έ-δεσ-α* ‘I tied’, *γέλασ-α* ‘I laughed’. Non-sigmatic forms, on the other hand, do not present the phoneme -σ-. E.g. *έ-πλυν-α* ‘I washed’, *έ-φυγ-α* ‘I left’ (Triandafyllidis 1976:176).

The character -σ- is assimilated when the verb stem ends with certain consonants. In these cases, instead of -σ-, we can have -ψ- [ps] and -ξ- [ks]. Verbs that form the consonant -ψ- are, for example: *λείπ-ω* ‘I am missing. I am absent’/ *έ-λειψ-α* ‘I was missing, I was absent’, *κρύβ-ω* ‘I hide’/ *έ-κρυψ-α* ‘I hid’. Verbs forming the consonant -ξ- instead of -σ- are, for example: *πλήττ-ω* ‘I am bored’/ *έ-πληξ-α* ‘I was bored’.

Moreover, certain verbs, which in the present tense end in -ώ (stressed), have a vowel affix before the character -σ- and the ending. The most common affix is -η-, [i], giving aoristic forms that end in -η-σ-α, [isa]. E.g. *τραγουδ-ώ* ‘I sing’/ *τραγουδ-η-σ-α* ‘I sang’. However, there are many verbs that do not follow this rule, ending in -ασα, -υσα, -ηξα, -εσα, -αξα, -εψα. E.g. (from Triandafyllidis 1976:178):

<b>Present</b>		<b>Aorist</b>	
γελ-ώ	‘I laugh’	γέλ-α-σ-α	‘I laughed’
μεθ-ώ	‘I get drunk’	μέθ-υ-σ-α	‘I got drunk’
τραβ-ώ	‘I pull’	τράβ-η-ξ-α	‘I pulled’
καλ-ώ	‘I invite’	κάλ-ε-σ-α	‘I invited’
πετ-ώ	‘I throw’	πέτ-α-ξ-α	‘I threw’
θαρρ-ώ	‘I think, I suppose’	θάρρ-ε-ψ-α	‘I thought, I supposed’

Non- sigmatic forms, on the other hand, are formed by the augment (whenever necessary), the verb stem and the appropriate ending, without the morpheme –σ- . Verbs belonging to this category often undergo stem mutation, i.e. the aoristic stem differs from the present stem. An example without stem modification is the following:

<b>Present</b>		<b>Aorist</b>	
κρίν-ω	‘I judge’	έ-κριν-α	‘I judged’

On the contrary, notice how verbs as the following undergo stem modification:

Present		Aorist	
μέν-ω	‘I stay’	έ-μειν-α	‘I stayed’
γέρν-ω	‘I lean’	έ-γειρ-α	‘I leaned’
καταλαβαίν-ω	‘I understand’	κατάλαβ-α	‘I understood’

To the category of the non- sigmatic aorist belong also irregular verbs, like:

Present		Aorist	
πηγαίν-ω	‘I go’	πήγ-α	‘I went’
τρώ-ω	‘I eat’	έ-φαγ-α	‘I ate’
παίρν-ω	‘I take’	πήρ-α	‘I took’

Irrespective of the type of the aorist, i.e. sigmatic, non- sigmatic or irregular, the endings that characterize it are the following:

1 <sup>st</sup> person singular	-α	[a]
2 <sup>nd</sup> person singular	-ες	[es]
3 <sup>rd</sup> person singular	-ε	[e]
1 <sup>st</sup> person plural	-αμε	[ame]
2 <sup>nd</sup> person plural	-ατε	[ate]
3 <sup>rd</sup> person plural	-αν	[an]

In the passive voice, the aorist is built with the aoristic stem and the ending **–ηκ-α [ika]**. The augment, being unstressed, is always omitted. The verb ending can be preceded by various consonantal morphemes like **–θηκ-α [θika]**, **–νθηκ-α [nθika]**, **–τηκ-α [tika]**, **–χτηκ-α [xtika]** etc, depending on the phonological nature of the verb. E.g.:

<b>Present</b>		<b>Aorist</b>	
<b>δέν-ομαι</b>	<b>‘I am tied’</b>	<b>δέ-θηκ-α</b>	<b>‘I was tied’</b>
<b>αισθάν-ομαι</b>	<b>‘I feel’</b>	<b>αισθάν-θηκ-α</b>	<b>‘I felt’</b>
<b>γεύ-ομαι</b>	<b>‘I taste’</b>	<b>γεύ-τηκ-α</b>	<b>‘I tasted’</b>

The endings forming the passive aorist are actually the same as the active endings. Adding the affix **–ηκ-**, they result as follows:

<b>1<sup>st</sup> person singular</b>	<b>–ηκ-α [ika]</b>
<b>2<sup>nd</sup> person singular</b>	<b>–ηκ-ες [ikes]</b>
<b>3<sup>rd</sup> person singular</b>	<b>–ηκ-ε [ike]</b>
<b>1<sup>st</sup> person plural</b>	<b>–ηκ-αμε [ikame]</b>
<b>2<sup>nd</sup> person plural</b>	<b>–ηκ-ατε [ikate]</b>
<b>3<sup>rd</sup> person plural</b>	<b>–ηκ-αν [ikan]</b>

### 4.3 A simplified verb categorization

The formation of the past tense in Modern Greek is much more complex than what we have seen so far. However, a certain level of simplification is necessary. At this point, we illustrate the scheme proposed by Kehayia (1990), which has been the basis for the stimuli constituting the tests of this research.

Kehayia assumes the existence of the following four categories (her examples):

- 1) Verbs ending in –ω e.g. γράφ-ω ‘I write’
- 2) Verbs ending in –ώ e.g. μιλ-ώ ‘I speak’
- 3) Reflexive verbs ending in –ομαι e.g. πλέν-ομαι ‘I wash myself’  
Passive verbs ending in –ομαι e.g. βρέχ-ομαι ‘I get wet’
- 4) Irregular verbs e.g. βλέπ-ω ‘I see’

We have already seen how the formation of the aorist takes place. The general form would be:

**(+/-) augment + aoristic stem + (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> singular/ plural) ending**

Kehayia (1990) makes an important consideration regarding the 2<sup>nd</sup> and 3<sup>rd</sup> verb category. Verbs belonging to these categories differ from the others in that they manifest an added affixation process. While all other verbs respect the above rule, these verbs contain one more affix.

In section 4.2, we have seen that verbs ending in stressed –ώ develop a vowel, usually the vowel –η-, before the sigmatic character and the person and number ending, forming the complex ending – ησα (for ending variations see section 4.2). E.g. (from Kehayia 1990):

Present		Aorist	
μετρ-ώ	‘I count’	μέτρ-η-σ-α	‘I counted’

Moreover, we have observed that the passive aorist is formed attaching the ending  $-\eta\kappa-\alpha$  (or its possible variants) to the aoristic verb stem. In fact, this ending consists of two morphemes, namely of the affix  $-\eta\kappa-$  and the person and number ending  $-\alpha$ . E.g. (from Kehayia 1990):

Present		Aorist	
$\beta\rho\acute{\epsilon}\chi-\omicron\mu\alpha\iota$	‘I get wet’	$\beta\rho\acute{\alpha}\chi-\eta\kappa-\alpha$	‘I got wet’

According to Kehayia (1990), the two endings  $-\eta\sigma\alpha$  and  $-\eta\kappa\alpha$  are the result of two subsequent suffixations.

#### 4.4 The Italian verbal system: an introduction

Italian, as well as Modern Greek, is a language with a rich inflectional system. Verbs are marked for voice, mood, tense, person and number.

Verbs in Italian have two **voices**, active and passive. The passive voice is formed with the auxiliary verb *essere* and the past participle of the verb, marked for gender and number.

Italian verbs have four **moods**: indicative, subjunctive, conditional and imperative, all non- compound and marked for tense, person and number. The infinitive, as well as participles and gerunds, constitute three indefinite moods, as they are marked only partially for tense and person/number (Prandi 2006: 311).

The **tenses** in Italian are eight: present, imperfect, simple past (*passato remoto*), compound past (*passato prossimo*), future, compound future, past perfect (*trapassato prossimo*) and preterite perfect (*trapassato remoto*) (Regula and Jernej 1965: 216- 219). Tenses are distinguished with respect to their reference in present, past and future.

In Italian, unlike Modern Greek, aspect is not morphologically realized in the verb form. However, as Prandi says (2006: 312), it is an implication of the verbal tense. In this perspective, some tenses are perfective, describing processes as concluded, while others are imperfective, as they describe processes without a defined duration or habitual processes that are often repeated.

Verbs in Italian are inflected for three **persons** (1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup>) and two **numbers** (singular and plural).

Verbal conjugations of regular verbs are three. To the first conjugation belong verbs that end in *-are*, like *amare* ‘love’. The second conjugation contains verbs ending in *-ere* or *-'ere*, such as *credere* ‘believe’ and *tem'ere* ‘fear’. The third conjugation consists of verbs ending in *-ire*, like *capire* ‘understand’. Furthermore, there is a large group of irregular verbs, which end mostly in *-ere*, like *potere* ‘can’, *bere* ‘to drink’, *tenere* ‘to hold, to keep’.

#### **4.5 The past tense in Italian**

The Italian language possesses two types of tenses describing an action or a situation taking place in the past, a simple and a compound one. The simple form is called “*passato remoto*” (‘remote’, ‘historic’ past), while the compound form is called “*passato prossimo*” (‘near’ past) and is formed with the auxiliary verbs *avere/ essere* + past participle. Bertinetto (2002 Vol.2:89) proposes the terms “*perfetto semplice*” (‘simple perfect’) and “*perfetto composto*” (‘compound perfect’), terms that depend mostly on the morphological structure of the two tenses, rather than on their function.

According to Palmieri (1990:7), the opposition between the simple and the compound past tense form is uncertain and unsteady in Italian

grammar. Italian prescriptive grammar books have been showing for over a hundred years their inadequacy and their abstractness on this issue. In fact, the domain of reference of each tense seems to be rather unclear, and the use of the two tenses depends more on geographical than on grammatical factors. However, the same problem exists in other languages and families of languages, like French, Spanish, Portuguese as far as Romance languages are concerned, but also in Germanic and Slavic languages (Palmieri 1990:7).

#### **4.6 Perfetto semplice versus perfetto composto: the grammatical differences**

As said above, the use of the two Italian past tenses is not very clear. This section tries to present their main differences, concentrating mostly on the “perfetto semplice”, which has been the tense used in the tests with the aphasic patients. The terminology chosen here is the one proposed by Bertinetto, who distinguishes between a simple and a compound past tense form (2002:Vol.2, 88- 101).

According to Rohlfs (1966:Vol.3, p.45), the simple past tense form indicates a single event, with the accent being put on the moment rather than on its duration. In contrast to the compound past, the simple one indicates an action referring to a remote past that is not related to the present. The simple form can also express the introduction of an event, the starting of a process, an aspect called “inchoative”.

Unlike Rohlfs, Bertinetto claims that the remoteness of the event is not what characterizes the simple past tense form (2002:Vol. 2, 95). Rather, the simple past tense describes a process that took place in the past and cannot be connected to the present. Similarly, Fornaciari (1881:111) explains that the simple form of the past refers to actions and states or ways of having happened in the past, without any connection to the

present. In fact, as Fornaciari says, this kind of past excludes the present, being its opposite. This might be possible either because it refers to a concluded period of time or to a precise historical period.

Moreover, according to Bertinetto, this tense, due to its eventive nature, is particularly indicated for the narration of facts and events (2002:95). This characteristic depends on the ‘aoristic’ aspect of the simple past tense form, i.e. on the fact that it designates a concluded process, the consequences of which are not believed to be current/ up- to- date by the speaker. For Fornaciari, it is ideal for narration because it designates a finished process, which gives place to another one that follows, without referring to its duration (1881:112).

Another significant characteristic of the simple past tense form is its deictic nature, which imposes that processes expressed in it should always precede speech time (Bertinetto 2002:Vol.2, 96).

These two aspects of the simple past tense, the aoristic and the deictic, give to the processes expressed in it a sense of conclusion, i.e., that it cannot be continued.<sup>22</sup>

On the other hand, the compound past tense form describes a process, the results of which are considered as psychologically current by the speaker. This tense can also assume an ‘inclusive’ (imperfective) character, meaning that the process expressed in it might not be concluded at the speech time. Rather, the same process can possibly continue even after speech moment. Lastly, the event expressed by the compound past tense can be anterior to a moment located in the present or future (especially in

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<sup>22</sup> In this chapter, I limited myself to point out only the most important characteristics of the “*perfetto semplice*”. For more peculiar uses of this tense, see Bertinetto 2002, Vol. 2: 97- 98.

subordinate clauses), or to an atemporal or omnitemporal present (Bertinetto 2002:Vol.2, 88-95).

#### 4.7 The geographical dimension

It has already been mentioned that the use of the two past forms, the simple and the compound one, is determined mainly by the geographical origin of the speaker. The grammatical differences that actually exist between the two tense forms play little role. As Rohlfs says, in the southern regions of Italy, such as Calabria and Sicily (we might as well add the region of Apulia, where the present study has taken place), the simple past tense is still at use. On the contrary, in the regions of the North, like Piedmont, Lombardy, Veneto, the simple past tense form is not used any more. In central regions, as Abruzzo and Marche, the simple form is slowly losing field. The phenomenon of the withdrawal of the simple past tense form is observed since the 14<sup>th</sup> century (1966:Vol.2, 309- 329).

More specifically, Palmieri distinguishes the following four zones of distribution (1990:62):

- 1) In northern Italy<sup>23</sup>, except from the regions of Liguria and Emilia-Romagna, the use of the compound past tense form is predominant. In the region of Veneto the simple past tense is practically extinct, a process that started in the 16<sup>th</sup> century.
- 2) In central regions, as well as in Liguria and in Emilia- Romagna, speakers use both tenses. However, selection of one or another tense is based more on ‘tendencies’, and not on precise rules<sup>24</sup>.

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<sup>23</sup> Above the imaginary line that connects the city of La Spezia to Rimini.

<sup>24</sup> Speakers that come from central regions refute Palmieri’s claim that the past tense is still in use.

- 3) From the regions of Lazio, Campania and downwards, up to the region of Apulia and Calabria, we observe a gradual predominance of the simple past tense form, with significant unsteadiness depending on the place and speaker. As Palmieri stresses, in the city of Rome the simple past tense form, which was still at use fifty years ago, is becoming rarer.
- 4) Regions of the extreme South, such as the southern part of Calabria and the island of Sicily, use almost exclusively the simple past tense form.

The existence of only one past tense in the regions of Sicily, Calabria and in the zone of Salento in Apulia is to be attributed, according to Rohlfs, to the influence of the Greek language. Namely, as Rohlfs observes, the Greek populations that lived in this area before its Romanization used only one perfective tense, the aorist, without distinguishing between recent and more remote events. Once the Latin language absorbed the Greek dialects that existed in the territory, the Greek-speaking populations transferred the characteristics of their aorist to the corresponding Romance tense (1966:Vol.3, par.672).

In fact, as Tekavčić claims, the syntactic duplicity of the Latin perfect is a result of the fusion of the original aorist and the original perfect in it, which are still distinct in Greek. The co-existence in Latin of sigmatic perfect forms (e.g. *scripsi*), typical of the aorist, along with reduplicated forms (e.g. *momordi*), characteristic of the perfect, would present evidence for this hypothesis (Tekavčić, 1972: 227).

## 4.8 Reasons of the progressive substitution of the simple past tense form

In Italy, as we have seen above, we observe a different distribution of the past tense. In northern regions of Italy, the compound past form is used, while in the South, the simple past is used.

As Bertinetto claims, this phenomenon can be explained by the ability of the compound form to assume almost all the functions of the simple one (2002:100).

Palmieri (1990:70) gives five reasons that have contributed to the gradual elimination of the simple past tense form from northern Italian. As he claims, these reasons are more or less common to all languages that have manifested this phenomenon.

- 1) The difficult verbal paradigm, with forms varying from verb to verb and from person to person, especially in Italian, French and Spanish.
- 2) The archaic aspect of the forms, which reflects the Latin verbal inflection. However, as Palmieri stresses, this kind of difficulty is mere “impressionism”. In fact, Palmieri cites Todisco (“Ma che Lingua parliamo”), who claims that the difficulty (according to Todisco, the difficulty would be ‘presumed’ and not real) of this tense for the people has always been a Leitmotiv among grammarians.
- 3) The simplicity of the compound forms, constructed with the auxiliary verbs *avere* (to have) or *essere* (to be) and the past participle. According to Palmieri, auxiliaries are the first verbs to be learned, and past participles vary only with respect to number and gender, just like nouns and adjectives.

- 4) The language's simplification process and the tendency, in all Romance languages, to prefer nominal to verbal structures, with the latter being far more complicated.
- 5) Journalism's influence.

Moreover, as Palmieri suggests, the increasing number of the compound forms found in the dialogues of Italian prose are to be partially attributed to the prestige of the northern variety of Italian, but also to the influence of French narrative during the last two centuries, in which direct dialogues are written in the compound past tense.

Palmieri also takes into account the existence of an isogloss- zone expanding from France to the southern parts of Germany and the confining parts of North Italy. From this point of view, it would seem possible to assume that the compound past tense form was spread in Southern Germany and Northern Italy under the influence of French, substituting the simple one (1990:74).

#### **4.9 The simple past tense ('passato remoto')**

We have already seen in section 3.6 the functions of the simple past tense that distinguish it from the compound past. In the present section we are going to examine the formation of this Italian tense, to the extent necessary for the goals of this research.

The regular endings of the simple past tense for the three conjugations are the following:

	<b>-are</b>	<b>-ere</b>	<b>-ire</b>
<b>1<sup>st</sup> person singular</b>	-ai	-ei/-etti	-ii
<b>2<sup>nd</sup> person singular</b>	-asti	-esti	-isti
<b>3<sup>rd</sup> person singular</b>	-ò	-è/- ette	-ì
<b>1<sup>st</sup> person plural</b>	-ammo	-emmo	-immo
<b>2<sup>nd</sup> person plural</b>	-aste	-este	-iste
<b>3<sup>rd</sup> person plural</b>	-arono	-erono/-ettero	-irono

Furthermore, the set of endings characterizing verbs with irregular past tense is the following:

<b>1<sup>st</sup> person singular</b>	<b>-i</b>
<b>2<sup>nd</sup> person singular</b>	-esti
<b>3<sup>rd</sup> person singular</b>	-e
<b>1<sup>st</sup> person plural</b>	-emmo
<b>2<sup>nd</sup> person plural</b>	-este
<b>3<sup>rd</sup> person plural</b>	-ero

In order to present an overlook of the formation of the Italian simple past tense, which is rather complex, we assume the categorization proposed by Goidânich (1967: 129-132), simplified to a certain level as follows:

- To the first category belong the verbs *dare* ‘to give’>*diedi/ detti* and *stare* ‘to stay’>*stetti*.
- The second category contains verbs of the second and third conjugation, which present a mixed paradigm. As a matter of fact, the 1<sup>st</sup> and the 3<sup>rd</sup> person singular and the 3<sup>rd</sup> person plural are irregular, while forms in the other persons are regular. As Tekavčić (1972: 298) observes, there are two allomorphs for each of these verbs. The regular allomorph appears in the 2<sup>nd</sup> person singular and

in the 2<sup>nd</sup> and 3<sup>rd</sup> person plural, which are stressed at the ending. The irregular allomorph, on the other hand, appears in the rhizotonic forms, i.e. the forms that are stressed at the root (1<sup>st</sup> and 3<sup>rd</sup> person singular and 3<sup>rd</sup> person plural). More specifically, the second conjugation, which is formed by verbs ending in -ere, can be divided as follows:

<b>Past tense form with consonant reduplication:</b>	<i>tenere</i> ‘to hold’	> <b><i>tenni</i></b>
	<i>bere</i> ‘to drink’	> <b><i>bevvi</i></b>
<b>Past tense form ending in –si:</b>	<i>ridere</i> ‘to laugh’	> <b><i>risi</i></b>
	<i>valere</i> ‘be worth’	> <b><i>valsi</i></b>
	<i>emergere</i> ‘to emerge’	> <b><i>emersi</i></b>
	<i>nascondere</i> ‘to hide’	> <b><i>nascosi</i></b>
<b>Past tense form ending in –ssi:</b>	<i>leggere</i> ‘to read’	> <b><i>lessi</i></b>
	<i>condurre</i> ‘to conduct’	> <b><i>condussi</i></b>

- The third conjugation, which contains verbs ending in –ire, forms the simple past tense with the ending -ii.

E.g.: *aprire* ‘to open’ > ***aprii***  
*morire* ‘to die’ > ***morii***  
*costruire* ‘to construct’ > ***costruii***

## 4.10 Conclusions

In this chapter we have briefly presented the grammatical systems of two morphologically rich languages, i.e. Modern Greek (section 4.1) and Italian (section 4.4). We have also discussed the formation of the past tense in these two languages (sections 4.2 and 4.9). As far as Italian is concerned, we have discussed an important geographical distinction that influences the use of the past tense in the various regions of the country (section 4.7) and we have seen some of the reasons that might have conditioned the gradual disappearance of the simple past tense form in certain regions (section 4.8). As the research on Italian has been conducted in the region of Apulia, and specifically in the province of Bari, we assume that the agrammatic subject examined had an excellent and active knowledge of the simple past tense form (“passato remoto”), at least before his CVA.

## 5 The research

### 5.1 Introduction

In chapter 4 we have presented the grammatical systems of Modern Greek and Italian. This analysis has shown many similarities, as both languages are characterized by a rich inflectional system.

More precisely, as far as the verbal system is concerned, the two languages under investigation have more or less the same grammatical categories, with aspect being the most important point of divergence.

Furthermore, both Modern Greek and the variety of Italian spoken by the aphasic patient who participated in the present research have a simple perfective past tense form, which refers to processes or actions concluded in the past and with no connection to the present.

The above considerations have led to the following two hypotheses:

- As the formation of the tense under investigation presents in both languages a high percentage of irregular along with regular forms, the performance of both groups of subjects is expected to reveal a specific deficit in one or another direction.
- If the tense under investigation is similar in both languages, then the performance pattern of both groups of subjects will presumably be alike.

### 5.2 Subjects

Five Greek-speaking agrammatic patients and one Italian-speaking (Southern variant) agrammatic patient participated in the research. The group of Greek-speaking patients consisted of four male and one female subject, while the Italian patient was male. All six subjects were non-fluent aphasics who had suffered a left *cerebrovascular accident* (CVA).

Dysarthric and severely anomic patients, as well as patients with extremely stereotypical speech have been excluded from the research. A more detailed view of all participants is given in the following tables:

<b>Greek-speaking patients</b>	<b>Sex</b>	<b>Age</b>	<b>Cause of accident</b>	<b>Time of accident</b>	<b>WAB<sup>25</sup> test results (when available)</b>
<b>MG1</b>	M	32	Left Ischemic CVA, with hemorrhage at the basal ganglia	04/2012	None
<b>MG2</b>	M	not specified, approx. 60	Left hemorrhagic CVA	01/2012	48%
<b>MG3</b>	M	62	Left Ischemic CVA, with hemorrhage at the basal ganglia	12/2011	64,4%
<b>MG4</b>	M	78	Left Ischemic CVA	2012	54,16%
<b>MG5.</b>	F	32	Left CVA	2010	None

**Table 1:** Greek- speaking participants

<sup>25</sup> Western Aphasia Battery test

<b>Italian-speaking patient</b>	<b>Sex</b>	<b>Age</b>	<b>Lesion</b>	<b>Time of incident</b>	<b>WAB test results (when available)</b>
<b>I</b>	M	60	Left CVA due to tumor removal	1994	None

**Table 2:** Italian- speaking participant

At the time of testing, all five Greek patients presented a non- fluent spontaneous speech with difficulties at the syntactic and the grammatical level. On the other hand, repetition and comprehension were good. All five of them were still under speech treatment in Greek.

As far as the Italian patient is concerned, it is obvious from the table above that his condition was better and more stable, if compared to the Greek patients, due to the years passed from the accident. However, even after 18 years, the Italian patient still presents difficulties with inflectional morphology and syntax. Post onset, the patient underwent speech therapy in Italian.

All six participants had an education varying from six to twelve years, and were matched to control subjects for language, sex, age and educational/ socio-cultural level.

### **5.3 Methodology**

In order to examine agrammatic performance regarding the past tense, I have used a test proposed by Kehayia (1990), slightly modified for the needs and purposes of this research. The test examines both productive and receptive capacities of agrammatic patients aiming at an understanding of the agrammatic deficit. Therefore, the test comprised a

repetition task, two production tasks and a comprehension task. As Kehayia (1999:44) explains, the results on each task separately may reveal “trends” regarding the subjects’ performance on each task, while a general overview of the results could be necessary in order to better understand the agrammatic deficit. This means that a comparison of the data in all four tasks might be useful in order to confirm or to refute the hypothesis of a specific deficit in production, as proposed in the literature (Friedmann and Grodzinsky 1997, 2000).

The set of stimuli contained 24 sentences formed in present and past tense. For the **repetition** task, subjects were orally presented with the set of stimuli. The stimuli were organized in couples, with each sentence both in the present and the past tense. Subjects were asked to repeat each sentence immediately after its production by the examiner.

In order to examine **comprehension**, a sentence- picture matching task was administered. Stimuli were the same as in repetition. The couples of pictures were presented vertically, and the order was random. One picture represented the action in the present and the other one the same action concluded and hence in the past. Subjects were asked to match the sentence pronounced each time by the examiner with the appropriate picture.

Last, for the investigation of **production**, two tasks were administered. For production task I, subjects were presented with the same set of pictures used for comprehension. The examiner produced the sentence corresponding to the picture in present (e.g. ‘the man is repairing the car’) and asked the subjects to produce the appropriate sentence in the past. This was achieved by pointing out the picture referring to the past and asking the subject ‘and here...’. This way, as Kehayia observes

(1990:46), the patient was “provided with all the necessary lexical items, in an attempt to diminish the possibility of word finding difficulties”.

Production task II consisted in administration of the same set of pictures as in production task I. Subjects were required to spontaneously produce both present and past tense forms, without being provided with any kind of cues. The aim was to understand whether there is a general deficit regarding Tense or a specific deficit concerning only past tense.

Kehayia’s (1999) test was translated into Italian. It was administered to the Italian subject in the same way as with the Greek subjects.

For Italian, another production task was added, in an effort to capture the peculiarities in the formation of the past tense in this language (see section 5.4).

In all tasks, responses were judged as correct when the subject was able to repeat the whole sentence or at least the verb, inflected for the correct tense, person and number. Only two attempts were accepted. Whenever the subject produced a correct answer at a third or fourth attempt to respond, his answer was coded as incorrect. Moreover, responses were judged as incorrect if the subject refused to respond by answering ‘I don’t know’, ‘I don’t remember’, or ‘It doesn’t come to my mind’. Responses were also judged as wrong if the target verb was inflected incorrectly or if the subject substituted the target verb with another one semantically or phonologically similar.

## 5.4 Investigation of the Italian past tense

In order to investigate the simple past tense form in Italian, two tests were administered.

The first was the test of Kehayia (1990) used for Greek, translated (but not adapted) into Italian. However, in order to investigate more thoroughly the Italian past tense, a second test that covered more or less all the verb types in Italian was added.

The second test had the form of a gap filling task. The patient was presented with 39 couples of sentences. The first sentence was in the present, with a temporal adverb or adverbial phrase referring to it. The verb of the first sentence was given in the compound past tense form ('passato prossimo'). The second sentence was identical to the present sentence, but contained an adverb or adverbial phrase referring to the past. The verb form was omitted. The patient's task was to fill in the gap with the appropriate verb form, transforming the present tense, given in the first sentence, into past. E.g.:

1. Oggi            è        nato            mio            figlio.  
Today        is        born<sub>past part.</sub>    my<sub>masc.</sub>        son  
(‘My son has been born today.’)
2. Dieci anni fa        nacque                    mio            figlio.  
Ten    years ago        born<sub>3rd pers. simple past</sub>    my<sub>masc.</sub>        son.  
(‘My son was born ten years ago’.)

All adverbs and adverbial phrases chosen for the sentences of the task referred to a remote past, in order to elicit the simple past tense form.<sup>26</sup>

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<sup>26</sup> This choice would have been strictly necessary if the subject were a patient speaking the northern variety of Italian. As has been said in Chapter 4, in northern regions of Italy the past tense predominantly used is the compound past. The simple past, on the other hand, is used very rarely, especially when referring to remote

Verbs chosen for this second test in Italian were divided in the following seven groups:

<b>Verb type</b>	<b>Number of verbs tested</b>	<b>Present</b>	<b>Past</b>
<b>1) Regular verbs ending in –ARE.</b>	6	parlare ‘to speak’	parlai
<b>2) Irregular verbs ending in –ARE.</b>	3	stare ‘to be, to stay’	stetti
<b>3) Verbs ending in –ERE&gt; past with consonant reduplication.</b>	6	tenere ‘to keep’	tenni
<b>4) Verbs ending in –ERE&gt; past in –si.</b>	6	ridere ‘to laugh’	risi
<b>5) Verbs ending in –ERE&gt; past in consonant+ –si.</b>	6	correre ‘to run’	corsi
<b>6) Verbs ending in –ERE&gt; past in –ssi.</b>	6	dire ‘to say’	dissi
<b>7) Verbs ending in –IRE.</b>	6	aprire ‘to open’	aprii

**Table 3:** verb groups tested in Italian (test 2)

In total, 39 verbs were tested. All verb groups consisted in six verbs, except from group 2, which contained only three verbs. This happened because, as far as the past tense is a concerned, irregular verbs in –ARE are the following three: *fare* ‘to do’, *stare* ‘to be, to stay’, and *dare* ‘to

events. On the contrary, in the region of Apulia, where the research took place, speakers use the simple past tense also for events happened recently, with adverbs like ‘ieri’ (yesterday), ‘due giorni fa’ (two days ago) etc. However, in order to rule out the possibility to elicit the wrong tense form, adverbs referring to a remote past were chosen.

give'. Verb length varied from two to four syllables. All verbs were in the 3<sup>rd</sup> person singular. Thus, the patient's task was to produce the verb in the past tense and in 3<sup>rd</sup> person singular. All lexical items were supplied by the sentence referring to the present.

## 5.5 Investigation of the Greek aorist

The aim of this research was to control agrammatic performance regarding the Past Tense, and especially the simple form of the past, i.e. the aorist. This control has been realized via comparison with the performance in the Present Tense.

The verbs used for this purpose were divided into four subgroups, a classification proposed by Kehayia (1990) and based on the internal structure of Greek verbs. The verbs tested were grouped in the following four categories (see also 4.3):

<b>Verb category</b>	<b>Number of verbs tested</b>	<b>Present</b>	<b>Past</b>
<b>A active verbs ending in –ω</b>	6	γράφ-ω 'I write'	έ-γραψ-α 'I wrote'
<b>B active verbs ending in –ώ</b>	6	μιλ-ώ 'I speak'	μίλ-ησ-α 'I spoke'
<b>C passive and reflexive verbs ending in –ομαι</b>	6	πλέν-ομαι 'I wash myself'	πλύθ-ηκ-α 'I washed myself'
<b>D irregular verbs</b>	6	βλέπ-ω 'I see'	είδ-α 'I saw'

**Table 4:** the four verb groups in Greek

As Kehayia (1990: 90) explains, in her research Greek verbs were divided into these four categories, not only because they correspond to all the verb types in Modern Greek, but also because structural variation might be a parameter influencing the performance of aphasic patients.

We have seen in section 4.2 that Greek verbs have two stems, namely a present and a past one. The past tense is built with the augment ε-, when stressed, the past verb stem and the ending. E.g.:

<b>Verb category</b>	<b>Present</b>	<b>Aorist</b>
A	παίζ-ω ‘I play’	έ-παιξ-α ‘I played’

**Table 5:** formation of the past tense in Greek

However, as already said, formation of verbs belonging to the groups B and D requires an additional affix between the verb stem and the ending. Verbs that belong to group B take the affix -ησ-, while verbs belonging to group C require the affix -ηκ-. E.g.:

<b>Verb category</b>	<b>Present</b>	<b>Aorist</b>
B	αγαπ-άω ‘I love’	αγάπ-ησ-α ‘I loved’
C	λούζ-ομαι ‘I wash my hair’	λούστ-ηκ-α ‘I washed my hair’

**Table 6:** additional affixation process

Moreover, while for regular verbs the two stems are different, but they do not vary significantly, irregular verbs present two stems completely different from each other. Compare for example the following two verbs:

Verb category	Present	Aorist
B	αγαπ-άω ‘I love’	αγάπ-ησ-α ‘I loved’
D	τρώω ‘I eat’	έ-φαγ-α ‘I ate’

Table 7: Irregular past tense stem

The verbs that compose the test battery have been matched, according to Kehayia (1990:92), for length, complexity and frequency.

## 5.6 Results: Greek subjects

As already said, Greek- speaking subjects were tested in repetition, comprehension, and guided production of the past tense, as well as in spontaneous production of the present and the past tense. Tasks and stimuli were taken from Kehayia (1990). In this section, results of the Greek- speaking subjects will be discussed.

### 5.6.1 Repetition task

In the repetition task, results were variable. The younger subjects MG1 and MG5 had a completely or almost completely correct performance, while the task was shown to be more difficult for elder subjects. Subject MG4, in particular, was the one who had the highest error rate.

Errors in this task regarded erroneous production of the target verb, e.g. \*φύτεξε, instead of ‘φύτεψε’ (‘planted’ 3<sup>rd</sup> person singular); \*έκλεξε, instead of ‘έτρεξε’ (‘run’ 3<sup>rd</sup> person singular) or substitution of the target verb with another one, e.g. είπε (‘said’ 3<sup>rd</sup> person singular) instead of ήπιε (‘drunk’ 3<sup>rd</sup> person singular). Subject MG4 in many cases wasn’t able to repeat the sentence.

Omission of the verb’s subject or object, or inversion of the phrase’s constituents wasn’t judged as incorrect, as long as the target verb had

been produced correctly. E.g. instead of producing the phrase ‘The girl wrote a letter’, the subject produced ‘A letter wrote the girl’, with right-dislocation of the subject. It is important to underline that such a word order is not ungrammatical in Modern Greek, due to the existence of nominal inflection, and more specifically of case inflection. The subject of a phrase, irrespective of its position, is always found in nominative case, and thus recognized as such. Direct objects are marked with accusative case.<sup>27</sup>

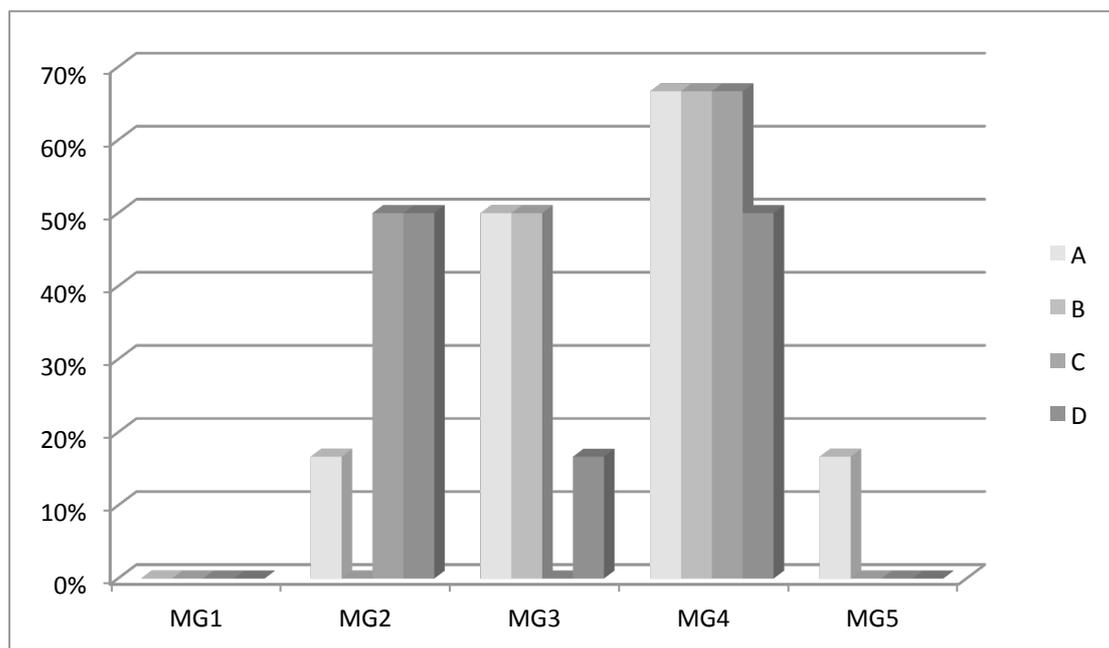
The table below presents absolute and percent error rate in repetition:

<b>Repetition</b>	<b>A raw</b>	<b>A %</b>	<b>B raw</b>	<b>B %</b>	<b>C raw</b>	<b>C %</b>	<b>D raw</b>	<b>D %</b>
<b>MG1</b>	0/6	0%	0/6	0%	0/6	0%	0/6	0%
<b>MG2</b>	1/6	17%	0/6	0%	3/6	50%	3/6	50%
<b>MG3</b>	3/6	50%	3/6	50%	0/6	0%	1/6	17%
<b>MG4</b>	4/6	67%	4/6	67%	4/6	67%	3/6	50%
<b>MG5</b>	1/6	17%	0/6	0%	0/6	0%	0/6	0%

**Table 8:** Repetition task in Greek

<sup>27</sup> As Philippaki- Warburton (1998) observes, the English sentence *John kissed Mary* can be rendered in Modern Greek in twelve different ways. However, she accepts that the ‘basic’ or ‘dominant’ word order in Greek is Subject- Verb- Object (SVO).

In the following figure it is possible to compare the performance of the Greek-speaking subjects in repetition of the past tense:



**Fig. 8:** Repetition task- total error rate

### 5.6.2 Comprehension task

Comprehension was tested by administrating to the subject two pictures representing the same action in the present and in the past. The subject was asked to point out the picture that referred to the past with questions like: ‘In which picture did the girl cut the flowers?’.

The response was counted as correct if the subject pointed out to the correct picture. Spontaneous self- correction was also judged as correct. On the other hand, if the subject indicated the picture that referred to the present or indicated them both alternately, performance was judged as unsuccessful.

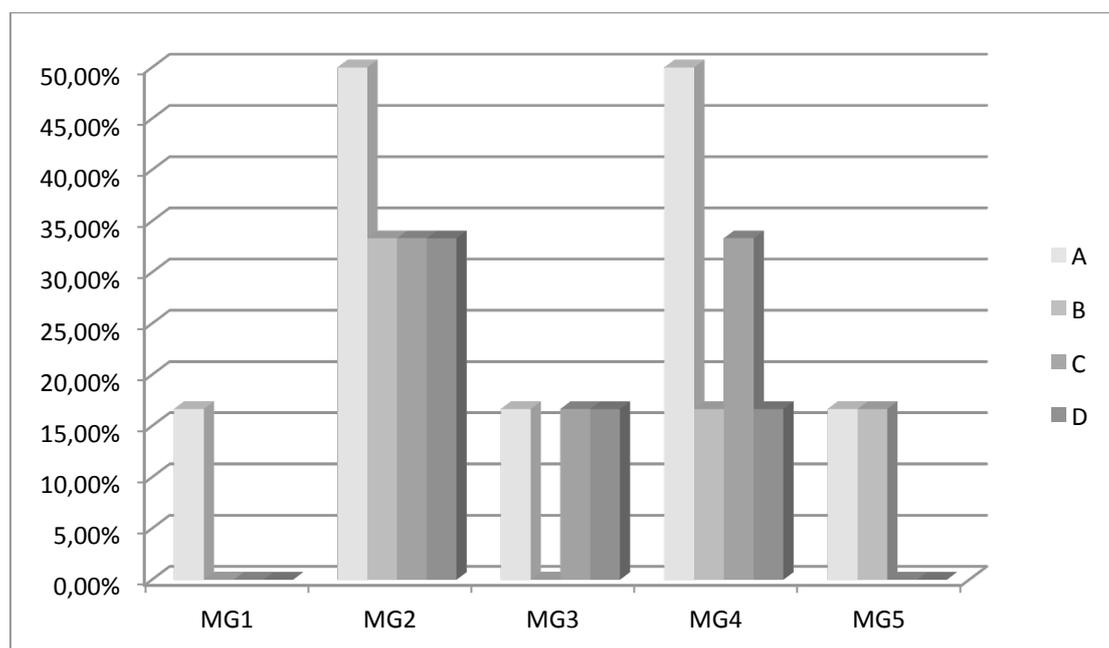
Again, subjects MG1 and MG5 demonstrated a better performance compared to older participants.

Error rate in absolute and in percent values is expressed in the following table:

<b>Comprehen sion</b>	<b>A raw</b>	<b>A %</b>	<b>B raw</b>	<b>B %</b>	<b>C raw</b>	<b>C %</b>	<b>D raw</b>	<b>D %</b>
<b>MG1</b>	1/6	17%	0/6	0%	0/6	0%	0/6	0%
<b>MG2</b>	3/6	50%	2/6	33%	2/6	33%	2/6	33%
<b>MG3</b>	1/6	17%	0/6	0%	1/6	17%	1/6	17%
<b>MG4</b>	3/6	50%	1/6	17%	2/6	33%	1/6	17%
<b>MG5</b>	1/6	17%	1/6	17%	0/6	0%	0/6	0%

**Table 9:** Comprehension task in Greek

The following figure illustrates performance in comprehension of all five Greek- speaking subjects:



**Fig. 9:** Comprehension task- total error rate

### 5.6.3 Guided production task

In this task, production of the past tense only was elicited. The examiner produced the target sentence inflected in present tense. In this way, the subject was supplied with all necessary lexical items. The examiner, then, asked the subject to produce the appropriate sentence in the past by pointing to the corresponding picture and saying ‘and here..?’.

Erroneous responses were ungrammatical productions, e.g. \*βάφασε<sup>28</sup> instead of έβαψε (‘painted’ 3<sup>rd</sup> person singular), substitutions of the target verb with another verb, e.g. έδειξε (‘showed’ 3<sup>rd</sup> person singular), instead of κυνήγησε (‘hunted’ 3<sup>rd</sup> person singular), or production of a past tense other than the aorist. Alternative past tenses produced were imperfect, perfect and pluperfect. Some examples are: μετρούσε (‘was counting’ 3<sup>rd</sup> person singular, imperfect) or είχε μετρήσει (‘had counted’ 3<sup>rd</sup> person singular, past perfect) instead of μέτρησε (‘counted’ 3<sup>rd</sup> person singular, past), έχει φύγει (‘has gone’ 3<sup>rd</sup> person singular, perfect), instead of φεύγει. In some cases, subjects simply repeated the verb in the present tense.

Error rate in absolute and percent values is given by the table below:

<b>Guided Production</b>	<b>A</b>	<b>A %</b>	<b>B</b>	<b>B %</b>	<b>C</b>	<b>C %</b>	<b>D</b>	<b>D %</b>
	<b>raw</b>		<b>raw</b>		<b>raw</b>		<b>raw</b>	
<b>MG1</b>	2/6	33%	3/6	50%	2/6	33%	2/6	33%
<b>MG2</b>	3/6	50%	1/6	17%	4/6	67%	4/6	67%
<b>MG3</b>	3/6	50%	5/6	83%	4/6	67%	5/6	83%
<b>MG4</b>	3/6	50%	2/6	33%	3/6	50%	5/6	83%
<b>MG5</b>	0/6	0%	0/6	0%	0/6	0%	3/6	50%

**Table 10:** Guided production task in Greek

<sup>28</sup> Verb ending looks like 2<sup>nd</sup> person singular. However, the production is ungrammatical, as the grammatical form would be ‘έβαψες’.

The following figure illustrates the total error rate in elicited production of the past tense:

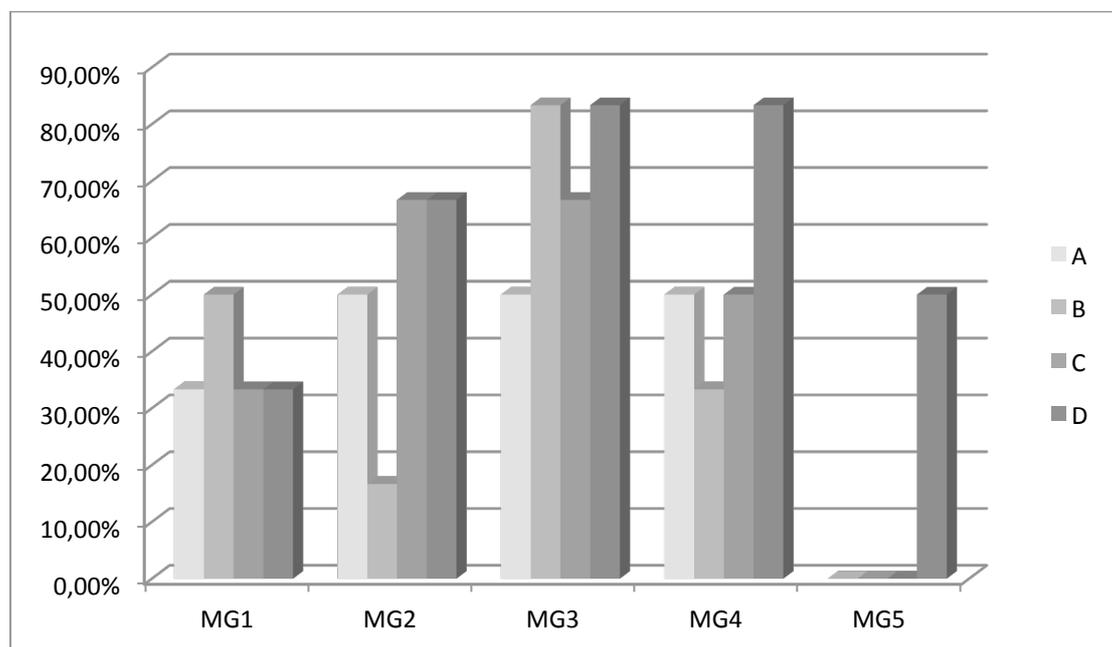


Fig 10: Guided production task- total error rate

#### 5.6.4 Spontaneous production

Spontaneous production of the aphasic subjects was tested both in the present and in the past tense. Again, efforts to respond were judged as incorrect whenever the subject substituted the target verb with another one or produced it in an inappropriate tense (an example that represents both: “*Η κοπέλα βγάζει τα λουλούδια*” (‘The girl takes the flowers out’) instead of “*Η κοπέλα έκοψε τα λουλούδια*” (‘The girl cut the flowers’). Substitution of the verb was mostly manifested in production of the present tense, whereas production of the right verb in an inappropriate tense regarded the past. Tenses that were produced instead of the aorist were present, e.g. ‘*προσγειώνεται*’ (‘land’ 3<sup>rd</sup> person singular, present) instead of ‘*προσγειώθηκε*’ (‘landed’ 3<sup>rd</sup> person singular, past), perfect, ‘*έχει φύγει*’ (‘is gone’ 3<sup>rd</sup> person singular, perfect) instead of ‘*έφυγε*’ (gone 3<sup>rd</sup> person singular, past) and pluperfect, e.g. ‘*είχε ντυθεί*’ (‘had dressed’

3<sup>rd</sup> person singular) instead of ντύθηκε ('dressed' 3<sup>rd</sup> person singular), while in one case a passive participle was produced, e.g. 'πεταμένα' ('tossed' passive participle, nominative case, neutral) 'πέταξε' ('tossed' 3<sup>rd</sup> person singular past).

The following table shows the performance of the Greek-speaking subjects in spontaneously producing the present tense. Error rate is expressed in absolute and in percentage.

<b>Spontaneous Production (present)</b>	<b>A</b>	<b>A %</b>	<b>B</b>	<b>B %</b>	<b>C</b>	<b>C %</b>	<b>D</b>	<b>D %</b>
	<b>raw</b>		<b>raw</b>		<b>raw</b>		<b>raw</b>	
<b>MG1</b>	2/6	33%	1/6	17%	2/6	33%	2/6	33%
<b>MG2</b>	4/6	67%	6/6	100%	5/6	83%	5/6	83%
<b>MG3</b>	3/6	50%	5/6	83%	5/6	83%	3/6	50%
<b>MG4</b>	2/6	33%	1/6	17%	0/6	0%	2/6	33%
<b>MG5</b>	0/6	0%	1/6	17%	1/6	17%	2/6	33%

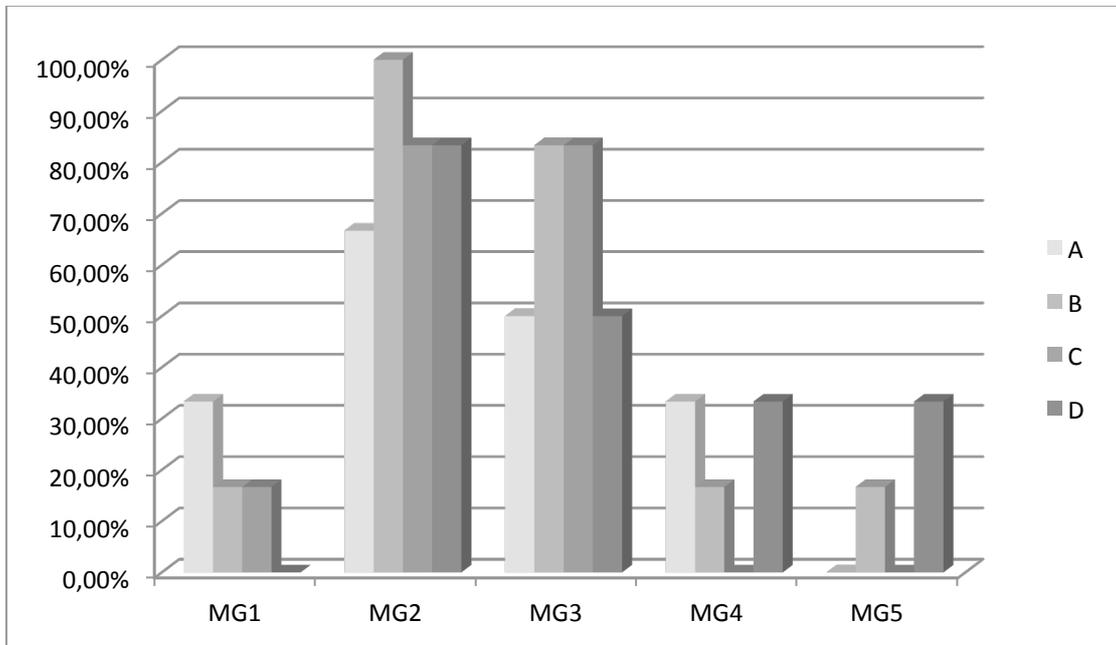
**Table 11:** Spontaneous production task (present)

The table below expresses the results regarding spontaneous production of the past tense.

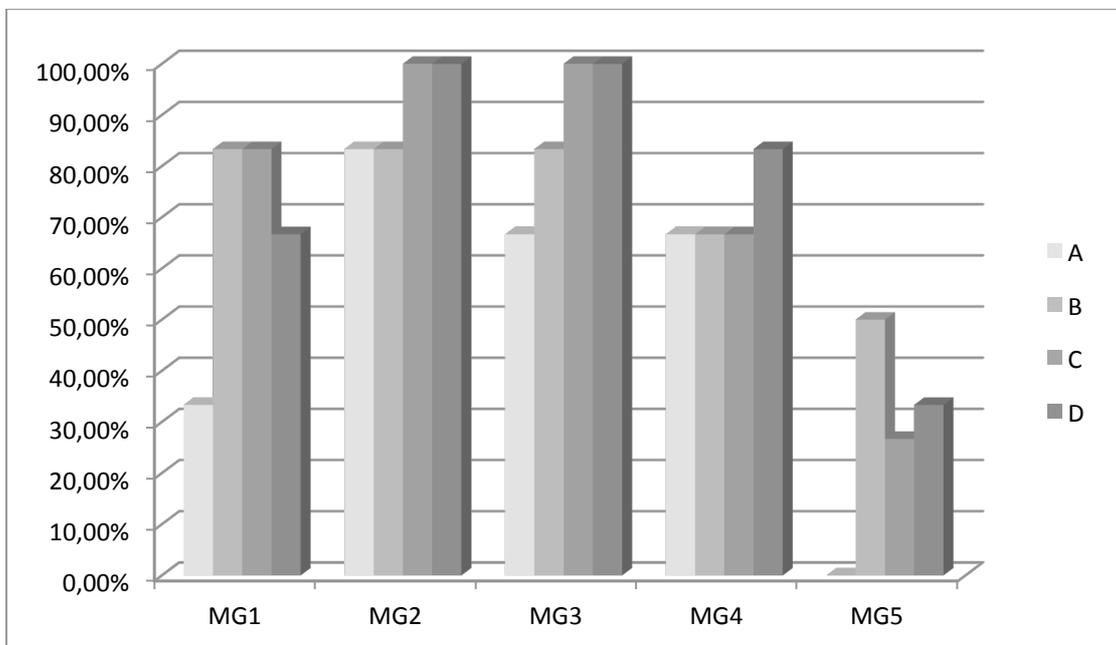
<b>Spontaneous Production (past)</b>	<b>A</b>	<b>A %</b>	<b>B</b>	<b>B %</b>	<b>C</b>	<b>C %</b>	<b>D</b>	<b>D %</b>
	<b>raw</b>		<b>raw</b>		<b>raw</b>		<b>raw</b>	
<b>MG1</b>	2/6	33%	5/6	83%	5/6	83	4/6	67%
<b>MG2</b>	5/6	83%	5/6	83%	6/6	100%	6/6	100%
<b>MG3</b>	4/6	67%	5/6	83%	6/6	100%	6/6	100%
<b>MG4</b>	4/6	67%	4/6	67%	4/6	67%	5/6	83%
<b>MG5</b>	0/6	0%	3/6	50%	1/6	17%	2/6	33%

**Table 12:** Spontaneous production task (past)

It is clear from figures 11 and 12 below that the task of the spontaneous production was quite problematic for the aphasic subjects. In particular, production of the past tense had a higher error rate compared to the present.



**Fig. 11:** Spontaneous Production (present) task- total error rate



**Fig. 12** Spontaneous Production (present) task- total error rate

## 5.7 Results: Italian subject

As has been said above, the first part of the research on Italian (Test 1) consisted in administering the test of Kehayia (1990) translated into Italian. The second part of the research (Test 2) was based on a test structured by the writer.

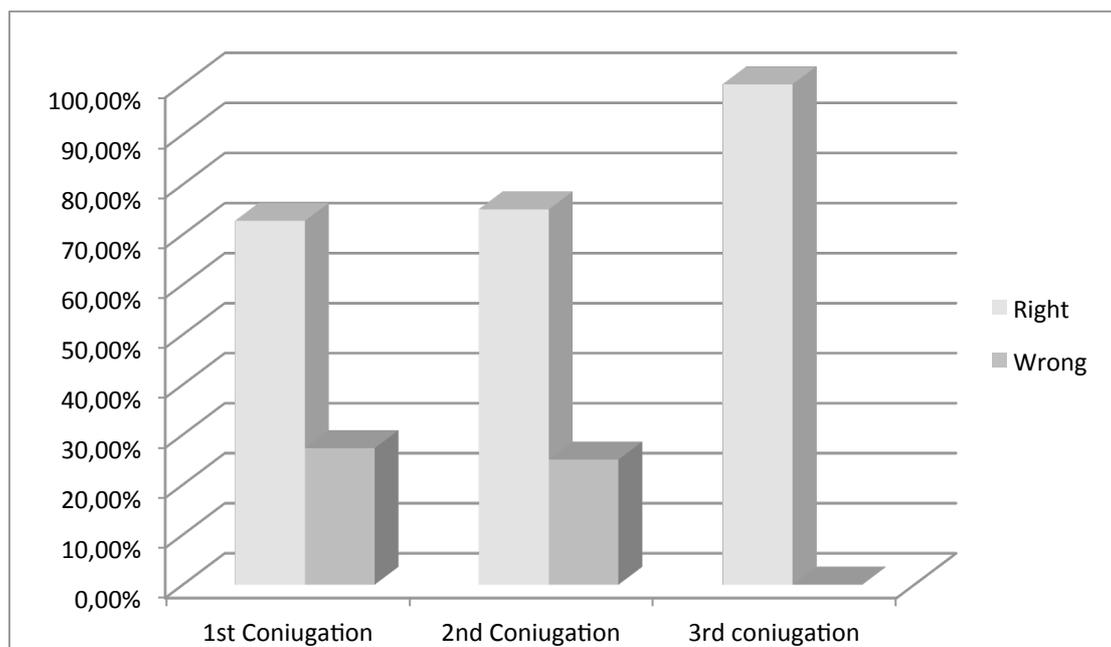
### 5.7.1 Test 1- Repetition task

The subject's capacity to repeat was controlled for the present tense and the simple past tense ('passato remoto').

The Italian subject's performance in repetition of the present tense revealed some errors in the first two verb groups, while performance in the third category was 100% correct. Errors regarded mostly phonological or semantic substitutions, e.g. '*apre*' ('open' 3<sup>rd</sup> person singular, present) instead of '*appende*' ('hang' 3<sup>rd</sup> person singular, present) and '*butta*' ('toss' 3<sup>rd</sup> person singular, present) instead of '*getta*' ('toss' 3<sup>rd</sup> person singular, present). Error rate (raw and per cent) is illustrated in detail in the following table, while figure 13 depicts the subject's performance in the task of repetition:

Repetition (Present)	-ARE		-ERE		-IRE	
	raw	%	raw	%	raw	%
<b>Errors</b>	3/11	27%	2/8	25%	0/5	0%

Table 13: Repetition of the Present tense in Italian



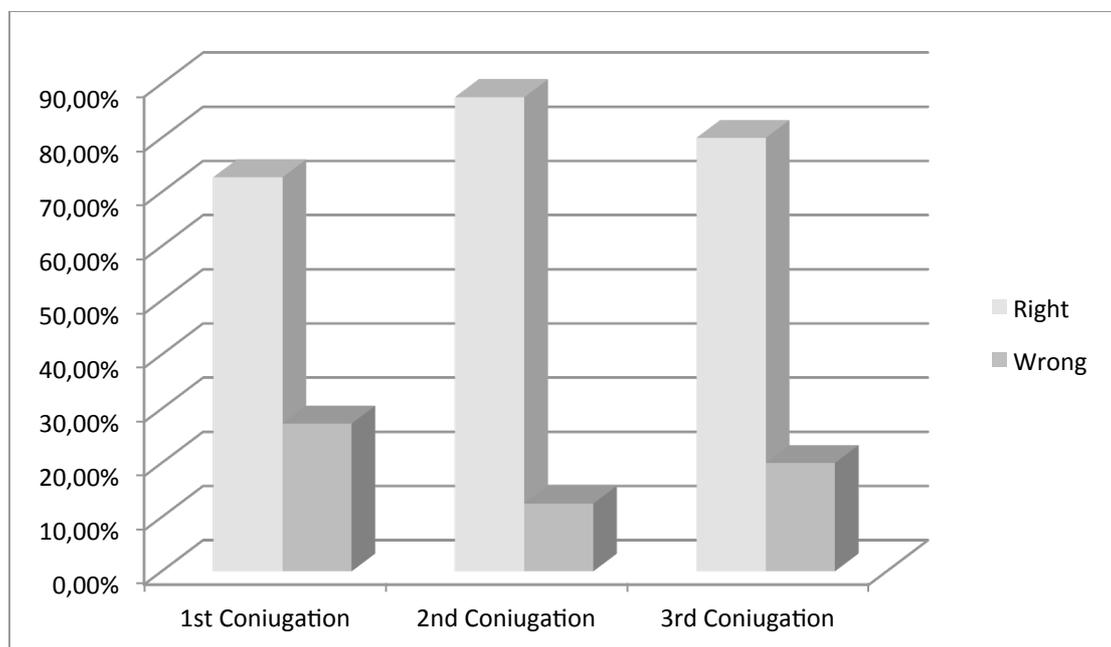
**Fig.13:** Italian: Test 1- Repetition of the Present Tense

Repetition of the past tense was shown to be of equal difficulty as repetition of the present tense. The total error rate was the same. However, a qualitative analysis of the performance revealed more errors concerning verb inflection. The table below contains data from repetition of the Italian past tense in all three verb conjugations.

<b>Repetition (Past)</b>	<b>-ARE</b>	<b>-ARE</b>	<b>-ERE</b>	<b>-ERE</b>	<b>-IRE</b>	<b>-IRE</b>
	<b>raw</b>	<b>%</b>	<b>raw</b>	<b>%</b>	<b>raw</b>	<b>%</b>
<b>Errors</b>	<b>3/11</b>	<b>27%</b>	<b>1/8</b>	<b>13%</b>	<b>1/5</b>	<b>20%</b>

**Table 14** Repetition of the Italian Simple Past Tense

The following figure illustrates the subject's performance in repetition of the past tense.



**Fig.14:** Italian, Test1- Repetition of the Simple Past Tense

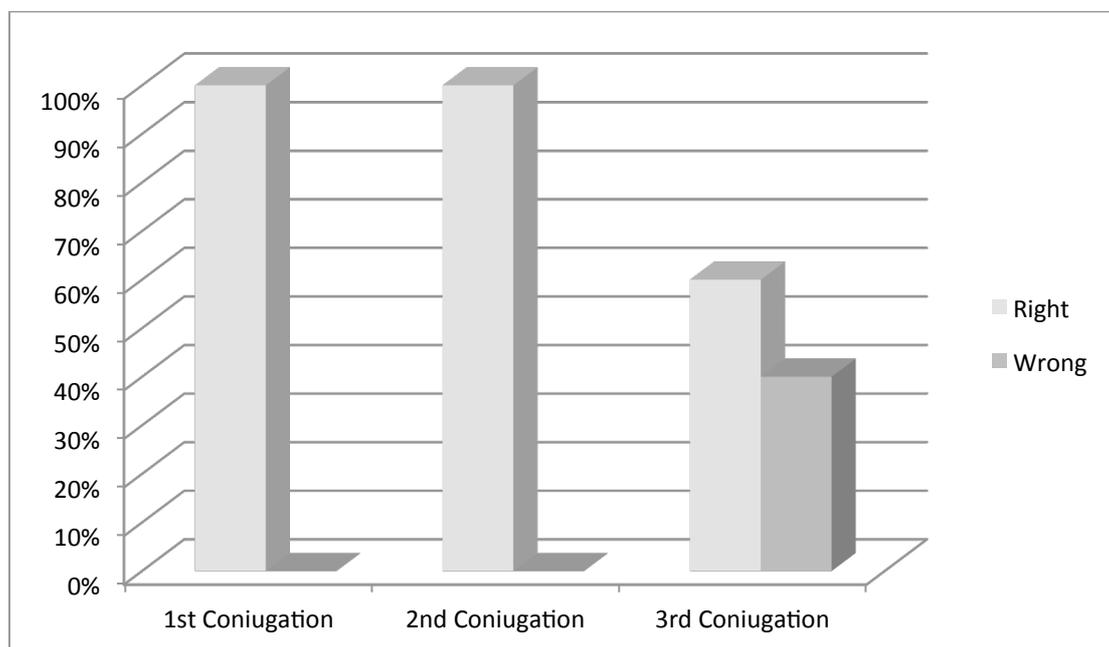
### 5.7.2 Test 1- Comprehension task

Testing the comprehension consisted in asking the subject to point to the picture referring to the past. The subject's performance revealed, as expected, a low error rate, which concerned only the third verb group. Both incorrect responses regarded transitive verbs with one object. Error distribution can be seen in table 15:

Comprehension (Past)	-ARE raw	-ARE %	-ERE raw	-ERE %	-IRE raw	-IRE %
<b>Errors</b>	0/11	<b>100%</b>	0/8	<b>100%</b>	2/5	<b>60%</b>

**Table 15** – Comprehension of the Italian Simple Past Tense

The subject's performance in the comprehension of the past tense is illustrated in figure 15:



**Fig.15:** Test 1(Italian) - Comprehension of the Simple Past Tense

### 5.7.3 Test 1- Guided Production task

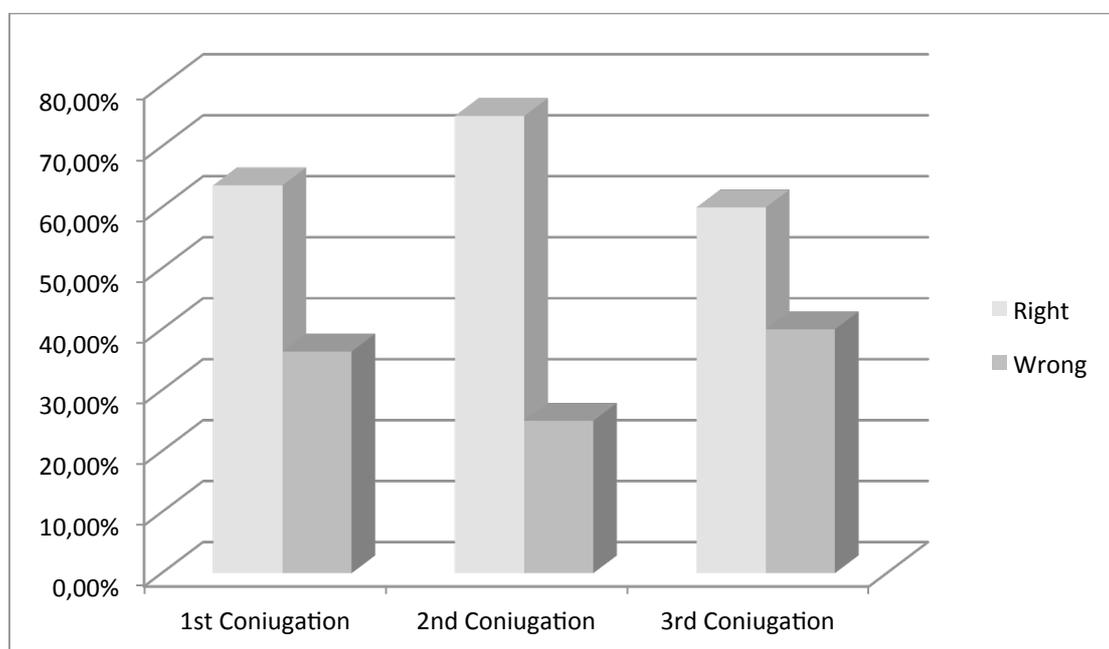
This task consisted in eliciting the past tense by providing the subject with a sentence in the present tense. Error percentage was comparable for the first and third verb category, while it was lower for the second one. Significantly, this task was more difficult for the subject, if compared to the previous tasks. Errors varied qualitatively: the subject committed errors that consisted in the production of semantically similar verbs, e.g. *'dipinse'* ('painted' 3<sup>rd</sup> person singular, past) instead of *'pittò'* ('painted' 3<sup>rd</sup> person singular past) as well as erroneous production of tense (present for past tense), e.g. *'vende'* ('sell' 3<sup>rd</sup> person singular, present) instead of *'vendette'* ('sold' 3<sup>rd</sup> person singular, past) and person (first person instead of the third), e.g. *'piantai'* ('planted' 1<sup>st</sup> person singular, past) instead of *piantò* (3<sup>rd</sup> person singular, past). In two cases, the subject produced ungrammatical responses, such as *\*inseguò* instead of *'inseguì'*

(‘hunted’ 3<sup>rd</sup> person singular, past) and *\*appendì* instead of ‘appese’ (‘hung’ 3<sup>rd</sup> person singular, past). However, it is important to notice that the subject was conscious of the errors committed. He manifested his being aware of it by saying ‘Non mi piace’ (‘I don’t like it’). The subject’s performance in this task is illustrated in table 16 below.

Guided production (past)	-ARE	-ARE	-ERE	-ERE	-IRE	-IRE
	raw	%	raw	%	raw	%
<b>Errors</b>	4/11	<b>36%</b>	2/8	<b>25%</b>	2/5	<b>40%</b>

**Table 16** – Guided Production of the Italian Simple Past Tense

It is quite evident from figure 16 that this task revealed to be more difficult for the aphasic subject in comparison with repetition and comprehension tasks, analyzed above.



**Fig.16:** Test 1(Italian) - Production (guided) of the Simple Past Tense

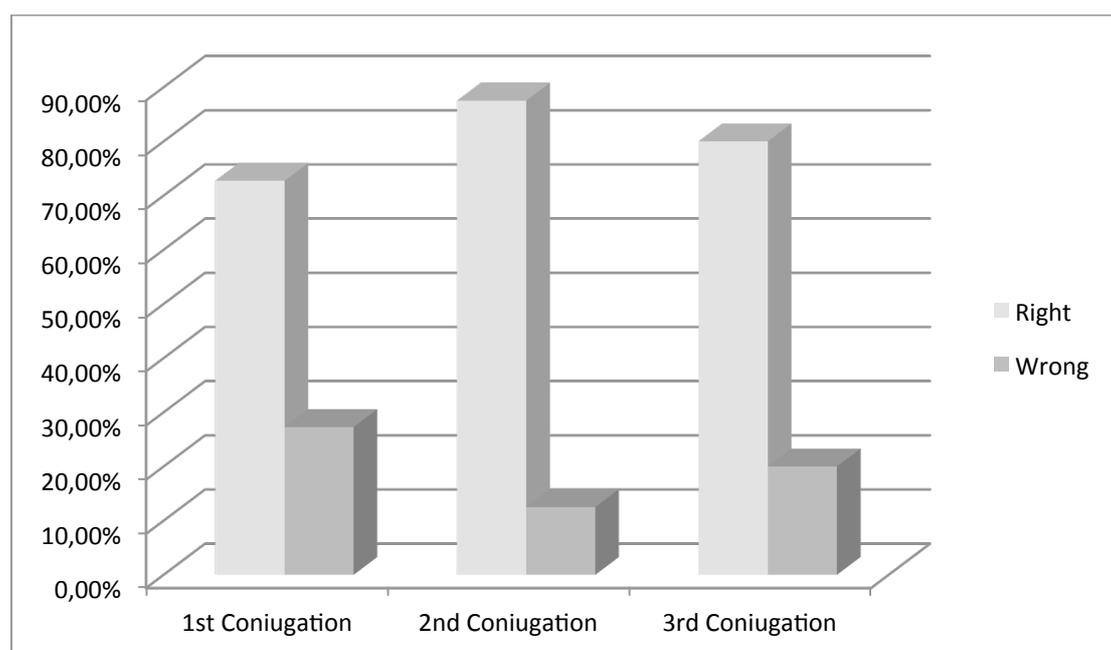
### 5.7.4 Test 1- Spontaneous Production task

Spontaneous production of the Italian- speaking subject was tested in the present and the past tense ('passato remoto'). Production of the present tense revealed more errors in the first conjugation. Errors regarded mostly substitution of the target verb, e.g. 'taglia' ('cuts' 3<sup>rd</sup> person singular, present) instead of 'raccoglie' ('picks up' 3<sup>rd</sup> person singular, present). However, the aphasic subject did not produce any ungrammatical verb forms. Performance in the present tense is presented in the following table:

Spontaneous production (present)	-ARE raw	-ARE %	-ERE raw	-ERE %	-IRE raw	-IRE %
<b>Errors</b>	3/11	<b>27%</b>	1/8	<b>13%</b>	1/5	<b>20%</b>

**Table 17** – Spontaneous Production of the Italian Present Tense

The subject's performance in this task is represented in figure 17:



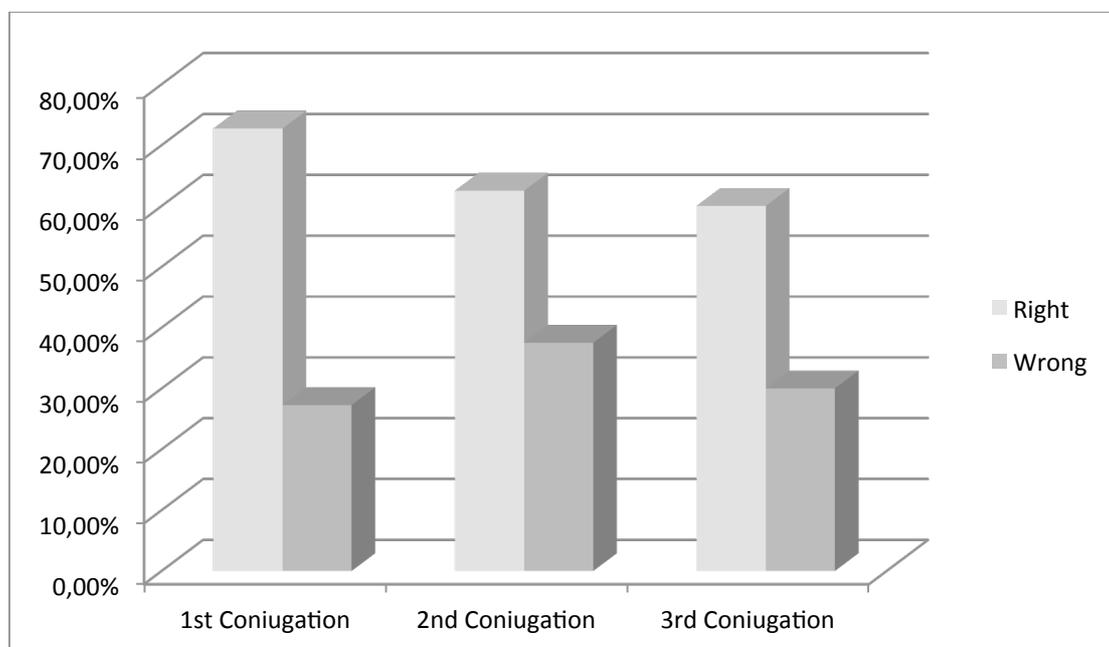
**Fig. 17:** Test 1(Italian) - Spontaneous Production of the Present Tense

Past tense, on the other hand, was shown to be more problematic for the aphasic subject. Errors were distributed more or less equally in the three verb categories. In the case of the past tense, the subject produced many erroneous forms of irregular verbs, e.g. \*‘prendò’ instead of ‘prese’ (‘took’ 3<sup>rd</sup> person singular, past). His responses showed an over-regularization tendency, i.e. an effort to regularize the irregular verb forms. Error distribution is given in the table below:

<b>Spontaneous production (past)</b>	<b>-ARE</b>	<b>-ARE</b>	<b>-ERE</b>	<b>-ERE</b>	<b>-IRE</b>	<b>-IRE</b>
	<b>raw</b>	<b>%</b>	<b>raw</b>	<b>%</b>	<b>raw</b>	<b>%</b>
<b>Errors</b>	3/11	27,27%	3/8	37,5%	2/5	40%

**Table 18** – Spontaneous Production of the Italian Past Tense

The following chart visually represents the increased difficulty of the subject to produce autonomously the simple past tense form.



**Fig. 18:** Test 1 (Italian) - Production (spontaneous) of the Simple Past Tense

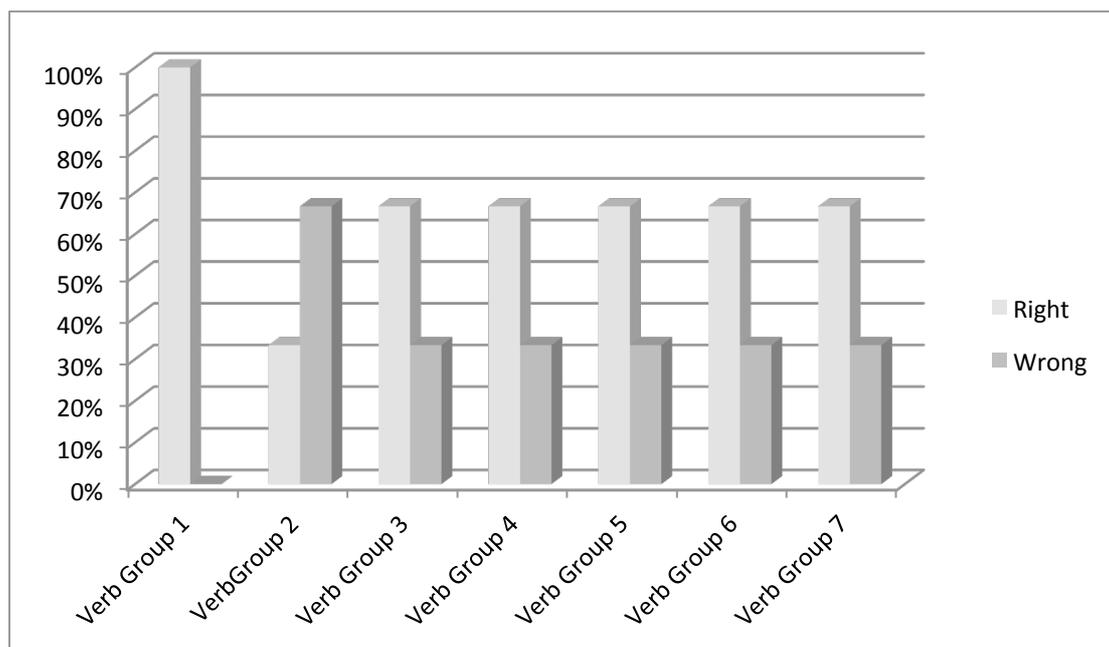
### 5.7.5 . Test 2

In order to control better the aphasic subject's performance in the simple past tense, a second test was administered. Verbs were divided into seven categories (for a more precise description, see section 4.4.).

The performance in the first verb group, which contained regular verbs ending in –are, was 100% correct. The performance in the second category was shown to be highly problematic. In fact, two of the three verbs belonging to this group were produced incorrectly. The verb produced correctly was *dare* 'to give', while *fare* 'to do' and *stare* 'to be, to stay' were both substituted with the verb 'avere'.

Performance in all other verb categories (verb groups 3-7) was equal. The aphasic subject produced four correct and two incorrect verb forms in each category. In some cases, he produced the compound past tense form (in 1st person singular) instead of the simple one, e.g. '*mi sono alzato*' ('woke up' 1<sup>st</sup> person singular, passato prossimo) for '*mi alzai*' ('woke up', 1<sup>st</sup> person singular, passato remoto). In three cases, he substituted the target verb with another one semantically similar to it, e.g. '*si tagliò*' ('cut' 3<sup>rd</sup> person singular, past) instead of '*si rase*' ('shaved' 3rd person singular, past). Furthermore, four responses were ungrammatical, e.g. \*'*nascosse*', instead of '*nascose*' ('hide' 3<sup>rd</sup> person singular, past) or \*'*scomparse*' instead of '*scomparve*' ('disappeared' 3<sup>rd</sup> person singular, past).

The performance of the Italian- speaking subject in the different verb groups is illustrated in the following chart.



**Fig. 19:** Test 2 (Italian)

## 5.8 Discussion

In the present research, we have tried to examine the performance in the past tense of six non- fluent aphasic subjects, five Greek- speaking and one Italian-speaking. The research was based on a test created by Kehayia (1990). Moreover, in order to control the production of the past tense in Italian, a supplementary test was administered. In this section, we will discuss our results in the light of previous research about the grammatical category of Tense in aphasia.

### 5.8.1 Discussion of the results in Greek

As far as Greek is concerned, a comparison with Kehayia’s (1990) results is important. However, before proceeding to a comparative analysis, a premise needs to be made. Two of the Greek- speaking subjects were significantly younger (32 years), if compared to the rest of the participants and to Kehayia’s subjects. We believe that this age difference is reflected in our findings in that they have a better performance than the other subjects.

First of all, results in the repetition task were similar to those of Kehayia (1990). The highest error percentage was in both cases 66, 7%. Kehayia's results, however, revealed an increased difficulty with verb groups C (passive and reflexive verbs) and D (irregular verbs). Our results support these findings only partially, as only subject MG2 manifested the same error pattern. As already said, the younger subjects MG1 and MG5 had a perfect or almost perfect performance in repetition. Patient MG3 seemed to display the inverse pattern, i.e. his error rate was higher in verb categories A and B. Last, subject MG4 had difficulties with the repetition of all four verb categories.

In the comprehension of past tense, the number of errors of the Greek-speaking patients is in line with those of Kehayia. Kehayia's patient G1 had a 6/24 error rate regarding the past tense. Patient G2 performed better, with a 2/24 error score. In our research, the worst performance regarded subjects MG2 and MG4, who performed 9/24 and 7/24 errors, respectively. The other three subjects performed almost perfectly, with 2/24 errors at most.

A comparison of our data in repetition and comprehension partially confirms Kehayia's thesis that her two Greek-speaking participants performed better in comprehension than in repetition. In fact, subjects MG3 and MG4 performed categorically worse in the repetition task, with 7/24 and 15/24 errors, respectively. Subject MG2 performed slightly better in repetition (7/24 errors) than in comprehension (9/24 errors). The youngest subjects MG1 and MG5 committed in repetition one error less than in comprehension, i.e. subject MG1 had a 100% correct performance in the repetition task, committing one error in the comprehension task, whereas subject MG5 had 1/24 errors in repetition and 2/24 errors in comprehension.

Moving on to guided production, the total error rate of our five Greek-speaking patients were similar to those of Kehayia's subjects. Kehayia reported a 14/24 error rate (59,4%) of G1 and a 10/24 (43,75%) of G2. The worst performance in our research regarded the subject MG3, who reached a 17/24 error rate. All other results were at the same levels as Kehayia's, i.e. from a minimum of 3/24 to a maximum of 13/24 total error rate.

The examination of the capacity of the non-fluent subjects to autonomously produce the category of Tense included testing both the present and the past tense. Generally speaking, spontaneous production revealed in most cases to be more problematic for the non-fluent subjects than guided production, independently of the tense in question.

More precisely, as far as present tense is concerned, subjects MG2 and MG5 performed worse than in the guided production of the past tense. The other three subjects instead had a lower error rate in producing spontaneously the present tense, i.e. they had more difficulties with the elicited production of the past tense. However, spontaneous production of the present tense was relatively easier than spontaneous production of the past for all five subjects, as errors were lower. This finding is confirmed by Kehayia, whose subjects also performed better in producing the present than the past tense.

Moreover, all five Greek-speaking patients of our research demonstrated an increased difficulty in coping with the task of spontaneous production of the past tense. Error rate was significantly higher compared to the previous task of elicited production. Subject MG2, who had the highest deviation, produced 10 more erroneous responses (22/24 compared to a 12/24 score in guided production). All other subjects had a variation of a minimum of 3 up to a maximum of 7 errors more with respect to guided

production. Such a result totally confirms Kehayia's findings that spontaneous production of the past tense turns out to be more problematic than elicited production.

We are now going to look deeper into the spontaneous production of the past tense in Greek by analyzing individual performance in each verb category and by comparing it with Kehayia's results.

Kehayia's initial hypothesis was that the formation of the past tense of verbs that in Modern Greek undergo an additional affixation process, as well as the past of irregular verbs, should be more problematic to produce for aphasic patients. This hypothesis was confirmed by her findings. In fact, Kehayia reported that both aphasic subjects that participated in her research had a markedly better performance in producing the past tense of category A verbs. Kehayia's findings actually depict a crescendo of difficulty, which in the case of categories C and D reaches 100% error rate. Kehayia's results are reported in the table below:

	<b>Cat. A %</b>	<b>Cat. B %</b>	<b>Cat. C %</b>	<b>Cat. D %</b>
<b>G1</b>	33,3%	66,6%	100%	100%
<b>G2</b>	17,7 %	66,6%	100%	100%

**Table 19:** Kehayia's results

Turning now to our findings, verb group A was indeed the one with the lowest error percentage in all five aphasic subjects. An error pattern similar to that of Kehayia, i.e. an increasing difficulty along the four verb groups, was encountered in the performance of three out of five subjects, namely subjects MG2, MG3 and MG4. Performance of subject MG1, however, is not that different, if we consider that the lower error rate in verb group D was due to only one error, compared to verb groups B and C. Performance of subject MG5 is more deviating, as she reached a 50%

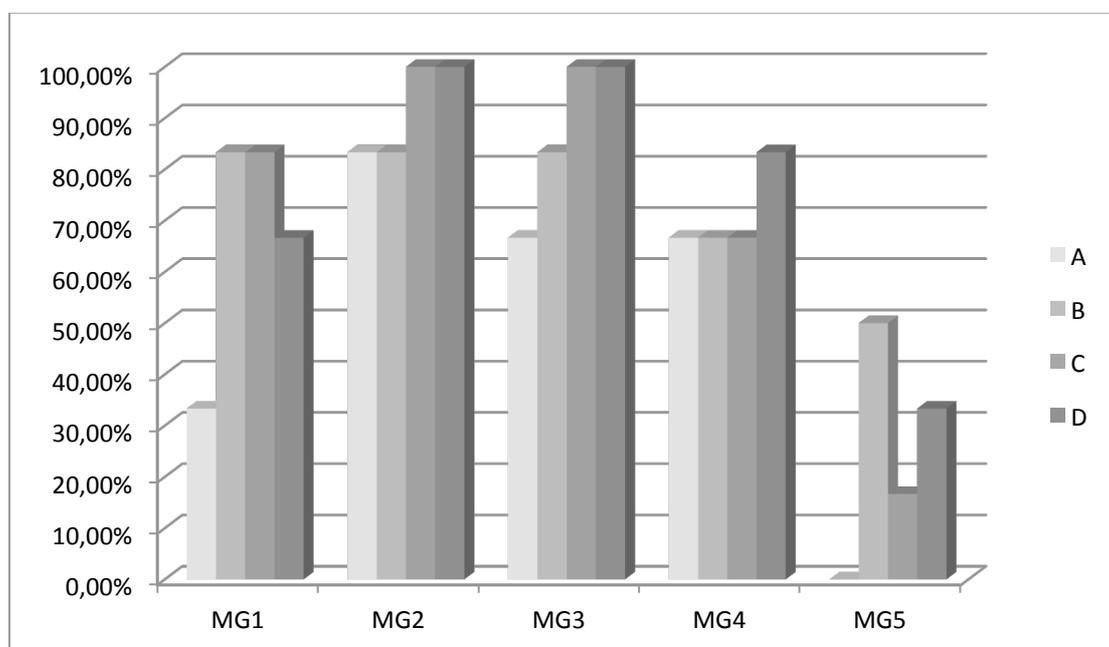
error rate in verb group B, while performance in verb groups C and D was more successful.

Results regarding the performance of the five Greek-speaking subjects are presented in the following table:

	<b>A</b>	<b>A %</b>	<b>B</b>	<b>B %</b>	<b>C</b>	<b>C%</b>	<b>D</b>	<b>D %</b>
	<b>raw</b>		<b>raw</b>		<b>raw</b>		<b>raw</b>	
<b>MG1</b>	2/6	33%	5/6	83%	5/6	83%	4/6	67%
<b>MG2</b>	5/6	83%	5/6	83%	6/6	100%	6/6	100%
<b>MG3</b>	4/6	67%	5/6	83%	6/6	100%	6/6	100%
<b>MG4</b>	4/6	67%	4/6	67%	4/6	67%	5/6	83%
<b>MG5</b>	0/6	0%	3/6	50%	1/6	17%	2/6	33%

**Table 20:** Performance of the Greek subjects in the 4 verb groups

The following figure displays the performance of the five Greek-speaking agrammatic subjects in the four different verb categories:



**Fig.20:** Spontaneous Production of the Past tense

Summing up, trends that emerged from the present research support Kehayia's findings. In fact, spontaneous production of the past tense in Greek was shown to be the most problematic task, as it yielded the highest error rate. The most important finding, however, is that verb group A, which contained regular verbs, yielded the lowest error rate. Furthermore, it is also important to notice that three of our Greek-speaking patients manifested the same error pattern as Kehayia's patients, i.e. an increasing difficulty along verb groups, with groups C and D being the most problematic. These findings have some important theoretical implications that will be discussed later.

### **5.8.2 Discussion of the results in Italian**

In this section the results yielded by our Italian subject will be discussed. Greek and Italian results cannot be directly comparable, as they regard two different languages. However, we have seen that both languages are morphologically rich, and, thus, we might expect analogous results.

Repetition in Italian was tested in the present and the past tense. In both tenses, error rate was at a similar level, with a maximum of 27,27% errors in repetition of both the present and the past of the first conjugation. The Italian subject, thus, performed better in repetition than the Greek-speaking subjects did. The comprehension task yielded a 40% error rate in the third conjugation, while performance in the other two verb groups was 100% successful. This finding confirms Kehayia's results that performance in comprehension is better than in repetition.

Results in elicited production of the past tense in Italian are in line with our results in Greek, as well as with Kehayia's results. The total error number was 8/24. Errors were distributed more or less equally in the

three verb groups, with the third verb group having the highest percentage of errors (40%).

Spontaneous production in Italian, as well as in Greek, was tested in the present and the past tense. Spontaneous production of the past tense (8/24 errors) was more problematic than spontaneous production of the present tense (5/24 errors), a result which is in line with both Kehayia's and our results in Greek. Interestingly, the Italian subject had the same error rate in producing the past tense, in the guided and spontaneous production tasks, i.e. 8/24 errors.

As already said in previous sections, in order to be able to test the regularity vs. irregularity hypothesis in Italian, it has been necessary to add a supplementary gap- filling test (Test 2). Results in test 2 yielded a 100% successful performance in producing the past tense of the verbs that belonged to the –ARE conjugation, i.e. the regular verb category. Interestingly, production of the irregular verbs belonging to the second verb category was the most problematic, with a 66,67% error rate. Lastly, performance in the other five verb groups that contained verbs in –ERE and in –IRE was equal, with a 33,33% error rate in all five verb groups. These last five verb categories are not irregular. Formation of the past tense, however, requires specific verb endings, different for each verb category.

Results in Test 2 of the Italian subject, even if not directly comparable to our Greek results due to the different nature of the modality of testing, show a similar error trend, i.e. spared production of the past tense of regular verbs and impaired production of irregular or quasi- irregular verbs. These results confirm Kehayia's hypothesis that the past tense of irregular verbs in highly inflected languages, like Greek and Italian in this case, is problematic for aphasic subjects.

## 5.9 Summary

So far we have seen how and to what extent our results corresponded to the findings reported by Kehayia (1990). Summing up our findings, we observe that: **a)** non- fluent agrammatic subjects have difficulties with production in general, compared to other modalities; **b)** non- fluent agrammatic subjects have difficulties with the production of the past tense; and **c)** non- fluent agrammatic subjects manifest more difficulties with irregular than with regular verbs.

With regard to point (a), our results have shown that the tasks of guided and spontaneous production were in general more problematic for the aphasic subjects than the other tasks. This finding is in line with Valeonti et al. (2004), who observed that production was more problematic than comprehension for their Greek- speaking subjects. Moreover, in relation to production of the past tense (point b), Valeonti et al. showed that agreement tended to be least impaired, while both tense and aspect resulted problematic for their agrammatic participants.

Our results about tense seem to confirm also Varlokosta et al. (2005) and Varlokosta et al. (2006) who showed that inflectional morphology is not equally impaired in aphasia. The authors claim that through their results a more severe impairment of tense and aspect emerged, with agreement being relatively spared. Indeed, even if our research did not directly test agreement, all aphasic subjects rarely, if ever, produced errors that concerned the category of agreement. In other words, the verbs produced by our aphasic subjects, even if ungrammatical, were almost always in the correct person and number (i.e. 3<sup>rd</sup> person singular), e.g. from Greek ‘Ο άντρας \*έπασε το \* στίκι’, instead of the target sentence ‘Ο άντρας έβαψε το σπίτι’ (‘the man painted the house’). In this case, the agrammatic subject produced an ungrammatical verb form, as well as an

ungrammatical noun (the object ‘house’). However, the verb displayed the correct ending, which was in agreement with the sentence’s subject.

Furthermore, as far as production of the past tense is concerned (point b above), our results are in line with Stavrakaki and Kouvava (2003), who observed that present tense resulted intact for their agrammatic patients, whereas past tense was impaired. As we have already seen in section 2.6., the authors reported that the perfective stem used for the formation of the Greek aorist was problematic for both their subjects.

Moreover, our results concerning the production of the present and past tense are also in line with Yarbay Duman and Bastiaanse (2009) who suggest that production of the present tense is less impaired in agrammatic aphasia, due to its [-remote] and [+factive] features. Past tense, on the other hand, would be, as we have already said in section 2.6 more impaired, because it bears the features [+remote] and [+factive]. More specifically, the feature [+remote] of the past tense would be the one that causes the difficulties agrammatic patients have with this tense. In fact, as we have seen, production of the present tense seemed to be less problematic for both Greek and Italian subjects.

On the contrary, our results on tense production seem to contradict Kok, van Doorn and Kolk (1997) who report a 55% error rate produced when present tense was required and a 45% error rate when past tense was required. However, as far as regularity is concerned (point c above), authors observed a slightly higher impairment in producing the past tense morphology of irregular verbs.

Moving to the question of regularity and irregularity, except from results of Kehayia (1990) and Kok, van Doorn and Kolk (1997), our findings are in line with De Diego Balaguer (2004), Faroqi- Shah (1997), and Faroqi- Shah and Thompson (2003, 2007, and 2010). As already

discussed in section 2.5.3, all these researches reported that production of the past tense of irregular verbs was more impaired than the past tense of regular verbs. However, as Faroqi- Shah and Thompson (2003) observe, tense marking in agrammatism is impaired irrespective of inflectional regularity.

Lastly, our findings in Greek and in Italian contradict Ullman et al. (1997), whose agrammatic patient, according to the authors, had a better performance in inflecting irregular verbs than regular and novel verbs. Moreover, Ullman et al. claim that their patient did not over-regularize, a finding that is contrary to ours. In fact, especially the Italian patient produced in many instances forms that seemed to reflect an over-regularization strategy, e.g. *\*prendò* instead of *prese* ('took' 3<sup>rd</sup> person singular); *\*mi vestai* instead of *mi vestii* ('I dressed myself' 1<sup>st</sup> person singular); *\*si vestò* instead of *si vestì* ('he/ she dressed his-/ herself').

## 6 Conclusions

The basic goal of the present study was to examine the performance of subjects with agrammatic aphasia in relation to the past tense, i.e. the capacity to repeat, comprehend and produce –spontaneously or after elicitation- the past tense. The languages under investigation were Modern Greek and Italian, both with a rich inflectional system. For this reason, we hypothesized that the two languages would have yielded similar results.

Our experiment was based on a research conducted by Kehayia (1990). For the investigation of the Italian simple past tense form, a supplementary test (Test 2) was added.

Results in Greek showed that the tasks of repetition and comprehension result generally easier for agrammatic subjects than the tasks of production. More specifically, two of our Greek- speaking subjects (MG3 and MG4) performed better in comprehension than in repetition, while the other three Greek- speaking subjects showed the inverse pattern, with a better repetition than comprehension. The two tasks of production were definitely more difficult for our agrammatic subjects, with spontaneous production of present and past tense being the most problematic. However, as we have seen, spontaneous production of the present tense seemed to be slightly easier for all agrammatic subjects than spontaneous production of the past.

Performance of the Italian subject was shown to be better in comprehension than in repetition. Here, as well, the performance of the agrammatic subject was worse in the two production tasks. The Italian subject had the same error percentage both in elicited and in spontaneous

production of the simple past tense form. Spontaneous production of the present tense resulted easier than spontaneous production of the past.

From this point of view, our data both in Greek and in Italian seem to be in line with previous research that supports the existence of a more severe impairment in the production of the past tense, compared to the present tense (among others, Stavrakaki and Kouvava 2003, Yarbay Duman and Bastiaanse 2009).

Another aim of this study was to provide cross-linguistic data to address the regularity vs. irregularity issue, mentioned in chapter 2. For this reason, verbs in both languages were divided in subgroups, depending on the regular or irregular formation of the past tense.

More precisely, verbs in Greek were divided into four groups, following Kehayia's classification (1990). Groups A, B and C contained regular verbs, while group D was formed by irregular verbs. However, it is important to notice that verbs belonging to groups B and C undergo an extra affixation process, whenever past tense is formed.

Verbs in Italian (Test 2) were divided in seven subgroups. Verb group 1 contained regular verbs ending in –ARE, while verb group B comprised irregular verbs of the same conjugation. Verb groups 3-6 were formed by verbs ending in –ERE and were divided in respect with the various endings these verbs have in the simple past. Last, verb group 7 contained verbs that end in –IRE.

Results in both languages showed that agrammatic subjects perform better in production of the past tense of regular verbs, confirming Kehayia's results. Verb group A in Greek yielded the lowest error rate, while verbs belonging to verb group 1 of Italian were produced 100% correctly. Moreover, three of our five Greek-speaking subjects seemed to

have an increasing difficulty along the verb categories, with verb groups C and D being the most problematic. In parallel, the Italian subject had significant difficulties in producing irregular verbs that belonged to verb group 2 (66,67% errors). His performance was better, yet not perfect (33,33% errors) , in the other verb groups that contained regular verbs, which, however, require particular endings for the formation of the past tense.

Our results regarding the regularity or irregularity of the verb inflection are also in line with De Diego Balaguer et al. (2004), Kok, van Doorn and Kolk (1997), Faroqi - Shah (1997), and Faroqi- Shah and Thompson (2003, 2007, and 2010), who show that, at least for morphologically rich languages, such as Spanish, Greek and Italian, production of the past tense of irregular verbs in aphasia is more impaired than the formation of regular past forms. Our data also contradict Ullman et al (2007), who claim that production of regular, as well as of novel verbs in aphasia results more difficult, because of them being processed in the frontal cortex and the basal ganglia, zones that result lesioned in Broca's (agrammatic) aphasia.

## References

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Aglioti, S., M., Fabbro, F. 2006. *Neuropsicologia del Linguaggio*. Bologna: il Mulino Itinerari.

Bastiaanse, R., Thompson, C.K. 2012. *Perspectives on Agrammatism*. New York: Psychology Press.

Beretta, A. 2006. Agrammatism II: Linguistic Approaches. In Whitaker H. A. 2010. *Concise Encyclopedia of Brain and Language*. Oxford and Amsterdam: Elsevier Ltd, pp. 9-14.

Caplan, D. 1987. *Neurolinguistics and Linguistic Aphasiology: an Introduction*. New York: Cambridge University Press.

Caramazza, A., Zurif, E.G. 1976. Dissociation of Algorithmic and Heuristic Processes in Language Comprehension: Evidence from Aphasia. *Brain and Language*, **3**, pp.572-582.

Chinellato, P. 2007. *Lezioni di Linguistica Clinica*. Venezia: Libreria Editrice Cafoscarina.

Chomsky, N. 1965. *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press.

Chomsky, N. 1969. *L'analisi formale del linguaggio*. Torino: Boringhieri.

Chomsky, N. 1972. *Language and Mind*. New York: Harcourt Brace Jovanovich.

Chomsky, N. 1981. *Lectures on Government and Binding: The Pisa Lectures*. Holland: Foris Publications. Reprint. 7<sup>th</sup> Edition. Berlin and New York: Mouton de Gruyter, 1993.

- Chomsky, N. 1981. *Riflessioni sul linguaggio*. Torino: Einaudi.
- Chomsky, N. 1989. *La conoscenza del Linguaggio: natura, origine e uso*. Milano: Il Saggiatore.
- Chomsky, N. 1993. *A Minimalist Program for Linguistic Theory*. In K. Hale & J. Keyser (eds.), *The View from Building 20*. Cambridge, MA: MIT Press.
- Chomsky, N. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.
- Chomsky, N., Halle, M. 1968. *The Sound Pattern of English*. New York: Harper & Row.
- Clahsen, H. *Chomskyan Syntactic Theory and Language Disorders*. In Ball M.J., Perkins, M.R., Müller, N., Howard, S. (eds.). *The Handbook of Clinical Linguistics*. Blackwell Publishing Ltd. 2008.
- De Diego Balaguer, R., Costa, A., Sebastián- Galles, N., Juncadella, M., Caramazza, A. 2004. Regular and Irregular Morphology and its Relationship with Agrammatism: Evidence from two Spanish- Catalan Bilinguals. *Brain and Language*, **91**, pp.212-222.
- De Diego Balaguer, R., Rodriguez-Fornells, A., Rotte, M., Bahlmann, J., Heinze, H.J., Munte, T.F. 2006. Neural Circuits Subserving the Retrieval of stems and grammatical features in regular and irregular verbs. *Human Brain Mapping*, **27**, pp. 874–888.
- Denes, G. 2009. *Parlare con la Testa. Le Basi Neurologiche e la Struttura del Linguaggio*. Bologna: Zanichelli.

Faroqi- Shah, Y. 2007. Are Regular and Irregular Verbs dissociated in non- fluent Aphasia? A Meta- analysis. *Brain Research Bulletin*, **74**, pp. 1–13.

Faroqi- Shah, Y., Thompson, C. K. 2003. Regular and Irregular Verb Inflections in Agrammatism: Dissociation or Association? *Brain and Language*, **87**, pp. 9–10.

Faroqi- Shah, Y., Thompson, C. K. 2007. Verb Inflections in Agrammatic Aphasia: Encoding of Tense Features. *Journal of Memory and Language*, **56** (1), pp. 129–151. Downloaded from PMC, U.S. National Institutes of Health's National Library of Medicine. <http://www.ncbi.nlm.nih.gov/pmc/>

Faroqi- Shah, Y., Thompson, C. K. 2010. Production Latencies of Morphologically Simple and Complex Verbs in Aphasia. *Clinical Linguistics and Phonetics*. **24** (12), pp. 963- 979. Downloaded from PMC, U.S. National Institutes of Health's National Library of Medicine. <http://www.ncbi.nlm.nih.gov/pmc/>

Finocchiaro, C., Basso, G., Giovenzana, A., Caramazza, A. 2010. Morphological Complexity reveals Verb- Specific Prefrontal Engagement. *Journal of Neurolinguistics*, **23**, pp. 553-563.

Finocchiaro, C., Fierro, B., Brighina, F., Giglia, G., Francolini, M., Caramazza, A. 2008. When Nominal Features are marked on Verbs: A Transcranial Magnetic Stimulation Study. *Brain and Language*, **104**, pp.113-121.

Fornaciari, R. 1881. *Sintassi Italiana dell' Uso Moderno*. Firenze: Sansoni. E-book downloaded from <http://www.liberliber.it>

Friedmann, N., Grodzinsky, Y. 1997. Tense and Agreement in Agrammatic Production: Pruning the Syntactic Tree. *Brain and Language*, **56**, pp. 397- 425.

Friedmann, N., Grodzinsky, Y. 2000. Split Inflection in Neurolinguistics. In M. –A. Friedmann & L. Rizzi (eds.), *The acquisition of syntax*. London: Longmans.

Goidânich, P. G. 1967. *Grammatica Italiana*. Bologna: Zanichelli.

Grodzinsky, Y. 1984. The Syntactic Characterization of Agrammatism. *Cognition*, **16**, pp.99-120.

Grodzinsky, Y. 1986. Language Deficits and the Theory of Syntax. *Brain and Language*, **27**, pp. 135-159.

Grodzinsky, Y. 1995. A Restrictive Theory of Agrammatic Comprehension. *Brain and Language* ,**51**, pp. 26- 51.

Grodzinsky, Y. 1995. Trace Deletion, Theta- Roles, and Cognitive Strategies. *Brain and Language* ,**51**, pp.467-497.

Grodzinsky, Y., Amunts, K. (eds.) (2006). *Broca's Region*. New York: Oxford University Press, pp. 83-108 and 287- 336.

Haegeman, L. 2000. *Manuale di Grammatica Generativa*. Milano: Hoepli.

Hagiwara, H. 1995. The Breakdown of Functional Categories and the Economy of Derivation. *Brain and Language* , **50**, pp. 92-116.

Harley, T. 2001. *The Psychology of Language: from Data to Theory*. New York: Psychology Press.

Hauser, M. D., Chomsky, N., Fitch, W.T. 2002. The Faculty of Language: What Is It, Who Has It, and How Did It Evolve? *Science*, **298**, pp.1569–1579.

Holton, D., Mackridge, P., Philippaki- Warburton, I. 1997. *Greek: A Comprehensive Grammar of the Modern Language*. London: Routledge.

Ingram, J.C.L. 2007. *Neurolinguistics: an Introduction to Spoken Language Processing and its Disorders*. New York: Cambridge University Press.

Kean, M.L. 1977. The Linguistic Interpretation of Aphasic Syndromes: Agrammatism in Broca's Aphasia, an Example. *Cognition*, **5**, pp.9- 46.

Kean, M.L. 1979. Agrammatism: A Phonological Deficit? *Cognition*, **7**, pp. 69-83.

Kehayia, E. 1990. *Morphological Deficits in Agrammatic Aphasia: a Comparative Linguistic Study*. National Library of Canada, Canadian Theses Service. (Downloaded from [http://digitool.library.mcgill.ca/webclient/StreamGate?folder\\_id=0&dvs=1358755296138~103](http://digitool.library.mcgill.ca/webclient/StreamGate?folder_id=0&dvs=1358755296138~103))

Kok, P., Kolk, H., Haverkort, M. 2006. Agrammatic sentence production: Is verb second impaired in Dutch? *Brain and Language*, **96**, 243- 254.

Kok, P., van Doorn, A., Kolk, H. 2007. Inflection and computational load in agrammatic speech. *Brain and Language*, **102**, pp. 273- 283.

Kolk, H. 2006. Agrammatism I, Process Approaches. In Whitaker H. A. *Concise Encyclopedia of Brain and Language*. Amsterdam: Elsevier Ltd, pp.3-8. 2010.

Laiacona, M., Caramazza, A. 2004. The Noun/ Verb Dissociation in Language Production: Varieties of Causes. *Cognitive Neuropsychology*, **21**, pp.103-123.

Lapointe, S.G. 1983. Some Issues in the Linguistic Description of Agrammatism. *Cognition*, **14**, pp.1-39.

Lasnik, H. 2002. The minimalist program in syntax. *Trends in Cognitive Sciences*, 6: 10, pp.432- 436.

Lesser, R. 1978. *Linguistic Investigations of Aphasia*. London: Arnold.

Levy, Y., Kavé, G. 1999. Language Breakdown and Linguistic Theory: a Tutorial Overview. *Lingua*, **107**, pp.95- 143.

Lonzi, L., Luzzatti, C. 1993. Relevance of Adverb Distribution for the Analysis of Sentence Representation in Agrammatic Patients. *Brain and Language*, **45**, pp. 306-317.

Lyons, J. 1968. *Introduction to Theoretical Linguistics*. Cambridge : Cambridge University Press.

Martin, R.C., Newsome, M.R., Hoang, V. Language and Lexical Processing. In: *Encyclopedia of the Human Brain*. Elsevier Science. Ramachandran, V.S. (ed.). Vol.2, pp. 631-643. 2002.

Maurer, G., Fromkin, V.A., Cornell, T.L. 1993. Comprehension and Acceptability Judgments in Agrammatism: Disruptions in the Syntax of Referential dependencies. *Brain and Language*, **45**, pp. 340-370.

Menn, L., Obler, L.K. 1988. Agrammatism – the Current Issues. *Journal of Neurolinguistics*, **3 (1)**, pp.63-76.

Miceli, G. 2003. Agrammatism. Elsevier Science (USA), in Whitaker H. A. *Concise Encyclopedia of Brain and Language*, Amsterdam: Elsevier Ltd, pp.14-19. 2010.

Miceli, G., Caramazza, A. 1988. Dissociation of Inflectional and Derivational Morphology. *Brain and Language*, **35**, pp. 24-65.

- Nanousi, V., Masterson, J., Druks, J., Atkinson, M. 2006. Interpretable vs. uninterpretable features: Evidence from six Greek speaking agrammatic patients. *Journal of Neurolinguistics*, **19**, pp. 209- 238.
- Nespoulous, J., Dordain, L., Perron, M., Jarema, G., Chazal, M. 1990. Agrammatism in French: two case studies. In Menn, L and Obler, L. (eds.). *Agrammatic Aphasia: a Cross- Language Narrative Sourcebook*. Amsterdam: John Benjamins Publishing Company.
- Palmieri, V. 1990. *L' Opposizione ' Passato Remoto' vs ' Passato Prossimo' in Italiano e ' Aoristo' vs ' Perfetto' in Greco*. Atripalda: WM Edizioni.
- Pinelli, P., Poloni, M. 2003. *Neurologia. Principi di Diagnostica e Terapia*. 3<sup>a</sup> Edizione. Milano: Casa Editrice Ambrosiana.
- Pinker, S., Jackendoff, R. 2005. The Faculty of Language: What's special about it? *Cognition*, **95**, pp. 201- 236.
- Pollock, J. Y. 1989. Verb Movement, Universal grammar and the Structure of IP. *Linguistic Inquiry*, **20**, pp. 365- 424.
- Prandi, M. 2006. *Le Regole e le Scelte. Introduzione alla Grammatica Italiana*. Torino: UTET Università.
- Regula, M., Jernej, J. 1965. *Grammatica Italiana Descrittiva su Basi Storiche e Psicologiche*. Bern: Francke Verlag.
- Renzi, L., Salvi, G, Cardinaletti, A. (a cura di). 2002. *Grande Grammatica Italiana di Consultazione*. Bologna: Il Mulino, Strumenti, Vol. II (I Sintagmi Verbale, Aggettivale, Avverbiale. La Subordinazione).
- Rohlf's, G. 1966. *Grammatica Storica della Lingua Italiana e dei suoi Dialetti*. Torino: Einaudi, Vol. II (Morfologia) and III ( Sintassi e Formazione delle Parole).

- Ronat, M. (a cura di). 1977. *Noam Chomsky: Intervista su linguaggio e ideologia*. Roma & Bari: Laterza, Saggi Tascabili.
- Shapiro, K., Caramazza, A. 2003a. Grammatical Processing of Nouns and Verbs in Left Frontal Cortex? *Neuropsychologia*, **41**, pp. 1189- 1198.
- Shapiro, K., Caramazza, A. 2003b. Looming a loom: Evidence from Independent Access to Grammatical and Phonological Properties in Verb Retrieval. *Journal of Neurolinguistics*, **16**, pp. 85- 111.
- Stavrakaki, S., Kouvava, S. 2003. Functional categories in agrammatism: Evidence from Greek. *Brain and Language*, **86**, pp. 129–141.
- Stemmer, B., Whitaker, H.A. (eds.) 2008. *Handbook of the Neuroscience of Language*. Holland: Elsevier Ltd.
- Tekavčić, P. 1972. *Grammatica Storica dell' Italiano*. Bologna: Il Mulino, Vol. II (Morfosintassi).
- Tsapkini, K., Jarema, G., Kehayia, E. 2002. Regularity Revisited: Evidence from Lexical Access of Verbs and Nouns in Greek. *Brain and Language*, **81**, pp. 103–119.
- Tsapkini, K., Jarema, G., Kehayia, E. 2004. Regularity re- revisited: Modality matters. *Brain and Language*, **89**, pp. 611–616.
- Ullman, M. T., Corkin, S., Coppola, M., Hickok, G., Growdon, J. H., Koroshetz W. J., Pinker S. 1997. A neural Dissociation within Language: Evidence that the Mental Dictionary Is Part of Declarative Memory, and that Grammatical Rules Are Processed by the Procedural System. *Journal of Cognitive Neuroscience*, **9 (2)**, pp. 266-276.

Valeonti, N., Economu, A., Kakavoulia, M., Protopapas, A., Varlokosta S. 2004. The breakdown of functional categories in Greek aphasia, *Science of Aphasia V*, Potsdam.

Varlokosta, S., Valeonti, N., Economu, A., Kakavoulia, M., Protopapas A. 2005. Verbal inflection in Greek aphasia. *Reading Working Papers in Linguistics*, **8**, pp. 245-270.

Yarbay Duman, T., Bastiaanse, R. 2009. Time reference through verb inflection in Turkish agrammatic aphasia. *Brain and Language*, **108**, pp. 30- 39.

Τριανταφυλλίδης, Μ. 1976. *Νεοελληνική Γραμματική*. Οργανισμός Εκδόσεως Διδακτικών Βιβλίων Αθήνα.

## Electronic resources

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- [http://www.google.com/imgres?q=Lichtheim&hl=el&sa=X&tbo=d&rlz=1C1SKPM\\_enGR406GR406&biw=1280&bih=662&tbm=isch&tbnid=-tMF74pHH5hr4M:&imgrefurl=http://www.revista.unam.mx/vol.9/numhttp://language-theory.info/language731.html12/art103/int103-1b.htm&docid=00KYxq5SdO-QOM&imgurl=http://www.revista.unam.mx/vol.9/num12/art103/imagenes/Lichtheim.jpg&w=200&h=267&ei=8o-8ULSLC8XWtAa3jIHoAQ&zoom=1&iact=hc&vpx=1051&vpy=128&dur=240&hovh=213&hovw=160&tx=111&ty=171&sig=103744324741192822206&page=1&tbnh=161&tbnw=121&start=0&ndsp=27&ved=1t:429,r:7,s:0,i:105](http://www.google.com/imgres?q=Lichtheim&hl=el&sa=X&tbo=d&rlz=1C1SKPM_enGR406GR406&biw=1280&bih=662&tbm=isch&tbnid=-tMF74pHH5hr4M:&imgrefurl=http://www.revista.unam.mx/vol.9/numhttp://language-theory.info/language731.html12/art103/int103-1b.htm&docid=00KYxq5SdO-QOM&imgurl=http://www.revista.unam.mx/vol.9/num12/art103/imagenes/Lichtheim.jpg&w=200&h=267&ei=8o-8ULSLC8XWtAa3jIHoAQ&zoom=1&iact=hc&vpx=1051&vpy=128&dur=240&hovh=213&hovw=160&tx=111&ty=171&sig=103744324741192822206&page=1&tbnh=161&tbnw=121&start=0&ndsp=27&ved=1t:429,r:7,s:0,i:105) Image of Lichtheim's Model.
- <http://brain.oxfordjournals.org/content/130/5/1432/F3.expansion> Images of Broca's patients.
- <http://language-theory.info/language731.html> Wernicke's Model.
- *The MIT Encyclopedia of communication disorders*  
[http://books.google.it/books?id=mPIhN13uHJcC&pg=PA263&lpg=PA263&dq=benson+and+geschwind&source=bl&ots=YUj\\_VidvNB&sig=zKuawUfom-KYix1Ya\\_QnWIQ4jSg&hl=el&sa=X&ei=IyG\\_UKyeH8jDswbegYGwDA&redir\\_esc=y#v=onepage&q=benson%20and%20geschwind&f=false](http://books.google.it/books?id=mPIhN13uHJcC&pg=PA263&lpg=PA263&dq=benson+and+geschwind&source=bl&ots=YUj_VidvNB&sig=zKuawUfom-KYix1Ya_QnWIQ4jSg&hl=el&sa=X&ei=IyG_UKyeH8jDswbegYGwDA&redir_esc=y#v=onepage&q=benson%20and%20geschwind&f=false) for Benson and Geschwind's classification of aphasia.
- <http://en.wikipedia.org/wiki/File:Brodman-areas.png> for Brodmann's cortical areas.
- Google books: *Assessment of Aphasia*. Spreen, O., Risser, A. H. Oxford University Press. 2003.  
[http://books.google.it/books?id=k4zgc5ZiYzsC&q=Broca's+aphasia&hl=el&source=gbs\\_word\\_cloud\\_r&cad=5#v=snippet&q=Broca%E2%80%99s%20aphasia&f=false](http://books.google.it/books?id=k4zgc5ZiYzsC&q=Broca's+aphasia&hl=el&source=gbs_word_cloud_r&cad=5#v=snippet&q=Broca%E2%80%99s%20aphasia&f=false) for description of aphasic syndromes.
- [http://www.ped.fas.harvard.edu/people/faculty/all\\_publications.html](http://www.ped.fas.harvard.edu/people/faculty/all_publications.html) for Nowak, M.A. 2000. Homo Grammaticus. *Natural History*, 109, pp. 36-44 and Nowak, M.A., Plotkin, J.B., Jansen, V.A.A. 2000. The evolution of syntactic communication. *Nature*, **404**, pp. 495-498.

- <http://www-bcf.usc.edu/~pancheva/PanchevaUllman.pdf> for Pancheva, R., Ullman M. T., Agrammatic Aphasia and the Hierarchy Complexity Hypothesis.
- [http://www.artdreamguide.com/italia/map\\_02.htm](http://www.artdreamguide.com/italia/map_02.htm) for the political map of Italy.
- <http://www.chomsky.info/articles/2000----.pdf> Linguistics and Brain Science, Noam Chomsky

## APPENDIX 1: SENTENCES TESTED IN MODERN GREEK (Kehayia 1990)

### Verb group A

1. Η κοπέλα **κόβει** τα λουλούδια.  
Η κοπέλα **έκοψε** τα λουλούδια.
2. Ο κηπουρός **φυτεύει** τα λουλούδια.  
Ο κηπουρός **φύτεψε** τα λουλούδια.
3. Ο άντρας **βάφει** το σπίτι.  
Ο άντρας **έβαψε** το σπίτι.
4. Η κοπέλα **γράφει** ένα γράμμα.  
Η κοπέλα **έγραψε** ένα γράμμα.
5. Η γυναίκα **ανοίγει** ένα κουτί.  
Η γυναίκα **άνοιξε** ένα κουτί.
6. Ο αθλητής **τρέχει**.  
Ο αθλητής **έτρεξε**.

### Verb group B

7. Ο άντρας **μετρά** τα λεφτά.  
Ο άντρας **μέτρησε** τα λεφτά.
8. Η γυναίκα **πουλά** τα μήλα.  
Η γυναίκα **πούλησε** τα μήλα.
9. Ο αθλητής **πηδά**.  
Ο αθλητής **πήδηξε**.
10. Η γάτα **κυνηγά** τα ποντίκια.  
Η γάτα **κυνήγησε** τα ποντίκια.
11. Η μητέρα **κρεμά** τα ρούχα.  
Η μητέρα **κρέμασε** τα ρούχα.
12. Το παιδί **πετά** τα χαρτιά.  
Το παιδί **πέταξε** τα χαρτιά.

### Verb group C

13. Η κοπέλα **ανεβαίνει** τις σκάλες.  
Η κοπέλα **ανέβηκε** τις σκάλες.
14. Η κοπέλα **κατεβαίνει** τις σκάλες.  
Η κοπέλα **κατέβηκε** τις σκάλες.

15. Το αεροπλάνο **προσγειώνεται**.  
Το αεροπλάνο **προσγειώθηκε**.
16. Το παιδί **ντύνεται**.  
Το παιδί **ντύθηκε**.
17. Η κοπέλα **χτενίζεται**.  
Η κοπέλα **χτενίστηκε**.
18. Το κορίτσι **σκουπίζεται**.  
Το κορίτσι **σκουπίστηκε**.

### **Verb group D**

19. Το παιδί **τρώει** το γλυκό.  
το παιδί **έφαγε** το γλυκό.
20. Το παιδί **πίνει** το γάλα.  
Το παιδί **ήπια** το γάλα.
21. Το τρένο **φεύγει**.  
Το τρένο **έφυγε**.
22. Ο κύριος **έρχεται**.  
Ο κύριος **ήρθε**.
23. Το παιδί **παίρνει** ένα βιβλίο.  
Το παιδί **πήρε** ένα βιβλίο.
24. Ο μαθητής **μπαίνει** στην τάξη.  
Ο μαθητής **μπήκε** στην τάξη.

**APPENDIX 2: SENTENCES TESTED IN ITALIAN (a translation of Kehayia's test in Modern Greek, 1990)**

**Verb group A (- ARE)**

1. I giardiniere **pianta** i fiori.

Il giardiniere **piantò** i fiori.

2. L'uomo **pitta** la casa.

L'uomo **pittò** la casa.

3. L'uomo **conta** i soldi.

L'uomo **contò** i soldi.

4. L'atleta **salta**.

L'atleta **saltò**.

5. Il bambino **getta** le carte.

Il bambino **gettò** le carte.

6. Il bambino **mangia** il dolce.

Il bambino **mangiò** il dolce.

7. L' uomo **arriva**.

L' uomo **arrivò**.

8. La ragazza si **pettina**.

La ragazza si **pettinò**.

9. La ragazza si **asciuga**.

La ragazza si **asciugò**.

10. Il bambino **entra** in classe.

Il bambino **entrò** in classe.

11. L'aereo **atterra**.

L'aereo **atterrò**.

**Verb group B (- ERE)**

12. La ragazza **raccoglie** i fiori.

La ragazza **raccolse** i fiori.

13. La ragazza **scrive** una lettera.

La ragazza **scrisse** una lettera.

14. L'atleta **corre**.

L'atleta **corse**.

15. La donna **vende** le mele.

La donna **vendette** le mele.

16. La donna **appende** gli abiti.

La donna **appese** gli abiti.

17. Il bambino **beve** il latte.

Il bambino **bevve** il latte.

18. La ragazza **scende** le scale.

La ragazza **scese** le scale.

19. Il ragazzo **prende** un libro.

Il ragazzo **prese** un libro.

### **Verb Group C (- IRE)**

20. La donna **apre** una scatola.

La donna **apri** una scatola.

21. Il bimbo si **veste**.

Il bimbo si **vestì**.

22. Il treno **parte**.

Il treno **partì**.

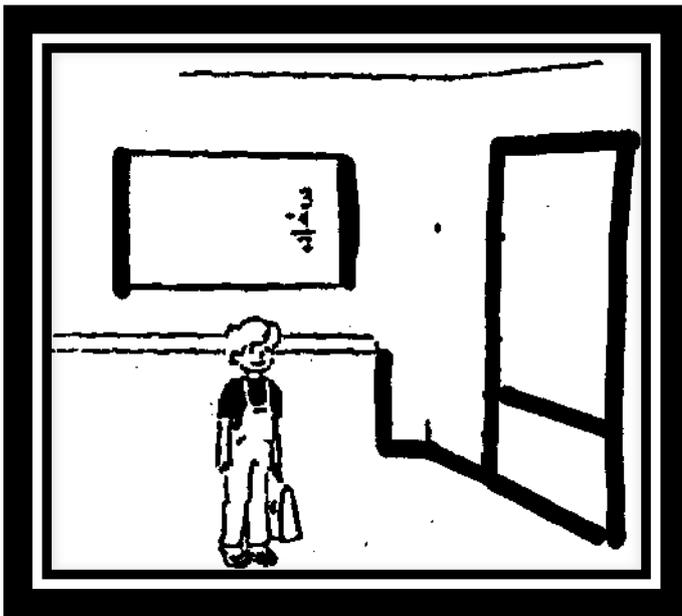
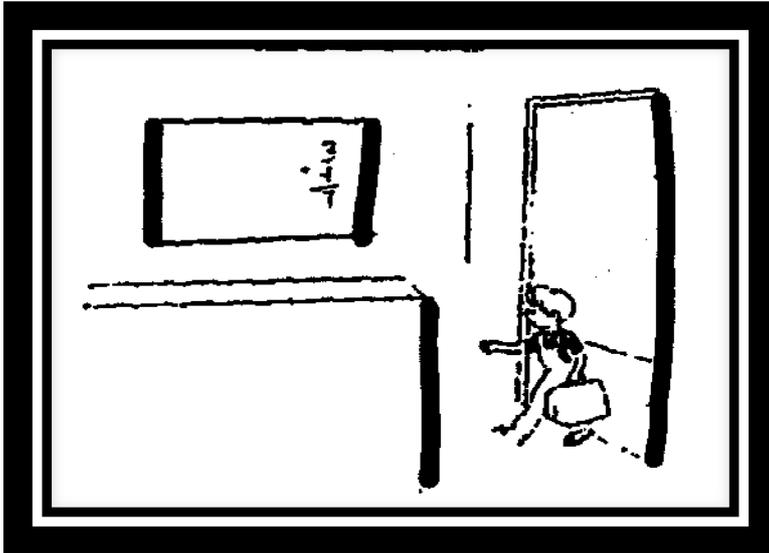
23. La ragazza **sale** le scale.

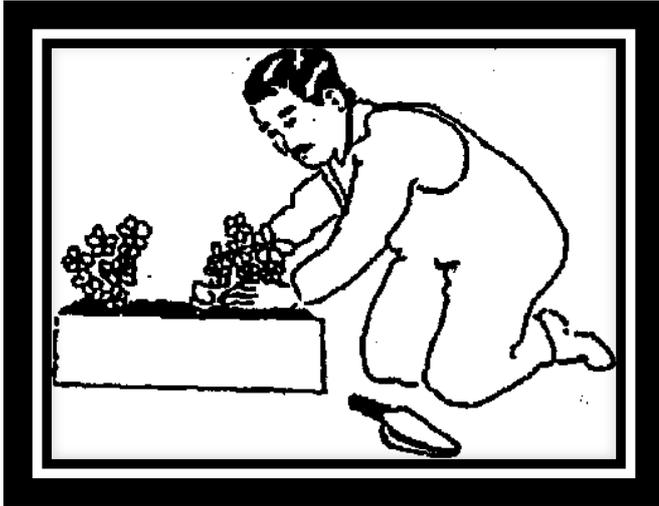
La ragazza **salì** le scale.

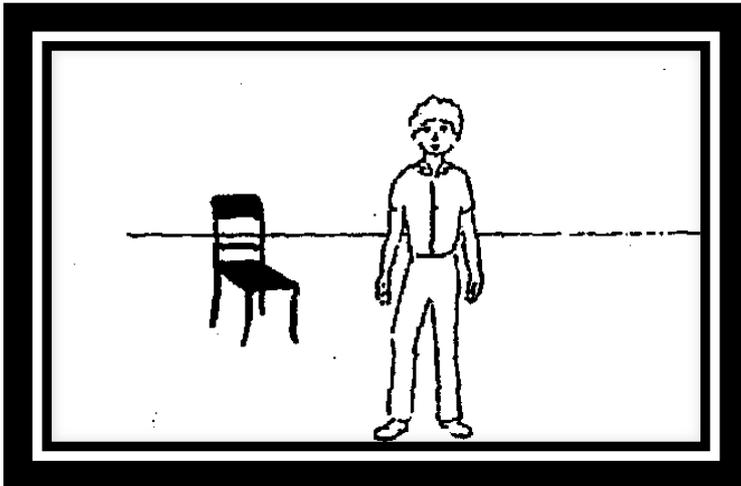
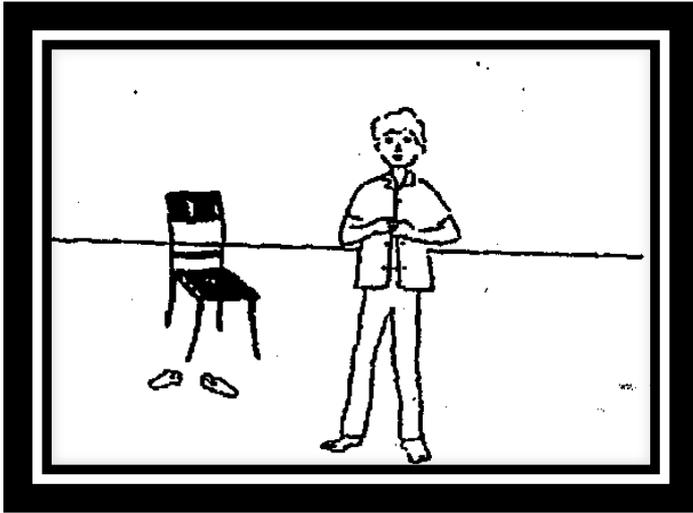
24. Il gatto **insegue** i topi.

Il gatto **inseguì** i topi

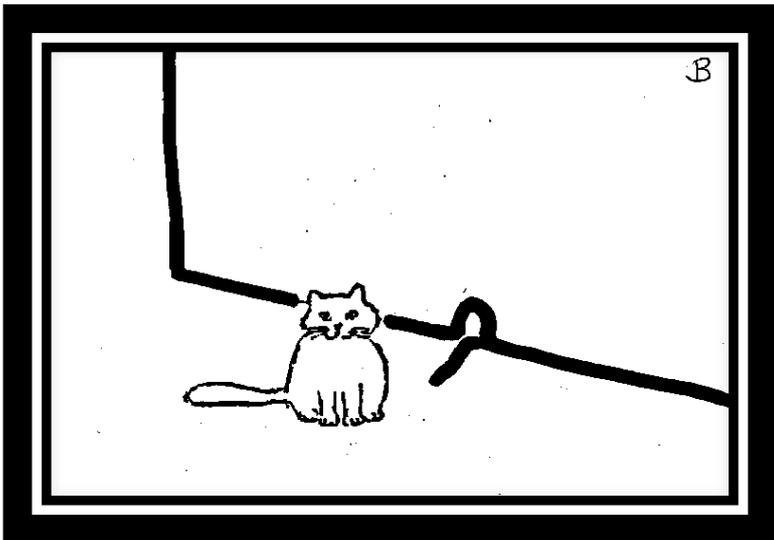
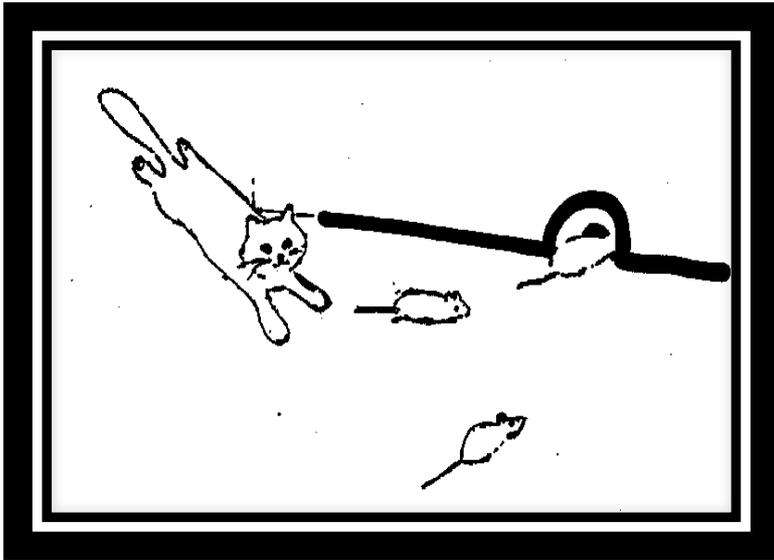
APPENDIX 3: PICTURES USED FOR TEST 1 (Kehayia 1990)



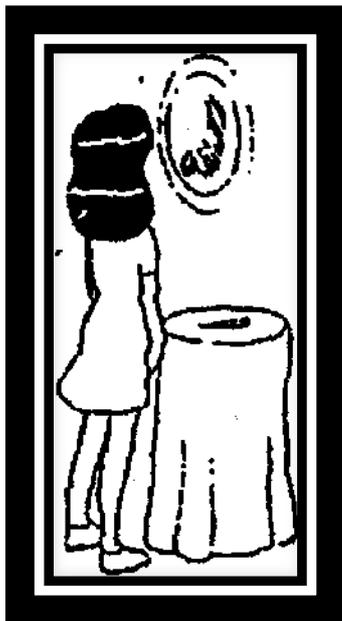


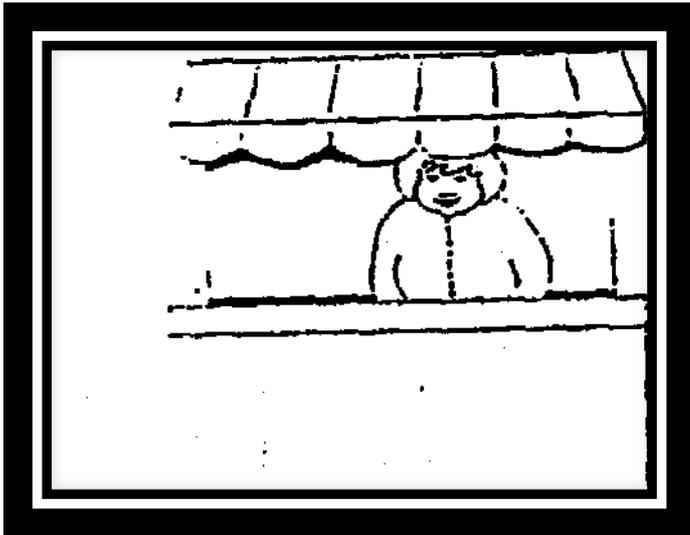
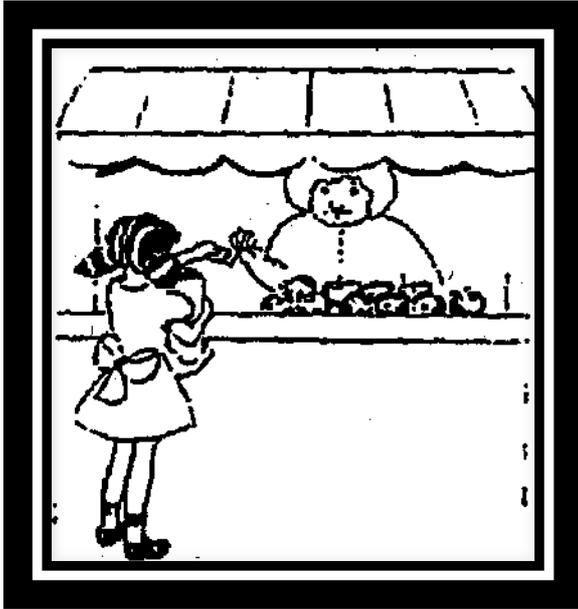


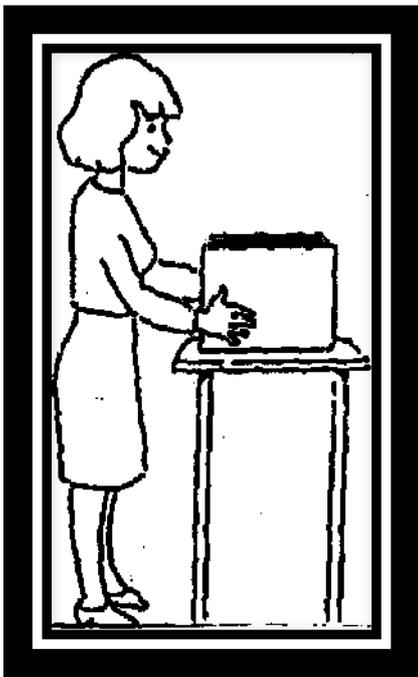
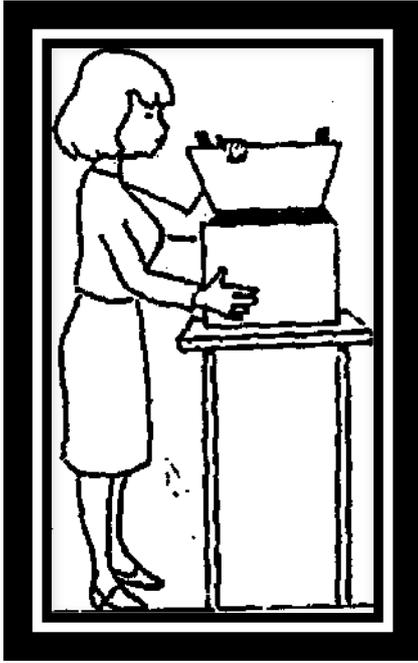


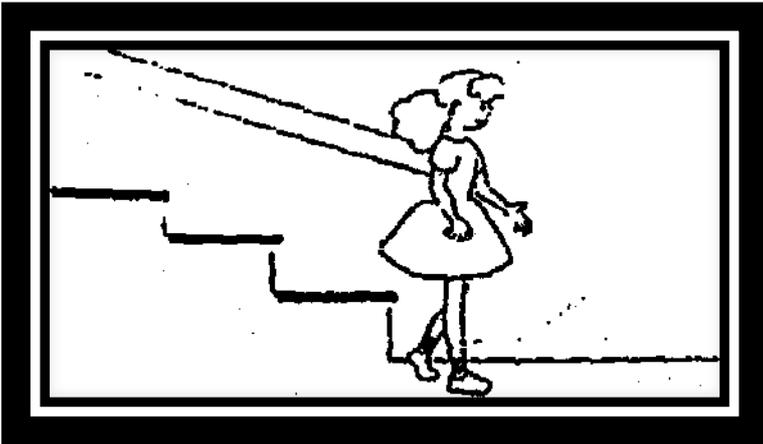
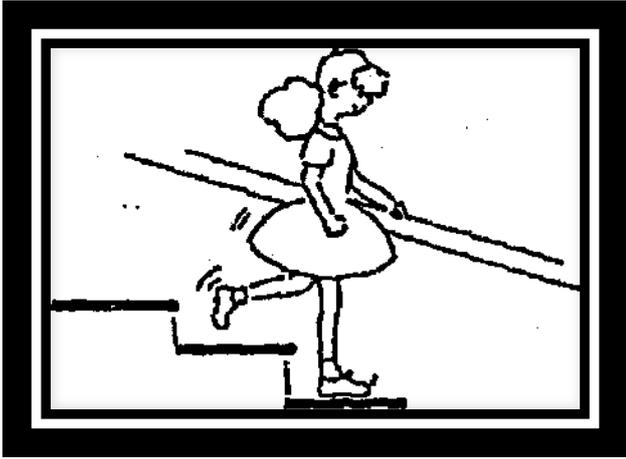


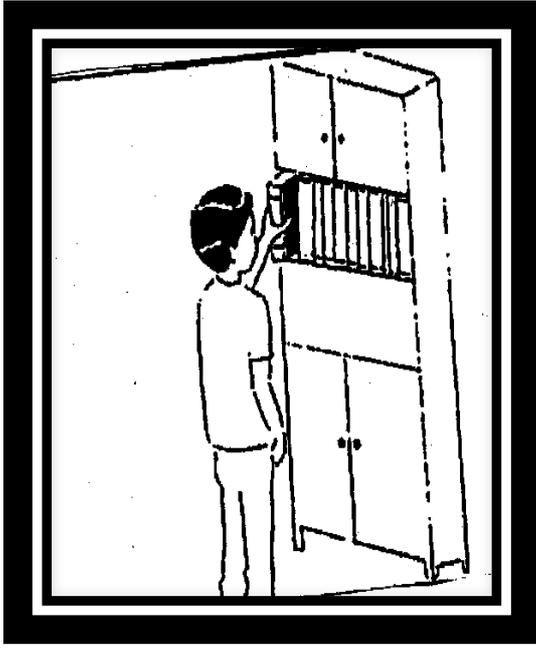


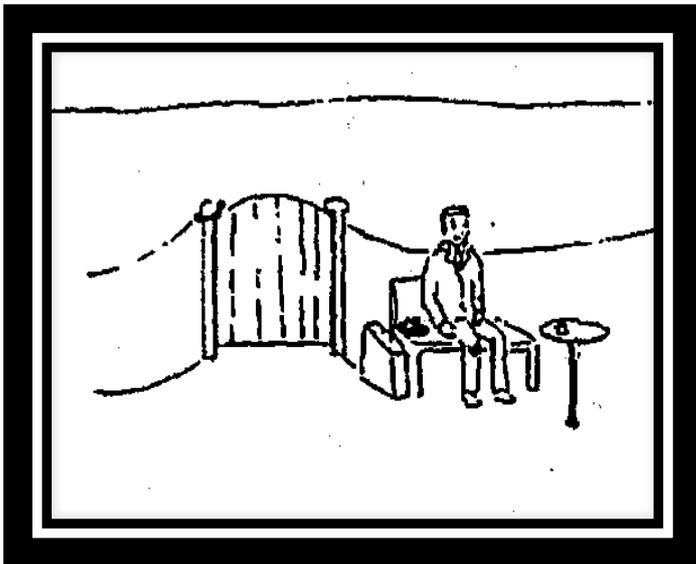
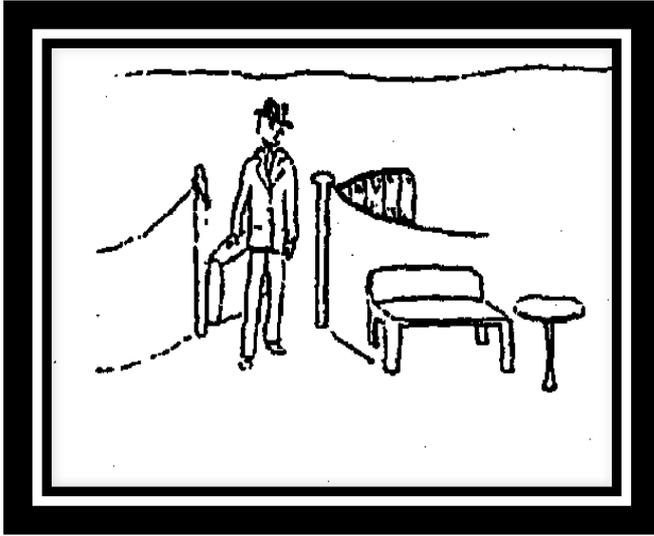


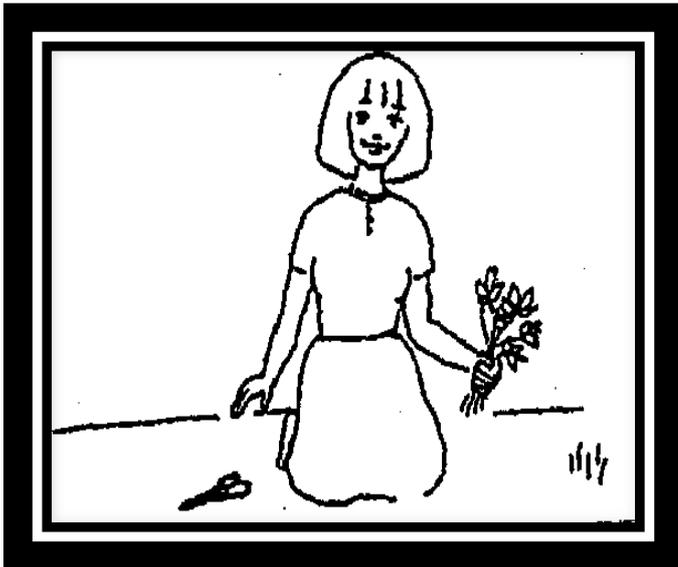
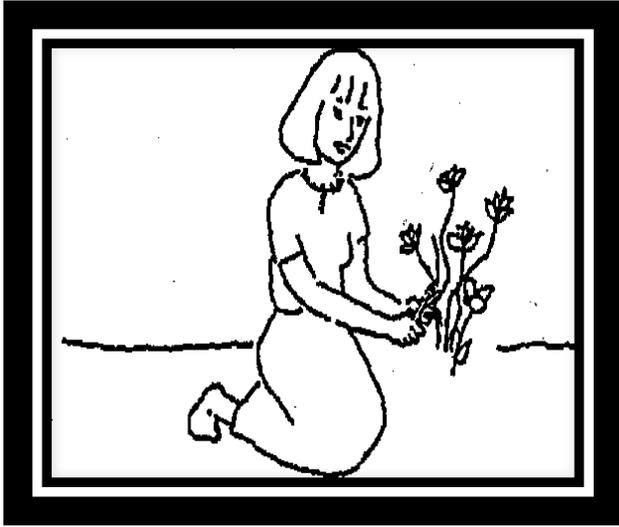


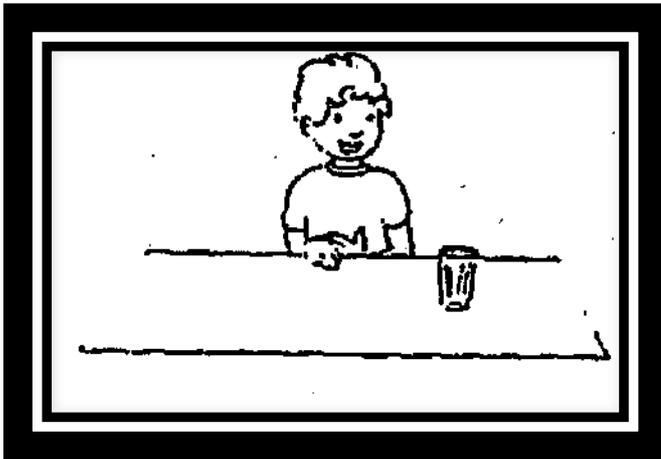
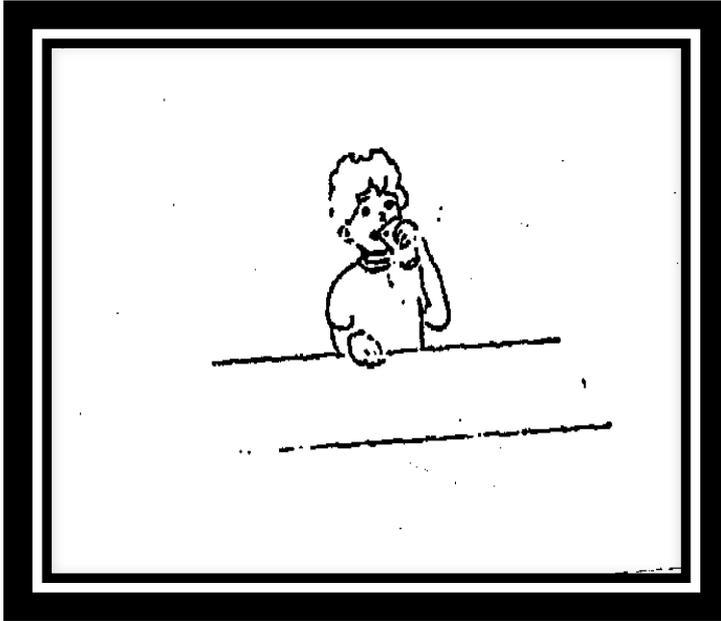


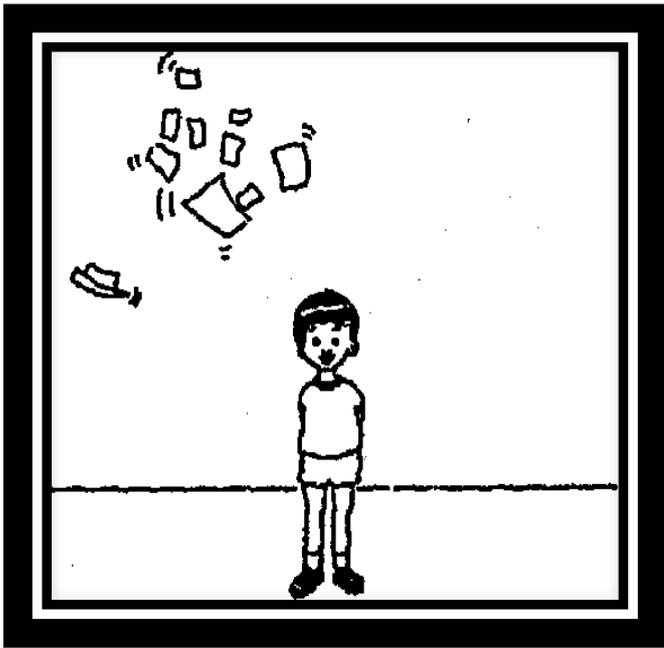


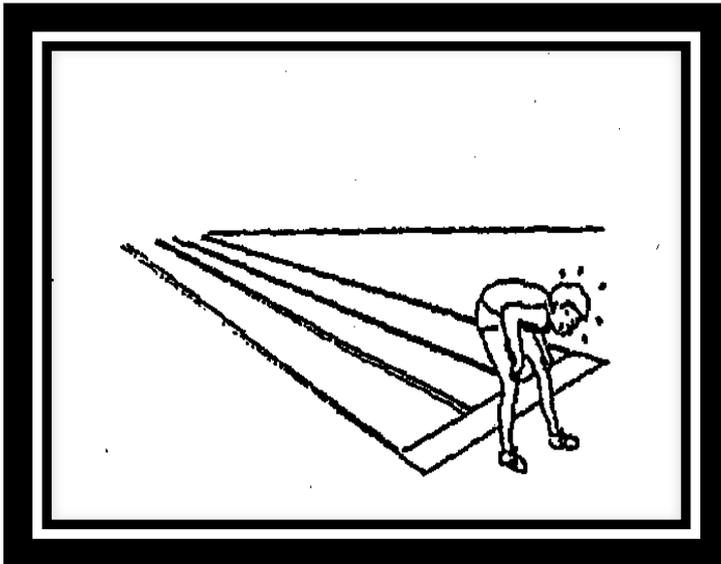
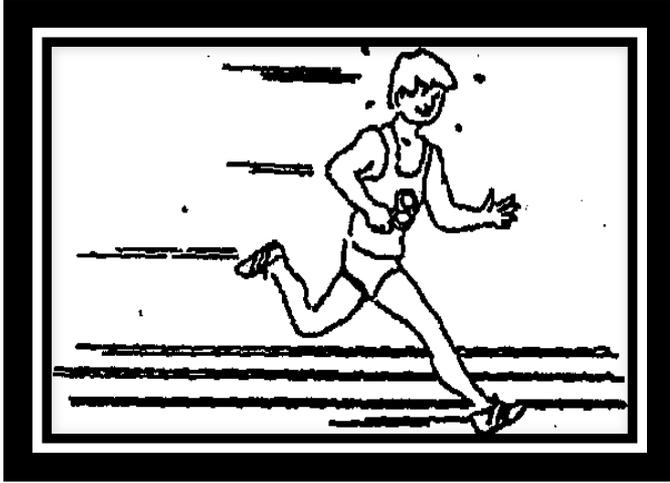


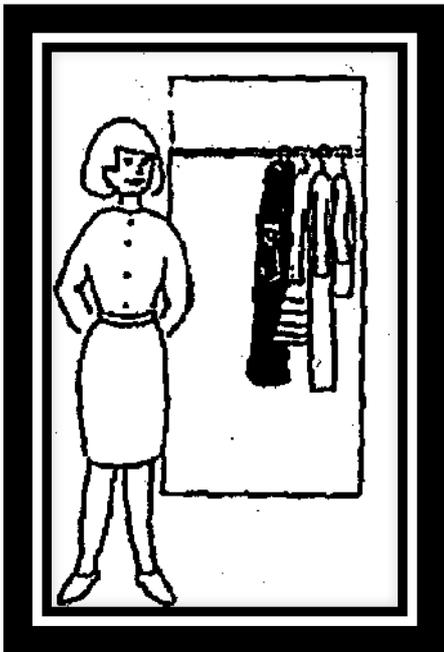
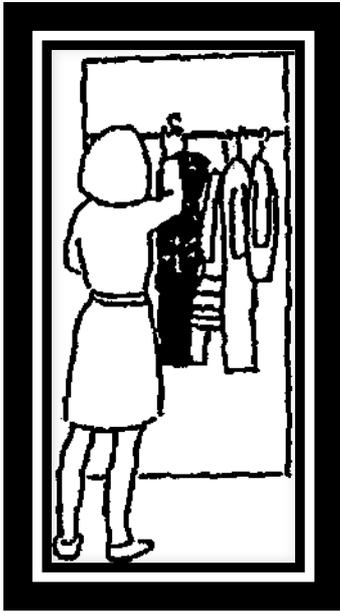


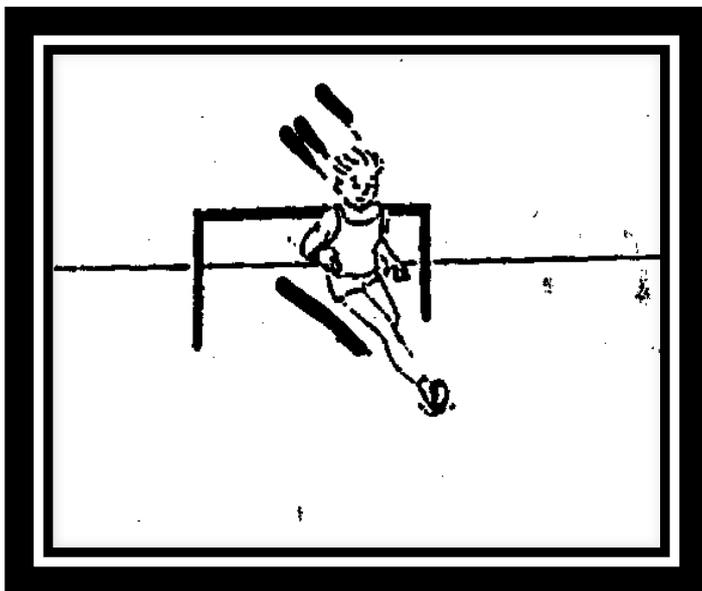
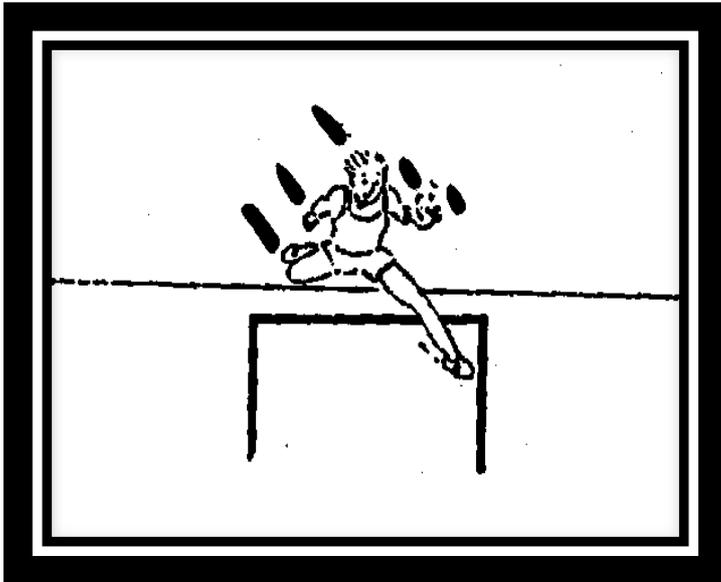


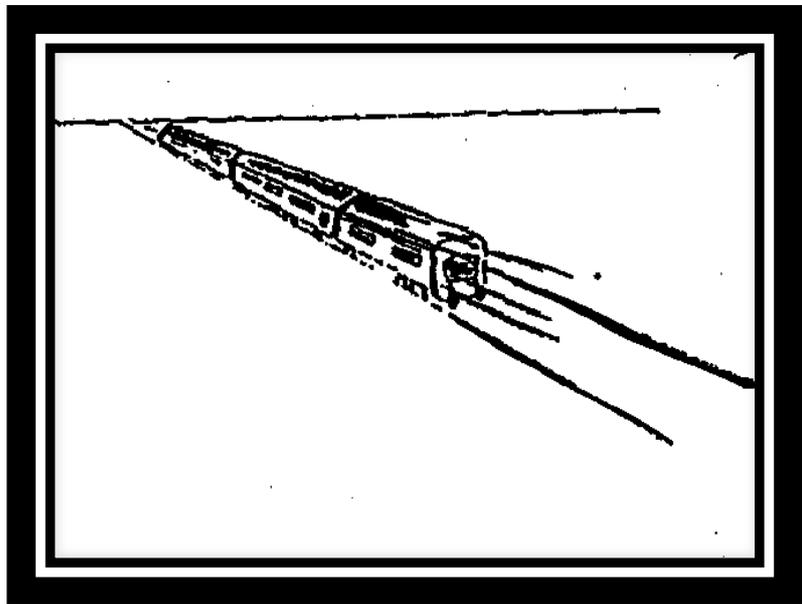
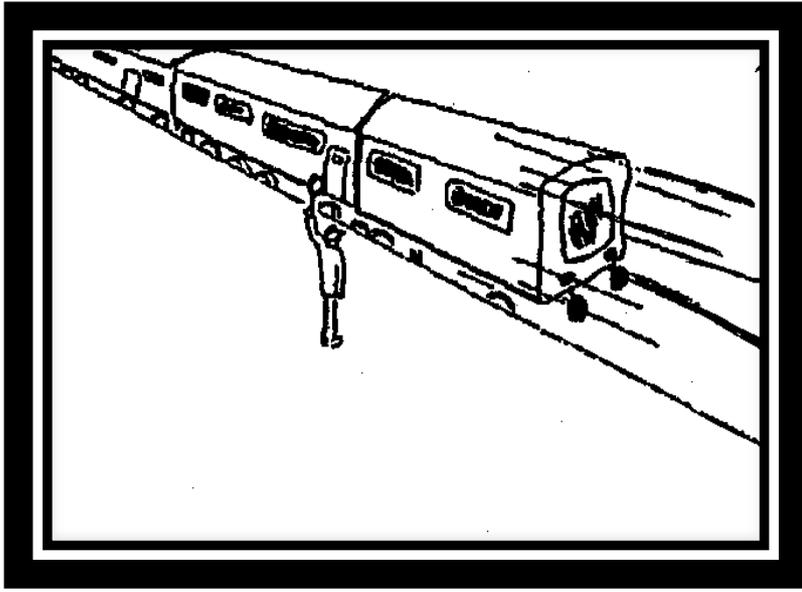


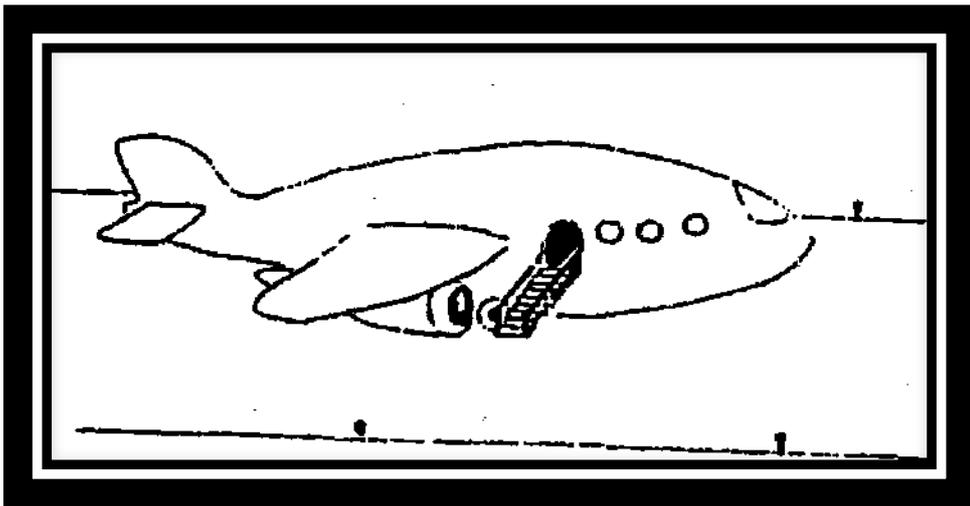
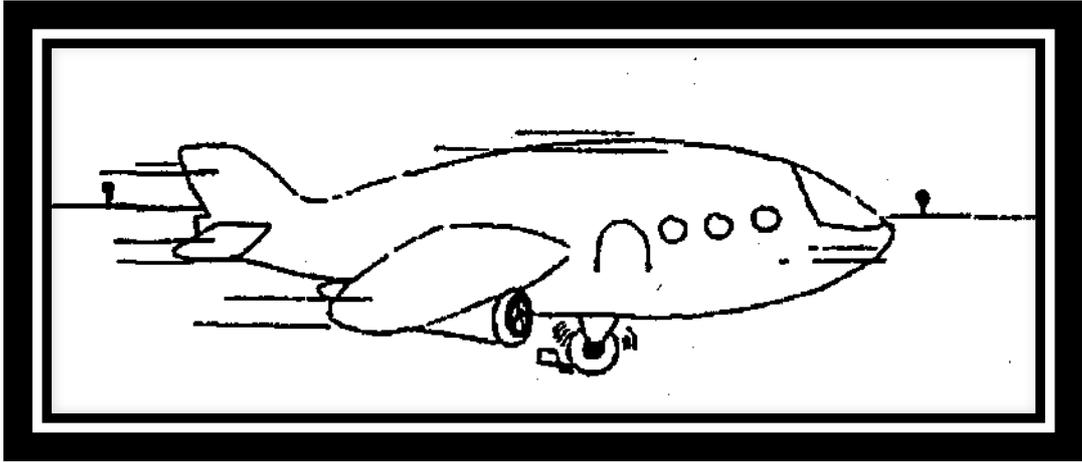


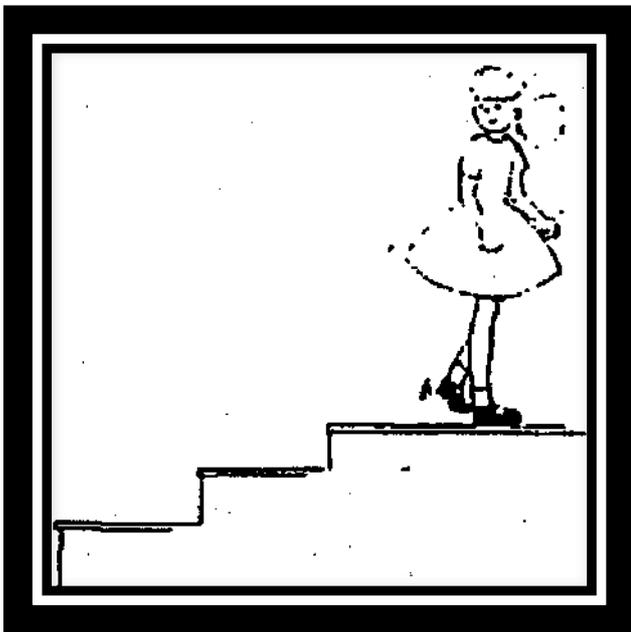


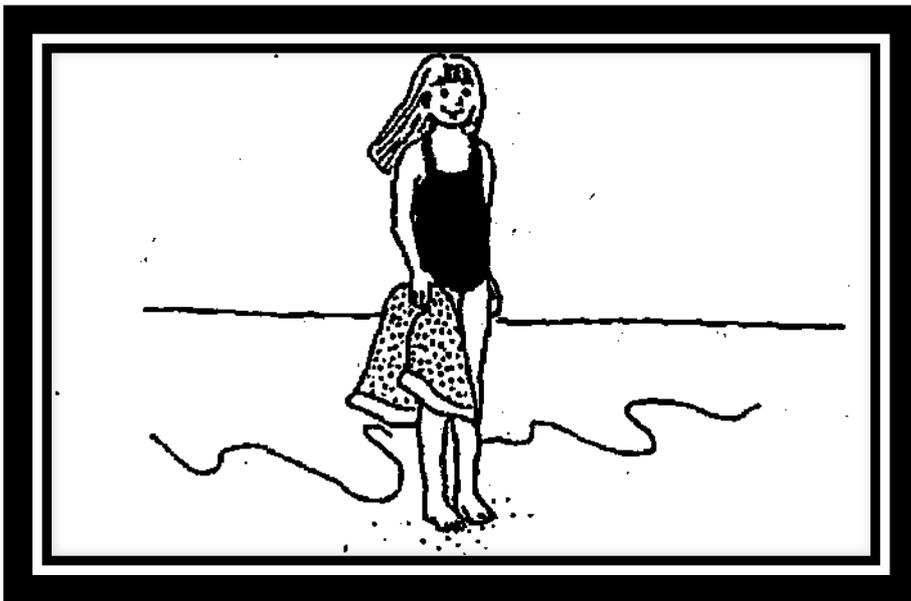
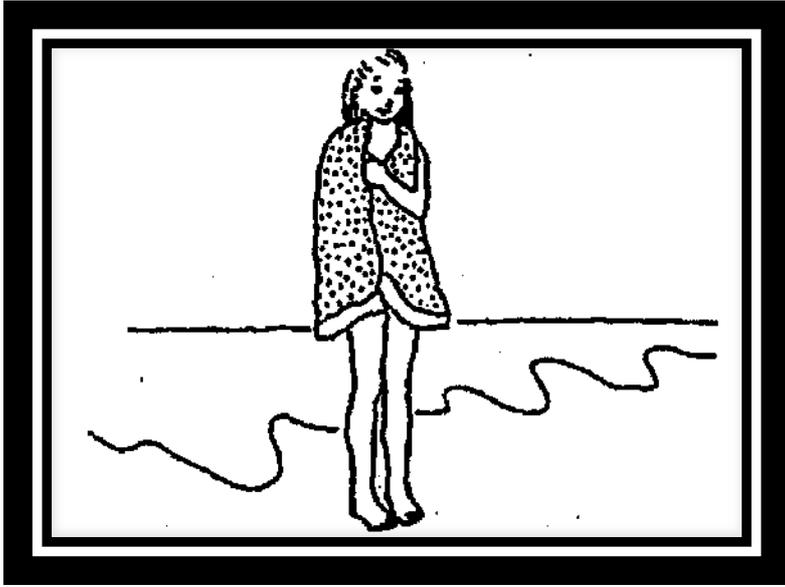




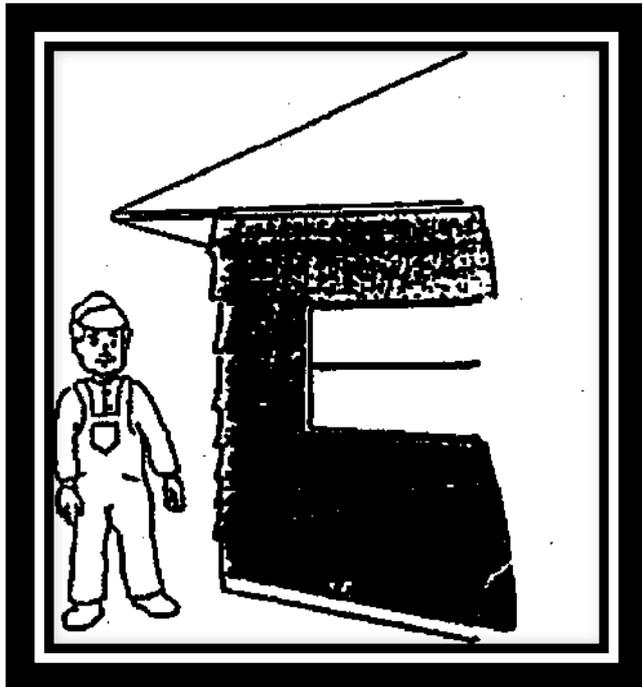












## APPENDIX 4: TEST 2 IN ITALIAN

### GAP- FILLING TASK

1. a) Oggi Nicola **ha sostenuto** un esame difficile.  
b) L' anno scorso Nicola ..... un esame difficile.(*sostenne*)
2. a) Stamattina Nicola è **caduto** dalla bicicletta.  
b) Quando aveva 10 anni Nicola ..... dalla bicicletta.(*cadde*)
3. a) Oggi Nicola **ha conosciuto** una persona importante.  
b) Tanti anni fa Nicola .....una persona importante.(*conobbe*)
4. a)Oggi Nicola si è **raso** i capelli.  
b) L'estate scorsa Nicola si ..... i capelli.(*rase*)
5. a)Oggi un assassino **ha ucciso** tre persone.  
b) Nel 1980 un assassino.....tre persone.(*uccise*)
6. a) Oggi Nicola **ha deciso** di abbandonare l' università.  
b)Tanti anni fa Nicola .....di abbandonare l' università.(*decise*)
7. a)Stamattina Nicola **ha perso** il suo orologio.  
b)L' anno scorso Nicola ..... il suo orologio.(*perse*)
8. a)Oggi il nostro cane **ha morso** un bambino.  
b) L'anno scorso il nostro cane .....un bambino.(*morse*)
9. a)Stamattina, dopo la nevicata, Nicola **ha sparso** del sale.  
b) L'anno scorso, dopo la nevicata, Nicola.....del sale.(*sparse*)
10. a)Questa settimana Nicola **ha letto** un libro.  
b) L'anno scorso Nicola .....un libro.(*lesse*)
11. a)Questa stagione Nicola **ha condotto** un programma televisivo.  
b) Tre anni fa Nicola .....un programma televisivo.(*condusse*)
12. a)Oggi all' università Nicola **ha discusso** la sua tesi.  
b)Lo scorso semestre Nicola ..... la sua tesi.(*discusse*)
13. a)Oggi è morto il mio cane.  
b) Qualche mese fa .....il mio cane.(*mori*)

14. a) Quest'anno Nicola **ha costruito** una casa.  
 b) L'anno scorso Nicola.....una casa.(*costrui*)
15. a) Stamattina Nicola mi **ha offerto** un passaggio.  
 b) La settimana scorsa Nicola mi.....un passaggio(*offrì*).
16. a) Oggi Nicola **ha aperto** un negozio.  
 b) L'anno scorso Nicola.....un negozio.(*apri*)
17. a) Oggi Dio **ha esaudito** le mie preghiere.  
 b) Quel giorno Dio .....le mie preghiere.(*esaudi*)
18. a) Oggi è **scomparsa** una donna.  
 b) Il mese scorso.....una donna.(*scomparve*)
19. a) Oggi è **nato** mio figlio.  
 b) Nel 1990 .....mio figlio.(*nacque*)
20. a) Stamattina Nicola **ha dato** un passaggio a Gianni.  
 b) La settimana scorsa Nicola .....un passaggio a Gianni.(*diede/ dette*)
21. a) Oggi mio nonno è **stato** male.  
 b) L'anno scorso mio nonno .....male.(*stette*)
22. a) Oggi Nicola **ha voluto** comprare un pantalone.  
 b) Lo scorso mese Nicola .....comprare un pantalone.(*volle*)
23. a) Stasera Nicola **ha bevuto** tanto vino.  
 b) Quella sera Nicola.....tanto vino.(*bevve*)
24. a) Oggi Nicola **ha preso** 10 a scuola.  
 b) Il semestre scorso Nicola.....10 a scuola.(*prese*)
25. a) Oggi Nicola **ha riso** di me.  
 b) Quella volta Nicola ..... di me.(*rise*)
26. a) Oggi il contadino **ha arso** i campi.  
 b) L'estate scorsa il contadino .....i campi.(*arse*)
27. a) Alla gara di oggi il maratoneta **ha corso** per 4 ore di fila.  
 b) Alla gara del mese scorso il maratoneta .....per 4 ore di fila.(*corse*)
28. a) Oggi Nicola non si è **mosso** di casa.

- b) Il fine-settimana scorso Nicola non si ..... di casa. (*mosse*)
29. a) Dall'esperienza di oggi Nicola non **ha tratto** nessun insegnamento.
- b) Dall'esperienza di quel giorno Nicola non ..... nessun insegnamento. (*trasse*)
30. a) Questo Natale ne **è valsa** la pena spendere tanti soldi.
- b) A Natale scorso ne ..... la pena spendere tanti soldi. (*valse*).
31. a) Oggi Nicola **ha fatto** incidente con la macchina.
- b) L'anno scorso Nicola ..... incidente con la macchina. (*fece*)
32. a) Oggi il bambino si **è nascosto** sotto il letto.
- b) Qualche tempo fa il bambino si ..... sotto il letto. (*nascose*)
33. a) Oggi Nicola mi **ha detto** una bugia.
- b) In quell'occasione Nicola mi ..... una bugia. (*disse*)
34. a) Stamattina Nicola **ha parlato** con Gianni.
- b) Un mese fa Nicola ..... con Gianni. (*parlò*)
35. a) Oggi alla festa il bambino **ha cantato** una canzone.
- b) L'anno scorso alla festa il bambino ..... una canzone. (*cantò*)
36. a) Quest'anno al mio compleanno mio padre mi **ha portato** un regalo.
- b) L'anno scorso al mio compleanno mio padre mi ..... un regalo. (*portò*)
37. a) Oggi mia madre **ha preparato** una torta.
- b) Lo scorso fine-settimana mia madre ..... una torta. (*preparò*)
38. a) Stamattina Nicola si **è alzato** presto.
- b) Quel giorno Nicola si ..... presto. (*alzò*)
39. a) Oggi Nicola **ha guardato** un bel film.
- b) Qualche tempo fa Nicola ..... un bel film. (*guardò*)

## APPENDIX 5: RESPONSES OF THE SUBJECT MG1

### REPETITION TASK

1. «Η κοπέλα έκοψε τα λουλούδια»
2. «Ο κηπουρός φύτεψε τα λουλούδια»
3. «Ο άντρας έβαψε το σπίτι.»
4. «Η κοπέλα έγραψε ένα γράμμα.»
5. «Η γυναίκα άνοιξε ένα κουτί.»
6. «Ο αθλητής έτρεξε.»
7. «Ο άντρας μέτρησε τα λεφτά.»
8. «Η γυναίκα πούλησε τα μήλα.»
9. «Ο αθλητής πήδηξε.»
10. «Η γάτα κυνήγησε τα ποντίκια.»
11. «Η μητέρα κρέμασε τα ρούχα.»
12. «Το παιδί πέταξε τα χαρτιά.»
13. «Το παιδί έφαγε το γλυκό.»
14. «Το παιδί ήπιε το γάλα.»
15. «Η κοπέλα ανέβηκε τις σκάλες.»
16. «Η κοπέλα κατέβηκε τις σκάλες.»
17. «Το τρένο έφυγε.»
18. «Ο κύριος ήρθε.»
19. «Το αεροπλάνο προσγειώθηκε.»
20. «Το παιδί ντύθηκε.»
21. «Η κοπέλα χτενίστηκε.»
22. «Το παιδί πήρε ένα βιβλίο.»
23. «Το κορίτσι σκουπίστηκε.»
24. «Ο μαθητής μπήκε στην τάξη.»

## COMPREHENSION TASK

- |                                    |       |
|------------------------------------|-------|
| 1. Η κοπέλα έκοψε τα λουλούδια.    | RIGHT |
| 2. Ο κηπουρός φύτεψε τα λουλούδια. | RIGHT |
| 3. Ο άντρας έβαψε το σπίτι .       | RIGHT |
| 4. Η κοπέλα έγραψε ένα γράμμα.     | RIGHT |
| 5. Η γυναίκα άνοιξε ένα κουτί.     | WRONG |
| 6. Ο αθλητής έτρεξε.               | RIGHT |
| 7. Ο άντρας μέτρησε τα λεφτά.      | RIGHT |
| 8. Η γυναίκα πούλησε τα μήλα.      | RIGHT |
| 9. Ο αθλητής πήδηξε.               | RIGHT |
| 10. Η γάτα κυνήγησε τα ποντίκια.   | RIGHT |
| 11. Η μητέρα κρέμασε τα ρούχα.     | RIGHT |
| 12. Το παιδί πέταξε τα χαρτιά.     | RIGHT |
| 13. Το παιδί έφαγε το γλυκό.       | RIGHT |
| 14. Το παιδί ήπιε το γάλα.         | RIGHT |
| 15. Η κοπέλα ανέβηκε τις σκάλες.   | RIGHT |
| 16. Η κοπέλα κατέβηκε τις σκάλες.  | RIGHT |
| 17. Το τρένο έφυγε.                | RIGHT |
| 18. Ο κύριος ήρθε.                 | RIGHT |
| 19. Το αεροπλάνο προσγειώθηκε.     | RIGHT |
| 20. Το παιδί ντύθηκε.              | RIGHT |
| 21. Η κοπέλα χτενίστηκε.           | RIGHT |
| 22. Το παιδί παίρνει ένα βιβλίο.   | RIGHT |
| 23. Το κορίτσι σκουπίστηκε.        | RIGHT |
| 24. Ο μαθητής μπήκε στην τάξη.     | RIGHT |

## GUIDED PRODUCTION TASK

1. «Η κοπέλα έχει κόψει τα λουλούδια.»
2. «Ο κηπουρός φύτεψε τα λουλούδια»
3. «Ο άντρας έβαψε το σπίτι.»
4. «Η κοπέλα έγραφε ένα γράμμα»
5. «Η γυναίκα άνοιξε ένα κουτί.»
6. «Ο αθλητής έτρεξε.»
7. Ο άντρας είχε μετρήσει τα λεφτά.»
8. «Η γυναίκα πούλησε τα μήλα.»
9. «Ο αθλητής πήδηξε.»
10. «Η γάτα είχε κυνηγήσει τα ποντίκια.»
11. «Η μητέρα είχε κρεμάσει τα ρούχα.»
12. «Το παιδί πέταξε τα χαρτιά.»
13. «Το παιδί έφαγε το γλυκό.»
14. «Το παιδί ήπιε το γάλα.»
15. «Η κοπέλα ανέβηκε τις σκάλες»
16. «Η κοπέλα κατέβηκε τις σκάλες.»
17. «Το τρένο έχει φύγει.»
18. «Ο κύριος ήρθε.»
19. «Το αεροπλάνο έχει προσγειωθεί.»
20. «Το παιδί ντύθηκε.»
21. «Η κοπέλα είχε χτενιστεί.»
22. «Το παιδί πήρε ένα βιβλίο.»
23. «Το κορίτσι σκουπίστηκε.»
24. «Ο μαθητής είναι στην τάξη.»

## SPONTANEOUS PRODUCTION TASK- PRESENT

1. «Η κοπέλα κόβει τα λουλούδια.»
2. «Ο κηπουρός φυτεύει τα λουλούδια»
3. **X**
4. «Η κοπέλα γράφει ένα γράμμα»
5. «Η γυναίκα **άνοιξε** ένα κουτί.»
6. «Ο αθλητής έτρεξε.»
7. Ο άντρας **\*μέτριζε** τα λεφτά.»
8. «Η γυναίκα πουλάει τα μήλα.»
9. «Ο αθλητής πηδάει.»
10. «Η γάτα κυνηγάει τα ποντίκια.»
11. «Η μητέρα κρεμάει τα ρούχα.»
12. «Το παιδί πετάει τα χαρτιά.»
13. «Το παιδί τρώει το γλυκό.»
14. «Το παιδί πίνει το γάλα.»
15. «Η κοπέλα ανεβαίνει τις σκάλες»
16. «Η κοπέλα κατεβαίνει τις σκάλες.»
17. «Το τρένο φεύγει.»
18. «Ο κύριος έρχεται.»
19. «Το αεροπλάνο **προσγειώθηκε.**»
20. «Το παιδί ντύνεται.»
21. «Η κοπέλα χτενίζεται.»
22. «Το παιδί παίρνει ένα βιβλίο.»
23. «Το κορίτσι σκουπίζεται.»
24. «Ο μαθητής μπαίνει στην τάξη.»

## SPONTANEOUS PRODUCTION TASK- PAST

1. «Η κοπέλα είχε κόψει τα λουλούδια.»
2. «Ο κηπουρός φύτεψε τα λουλούδια
3. «Ο άντρας έβαψε το σπίτι.»
4. «Η κοπέλα έγραψε ένα γράμμα»
5. \* «Η γυναίκα ανοίξει ένα κουτί.»
6. «Ο αθλητής έτρεξε.»
7. Ο άντρας είχε μετρήσει τα λεφτά.»
8. «Η γυναίκα είχε πουλήσει τα μήλα.»
9. «Ο αθλητής είχε πηδήξει.»
10. «Η γάτα έχει \*κυνηγήσει τα ποντίκια.»
11. \* «Η μητέρα είχε.....ΟΧΙ... κρεμήσει τα ρούχα.»
12. «Το παιδί πέταξε τα χαρτιά.»
13. «Το παιδί έφαγε το γλυκό.»
14. «Το παιδί είχε.... »
15. «Η κοπέλα είχε ανεβαίνει, ΟΧΙ... είχε ανέβει»
16. «Η κοπέλα κατέβηκε τις σκάλες.»
17. «Το τρένο έχει φύγει.»
18. «Ο κύριος είχε έρθει.»
19. «Το αεροπλάνο προσγειώνεται.»
20. «Το παιδί είχε ντυθεί.»
21. «Η κοπέλα είχε χτενιστεί.»
22. «Το παιδί πήρε ένα βιβλίο.»
23. «Το κορίτσι έχει σκουπιστεί.»
24. «Ο μαθητής έχει έρθει... ΟΧΙ...»

## APPENDIX 6: RESPONSES OF THE SUBJECT MG2

### REPETITION TASK

1. «Η κοπέλα έκοψε τα λουλούδια»
2. «Ο κηπουρός φύτεψε τα λουλούδια»
3. \* «Ο άντρας έπασε το στίκι.»
4. «έγραψε ένα γράμμα»
5. X
6. X
7. «Ο άντρας μέτρησε τα λεφτά.»
8. «Η γυναίκα πούλησε τα μήλα.»
9. «Ο αθλητής πήδηξε.»
10. «Η γάτα κυνήγησε τα ποντίκια.»
11. «Η μητέρα κρέμασε τα ρούχα.»
12. «Πέταξε τα χαρτιά.»
13. «Το παιδί έφαγε το γλυκό.»
14. \* «Το παιδί είπε το γάλα.»
15. X
16. «Η κοπέλα κατέβηκε τις σκάλες.»
17. «Το τρένο έφυγε.»
18. «Ο κύριος ήρθε.»
19. X
20. «Το παιδί ντύθηκε.»
21. X
22. «ένα βιβλίο.»
23. «Το κορίτσι σκουπίστηκε.»
24. \* «γήκε στην κάτση.»

### COMPREHENSION TASK

- |                                    |       |
|------------------------------------|-------|
| 1. Η κοπέλα έκοψε τα λουλούδια.    | RIGHT |
| 2. Ο κηπουρός φύτεψε τα λουλούδια. | WRONG |
| 3. Ο άντρας έβαψε το σπίτι.        | RIGHT |
| 4. Η κοπέλα έγραψε ένα γράμμα.     | RIGHT |
| 5. Η γυναίκα άνοιξε ένα κουτί.     | WRONG |
| 6. Ο αθλητής έτρεξε.               | RIGHT |
| 7. Ο άντρας μέτρησε τα λεφτά.      | RIGHT |
| 8. Η γυναίκα πούλησε τα μήλα.      | RIGHT |
| 9. Ο αθλητής πήδηξε.               | RIGHT |
| 10. Η γάτα κυνήγησε τα ποντίκια.   | WRONG |
| 11. Η μητέρα κρέμασε τα ρούχα.     | RIGHT |
| 12. Το παιδί πέταξε τα χαρτιά.     | WRONG |
| 13. Το παιδί έφαγε το γλυκό.       | WRONG |
| 14. Το παιδί ήπιε το γάλα.         | RIGHT |
| 15. Η κοπέλα ανέβηκε τις σκάλες.   | RIGHT |
| 16. Η κοπέλα κατέβηκε τις σκάλες.  | RIGHT |
| 17. Το τρένο έφυγε.                | RIGHT |
| 18. Ο κύριος ήρθε.                 | RIGHT |
| 19. Το αεροπλάνο προσγειώθηκε.     | WRONG |
| 20. Το παιδί ντύθηκε.              | RIGHT |
| 21. Η κοπέλα χτενίστηκε.           | RIGHT |
| 22. Το παιδί παίρνει ένα βιβλίο.   | RIGHT |
| 23. Το κορίτσι σκουπίστηκε.        | WRONG |
| 24. Ο μαθητής μπαίνει στην τάξη.   | WRONG |

## GUIDED PRODUCTION TASK

1. X
2. «Ο κηπουρός φύτεψε τα λουλούδια»
3. «Ο άντρας έβαψε το σπίτι.»
4. «Η κοπέλα έγραψε ένα γράμμα»
5. X
6. X
7. «Ο άντρας μέτρησε τα λεφτά.»
8. «Η γυναίκα πούλησε τα μήλα.»
9. «Ο αθλητής πήδηξε.»
10. «Η γάτα κυνήγησε τα ποντίκια.»
11. «Η μητέρα κρέμασε τα ρούχα.»
12. X
13. X
14. «Το παιδί ήπιε το γάλα.»
15. X
16. «Η κοπέλα κατέβηκε τις σκάλες.»
17. «Το τρένο έφυγε.»
18. «Ο κύριος πήγε.»
19. X
20. «Το παιδί ντύθηκε.»
21. X
22. X
23. X
24. X

## SPONTANEOUS PRODUCTION TASK- PRESENT

1. X
2. X
3. X
4. «Η κοπέλα γράφει ένα γράμμα»
5. «Η γυναίκα ανοίγει ένα κουτί.»
6. X
7. «Ο άντρας παίρνει τα λεφτά.»
8. «Η γυναίκα \* πουλίζει, 'ΟΧΙ ...πουλάει τα μήλα.»
9. X
10. X
11. X
12. X
13. «Το παιδί έφαγε το γλυκό.»
14. X
15. «Τώρα ανέβηκε»
16. X
17. X
18. X
19. \*«Το αεροπλάνο προσγειώσει».
20. X
21. «Τώρα χτενίζεται.»
22. X
23. X
24. «Ο μαθητής μπαίνει στην τάξη.»

## SPONTANEOUS PRODUCTION TASK- PAST

1. X
2. X
3. X
4. «Η κοπέλα έγραψε ένα γράμμα»
5. «Παίζει με το κουτί.»
6. X
7. \*«μετρήσει το μέτρημα»
8. «Η γυναίκα πούλησε τα μήλα.»
9. X
10. X
11. X
12. «πεταμένα»
13. X
14. X
15. X
16. «Ανέβηκε.»
17. X
18. «Κάθεται.»
19. X.
20. X
21. X
22. «Το αφαίρεσε.»
23. X
24. X

## APPENDIX 7: RESPONSES OF THE SUBJECT MG3

### REPETITION TASK

1. «Τα λουλούδια έκοψε η κοπέλα.»
2. X
3. «Το σπίτι έβαψε ο άντρας.»
4. Η κοπέλα έγραψε ένα γράμμα
5. X
6. «Ο αθλητής \*έκλεξε.»
7. «Ο άντρας μέτρησε τα λεφτά.»
8. «Η γυναίκα πούλησε τα μήλα.»
9. «Ο αθλητής \*μίληξε.»
10. «Τα ποντίκια κυνήγησε η γάτα»
11. X
12. «Το παιδί έτρεξε»
13. «Το παιδί έφαγε το γλυκό.»
14. «Το παιδί ήπιε το γάλα.»
15. «Η κοπέλα ανέβηκε τις σκάλες»
16. «Κατέβηκε η κοπέλα τις σκάλες.»
17. «Το τρένο έφυγε.»
18. «Ο κύριος ήρθε.»
19. «Προσγειώθηκε.»
20. «Ντύθηκε το παιδί.»
21. «Χτενίστηκε η κοπέλα.»
22. \*«Το παιδί πίνε ένα βιβλίο.»
23. «Το κορίτσι σκουπίστηκε.»
24. Στην τάξη μπήκε ο μαθητής.

## COMPREHENSION TASK

- |                                    |       |
|------------------------------------|-------|
| 1. Η κοπέλα έκοψε τα λουλούδια.    | RIGHT |
| 2. Ο κηπουρός φύτεψε τα λουλούδια. | RIGHT |
| 3. Ο άντρας έβαψε το σπίτι.        | RIGHT |
| 4. Η κοπέλα έγραψε ένα γράμμα.     | RIGHT |
| 5. Η γυναίκα άνοιξε ένα κουτί.     | WRONG |
| 6. Ο αθλητής έτρεξε.               | RIGHT |
| 7. Ο άντρας μέτρησε τα λεφτά.      | RIGHT |
| 8. Η γυναίκα πούλησε τα μήλα.      | RIGHT |
| 9. Ο αθλητής πήδηξε.               | RIGHT |
| 10. Η γάτα κυνήγησε τα ποντίκια.   | RIGHT |
| 11. Η μητέρα κρέμασε τα ρούχα.     | RIGHT |
| 12. Το παιδί πέταξε τα χαρτιά.     | RIGHT |
| 13. Το παιδί έφαγε το γλυκό.       | RIGHT |
| 14. Το παιδί ήπιε το γάλα.         | RIGHT |
| 15. Η κοπέλα ανέβηκε τις σκάλες.   | RIGHT |
| 16. Η κοπέλα κατέβηκε τις σκάλες.  | RIGHT |
| 17. Το τρένο έφυγε.                | RIGHT |
| 18. Ο κύριος ήρθε.                 | RIGHT |
| 19. Το αεροπλάνο προσγειώθηκε.     | RIGHT |
| 20. Το παιδί ντύθηκε.              | RIGHT |
| 21. Η κοπέλα χτενίστηκε.           | WRONG |
| 22. Το παιδί παίρνει ένα βιβλίο.   | RIGHT |
| 23. Το κορίτσι σκουπίστηκε.        | RIGHT |
| 24. Ο μαθητής μπαίνει στην τάξη.   | WRONG |

## GUIDED PRODUCTION TASK

1. «Είναι με το ψαλίδι.»
2. «Ο κηπουρός φύτεψε τα λουλούδια»
3. «\*βάφεσες το σπίτι.»
4. «Η κοπέλα γράφει ένα γράμμα»
5. «Το \*ανάγοιξε.»
6. «Ο αθλητής έτρεξε.»
7. Ο άντρας μετρούσε τα λεφτά.»
8. «Η γυναίκα πούλησε τα μήλα.»
9. X
10. «Η γάτα έδειξε τα ποντίκια.»
11. X
12. X
13. X
14. «Το παιδί άφησε το γάλα.»
15. «Κατέβηκες»
16. «Η κοπέλα κατέβηκε τις σκάλες.»
17. X
18. «Ο κύριος μπήκε.»
19. X
20. X
21. «Η κοπέλα χτενίστηκε.»
22. X
23. X
24. «Ο μαθητής μπήκε στην τάξη.»

## SPONTANEOUS PRODUCTION TASK- PRESENT

1. X
2. «Ο κηπουρός \*τράει τα λουλούδια»
3. «Το μέρος που είναι... που έκανε»
4. «Γράφει γράμμα»
5. «Ανοίγει ένα κουτί.»
6. «Ο αθλητής τρέχει.»
7. \* «Το πρωί... θα είναι τα λεφτά... κέρμα.»
8. «Τα πούλησε.»
9. X
10. «Κυνηγάει.»
11. \* «Το κοίταξε καλά... να είναι το μέρος.. ΝΑΙ..»
12. X
13. «Τρώει το ψωμί.»
14. «Το πίνει αυτό.»
15. «Ανέβηκε.»
16. X
17. X
18. \* «Βλέπω το νεαρό που κάθεται το τραπέζι.»
19. «Προσγειώθηκε αργά.»
20. «Βάλει τα ρούχα του.»
21. «Χτενίζεται.»
22. \* «Έχει με το βιβλίο.. το βιβλίο είναι..»
23. \* «Το καλοκαίρι κάνει με το μπάνιο.»
24. «Τώρα μπαίνει στην τάξη.»

## SPONTANEOUS PRODUCTION TASK- PAST

1. «Η κοπέλα **βγάζει** τα λουλούδια.»
2. «Τα φύτεψε μόλις»
3. X
4. «Εγραψε γράμμα»
5. «**Το έχει κλείσει... ανοίξει.**»
6. X
7. «**Τρώει** τα λεφτά.»
8. «Τα πούλησε»
9. X
10. X
11. X
12. «Τα **\*έπασε.**»
13. X
14. «**Τελείωσε.**»
15. X
16. X
17. X
18. X
19. X
20. \*«**Το ρούχο το φοράει.**»
21. X
22. «**Τρώει** το βιβλίο»
23. X
24. «**Έχτισε.**»

## APPENDIX 8: RESPONSES OF THE SUBJECT MG4

### REPETITION TASK

1. «Η κοπέλα έκοψε τα λουλούδια»
2. X
3. «Ο άντρας έβαψε το σπίτι.»
4. X
5. «Η γυναίκα έκανε...»
6. X
7. X
8. «Η γυναίκα πούλησε τα μήλα.»
9. X
10. X
11. «Πήγαμε...»
12. «Το παιδί πέταξε τα χαρτιά.»
13. X
14. «Το παιδί \*ήθε..»
15. X
16. X
17. «Το τρένο έφυγε.»
18. «Ο κύριος ήρθε.»
19. «Το αεροπλάνο προσγειώθηκε.»
20. X
21. X
22. «Το παιδί πήρε ένα βιβλίο.»
23. «Το κορίτσι σκουπίστηκε.»
24. X

## COMPREHENSION TASK

- |                                    |       |
|------------------------------------|-------|
| 1. Η κοπέλα έκοψε τα λουλούδια.    | WRONG |
| 2. Ο κηπουρός φύτεψε τα λουλούδια. | RIGHT |
| 3. Ο άντρας έβαψε το σπίτι.        | RIGHT |
| 4. Η κοπέλα έγραψε ένα γράμμα.     | RIGHT |
| 5. Η γυναίκα άνοιξε ένα κουτί.     | WRONG |
| 6. Ο αθλητής έτρεξε.               | WRONG |
| 7. Ο άντρας μέτρησε τα λεφτά.      | RIGHT |
| 8. Η γυναίκα πούλησε τα μήλα.      | RIGHT |
| 9. Ο αθλητής πήδηξε.               | RIGHT |
| 10. Η γάτα κυνήγησε τα ποντίκια.   | RIGHT |
| 11. Η μητέρα κρέμασε τα ρούχα.     | RIGHT |
| 12. Το παιδί πέταξε τα χαρτιά.     | WRONG |
| 13. Το παιδί έφαγε το γλυκό.       | RIGHT |
| 14. Το παιδί ήπιε το γάλα.         | RIGHT |
| 15. Η κοπέλα ανέβηκε τις σκάλες.   | RIGHT |
| 16. Η κοπέλα κατέβηκε τις σκάλες.  | RIGHT |
| 17. Το τρένο έφυγε.                | RIGHT |
| 18. Ο κύριος ήρθε.                 | WRONG |
| 19. Το αεροπλάνο προσγειώθηκε.     | WRONG |
| 20. Το παιδί ντύθηκε.              | RIGHT |
| 21. Η κοπέλα χτενίστηκε.           | WRONG |
| 22. Το παιδί παίρνει ένα βιβλίο.   | RIGHT |
| 23. Το κορίτσι σκουπίστηκε.        | RIGHT |
| 24. Ο μαθητής μπαίνει στην τάξη.   | RIGHT |

## GUIDED PRODUCTION TASK

1. «Η κοπέλα έκοβε τα λουλούδια.»
2. X
3. «Ο άντρας έβαψε το σπίτι.»
4. «Η κοπέλα έγραψε ένα γράμμα»
5. «Η γυναίκα άνοιξε ένα κουτί»
6. X
7. «Ο άντρας έκανε...»
8. «Η γυναίκα πούλησε τα μήλα.»
9. «Ο αθλητής πήδηξε.»
10. X
11. «Η μητέρα κρέμασε τα ρούχα.»
12. «Το παιδί πέταξε τα χαρτιά.»
13. «Το παιδί έφαγε το γλυκό.»
14. «Το παιδί το πήγε...»
15. «Η κοπέλα ανέβηκε τις σκάλες»
16. «Η κοπέλα κατέβηκε τις σκάλες.»
17. X
18. «Φτάνει...»
19. «Το αεροπλάνο προσγειώνεται.»
20. «Το παιδί ντύθηκε.»
21. X
22. X
23. «Το κορίτσι έκανε ...σκουπίζεται...»
24. X

## SPONTANEOUS PRODUCTION TASK- PRESENT

1. «Η κοπέλα κόβει τα λουλούδια.»
2. «Ο κηπουρός φυτεύει τα λουλούδια»
3. «Ο άντρας βάζει το σπίτι.»
4. X
5. X
6. «Ο αθλητής τρέχει.»
7. Ο άντρας μετράει τα λεφτά.»
8. «Η γυναίκα πουλάει τα μήλα.»
9. «Ο αθλητής πηδάει.»
10. «Η γάτα κυνηγάει τα ποντίκια.»
11. «Η μητέρα κρεμάει τα ρούχα.»
12. «**Τα σκορπάει....**»
13. \*«Το παιδί **φάει...**»
14. «Το παιδί πίνει το γάλα.»
15. «Η κοπέλα ανεβαίνει τις σκάλες»
16. «Η κοπέλα κατεβαίνει τις σκάλες.»
17. «Το τρένο φεύγει.»
18. «Ο κύριος έρχεται.»
19. «Το αεροπλάνο κατεβαίνει... προσγειώνεται.»
20. «Το παιδί ντύνεται.»
21. «Η κοπέλα χτενίζεται.»
22. «Το παιδί παίρνει ένα βιβλίο.»
23. «Το κορίτσι σκουπίζεται.»
24. X

## SPONTANEOUS PRODUCTION TASK- PAST

1. «Η κοπέλα έκοψε τα λουλούδια.»
2. X
3. «Ο άντρας έβαψε το σπίτι.»
4. «Η κοπέλα έκανε...»
5. X
6. X
7. Ο άντρας τα άφησε...»
8. «Η γυναίκα έκοψε...»
9. «Ο αθλητής πήδηξε.»
10. X
11. «Η μητέρα κρέμασε τα ρούχα.»
12. X
13. X
14. «Το παιδί το άφησε...»
15. X
16. X
17. X
18. «Ο κύριος ήρθε.»
19. X
20. «Το παιδί ντύθηκε»
21. «Η κοπέλα τα άφησε...»
22. X
23. «Το κορίτσι σκουπίστηκε.»
24. X

## APPENDIX 9: RESPONSES OF THE SUBJECT MG5

### REPETITION TASK

1. «Η κοπέλα έκοψε τα λουλούδια»
2. «Ο κηπουρός \*φύτεξε τα λουλούδια»
3. «Ο άντρας έβαψε το σπίτι.»
4. «Η κοπέλα έγραψε ένα γράμμα.»
5. «Η γυναίκα άνοιξε ένα κουτί.»
6. «Ο αθλητής έτρεξε.»
7. «Ο άντρας μέτρησε τα λεφτά.»
8. «Η γυναίκα πούλησε τα μήλα.»
9. «Ο αθλητής πήδηξε.»
10. «Η γάτα κυνήγησε τα ποντίκια.»
11. «Η μητέρα κρέμασε τα ρούχα.»
12. «Το παιδί πέταξε τα χαρτιά.»
13. «Το παιδί έφαγε το γλυκό.»
14. «Το παιδί ήπιε το γάλα.»
15. «Η κοπέλα ανέβηκε τις σκάλες.»
16. «Η κοπέλα κατέβηκε τις σκάλες.»
17. «Το τρένο έφυγε.»
18. «Ο κύριος ήρθε.»
19. «Το αεροπλάνο προσγειώθηκε.»
20. «Το παιδί ντύθηκε.»
21. «Η κοπέλα χτενίστηκε.»
22. «Το παιδί πήρε ένα βιβλίο.»
23. «Το κορίτσι σκουπίστηκε.»
24. «Ο μαθητής μπήκε στην τάξη.»

## COMPREHENSION TASK

- |                                    |       |
|------------------------------------|-------|
| 1. Η κοπέλα έκοψε τα λουλούδια.    | WRONG |
| 2. Ο κηπουρός φύτεψε τα λουλούδια. | RIGHT |
| 3. Ο άντρας έβαψε το σπίτι .       | RIGHT |
| 4. Η κοπέλα έγραψε ένα γράμμα.     | RIGHT |
| 5. Η γυναίκα άνοιξε ένα κουτί.     | RIGHT |
| 6. Ο αθλητής έτρεξε.               | RIGHT |
| 7. Ο άντρας μέτρησε τα λεφτά.      | RIGHT |
| 8. Η γυναίκα πούλησε τα μήλα.      | RIGHT |
| 9. Ο αθλητής πήδηξε.               | RIGHT |
| 10. Η γάτα κυνήγησε τα ποντίκια.   | WRONG |
| 11. Η μητέρα κρέμασε τα ρούχα.     | RIGHT |
| 12. Το παιδί πέταξε τα χαρτιά.     | RIGHT |
| 13. Το παιδί έφαγε το γλυκό.       | RIGHT |
| 14. Το παιδί ήπιε το γάλα.         | RIGHT |
| 15. Η κοπέλα ανέβηκε τις σκάλες.   | RIGHT |
| 16. Η κοπέλα κατέβηκε τις σκάλες.  | RIGHT |
| 17. Το τρένο έφυγε.                | RIGHT |
| 18. Ο κύριος ήρθε.                 | RIGHT |
| 19. Το αεροπλάνο προσγειώθηκε.     | RIGHT |
| 20. Το παιδί ντύθηκε.              | RIGHT |
| 21. Η κοπέλα χτενίστηκε.           | RIGHT |
| 22. Το παιδί παίρνει ένα βιβλίο.   | RIGHT |
| 23. Το κορίτσι σκουπίστηκε.        | RIGHT |
| 24. Ο μαθητής μπαίνει στην τάξη.   | RIGHT |

## GUIDED PRODUCTION TASK

1. «Η κοπέλα έκοψε τα λουλούδια.»
2. «Ο κηπουρός φύτεψε τα λουλούδια»
3. «Ο άντρας έβαψε το σπίτι.»
4. «Η κοπέλα έγραψε ένα γράμμα»
5. «Η γυναίκα άνοιξε ένα κουτί.»
6. «Ο αθλητής έτρεξε.»
7. Ο άντρας μέτρησε τα λεφτά.»
8. «Η γυναίκα πούλησε τα μήλα.»
9. «Ο αθλητής πήδηξε.»
10. «Η γάτα κυνήγησε τα ποντίκια.»
11. «Η μητέρα κρέμασε τα ρούχα.»
12. «Το παιδί πετούσε... ΌΧΙ... πέταξε τα χαρτιά.»
13. «Το παιδί έτρω-...ΌΧΙ ΣΥΝΕΧΕΙΑ..ΜΙΑ ΦΟΡΑ...ΌΧΙ, τρώει,... έτρωγε ...»
14. «Το παιδί έπινε...ΔΕΝ ΞΕΡΩ...»
15. «Η κοπέλα ανέβηκε τις σκάλες»
16. «Η κοπέλα κατέβηκε τις σκάλες.»
17. «Το τρένο έφυγε.»
18. «Ο κύριος ήρθε.»
19. «Το αεροπλάνο προσγειώθηκε.»
20. «Το παιδί ντύθηκε.»
21. «Η κοπέλα χτενίστηκε.»
22. «Το παιδί πήρε ένα βιβλίο.»
23. «Το κορίτσι σκουπιζόταν, ΌΧΙ..σκουπίστηκε.»
24. «Ο μαθητής έ-..., έπαι-..., τώρα μπαίνει, παλιά έπαι-..»

## SPONTANEOUS PRODUCTION TASK- PRESENT

1. «Η κοπέλα κόβει τα λουλούδια.»
2. «Ο κηπουρός φυτεύει τα λουλούδια»
3. «ΤΩΡΑ... βάφει...»
4. «Η κοπέλα γράφει ένα γράμμα»
5. «Η γυναίκα ανοίγει ένα κουτί.»
6. «Ο αθλητής τρέχει.»
7. Ο άντρας μετράει τα λεφτά.»
8. «Η γυναίκα πουλάει τα μήλα.»
9. «Ο αθλητής πηδάει.»
10. «Η γάτα κυνηγάει τα ποντίκια.»
11. «Η μητέρα κρέμασε... ΟΧΙ... κρεμάει τα ρούχα.»
12. «Το παιδί πέταξε τα χαρτιά.»
13. «Το παιδί τρώει το γλυκό.»
14. «Το παιδί πίνει το γάλα.»
15. «Η κοπέλα ανεβαίνει τις σκάλες»
16. «Η κοπέλα κατεβαίνει τις σκάλες.»
17. «Τώρα το τρένο ... φύγει, πρέπει να φύγει,.. έφυγε... τώρα το τρένο θα φύγει... φεύγει.»
18. «Ο κύριος έρχεται.»
19. «Το αεροπλάνο προσγειώθηκε, ΟΧΙ ...προσγειώνεται.»
20. «Το παιδί ντύνεται.»
21. «Η κοπέλα χτενίζεται.»
22. «Το παιδί παίρνει ένα βιβλίο.»
23. «Το κορίτσι σκουπίζεται.»
24. «Ο μαθητής μπαίνει στην τάξη.»

## SPONTANEOUS PRODUCTION TASK- PAST

1. «Η κοπέλα έκοψε τα λουλούδια.»
2. «Ο κηπουρός φύτεψε τα λουλούδια
3. «Ο άντρας τελείωσε... εεε..έβαψε.»
4. «Η κοπέλα έγραψε ένα γράμμα»
5. \* «Η γυναίκα άνοιξε ένα κουτί.»
6. «Ο αθλητής έτρεξε.»
7. Ο άντρας \*μέτρηξε, \*μέτρηψε, τα μετρά.., τα μέτρησε.»
8. «Η γυναίκα πούλησε τα μήλα.»
9. «Ο αθλητής πήδηξε.»
10. «Η γάτα κυ-., κυ..ΠΟΙΟ ΕΙΝΑΙ ΤΟ ΡΗΜΑ..κυ-νή-γη-ξε...»
11. \* «Η μητέρα κρέμασε τα ρούχα.»
12. X
13. «Το παιδί έτρωγε..., ΌΧΙ, ...έφαγε το γλυκό.»
14. «Το παιδί ήπιε...»
15. «Η κοπέλα ανέβηκε...»
16. «Η κοπέλα κατέβηκε τις σκάλες.»
17. «Το τρένο έφυγε»
18. «Ο κύριος έκατσε..., έρχεται..., έκατσε..»
19. X
20. «Το παιδί ντύθηκε.»
21. «Η κοπέλα χτενιζότ-..., ΌΧΙ, χτενίστηκε»
22. «Το παιδί πήρε ένα βιβλίο.»
23. «Το κορίτσι σκουπίστηκε.»
24. «Ο μαθητής μπήκε.»

## APPENDIX 10: RESPONSES OF THE ITALIAN SUBJECT

### REPETITION TASK- PRESENT AND PAST TENSE

1. “La ragazza raccoglie i fiori”  
“La ragazza –colse..., raccolse i fiori.”
2. “NON MI VIENE LA PAROLA..QUELLO CHE PORTA..Il ragioniere, ...”  
“Il giardiniere piantò ...”
3. “L’ uomo **dipinge** la casa..”  
\*“L’ uomo **puntò**, no puntò, **piantò** la casa”
4. “ La ragazza scrive una lettera.”  
“La ragazza scrisse una lettera.”
5. “La donna apre una scatola.”  
“La donna aprì.”
6. “L’ atleta corre.”  
“ L’atleta corse.”
7. “L’uomo conta i soldi.”  
“L’ uomo cantò, NO, contò i soldi.”
8. “La donna vende le mele.”  
“La donna vendette.”
9. “L’atleta salta.”  
“L’ atleta saltò.”
10. “Il gatto insegue i topi.”  
“Il gatto inseguì i topi.”
11. “ La donna **apre**...”  
“La donna aprì, appese...”
12. “Il bambino getta le carte.”  
“Il bambino **buttò** le carte.”
13. “Il bambino mangia la torta.”  
“Il bambino mangiò il dolce.”
14. “Il bambino beve il latte.”  
“Il bambino ...bevò, NO , bevve..”
15. “ La ragazza sale le scale.”  
“La ragazza salì le scale.”
16. “ La ragazza **scelse**,..**scese** le scale.”  
“ La ragazza scese.”
17. “Il treno parte.”  
“Il treno partì.”
18. “L’ uomo arriva.”  
“L’ uomo **revenue**...NO ..arrivò.”
19. “ L’aereo **arriva, arrivò**..” [target atterra]  
“L’aereo arrivò.”
20. “ Il bimbo si veste.”  
“Il bimbo si **vestò**.”
21. “La ragazza si pettina.”  
“ La ragazza si pettinò.”
22. “Il ragazzo prende un libro.”  
“Il ragazzo **prendò**.”
23. “La ragazza si asciuga.”  
“La ragazza si asciugò...asciugò.”

24. “Il bambino entra in classe.”  
“Il bambino entrò in classe.”

## COMPREHENSION TASK

- |                                    |       |
|------------------------------------|-------|
| 1. La ragazza raccolse i fiori.    | RIGHT |
| 2. Il giardiniere piantò i fiori.  | RIGHT |
| 3. L' uomo pittò la casa.          | RIGHT |
| 4. La ragazza scrisse una lettera. | RIGHT |
| 5. La donna aprì una scatola.      | WRONG |
| 6. L' atleta corre.                | RIGHT |
| 7. L' uomo contò i soldi.          | RIGHT |
| 8. la donna vendette le mele.      | RIGHT |
| 9. L' atleta saltò.                | RIGHT |
| 10. Il gatto inseguì i topi.       | WRONG |
| 11. La donna appese gli abiti.     | RIGHT |
| 12. Il bambino gettò le carte.     | RIGHT |
| 13. Il bambino mangiò il dolce.    | RIGHT |
| 14. Il bambino bevve il latte.     | RIGHT |
| 15. La ragazza salì le scale.      | RIGHT |
| 16. La ragazza scese le scale.     | RIGHT |
| 17. Il treno partì.                | RIGHT |
| 18. L' uomo arrivò.                | RIGHT |
| 19. L' aereo atterrò.              | RIGHT |
| 20. Il bimbo si vestì.             | RIGHT |
| 21. La ragazza si pettinò.         | RIGHT |
| 22. Il ragazzo prese un libro.     | RIGHT |
| 23. La ragazza si asciugò.         | RIGHT |
| 24. Il bambino entrò in classe.    | RIGHT |

## GUIDED PRODUCTION TASK

1. “La ragazza raccoglie..raccolse i fiori.”
2. “**Piantai..**”
3. “L’ uomo **dipinse** la casa.”
4. “La ragazza scrisse una lettera”.
5. “La donna aprì una scatola.”
6. “L’ atleta corre.”
7. “L’ uomo contò i soldi.”
8. “La donna **vende** le mele.”
9. “L’ atleta saltò.”
10. “Il gatto **inseguò**, ...**inseguirà**, ...NON MI PIACE...”
11. “La donna **piantò**, ...**piantai**..., **apò**-, ...**appendì**..”
12. Il bambino **buttò** le carte.”
13. “Il bambino mangiò il dolce.”
14. “Il bambino bevve il latte.”
15. “La ragazza **salò**, ...**sali** ...”
16. “La ragazza scese le scale.”
17. “Il treno partì.”
18. “L’ uomo arrivò.”
19. “L’ aereo **arrivò**, ..., **arressò**, ....**atterrò**.”
20. “ **Mi vestai**,...**insegnai**..., **si vestò**...”
21. “La ragazza si pettinò.”
22. “Il ragazzo prese un libro.”
23. “La ragazza pulì,... si asciugò.”
24. “Il bambino entrò.”

## SPONTANEOUS PRODUCTION TASK: PRESENT AND PAST TENSE

1. La ragazza **taglia** i fiori”  
“La ragazza **raccoglie** i fiori.”
2. “Il giardiniere pianta i fiori.”  
“Il giardiniere piantò i fiori.”
3. “L’ uomo **pin-, pitta** la casa.”  
“L’ uomo pittò la casa”
4. “ La ragazza scrive una lettera.”  
“La ragazza scrisse una lettera.”
5. “La donna aprì, ...apre una scatola.”  
“La donna **prese**...”
6. “L’ atleta corre.”  
“ L’ atleta corsì, ...corse.”
7. “L’ uomo conta i soldi.”  
“L’ uomo contò i soldi.”
8. “La donna vende le mele.”  
“La donna vende, ...vendette le mele.”
9. “L’ atleta salta.”  
“L’ atleta saltò.”
10. “Il gatto **corre**,... **colpisce**...”  
“Il gatto \*rincorrò,...inseguì i topi.”
11. “ La donna appende gli abiti.”  
“La donna \***appendi**, ...**appendi**,...\***pendò**, ....\***pendì**.”
12. “Il bambino **butta** le carte.”  
“Il bambino **buttò** le carte.”
13. “Il bambino mangia la torta.”  
“Il bambino mangiò il dolce.”
14. “Il bambino beve il latte.”  
“Il bambino bevve il latte.”
15. “ La ragazza sale le scale.”  
“La ragazza \*salò, No..sali le scale.”
16. “ La ragazza scende le scale.”  
“ La ragazza scese le scale.”
17. “Il treno parte.”  
“Il treno partì.”
18. ‘L’ uomo **entra**.”  
“L’ uomo arrivò.”
19. “ L’ aereo scende, ....arre-...” [target atterra]  
“L’ aereo arrivò, ...atterrò.”
20. “ Il bimbo si veste.”  
“Il bimbo si \***vestò**, ..**si vist-**,...**sei vestò**...”
21. “La ragazza si pettina.”  
“ La ragazza **si pen-**, ...**si pennè**..., ...pettinò.”
22. “Il ragazzo prende un libro.”  
“Il ragazzo \***prendò**, NO...prese.”
23. ‘La ragazza si asciuga.”  
“La ragazza si asciugò.”
24. “Il bambino entra in classe.”  
“Il bambino entrò in classe.”

## APPENDIX 11: TEST 2 IN ITALIAN

### GAP- FILLING TASK

#### Responses

1. a) Oggi Nicola ha sostenuto un esame difficile.  
b) L' anno scorso Nicola **ha avuto** un esame difficile.
2. a) Stamattina Nicola è caduto dalla bicicletta.  
b) Quando aveva 10 anni Nicola **\*cadai.., sono caduto** dalla bicicletta.
3. a) Oggi Nicola ha conosciuto una persona importante.  
b) Tanti anni fa Nicola conobbe una persona importante.
4. a) Oggi Nicola si è raso i capelli.  
b) L' estate scorsa Nicola **si tagliò** i capelli.
5. a) Oggi un assassino ha ucciso tre persone.  
b) Nel 1980 un assassino uccise tre persone.
6. a) Oggi Nicola ha deciso di abbandonare l' università.  
b) Tanti anni fa Nicola decise di abbandonare l' università.
7. a) Stamattina Nicola ha perso il suo orologio.  
b) L' anno scorso Nicola perse il suo orologio.
8. a) Oggi il nostro cane ha morso un bambino.  
b) L' anno scorso il nostro cane morse un bambino.
9. a) Stamattina, dopo la nevicata, Nicola ha sparso del sale.  
b) L' anno scorso, dopo la nevicata, Nicola sparse del sale.
10. a) Questa settimana Nicola ha letto un libro.  
b) L' anno scorso Nicola lesse un libro.
11. a) Questa stagione Nicola ha condotto un programma televisivo.  
b) Tre anni fa Nicola condusse un programma televisivo.
12. a) Oggi all' università Nicola ha discusso la sua tesi.  
b) Lo scorso semestre Nicola lesse..., discusse... la sua tesi.
13. a) Oggi è morto il mio cane.  
b) Qualche mese fa morì il mio cane.

14. a) Quest'anno Nicola ha costruito una casa.  
b) L'anno scorso Nicola costruì una casa.
15. a) Stamattina Nicola mi ha offerto un passaggio.  
b) La settimana scorsa Nicola **mi dettero** un passaggio.
16. a) Oggi Nicola ha aperto un negozio.  
b) L'anno scorso Nicola aprì un negozio.
17. a) Oggi Dio ha esaudito le mie preghiere.  
b) Quel giorno Dio esaudi le mie preghiere.
18. a) Oggi è scomparsa una donna.  
b) Il mese scorso \*scomparsa una donna.
19. a) Oggi è nato mio figlio.  
b) Nel 1990 nacque mio figlio.
20. a) Stamattina Nicola ha dato un passaggio a Gianni.  
b) La settimana scorsa Nicola diede un passaggio a Gianni.
21. a) Oggi mio nonno è stato male.  
b) L'anno scorso mio nonno **ebbe, ...si sentì, ...stette...** male.
22. a) Oggi Nicola ha voluto comprare un pantalone.  
b) Lo scorso mese Nicola volli, ...volle comprare un pantalone.
23. a) Stasera Nicola ha bevuto tanto vino.  
b) Quella sera Nicola bevve tanto vino.
24. a) Oggi Nicola ha preso 10 a scuola.  
b) Il semestre scorso Nicola prese 10 a scuola.
25. a) Oggi Nicola ha riso di me.  
b) Quella volta Nicola rise di me.
26. a) Oggi il contadino ha arso i campi.  
b) L'estate scorsa il contadino **bruciò** i campi.
27. a) Alla gara di oggi il maratoneta ha corso per 4 ore di fila.  
b) Alla gara del mese scorso il maratoneta corse per 4 ore di fila.
28. a) Oggi Nicola non si è mosso di casa.

- b) Il fine-settimana scorso Nicola non si mosse di casa.
29. a) Dall'esperienza di oggi Nicola non ha tratto nessun insegnamento.  
b) Dall'esperienza di quel giorno Nicola non **\*tratti** nessun insegnamento.
30. a) Questo Natale ne è valsa la pena spendere tanti soldi.  
b) \*A Natale scorso ne **ebbi** la pena spendere tanti soldi.
31. a) Oggi Nicola ha fatto incidente con la macchina.  
b) L'anno scorso Nicola **ebbi, ...ebbe...** incidente con la macchina.
32. a) Oggi il bambino si è nascosto sotto il letto.  
b) Qualche tempo fa il bambino si **\*nascosse** sotto il letto.
33. a) Oggi Nicola mi ha detto una bugia.  
b) In quell'occasione Nicola mi **diede..., dette, ...disse...** una bugia.
34. a) Stamattina Nicola ha parlato con Gianni.  
b) Un mese fa Nicola parlò con Gianni.
35. a) Oggi alla festa il bambino ha cantato una canzone.  
b) L'anno scorso alla festa il bambino cantò una canzone.
36. a) Quest'anno al mio compleanno mio padre mi ha portato un regalo.  
b) L'anno scorso al mio compleanno mio padre mi portò un regalo.
37. a) Oggi mia madre ha preparato una torta.  
b) Lo scorso fine-settimana mia madre preparò una torta.
38. a) Stamattina Nicola si è alzato presto.  
b) \*Quel giorno Nicola si...**mi alzai**...presto.
39. a) Oggi Nicola ha guardato un bel film.  
b) Qualche tempo fa Nicola guardò un bel film.