SYNTACTIC FEATURES IN AGRAMMATIC PRODUCTION

by

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ABSTRACT

This thesis examines the nature of the language deficit called agrammatism, the linguistic syndrome usually associated with Broca's aphasia. I focus on the narratives produced by agrammatics of five different languages, English, Dutch, German, French, and Italian, the transcripts of which are collected in Menn & Obler (1990). My goal is to account for the omission and substitution errors that characterize agrammatic production.

Agrammatic utterances with omissions display appropriate word order. Among these are structures that include adverbs, negation, and verb-second matrix clauses. These structures are derived by movement to functional projections. I argue that agrammatic clauses include minimally three functional projections above VP. I propose that the full array of functional projections is present in agrammatic speech. I argue that the most concise account of agrammatic production is one in which Universal Grammar governs agrammatic speech.

Although any syntactic category may be omitted, not all categories are omitted with the same frequency. Lexical categories are better retained than functional categories; and nominal categories are better retained than verbal categories. I propose a Principle of Robustness whereby the more Formal features a category is specified for, the more Robust it is. The net result is that the more features a syntactic category is specified for, the more likely it is retrieved. This results in the following Retrieval Hierarchy: N > V, A, D > P, T, K > C, where ">" means "better retained than".

In addition to omissions, agrammatic speech includes substitutions. Syntactic substitutions display two striking characteristics. First, substitutions are not cross-categorial. Second, substitutions are subject to the Single Feature Constraint: only one optional Formal feature from agreement (person, number and gender), Case and tense is altered. To derive these characteristics, I argue that the structure of the Lexicon is paradigmatic.

Both omissions and substitutions lead me to a discussion of Lexical Insertion, the process by which words are inserted into syntactic structures. I conclude that the agrammatic deficit lies
outside the phonological, syntactic and semantic components proper. Instead, omissions and substitutions result from an impairment to the interface mechanisms between the Lexicon, the Syntax and the Phonology.
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(24) Agrammatic Omissions: Missing Subject - 2Sg
(25) Agrammatic Omissions: Missing Subject DP - 3Sg Referential
(26) Agrammatic Omissions: Missing Subject DP - 3Sg Expletive Quasi-Argument
(27) Agrammatic Omissions: Missing Subject DP - 3Sg Expletive Non-Argument
(28) Agrammatic Omissions: Missing Subject DP - 1Pl
(29) Agrammatic Omissions: Missing Subject DP - 3Pl
(30) Agrammatic Omissions: Missing Object DP - 1Sg
(31) Agrammatic Omissions: Missing Object DP - 2Sg
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# Glossary

The following abbreviations are used in examples, tables and figures:

<table>
<thead>
<tr>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>adjective</td>
</tr>
<tr>
<td>Acc</td>
<td>accusative</td>
</tr>
<tr>
<td>Adj</td>
<td>(predicate) adjective</td>
</tr>
<tr>
<td>Adv</td>
<td>adverb</td>
</tr>
<tr>
<td>AG</td>
<td>agrammatic grammar</td>
</tr>
<tr>
<td>AgrSP</td>
<td>subject agreement phrase</td>
</tr>
<tr>
<td>AgrOP</td>
<td>object agreement phrase</td>
</tr>
<tr>
<td>AP</td>
<td>adjective phrase</td>
</tr>
<tr>
<td>Aux</td>
<td>auxiliary</td>
</tr>
<tr>
<td>Cl</td>
<td>clitic</td>
</tr>
<tr>
<td>Comp</td>
<td>complementizer</td>
</tr>
<tr>
<td>Conj</td>
<td>conjunction</td>
</tr>
<tr>
<td>CP</td>
<td>Complementizer phrase</td>
</tr>
<tr>
<td>CR</td>
<td>Capuceto Rojo</td>
</tr>
<tr>
<td>Dat</td>
<td>dative</td>
</tr>
<tr>
<td>Def</td>
<td>definite</td>
</tr>
<tr>
<td>Det</td>
<td>determiner</td>
</tr>
<tr>
<td>DP</td>
<td>determiner phrase</td>
</tr>
<tr>
<td>F</td>
<td>feminine</td>
</tr>
<tr>
<td>F-category</td>
<td>functional category</td>
</tr>
<tr>
<td>FP</td>
<td>functional projection</td>
</tr>
<tr>
<td>Gen</td>
<td>genitive</td>
</tr>
<tr>
<td>Indef</td>
<td>indefinite</td>
</tr>
<tr>
<td>Inf</td>
<td>infinitive</td>
</tr>
<tr>
<td>IO</td>
<td>indirect object</td>
</tr>
<tr>
<td>IP</td>
<td>inflectional phrase</td>
</tr>
<tr>
<td>K</td>
<td>kase</td>
</tr>
<tr>
<td>L-category</td>
<td>lexical category</td>
</tr>
<tr>
<td>LI</td>
<td>lexical item</td>
</tr>
<tr>
<td>Loc</td>
<td>locative</td>
</tr>
<tr>
<td>LP</td>
<td>lexical projection</td>
</tr>
<tr>
<td>LPH</td>
<td>Lexical Projection Hypothesis</td>
</tr>
<tr>
<td>LRRH</td>
<td>Little Red Riding Hood</td>
</tr>
<tr>
<td>M</td>
<td>masculine</td>
</tr>
<tr>
<td>MLU</td>
<td>mean length of utterance</td>
</tr>
<tr>
<td>Mod</td>
<td>modal</td>
</tr>
<tr>
<td>MRP</td>
<td>mean rate of production</td>
</tr>
<tr>
<td>N</td>
<td>neuter (context different from “noun”)</td>
</tr>
<tr>
<td>N</td>
<td>noun (context different from “neuter”)</td>
</tr>
<tr>
<td>N-category</td>
<td>nominal category</td>
</tr>
<tr>
<td>Neg</td>
<td>negation</td>
</tr>
<tr>
<td>NegP</td>
<td>negation phrase</td>
</tr>
<tr>
<td>NG</td>
<td>normal grammar</td>
</tr>
<tr>
<td>Nom</td>
<td>nominative</td>
</tr>
<tr>
<td>NP</td>
<td>noun phrase</td>
</tr>
<tr>
<td>O</td>
<td>object</td>
</tr>
<tr>
<td>OTH</td>
<td>Optional Tense Hypothesis</td>
</tr>
<tr>
<td>P</td>
<td>preposition</td>
</tr>
<tr>
<td>Part</td>
<td>participle</td>
</tr>
</tbody>
</table>
PCR Petit Chaperon Rouge
Pl plural
Prs present
Pron pronoun
Pst past
RH Riding Hood
RRH Red Riding Hood
S subject
Sg singular
t\textsubscript{AP} trace of an adjective phrase
t\textsubscript{IO} trace of an indirect object
t\textsubscript{O} trace of an object
t\textsubscript{S} trace of a subject
t\textsubscript{VP} trace of a verb phrase
t\textsubscript{Wh} trace of a Wh-phrase
T tense
TH Truncation Hypothesis
TP tense phrase
UG Universal Grammar
V verb
V\textsubscript{-category} verbal category
V\textsubscript{inf} infinitival verb
V\textsubscript{part} participial verb
V\textsubscript{t} tensed verb
1 first person
2 second person
3 third person
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The most difficult task in finishing any project is making sure that all those deserving of it receive appropriate recognition. My first thanks must go to Elizabeth Cowper. She introduced me to linguistics and is the reason I went into the field. Thanks Liz. You are one of the best teachers I have ever had. Your insight, energy and enthusiasm are a constant drive for me. Among the many other influences on me during my years at U of T are Yves Roberge, who supervised my MA forum paper, and Dianne Massam, who encouraged me at every turn.

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Chapter 1

INTRODUCTION

This thesis examines the nature of the language deficit called agrammatism. My goal is to account for the omission and substitution errors that characterize agrammatic production. For omission I focus on the nature of the syntactic categories and projections that underlie agrammatic clauses. For substitution I discuss the identity of the syntactic features that are mis-selected and their organization into paradigms. Both types of errors lead me to a discussion of Lexical Insertion, the process by which words are inserted into syntactic structures (sentences). I will show that omissions and substitutions result from two distinct deficits within the mechanisms governing Lexical Insertion.

Linguists have used “internal” data to formulate hypotheses about the structure of language; that is they relied solely on data provided by the intuitions of non-pathological adult native speakers. “External” data have also been included (Jakobson, 19??). External data consists of data from language acquisition (first and second), slips of the tongue in non-pathological speakers, and language disorders, in other words, language data other than grammaticality judgments from native speakers. Many have turned to language acquisition in order to test their hypotheses about the structure of language and to provide a better understanding of language development (Bloom, 1970; Hyams, 1986a; Davis, 1987; O’Grady, Peters & Masterson, 1989; Radford, 1990; Guilfoyle & Noonan, 1992; Déprez & Pierce, 1993; Poeppel & Wexler, 1993; among many others). Others have addressed the issues raised by language breakdown. More specifically, quite a few attempts have been made to develop a syntactic account for what is called agrammatic speech (Caplan, 1987; Grodzinsky, 1984b, 1990; to name just a few).

Agrammatism is the linguistic syndrome that is usually associated with Broca’s aphasia. Broca’s aphasia results from damage to the anterior portion of the left hemisphere of the brain (Broca’s area). The most striking characteristics of agrammatic production are the omissions and
substitutions of various parts of speech. This thesis investigates agrammatic production with special attention to the following syntactic categories: Noun, Verb, Determiner, Auxiliary/Modal. It focuses on the omission and substitution errors produced by agrammatics of five different languages, English, Dutch, German, French, and Italian. The utterances in (1) are a sample of agrammatic omission errors. Examples of omissions in English are from Menn (1990) (1a), Dutch from Kolk et al. (1990) (1b) German from Stark & Dressler (1990) (1c), French from Nespoulous et al. (1990) (1d), and Italian from Miceli & Mazzucchi (1990) (1e). Omissions are indicated by square brackets '[]'. Items that are omitted are underlined in the translation.

(1) Agrammatic clauses with omissions

<table>
<thead>
<tr>
<th>Language</th>
<th>Utterance</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>a. the wife was showing [DP] the clock “the wife was showing him the clock”</td>
</tr>
<tr>
<td>Dutch</td>
<td>b. zondagochtend [Aux] [DP] gewerkt Sunday-morning [Aux] [DP] work:Part “Sunday morning I had worked”</td>
</tr>
<tr>
<td>German</td>
<td>c. später begutachtet [DP] seinen Kukuruz later examines [DP] his corn “later he examines his corn”</td>
</tr>
<tr>
<td>French</td>
<td>d. et peu après [DP] contemple [Det] récolte and little after [DP] gazes at [Det] harvest “and a little later he considers the harvest”</td>
</tr>
<tr>
<td>Italian</td>
<td>e. i (gli) uccelli non mangiano [DP] the:M-Pl (the:M-Pl) birds not eat:3Pl [DP] “the birds don’t eat the seeds”</td>
</tr>
</tbody>
</table>

The utterances in (2) illustrate agrammatic substitution errors. Examples of substitution errors in English are from Menn (1990) (2a), Dutch from Kolk et al. (1990) (2b) German from Stark & Dressler (1990) (2c), French from Nespoulous et al. (1990) (2d), and Italian from Miceli & Mazzucchi (1990) (2e). Italics indicate the item that is substituted; the content of the following rounded brackets ‘( )’ represents the speaker’s target. Items that are substituted are underlined in the translation.
Agrammatic data serves the same purpose as internal data: as a source of empirical evidence for building a model of grammar. As such, I use agrammatic data to test and constrain linguistic theory. However, the interplay between linguistic theory and external data is a two-way street, wherein the Principles of Universal Grammar can explain the mechanisms that produce agrammatic utterances. Thus this thesis serves not only as a bridge between theoretical linguistics and the clinical disciplines but also as an example of how the two disciplines can mutually inform one another.

1.1 THEORETICAL FRAMEWORK

In this section I introduce the general constructs and assumptions that will be used throughout the thesis. Much of the analysis of the agrammatic data requires more specific theoretical proposals. These will be developed as they become relevant. I begin with the overall framework.
1.1.1 General Model

The theoretical constructs that I adopt hail from Generative Grammar. Each of us is endowed with the ability to acquire and ultimately manipulate language. Following Chomsky (1965, 1981, 1986, 1993), I assume that this linguistic knowledge is governed by the principles of Universal Grammar (henceforth UG). There has been much debate in the linguistic literature about the nature of UG. At the very least, however, UG is composed of a dictionary (Lexicon), a syntactic component (Syntax), a semantic component (Semantics) and a phonological component (Phonology).

The Lexicon is a structured list of words. Each word is a Lexical Item (LI). The information contained in the Lexicon includes the meaning, the syntactic category (noun, verb etc.), other syntactic features (such as agreement, etc.), and the pronunciation of the LI. Each of these four sets of information is discussed in detail in chapter 5. The Lexicon feeds into the Syntax. The process by which LIs are inserted into the Syntax is called Lexical Insertion. I discuss the nature and locus of Lexical Insertion in chapter 5. The structure that is produced by the Syntax is in turn input to the Phonology and the Semantics. The model is schematized below.

Figure 1: General Model of Universal Grammar

```
LEXICON
       /
SYNTAX
     /
SEMANTICS   \\
PHONOLOGY
```

The Syntax is responsible for sentence structure. It may be either derivational or representational; in other words, a series of operations may apply to one structure deriving another, or else syntactic representations may be subject to a set of constraints that eliminate illicit structures. I treat the two as equivalent. Any implications for the analysis of the agrammatic data will be discussed when relevant.
The Phonology produces the string of sounds associated with the intended utterance. It governs word and sentential stress, syllable structure, and allophonic variation, among other things.

The Semantics specifies the semantic features of a morpheme and the relations between the morphological items. The semantic component may also be the locus of discourse and pragmatic constraints.

Each component is relevant to agrammatic production. This is in evidence when considering substitution errors. There are three types of substitution errors: phonologically related, semantically related and syntactically related. Although I discuss each in turn, I focus on the errors that are syntactically constrained. In other words, I concentrate on the syntax as the central locus of the deficit.

1.1.2 Phrase Structure

I assume that every syntactic category (noun, verb, and so on) projects syntactic structure. I assume that these structural representations are constrained by X-bar theory, which licenses phrase structures of the following basic type (Chomsky, 1986):

(3) XP Projection of a Head X

```
                   XP
                  /   \    
     Specifier   X'       Complement
                      X
```

In (3), X is the head. Sister to X is its complement. Sister to X' is the specifier position, [Spec XP]. The position of specifiers and complements relative to their sisters is subject to parametric variation: they may be either to the left or to the right of their sisters. Some syntactic heads, like noun (N) and verb (V), project this structure. Other heads are adjuncts, like adverb (Adv). Adjuncts are adjoined to syntactic projections in the following manner.
The adjunct Y is adjoined to XP.

Within a given language, all phrasal projections have the same hierarchical structure. For example, in English a noun phrase (NP) always has the following structure (the rounded brackets indicate that the specifier and complement positions may not be filled, or may simply be absent).

I also adopt the stronger hypothesis that in all languages XP has the same hierarchical structure. That is, for all languages that have a head N, each of these languages projects the structure in (5) (taking parametric variation with respect to order into consideration). However, not all languages have the full inventory of heads.

1.1.3 Syntactic Features

Following Chomsky (1970), Jackendoff (1977) and many others I assume that syntactic heads are bundles of categorial features. For example, Chomsky (1970) proposes that Noun is [+Nominal, -Verbal] and Verb is [-Nominal, +Verbal]. This set of features distinguishes between the four categories N(oun), V(erb), P(reposition) and A(djective), as shown in (6).

\footnote{Kayne (19??) presents a model whereby Specifiers are always to the left of the head and Complements are always to the right.}
The category names (N, V, etc.) are simply abbreviations for the feature bundles. It is the features which project phrases.

Although the consensus is that syntactic categories are made up of features, a debate revolves around which features are relevant. Fukui (1986), Abney (1987) and Déchaîne (1993) (among others) propose more comprehensive categorial models that include categories beyond N, V, P and A. Fukui (1986), Fukui & Speas (1987) and many others propose a distinction between lexical and functional categories. Lexical categories consist of the traditional categories that denote entities (e.g. *wolf*), actions (e.g. *eat*), locations (e.g. *behind*) and states (e.g. *beautiful*) i.e. N, V, P and A. Functional categories have a more abstract interpretation. In general terms, they locate in space/time/etc. the entities, actions, locations and states. Consider the phrase *this wolf*. Among other functions, the determiner *this* (category D) locates in space the entity *wolf*. Consider a second phrase *this wolf ate*. The tense marking past (category T) locates in time the action *eat*. For Fukui (1986), every category has precise featural specifications, as shown in (7).

<table>
<thead>
<tr>
<th></th>
<th>[-Nominal]</th>
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<td>[-Kase]</td>
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<td>C</td>
<td>that</td>
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<td>V</td>
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<td>[+Nominal]</td>
<td>A</td>
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Abney (1987), on the other hand, proposes the smaller set of features in (8).

(8)  

[-Functional]  [+Functional]  
[-Nominal]  V, Aux, P  N, A, Q, Adv  I, C  D, Deg  
[+Nominal]  

Following Chomsky (1970), both Fukui and Abney capture the nominal-verbal distinction. Fukui includes both [+/- Nominal] and [+/- Verbal] whereas Abney settles for [+/- Nominal]. Their feature systems also distinguish between lexical and functional categories by having lexical categories defined as [-Functional] and functional categories defined as [+Functional]. However, several problems arise with respect to these models. The abundance of features proposed by Fukui leaves us with 'empty slots': we expect to find the [+Kase] counterparts to A and N, for example. With Abney's model, a problem opposite to Fukui's arises: too many distinctions are collapsed. For languages like English, A and N are different and need to be identified as such.

In this thesis, I adopt Déchaine's (1993) feature system. Déchaine's (1993) feature system is shown in (9). Like Fukui and Abney, Déchaine captures both the lexical-functional and the nominal-verbal distinctions: functional elements are [+Functional]; nominal elements are [+Nominal]; lexical and verbal elements are unspecified for [Functional] and [Nominal], respectively.

(9)  

C  T  V  K  D  N  P  A  
Nominal  +  +  +  +  +  +  
Referential  +  +  +  +  +  +  +  
Functional  +  +  +  +  +  +  

However, Déchaine differs from Fukui and Abney in two ways. First, she adopts the three features, [Referential], [Functional], and [Nominal]. This results in fewer features (and

2 Déchaine (1993) includes the feature [Referential]. She argues that it is required to distinguish between categories that have privileged relationships and categories that do not, in other words to account for the selectional properties of the various syntactic categories.
consequently fewer distinctions) than Fukui, but more than Abney. Déchaine's system is more accurate and, consequently, more desirable.

Second, Déchaine differs from Fukui and Abney in her use of privative features. Having both [+] and [-] values of each feature forces us to stipulate which value is to be selected for a given syntactic process. If, on the other hand, features are privative, then necessarily it is the feature that is present that is selected for a given syntactic process. No stipulation is required. Once again, Déchaine's is the preferred model; as such, it is the model that I adopt as the basis of my analysis of categorial disturbances in agrammatism. To account for the full range of agrammatic omission errors I modify Déchaine's feature inventory (chapter 5).

1.2 OUTLINE OF THE THESIS

The thesis is organized into the following sections. In chapter 2, I provide a discussion of agrammatism. I begin with a general description of the agrammatic deficit, and defend the thesis that agrammatism is a cohesive syndrome. I then turn to the data that is analyzed in this thesis. The data consists of agrammatic production narratives from five languages: English, Dutch, German, French and Italian. I review the criteria for the selection of subjects. In addition I describe the production tasks as well as the procedures for reconstructing agrammatic utterances. The chapter ends with a discussion of the questions that are relevant to the study of agrammatism and a brief overview of the issues that are addressed in the following chapters.

In chapter 3, I focus on omission errors. I show that Agrammatic Grammar is governed by the principles of Universal Grammar. I continue with an investigation of the number of

\[
\begin{align*}
(i) & \quad \text{DP} & \text{TP} \\
& \quad \text{D'} & \quad \text{T'} \\
& \quad \text{D} & \quad \text{T} \\
& \quad \text{NP} & \quad \text{VP} \\
& \quad \text{N'} & \quad \text{V'} \\
& \quad \text{N} & \quad \text{V} \\
\end{align*}
\]

N and D have a privileged relationship. V and T have a privileged relationship. P and A are not involved in privileged relationships. Déchaine (1993) also includes K(ase) and C(omplementizer)
functional projections in agrammatic clauses, concluding that (at least) CP, TP and a functional projection between TP and VP (possibly AgrOP) are required. The rate and distribution of omissions is then addressed. It is shown that lexical categories are produced more frequently than functional categories, and nominal categories more frequently than verbal categories, with the following retention hierarchy: N > V > D > Aux/Modal, where ">" means "better retained than".

In chapter 4, I address the nature and distribution of substitution errors. I show that substitutions involve agreement, Case and tense features, but any substitution involves only a single feature. I argue that this Single Feature Constraint on substitution results from the paradigmatic structure of the Lexicon.

In chapter 5, I develop an account of agrammatic omission and substitution. I argue that the deficit is not located in the phonological, morphological, syntactic or semantic components. I conclude that the agrammatic deficit is located instead at the interface between the Lexicon, Syntax and Phonology. Agrammatic omissions and substitutions result from damage to the mechanisms responsible for Lexical Insertion.

Chapter 6 concludes the thesis. Here, I summarize my findings and conclude with suggestions for further research. Following chapter 6, I include an appendix of the agrammatic data.

as categories that are not in privileged relationships. See Déchaine (1993) for arguments supporting the choice of this and the other two features.
Agrammatism in Broca's aphasia results from damage to the anterior portion of the left hemisphere of the brain. Historically, agrammatism was referred to as a production deficit, with little attention paid to comprehension (Pick, 1913; Goodglass, 1968; Tissot, Mounin & Lhermitte, 1973). As research progressed, discussion about agrammatism focused on reduced abilities in both production and comprehension (Zurif et al., 1972; Zurif et al., 1974; Miceli et al., 1983). The disorder was shown to involve differing retention of lexical categories (noun, verb, adjective, adverb, and preposition) and functional categories (determiners, tense markings, and other grammatical morphemes). The deficiency may be characterized by an ability to retain lexical categories, accompanied by widespread omission of functional categories. However, of the lexical categories retained, there is a tendency for agrammatics to use nouns more often than other categories. Moreover, it is not the case that all function words are always omitted; rather, there is an increased probability of omission correlated with the severity of the deficit.

This chapter begins with a description of agrammatic production. Because of the variability between patients and the dissociation between comprehension and production, it has been argued that agrammatism cannot be considered a cohesive syndrome (Badecker & Caramazza, 1985). However, I argue that neither variability nor dissociation are valid arguments against agrammatism being a single syndrome and conclude that agrammatism is a unified deficit.

Before delving into the linguistic analysis of agrammatism I present the data to be analyzed. I describe the subjects from Menn & Obler (1990), focusing on the severity of the deficit and the method of reconstructing agrammatic utterances. I end the chapter with a summary of the hypotheses to be tested.
2.1 A GENERAL DESCRIPTION OF AGRAMMATISM

There is a wide range of language disorders associated with brain injury. Lesser (1978) estimates that a total of 78 different subclassifications have been proposed. Of the 78, only two are assigned relatively firm status: Broca's and Wernicke's aphasia. Broca's aphasia, or nonfluent aphasia, results from a lesion to the anterior portion of the left hemisphere of the brain. Agrammatism is the linguistic syndrome that is usually associated with Broca's aphasia. Wernicke's aphasia, or fluent aphasia, is associated with a lesion to the posterior regions of the left hemisphere. Paragrammatism is the linguistic syndrome usually associated with Wernicke's aphasia. These two are frequently considered opposing syndromes. In very general terms, agrammatic speech is slow and labored, and is marked by omissions; paragrammatic speech is fluent, but displays numerous substitutions.

An on-going debate among some aphasiologists is whether or not there is a distinction between agrammatism and paragrammatism (Pick, 1913; von Stockert & Bader, 1976; Friederici, 1982; Shapiro & Levine, 1990; Blumstein et al., 1991; Kolk & Heeschen, 1992, among numerous others). Wernicke himself viewed the two as separate syndromes, using this difference to argue for distinct anatomical sites for language: "The great variability of the clinical picture of aphasia moves between the two extremes of pure motor aphasia [agrammatism] and the pure sensory form [paragrammatism]. The demonstration of these two types must be regarded as conclusive proof of the existence of two anatomically separate language centers" (Eling, 1994: 68). Although the evidence favors two syndromes, this debate does not affect the issue under discussion in this thesis. The production data remain the same regardless of whether they are part of a larger or smaller syndrome. I therefore leave the debate for others to continue and focus on the specifics of the agrammatic deficit.
Agrammatic production is frequently described as resembling telegraphic speech\(^1\). The term "telegraphic speech", however, is a misnomer. The linguistic features of agrammatism are not the same as those found in telegrams (Tesak & Dittman, 1991). Telegrams show the following linguistic characteristics: complete omission of functional categories, virtually no omission of lexical categories, and no substitution errors. While agrammatics omit functional categories, they do not omit all functional categories all the time: there is a gradient loss of functional categories in agrammatic speech. This is not found in telegraphese.

Further, agrammatic omission errors include lexical categories, albeit to a lesser degree. This too contrasts with telegraphese. Lastly, agrammatics produce substitution errors, which are completely absent from telegraphic style. These errors involve producing the wrong form of a particular category. Substitutions may be semantic in that the wrong word altogether is selected (producing *boy* instead of *girl*, for example), or they may be (morpho)syntactic (selecting *tell* instead of *told*)\(^2\). Clearly, agrammatic speech is not telegraphese.

Although most studies have focused on omission and substitution errors, these are not the only features of agrammatic speech. Agrammatics suffer from slow and labored speech, and produce fewer words per utterance. Moreover, agrammatics produce utterances that have reduced structural complexity (Saffran et al., 1989), thus lacking embedded clauses.

In addition to the linguistic deficit, agrammatics may have articulatory and phonatory difficulties. These difficulties result in segmental and voicing errors\(^3\).

Agrammatics may also suffer from impaired comprehension, as well as disturbed reading and writing. However, each modality suffers independently of the others. This means that while production is impaired, comprehension may be intact (Kolk et al., 1982; Miceli et al., 1983).

\(^1\) Kolk & Heeschen (1992) offer an alternative explanation of agrammatism. They argue that agrammatic production is the result of overuse of ellipsis. Notice however, that ellipsis cannot address the substitution errors also found in agrammatism.

\(^2\) Substitutions may also be phonological. This is discussed in chapter 4.

\(^3\) See Sanchez (1992a) for a detailed discussion of a case study involving a non-fluent speaker with a phonological deficit.
A final characteristic of agrammatic speech is variability. There is variation both within an individual and between speakers. There are many different influences on variability, which I address below.

2.2 AGRAMMATISM IS A COHESIVE SYNDROME

A further debate in the field of aphasiology is whether or not agrammatism is a single syndrome (Badecker & Caramazza, 1985; Miceli et al., 1989; Caplan, 1991, 1987; Grodzinsky, 1991). The crux of the debate lies with two issues: variability and a comprehension-production dichotomy. Badecker & Caramazza (B&C) (1985) argue that agrammatism ought to be viewed as several distinct syndromes. As evidence, they cite variability between patients and the fact that difficulties in comprehension and production do not always co-occur. Because agrammatic patients may omit main verbs, incorrectly nominalize these same verbs, display semantic illformedness, and show different patterns of omission of free and bound functional morphemes, B&C conclude that either 1) deficits exist in a variety of processing components or 2) the impairment is of a higher order, with the expression of the disturbance being affected by other linguistic features.

There are two issues which must be addressed in the single-syndrome debate: variability and the comprehension-production dissociation. First, I argue that variability cannot be an argument against viewing agrammatism as a single syndrome since it is predicted to be a characteristic of language breakdown. Second, I argue that the comprehension-production dissociation is illusory. The two modalities appear to be affected independently because the disruption to comprehension can be easily masked. I conclude that agrammatic production results from a single cohesive syndrome.

4 Others have used this dissociation to argue for a distinction between the processing mechanisms for comprehension and those for production (Nespoulous et al., 1988; Caramazza & Hillis, 1989; Druks & Marshall, 1991).
2.2.1 Variability

There is variation both between agrammatics (inter-agrammatic variability) and within a single individual (intra-agrammatic variability). For variation within an individual, there are two types: variation within a session (intra-sessional variability), and variation from session to session (inter-sessional variability). Intra-sessional variability may be due to task variation (see Heeschen & Kolk (1988) on German-speaking aphasics). Within a single session, frequency of omission and substitution may change depending on the task. With a more constrained production task (picture description as opposed to general conversation) agrammatics produce fewer omissions but more substitutions (Hofstede & Kolk, 1994). Inter-sessional variability is due to performance factors such as tiredness, time of day, and so on. Agrammatics produce fewer errors when they are rested (as do normals). Moreover, agrammatics produce fewer errors in morning sessions than in afternoon sessions.

Inter-agrammatic variability is of two types: variation within the same language (intra-linguistic variability) and variation between languages (inter-linguistic variability). Intra-linguistic variability results from several factors. The first factor is degree of impairment. Generally the more impaired the individual, the more omissions are produced (I show this in chapter 3). The second influence is attentional factors and compensatory strategies. No two individuals adopt exactly the same strategies to compensate for their deficit, neither do they have the same attention rate for any given task. While some agrammatics prefer avoidance, others adopt the over-use of familiar words, or the use of semantic opposites or the use of circumlocutions (describing the meaning of the intended word), and so on. Moreover, the interaction between the actual deficit and the compensatory mechanisms further affects variation (Nespoulous & Dordain, 1991). The third factor relates to the intra-agrammatic influences stated above. If agrammatic A performs

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5 Nespoulous & Dordain (1991) argue that (French-speaking) agrammatics do not use automatic processing for functional morphemes and that agrammatic variability is due to an interaction between the actual deficit and compensatory mechanisms.
task (a) in the morning and agrammatic B performs task (b) in the afternoon, they are sure to show variation in omission and substitution.

Inter-linguistic variation results from several factors. First, variation is due to the inter-agrammatic factors described above. Differing degrees of impairment and differing compensatory strategies affect levels of omission and substitution across languages, as they do within languages. Second, intra-agrammatic factors also contribute to variability across languages. And third, language-specific structural differences influence inter-linguistic variation (Caplan, 1987, 1991; Grodzinsky, 1984ab, 1991). Agrammatism may appear quite different from one language to another, with language-specific constraints governing agrammatic errors (Peuser & Fittschen, 1977; Grodzinsky, 1984ab; Caplan, 1987). Bates & Wulfeck state that “language differences account for more variance than patient group difference in all our experiments to date” (1989a:329). To give one example, agrammatics produce more substitution errors in non-concatenative languages where omissions would violate morphological restrictions.

There are many different influences on variability. What is important to notice is the cumulative effects of the various factors. One set of factors (set 1) influences intra-agrammatic variability. This set, along with an added series of factors (set 2) influence inter-agrammatic intra-linguistic variability. Language-specific structural differences make up a third set of influencing factors (set 3). Set 1, 2 and 3 affect inter-linguistic variability. It is not surprising, therefore, to find variability in agrammatic production.

The predictions from syntactic theory with respect to variability are clear: variability is predicted to occur. There are two areas of interest: variation within a language (intra-linguistic variability) and variation between languages (inter-linguistic variability). Intra-linguistic variability is an expected characteristic. Any given language includes a set of syntactic categories, say N(oun), V(erb), A(djective), and P(reposition). Each of these four categories consists of a

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6 There is a substantial body of more recent research that provides evidence for such language-specific constraints. Among these we find the following: Chen, 1989, 1993; Hagiwara & Caplan, 1990; Kehayia et al., 1990; Lorch, 1990; Kehayia & Jarema, 1991; MacWhinney & Osmán-Sági, 1991; MacWhinney et al., 1991; Safi-Stagni, 1991; Vaid & Pandit, 1991; Wulfeck
different bundle of categorial features. Minimally, N is [+Nominal, -Verbal]; V is [-Nominal, +Verbal]; A is [+Nominal, +Verbal]; and P is [-Nominal, -Verbal]. At this point, the identity of the features is not relevant. What is important is that the feature bundles are distinct from each other. Syntactic categories are distinguished by their categorial features. All else being equal, a linguistic disorder should reflect this contrast. We would, therefore, expect category-specific rates of omission and thus intra-linguistic variability. Indeed, it would be surprising if we didn’t see any variability. Variability is the reflection of the linguistic system itself.

A similar argument can be made for inter-linguistic variability. First, different languages employ different sets of syntactic categories. For example, English has N, V, A and P, whereas Walpiri has N/A, V, and P. Omissions errors in Walpiri would necessarily look different from omission errors in English by virtue of the fact that their categorial inventories are different. Second, a given syntactic category does not necessarily encode the same series of agreement, Case and tense features for each language that employs it. This is illustrated by contrasting the definite article in English and French. The English definite article the is unspecified for gender or number. French on the other hand has three definite articles: the masculine singular le, the feminine singular la, and the plural les. The expectation is that these two languages should display different omissions and substitution patterns. Third, languages display surface variation for identical relational structures. Consider abstract Case, for instance. English Case morphology is impoverished (only pronouns show Case distinctions: I (nominative Case) versus me (objective Case) versus my/mine (genitive Case)). Hungarian Case morphology, on the other hand, is quite substantial. English relies heavily on word order for subject and object interpretation whereas Hungarian relies on overt Case morphology. Once again, we expect linguistic disorders to reflect each of these distinctions. Syntactic theory therefore predicts a rather high level of variability in agrammatic production. Consequently, variability is not an argument against agrammatism being a single syndrome.

2.2.2 Comprehension-Production Dissociation

I now address the comprehension-production dissociation. B&C argue that because the two modalities do not suffer equally within a Broca’s aphasic, agrammatism cannot be considered a cohesive syndrome. First, B&C assume that agrammatism must affect these two modalities equally. This assumption, however, is false. Second, B&C maintain that there is in fact a dissociation between the two modalities. I argue that the dissociation is illusory.

To begin, a certain amount of independent processing for each of the modalities is required since comprehension involves hearing and production involves speaking. The link between the utterance and the motor system involves auditory mechanisms for comprehension and articulatory mechanisms for production. The link between the motor system and the phonological processes involves the auditory pathway for comprehension and the oral pathway for production. Thus, the differences in modality (hearing versus speaking) forces two distinct pathways at the outset. I schematize the pathways below.

Figure 2: Differing Comprehension and Production Modalities

![Diagram](image)

The principles of UG underlie both modalities. However, comprehension and production display independent pathways beyond UG. The fact that there are two distinct pathways allows for the possibility that the two modalities are independently affected. If the deficit lies outside UG, production may be disrupted independently of comprehension. Kolk et al. (1982), Miceli et al. (1983) and Nespoulous et al. (1989) argue that there is indeed a dissociation between production and comprehension but that this dissociation reflects two distinct impairments: expressive (production) and receptive (comprehension) agrammatism. Although Broca’s aphasics usually display a disruption to both production and comprehension, they claim this need
not be so: expressive and receptive agrammatism can occur independently of each other. Broca's aphasics with only a production deficit have expressive agrammatism, those with only a comprehension deficit have receptive agrammatism.

However, many have argued that 'intact' comprehension is in fact illusory. Numerous studies have shown that agrammatics do have comprehension difficulties (Heilman & Scholes, 1976; von Stockert & Bader, 1976; Zurif & Caramazza, 1976; Caramazza & Berndt, 1978, 1985; Goodglass et al., 1975; Bradley et al., 1980; Caramazza et al., 1981; Bates et al., 1987b; among others). Moreover, Zurif et al. (1972) and Zurif et al. (1976) argue that agrammatism involves all language modalities: speaking, hearing, reading and writing. Because these difficulties lie with functional morphemes rather than lexical categories, the comprehension disturbance can be masked. The comprehension deficits in agrammatism are not as obvious as the production deficits and require specialized testing.

Although work on the production-comprehension dissociation is still in flux, I maintain that agrammatics do indeed have both a production and comprehension disturbance, contrary to B&C's claim. I now proceed with the assumption that agrammatic production is a cohesive syndrome and leave the debate for others to continue.

2.3 THE DATA

The empirical data for this thesis comes from the production of ten agrammatic speakers, the transcripts of which are collected in Menn & Obler (1990). The interpretation of the agrammatic production data is dependent on several factors. First, since I am comparing ten different speakers, I must establish that each of the ten speakers has the same syndrome, namely agrammatism. To this end, I describe the criteria for selection. Second, the nature of the

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7 For more discussion on the production-comprehension dissociation, see the following authors: Hittmair-Delazer et al., 1994; Friederici et al., 1992; MacWhinney et al., 1991; Lukatela et al., 1988; Grossman et al., 1986.

8 My personal experience with agrammatics parallels these studies. I have never observed agrammatics that display intact comprehension.
production tasks allows us to determine the intent of the speaker, and thus their linguistic target. This leads me to the methods of reconstruction. Agrammatic production displays omission and substitution errors. The agrammatic utterances therefore need to be reconstructed. Knowledge of the linguistic target is therefore paramount.

2.3.1 *The Subjects*

The agrammatic data under study are transcripts collected in Menn and Obler (1990) (M&O). The data was produced by ten agrammatic speakers, two speakers of each of the following languages: English, Dutch, German, French, and Italian. Since the personal and educational background for each agrammatic is different, each subject was paired with a control. Non-pathological native speakers were used as controls. The controls were matched for age, sex, bilingualism, education, background, and handedness.

Four criteria were used to select the subjects. These are the following.

(1) Criteria for Selecting Agrammatic Subjects

- a. Demographic
- b. Neurolinguistic
- c. Neurological
- d. Neuropsychological

The demographic criteria ensured that subjects were native speakers of the language under study, were preferably monolingual, used the native language most of the time (if not monolingual), were between 18 and 65, and were literate.

The neurolinguistic criteria ensured that the subjects were all agrammatic by clinical standards. M&O define "agrammatic by clinical standards" "as being moderately fluent, having slow and halted speech, with three or four words being the usual maximum uninterrupted string" (1990:14). Further, these criteria ensured that the subjects could speak well enough to produce at least 250 words, could produce recognizable clauses and phrases of at least three words, had
adequate comprehension to perform the required tasks, had minimal articulatory impairment (dysarthria), and only mild word-finding difficulties.

The neurological criteria ensured that the subjects all had a unilateral left-sided lesion (preferably anterior to the rolandic fissure) and were physically stable (i.e. at least 3 to 4 months post onset of the lesion).

The neuropsychological criteria ensured that subjects were able to concentrate, could understand the production tasks, were free of general cognitive damage, and had minimal visual and auditory problems.

Each of the subjects under study in this thesis meets the criteria described above.

2.3.2 *Description of the Data*

Each of the agrammatics and controls were required to produce four narratives. These narratives consist of the following: a history of their state of health, a description of a complex picture (the 'Cookie Theft' picture), a description of four picture sequences (a farmer planting and harvesting crops; a thief caught in the midst of stealing; a couple on a picnic with their meal stolen by a dog; a man who oversleeps, is woken and then rushed by his wife, and falls asleep at work), and the telling of 'Little Red Riding Hood'.

The speech of the agrammatics is divided into utterances. Utterances are defined as a string in which a tensed verb is or should have been used. Agrammatic speech includes omissions and substitutions. This means that missing and incorrect elements must be reconstructed. There are several factors that influence the choice of the reconstruction. First, only the addition of syntactically obligatory elements is permitted (Brown, 1973) - give a more detailed set of criteria for defining 'obligatory'. Second, production task, context, discourse sequence and intonation patterns are used to determine the linguistic target. Third, stereotypes and 'metacommens' (e.g. "yeah, right") are not analyzed. Lastly, utterances are considered to
include a substitution when the syntactic and discourse contexts force the use of a word form other than that being produced.

All the data analyzed in this thesis comes from the Menn & Obler (1990) collection. The transcripts from each language was collected and discussed by different researchers. The English data is from Menn (1990); the Dutch is from Kolk, Heling & Keyser (1990); the German is from Stark & Dressler (1990); the French is from Nespoulous, Dordain, Perron, Jarema & Chazal (1990); and the Italian is from Miceli & Mazzucchi (1990). The reader should keep in mind that all data comes from these respective authors, unless otherwise indicated.

As mentioned above, the transcripts have been segmented into utterances. For omission errors, I have adopted Menn & Obler's (1990) notation, placing the omitted elements in square brackets, "[]". For substitution errors, I have created my own notation: substitutions are italicized, with the target provided within the following parentheses.

A final comment about the data deals with the number of tokens. The agrammatic production data that I analyze involves a small number of tokens. Despite this small sample I must emphasize the importance of any aberrations from normal speech. Any production distinct from normal production must be accounted for. Any patterns governing disturbed production must be predicted by Universal Grammar. If patterns generalize across languages, as I show that they do, it behooves UG all the more to account for them.

2.4 ISSUES IN AGRAMMATISM

The current consensus is that agrammatics tend to omit functional categories in general (Caplan, 1987; Grodzinsky, 1984b, 1990). This consensus has led to a line of research that leaves five issues unresolved. First, since omission of functional categories is the most striking aspect of agrammatic production, attention has centered on the behavior of functional categories rather than that of lexical categories. A few studies on the production of specific lexical categories exist. Friederici & Saddy (1991) discuss agrammatic processing of the various
syntactic categories. Fradis et al. (1992) compare Romanian-speaking aphasic production of nouns, verbs, adjectives and adverbs. However, there have been few attempts to compare the relative omission (and substitution) rates of the various lexical and functional categories.

Second, despite the consensus that functional categories are impaired, systematic studies of individual functional categories are scant (Grodzinsky, 1988, 1991; Hofstede & Kolk, 1994). There have been studies which touch on prepositions and particles (Jackendoff, 1977; Friederici, 1982; Grodzinsky, 1988), pronouns (Linebarger et al., 1983; Jarema et al., 1987; Friederici et al., 1991; Jarema & Friederici, 1994) and determiners (Goodglass et al., 1972; Zurif et al., 1972; Gleason et al., 1975; Goodenough et al., 1977; Schwartz et al., 1980; Bernstein, 1994; Jarema & Friederici, 1994). However, these studies focus only on comprehension, which brings us to the third issue.

Most studies focus on comprehension rather than production. What research there is on agrammatic production of functional categories focuses on prepositions (Friederici, 1982; Grodzinsky, 1988; Reyes, 1989; Tesak & Hummer, 1994) and inflectional morphology (Miceli

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9 The cross-linguistic collections of agrammatic narratives in Menn & Obler (1988, 1990) certainly attempt to tabulate the omission and substitution rates of the different categories (the languages include English, German, Swedish, Icelandic; French, Italian; Polish, Serbo-Croatian; Hindi; Finnish; Hebrew; Chinese; Japanese). They argue that a well-defined hierarchy of omission cannot be established but that the following tendency is exhibited: Aux & empty V > pre/post-position & pronouns > Det > N & V. Moreover they argue that the agrammatic deficit cannot be reduced to a purely phonological, morphological or syntactic deficit. For many of the languages not enough data was collected to be able to make any generalizations. However, in this thesis I reanalyze their data and find that, for the 5 languages that I focus on, generalizations are indeed possible.

10 Friederici et al. (1991) report on agrammatic comprehension of pronouns in German, Dutch, concluding that the errors depend on the semantic and syntactic information that is encoded rather than their phonological status, syntactic category or grammatical relation. Jarema & Friederici (1994) investigate agrammatic comprehension of articles and pronouns in French, with similar conclusions.

11 Jarema & Kehayia (1992) are a notable exception. They investigate the comprehension and production of number and tense in French-speaking agrammatics.

12 Friederici (1982) focuses on the production and grammaticality judgment of aphasics with regards to prepositions. She finds that there is a distinction between Wernicke’s and Broca’s aphasics. She finds that Wernicke’s aphasics perform better with syntactically determined prepositions for both tasks. Broca’s aphasics, on the other hand, perform well on the judgment task regardless of the role of the preposition. However, with the production task, agrammatics have difficulties producing syntactically conditioned prepositions. Grodzinsky (1988) investigates agrammatic treatment of prepositions and argues that the deficit involves government.
et al., 1983; Lorch, 1990; MacWhinney & Osmán-Sági, 1991; De Bleser & Luzzatti, 1994). Virtually no attention has been paid to the production of functional categories within the noun phrase, namely determiners and pronouns. Although some argue that similar aspects are affected in comprehension and production (Bradley, Garret & Zurif, 1980; Friederici & Saddy, 1991), there is no consensus with respect to the parallel between the two modalities (Grodzinsky, 1990). Moreover, even if we were to assert a parallel between comprehension and production deficits, independent studies of production are still required.

Fourth, much of the focus has remained on omission errors. Substitution errors are just as striking. Grodzinsky (1984) argues against characterizing agrammatism as an omission deficit. He shows that while free functional morphemes are omitted, substitution errors are found with bound functional morphemes. Grodzinsky makes the first important steps in the direction of noticing and explaining substitution errors. However, several problems arise. Grodzinsky’s claim implies that omission and substitution only involve functional categories. I argue that this is not the case: lexical categories are also affected by omission and substitution. As well, Grodzinsky’s claim implies that free morphemes do not undergo substitution. This too I show to be false: both free and bound morphemes undergo substitution. Lastly, where substitution errors do exist, Grodzinsky claims that the shift is to a base form (a stem containing no affixes) or the result of guessing (which, presumably is random). I argue that neither of these approaches is in evidence: substitution patterns are not random and do not always select the base form, even when one is available. Moreover, Grodzinsky’s explanation assumes that all categories that undergo substitution do so to the same extent. In other words, the assumption is that different categories suffer the same rate of substitution. Once again, I show this to be false.

Lastly, research on agrammatism focuses on omission and substitution errors, as opposed to misarticulations and rate of speech. These errors have been explained in terms of Tesak & Hummer (1994) argue against Grodzinsky, finding that there is no difference between governed and ungoverned prepositions. Bebout (1993) discusses aphasic treatment of morphological and syntactic negation, with morphological un- being more intact. She also discusses the complexities involved with adverbs, prepositions and derivational affixes.
phonology (Kean, 1977, 1979, 1980), morphology (Jarema & Kehayia, 1992), semantics (Caramazza & Hillis, 1989) and syntax (Grodzinsky, 1984a, 1984b, 1990; Caplan, 1987, 1992). However, the two following questions have rarely been asked: what exactly is omission? and what exactly is substitution? In other words, what exactly are the structures that underlie agrammatic utterances? When omissions are in evidence, what is 'missing'? The sounds? The syntactic word? The syntactic structure? When substitutions are produced, what features are altered? Segmental features? Syntactic features? Semantic features?

In the following chapters I address these five issues. The focus of this thesis is production. The bulk of my analysis centers on the structures that underlie the agrammatic utterance, concluding that the structures themselves are produced as in normal speakers. I investigate the omission and substitution patterns of both lexical and functional categories. Specifically, I examine the behavior of the following categories: noun, verb, determiner, pronoun, clitic, auxiliary and modal. I conclude that the agrammatic deficit lies outside the phonological, syntactic and semantic components proper. Instead, omissions and substitutions result from an impairment to the interface mechanisms between the Lexicon, the Syntax and the Phonology.
Agrammatic production has traditionally been characterized as involving errors of omission and errors of substitution. This chapter addresses errors of omission. The utterances in (1) illustrate omission errors in agrammatic speech. Examples are from English (1a), Dutch (1b), German (1c), French (1d), and Italian (1e). Omissions are indicated by square brackets '[]'. Items which are omitted are underlined in the translation.

(1) Agrammatic clauses with omissions

a. the wife was showing [DP] the clock
   "the wife was showing him the clock"

b. zondagochtend [Aux] [DP] gewerkt
   Sunday-morning [Aux] [DP] work:Part
   "Sunday morning I had worked"

c. später begutachtet [DP] seinen Kukuruz
   later examines [DP] his corn
   "later he examines his corn"

d. et peu après [DP] contemple [Det] récolte
   and little after [DP] gazes at [Det] harvest
   "and a little later he considers the harvest"

e. i (gli) uccelli non mangiano [DP]
   the:M-Pl (the:M-Pl) birds not eat:3Pl [DP]
   "the birds don't eat the seeds"

There are two basic issues which arise when investigating errors of omission: the nature of the omissions and their distribution. I address the nature of omissions first. What is omission? In other words, when an utterance includes an omission, what exactly is missing? The sound pattern? The syntactic category? The syntactic projections associated with that category? If structures are projected when agrammatics produce utterances with omissions, which ones are projected and what principles govern these structures? To determine what omissions are we must establish (i) what principles govern the words that are produced and (ii) the syntactic structures that underlie agrammatic utterances with omissions.
I begin by addressing the role of UG in agrammatic production. I show that the agrammatics under study produce utterances that are indistinguishable from normal production. Normal intact utterances are by definition governed by the principles of Universal Grammar (UG). I argue that intact agrammatic utterances are governed by the same UG principles found in the non-pathological population. Moreover, I maintain that UG principles govern agrammatic utterances that show omissions. Specifically, I argue that agrammatics do not produce clauses that violate the principles of UG. There are two possible interpretations of this claim. First, the agrammatic grammar and the normal grammar may be identical. Thus, the grammar of an English-speaking agrammatic would be the same as the grammar of a non-pathological English speaker. The second possibility is that the agrammatic speaker has a grammar different from the non-pathological speaker, but one that is nevertheless governed by UG. For example, an English-speaking agrammatic may now possess the grammar of, say, Italian. I will defend the position that agrammatics retain the grammar of their own native language.

I will then address the issue of what syntactic structures underlie agrammatic utterances that contain omissions. The logical possibilities are as follows: a complete absence of syntactic structures, a minimal set of (lexical) projections, a more substantial but incomplete set of projections, the full array of syntactic projections. I discuss each in turn, beginning with the most spartan hypothesis, that there is no syntactic structure. If there is a complete absence of structure, a possible result is chaos. If agrammatic utterances are chaotic, we expect random ordering of constituents. The fact that we get basic word order argues against a chaotic approach to agrammatic production. To derive basic word order minimally we must have a string of lexical categories (N, V, etc.), with no phrasal projections. Mechanisms independent of grammatical principles may govern agrammatic utterances, thus producing basic word order.

The second possibility is that there is a minimal amount of phrasal structure. Minimally we must have the lexical projections NP, VP and S. To account for early language acquisition, Radford (1990) proposes the Lexical Projection Hypothesis, whereby only lexical projections are available. I test this hypothesis on agrammatic production. The Lexical Projection Hypothesis
derives subject-predicate order as well as verb-object order. However, it cannot account for the presence of functional projections nor can it derive any word orders requiring movement to functional projections. I argue that both of these are in evidence in agrammatic speech. Functional projections must be present. The Lexical Projection Hypothesis must be discarded for agrammatic production.

The third possibility is that a fairly substantial but incomplete array of syntactic structures are projected in agrammatic clauses. Ultimately I argue that agrammatic clauses with omissions require the presence of at least two functional projections above the verb phrase (VP). Once again I draw from the acquisition literature. Around the age of 2, children frequently produce main clauses with infinitival verbs (henceforth root infinitives), where this option is disallowed in the target languages. This is often referred to as the optional infinitive stage. There are two proposals that I consider: Rizzi’s (1994a,b) Truncation Hypothesis and Poeppel & Wexler’s (1993) Optional Tense Hypothesis (also see Wexler, 1993, 1994). The Truncation Hypothesis states that all functional projections above and including TP are absent from root infinitives. The result is that only one functional projection is present in these structures. The Optional Tense Hypothesis states that only TP is absent from root infinitives. I test both proposals using agrammatic production and show that neither can account for the data.

Although the agrammatic data supports the existence of only two functional projections, I argue for the fourth and last possible set of syntactic structures: the full array of projections. My argument is based on the fact that agrammatic clauses display the full assortment of syntactic movement. If only two functional projections are present (assuming a model that requires more than two projections), we expect a restricted pattern of movement. This does not appear to be the case. I therefore conclude that agrammatic clauses, regardless of how many omissions, contain the full set of syntactic projections.

Having argued that the agrammatic clause includes the complete array of syntactic projections, I discuss the rate and distribution of omissions. Although any syntactic category may be omitted, not all categories are omitted with the same frequency. I show that the severity of the
deficit affects rates of omission. The more severe the deficit (as indicated by Mean Length of Utterance (MLU) and Mean Rate of Production (MRP) in words/minute), the higher the omission rates. Furthermore, I show that while absolute rates of omissions do vary from agrammatic to agrammatic, the relative rates of omissions are constant across agrammatics and across languages. The hierarchy of retention is as follows: N > V > D > Aux/Modal, where “>“ means “better retained than”. Moreover, two categorial splits are apparent. Lexical categories are produced more frequently than functional categories. Nominal categories are produced more frequently than verbal categories.

I end this chapter with a summary of the findings and return to the explanation of omission errors to chapter 5.

3.1 THE ROLE AND SIGNIFICANCE OF UNIVERSAL GRAMMAR

The single most important question to ask about agrammatic production is the following: What principles govern agrammatic utterances? A follow-up question is: What is the role of Universal Grammar? First, let me define the various domains that this discussion assumes. Universal Grammar (UG) governs the languages of non-pathological speakers. Each language is an instantiation of UG, which may result in a different language-specific grammar. The non-pathological speaker of any given language (or dialect) works with the Normal Grammar of that language (or dialect). I refer to this Normal Grammar as NG. NG is licensed by UG since it is one of the possible languages that is governed by UG principles. Assume the language of agrammatic speakers is governed by some set of principles (even if that set is simply the principle that there are no principles). I refer to this set as the Agrammatic Grammar, or AG. We can now discuss the relationship between AG and UG. There are four logical possibilities: UG and AG are completely separate; UG and AG intersect; AG is governed by UG, but is distinct from NG; AG is constrained by UG only indirectly, via NG. The first possibility is that AG and UG are independent of each other. The second is that some aspects of AG are constrained by UG but
others are not. The third possibility is that AG is directly constrained by UG, and is a grammar distinct from NG. The last possibility is that UG constrains AG via NG; in other words, AG is not reanalyzed as a grammar other than the original NG.

3.1.1 *Universal Grammar and Agrammatic Grammar Are Not Independent*

The first possibility is that AG and UG are independent of each other. If the grammar governing agrammatic production is completely removed from UG, there is no reason to expect agrammatic utterances to be similar to normal utterances. However, in addition to utterances with omissions, agrammatic speakers produce utterances with no omission or substitution errors. The data in (2) are examples for English (2a), Dutch (2b), German (2c), French (2d) and Italian (2e). The examples in (1) and (2) are from the same speakers: EF for English, DB for Dutch, GB for German, FC for French and IV for Italian. Each of the other agrammatic speakers (EE, DH, GM, FA and IR) can produce utterances with and without errors as well. For other examples of agrammatic clauses without errors see Appendix (1-2).

(2) Agrammatic Clauses without Errors

a. the dog steals the chicken
   English (EE)

b. de oude vrouw is ook woedend
   the old woman is also furious
   "the old woman is also furious"
   Dutch (DH)

c. der Wolf war tot
   the wolf was dead
   "the wolf was dead"
   German (GM)

d. j'ai subi une attaque la nuit
   I have suffered a night attack
   "I had an attack at night"
   French (FA)

e. e' un po' difficile spiegare la situazione
   be:Prs-3Sg a bit difficult explain:Inf the situation
   "it's a bit difficult to explain the situation"
   Italian (IV)
The data in (2) are identical to clauses produced by normal speakers. Recall that normal clauses are by definition governed by UG (either via NG or not). That means one of two things. First, if AG is independent of UG, AG must be able to produce strings identical to those produced by UG by means of principles that differ from those of UG. It is conceivable that these strings are produced using a set of semantic heuristics completely independent of UG. Such is the contention of Safran et al. (1980). They argue that constituent ordering is dependent on factors like animacy and potency. Safran et al. test the production abilities of five English-speaking agrammatic subjects. The agrammatics performed picture descriptions as well as sentence ordering tasks, which required them to piece together written sentence fragments. For the first experiment, the subjects were asked to describe pictures that depicted action relations (3) and locative relations (4). Examples of the target sentences are presented below.

(3) Some Target Sentences for Experiment 1 in Safran et al. (1980): Action Relations

a. The girl runs to the man.
b. The man washes the baby.
c. The girl runs to the house.
d. The man washes the car.

(4) Some Target Sentences for Experiment 1 in Safran et al. (1980): Locative Relations

a. The pencil is in the sink.
b. The ring is in the cup.
c. The bird is in the sink.
d. The mouse is in the cup.

The (a-b) sentences have like animacy for both arguments. For (3ab) both arguments are animate. For (4ab) both arguments are inanimate. The (c-d) sentences have opposing animacy for the two arguments in each of the sentences. Safran et al. found that agrammatic "[w]ord order was incorrect on more than one third of the trials in like-animacy conditions [...] In contrast, few errors occurred in the A/I [animate/inanimate] conditions" (1980:268). This effect was also

1 It should be noted that Safran et al. (1980) scored any deviation from canonical word order as errors. Thus the string "the wagon is pull the boy" would be scored as a word order error rather than as a correct passive sentence (cf. the wagon is pulled by the boy). Since correct non-
found in the sentence ordering task. They conclude that “agrammatic speech is generated without underlying structures that represent logical relations” (1980:278). Instead, word ordering reflects factors like animacy.

There are three problems with a semantic approach. First, semantic heuristics are general and apply across languages. If semantic heuristics govern word order, we expect agrammatics to use the same word order strategies across different languages. However, language-specific canonical word order is preserved in sentence production cross-linguistically (Pick, 1913; Smith & Mimica, 1984; Bates et al., 1988; Nespoulous et al., 1988; Ulatowska, 1988; Chen, 1989, 1993; Niemi et al., 1990; MacWhinney & Osmán-Sági, 1991; MacWhinney et al., 1991; Slobin, 1991). Since canonical word order varies from language to language, the set of semantic heuristics would have to vary accordingly, incidentally matching the orders derived by UG/NG.

Second, if word order is semantically driven, then it should be fairly rigidly constrained. In other words, for any given language, an agrammatic is expected to produce minimal variation in word order, if any. However, agrammatics use the same variety of complex relations and structures in a clause as normals do, though at a much lower rate (Armstrong, 1992). Moreover, when comparing agrammatic and normal production, Bates et al. (1988) find that English-, French- and Italian-speaking agrammatics produce both canonical and non-canonical word orders. Although there is a tendency for agrammatics to overuse the canonical word order, they do produce correct non-canonical word order in appropriate discourse situations. Such non-canonical word orders might be semantically driven; if so, however, the semantic heuristics would have to derive all the orders that incidentally match those derived by the principles of UG/NG. Further, variation in word order is more restricted for English-speaking agrammatics, where word order is more rigid, than for Italian-speaking agrammatics, where a freer word order

canonical word orders are part of the inventory of agrammatic production, they cannot be simply dismissed as errors.

2 Schwartz et al. (1980) report similar findings with a picture-pointing comprehension test.

3 Word order is also preserved in comprehension. Studies on grammaticality judgments (Wulfeck et al., 1991) have shown that English speaking agrammatics are sensitive to word order. These findings reveal that agrammatics retain the ability to construct representations. As well, Japanese
is the norm. This reveals that agrammatics must have access to language-specific syntactic constraints governing word order. Bates et al. (1988) conclude that word order in agrammatism is intact.

Third, if AG is independent from UG, it is completely coincidental that agrammatic strings have the same ordering as the strings produced by non-pathological speakers. For the production experiment in Safran et al. (1980), the agrammatics all produce an N-V-N order (when they manage to produce all three components). This is exactly what UG/NG would derive.

I show below that constituent order in agrammatic utterances is identical to that of non-pathological speakers. There are two basic types of constituent ordering: major constituent ordering (subject-predicate), and ordering within a constituent (determiner-noun, adjective-noun, verb-object, auxiliary-verb, adverb-verb). I consider each in turn below.

3.1.1.1 Major Constituent Order

Major constituent order is preserved. Subjects are appropriately ordered with respect to their predicates, and objects are appropriately ordered with respect to their verbs (Goodglass et al., 1972). The word orders for each of the five languages are not identical. I summarize the canonical word orders below (S=subject; Aux=auxiliary; V=verb; Adj=adjective; O=object), with predicates placed in square brackets "[ ]".

(5) a. English: S - [ (Aux) - V - O ]
   b. Dutch: S - [ Aux - O - V ]
      S - [ V - O ]
   c. German: S - [ Aux - O - V ]
      S - [ V - O ]

Phrasal integrity is also observed in comprehension tasks. Blumstein et al. (1991) show that while agrammatics do not show facilitory effects to word pairs forming constituents, they do show inhibitory effects with word pairs that cross syntactic boundaries.
d. French: \( S - [\text{(Aux)} - V - O] \)

c. Italian: \( [\text{(Aux)} V - O] - S \)

In (6), subjects are appropriately ordered with respect to their verbs. The last line of each example indicates the word order\(^5\). For more examples of S-V order see Appendix (3-4).

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\(^5\) The English and Italian data each display a single apparent counter-example to this expected word order. I begin with the English example, in (i).

(i) open the window
   “the window is open”

   In (i) the string is interpreted in Menn (1990) as “the window is open”. If we accept this interpretation, it appears as though the verb *open* has raised to T but that the subject *the window* has not raised to [Spec TP]. However, there is another possible interpretation of this utterance: “she opened the window”. Here, an action is described, with the resulting omission of the subject pronoun and the past tense marker. Pronoun and tense substitution are unambiguously attested elsewhere, which lends support to such an analysis. Moreover, the narrative which contains this utterance is a sequence of action descriptions. The sequence is presented below in (ii), with the ‘translation’ in (iii).

(ii) a. the girl asked the boy [P] [Det] cookie [P] [Det] jar
    b. [Det] leans [P]
    c. [DP] trips on the floor
   a’. [Det] mother washes the dishes
   b’. she absently pours water
   c’. [DP] open the window
   a”. [Ple] [Cop] [Det] nice day
   b”. [Ple] [Cop] a view shrubs, trees, grass

(iii) a. the girl asked the boy for a cookie from the jar
    b. the stool leans over
    c. it trips on the floor
   a’. the mother washes the dishes
   b’. she absently lets water pour (over the sink)
   c’. she opened the window
   a”. it’s a nice day
   b”. there’s a view of shrubs, trees, and grass

This sequence of statements is made up of three cohesive passages (the first sequence begins with (iia), the second with (iia’), the third with (iia’’)). The first makes reference to the activity that the boy and girl are involved in. The second describes the mother’s actions. The third shifts to a description of the view outside the window, and thus outside the main picture. The most likely interpretation is “she opened the window”, where a referential pronoun is omitted. Consequently, there is no word order violation. Rather, we have omission of the subject pronoun and a tense shift.

Consider now the Italian example in (iv)

(iv) il paniere prende con dentro, qua, con dentro tante cose
   the basket takes with inside, here, with inside many things
   “the basket has many things inside”

   The order is interpreted to be *prende il paniere con dentro tante cose*, with the verb in initial position. However, the sentence in (ii) simply displays a subject-shift construction. This is achieved by left dislocation. This process is usually accompanied by a resumptive clitic, which is absent in the agrammatic utterance. Whether or not the resumptive clitic is required, no word
(6) Agrammatic Clause Order: Subject-Predicate Order

a. [Det] nurse shaved me  
"the nurse shaved me"
S - V - O  
English

b. [Det] agent pakt de dief  
[D] policeman catch:3Sg the thief  
"a/the policeman catches the thief"
S - V - O  
Dutch

c. ein Einbrecher nutzt die [N]  
a thief uses the [N]  
"a thief uses the opportunity"
S - V - [O]  
German

d. ma femme [Aux] appelé/er un ami et les pompiers  
my wife [Aux] call:Part/Inf a friend and the firemen  
"my wife called a friend and the firemen"
S - V - O  
French

e. [CL] [Aux] mangiato il cane  
[CL] [Aux] eat:PastPart-M-Sg the dog  
"the dog has/had eaten it"
[CL] - [Aux] - V - S  
Italian

For each of the examples in (6), the word order is appropriate: subject-predicate (S-V) for English, French, Dutch and German; and predicate-subject (V-S) for Italian. In (7), subjects appropriately precede their predicate adjectives6. The required order for each of the languages is: S-Cop-Adj (Cop = copula; Adj = predicate adjective). The German example includes negation (Neg), which is appropriately ordered but which can be ignored for our purposes (since we are concerned with subject-predicate ordering). For more examples of subject-predicate adjective order, see Appendix (5).

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6 Italian displays an apparent counter-example to this word order. Consider the following.

(i) teso molto teso mi sentivo io  
tense very tense refl felt:1Sg I  
"I felt tense, very tense"

The required order is apparently io mi sentivo teso molto teso. However, the order in (i) is actually grammatical since word order in Italian is fairly liberal. The sentence in (i) displays fronting of the complement of sentivo "felt" (i.e. teso molto teso) and right dislocation of the subject io.
(7) Agrammatic Clause Order: Subject Precedes Predicate Adjective

a. [Det] chicken [Cop] gone  
   “the chicken is gone”  
   S - [Cop] - Adj

b. [Det] kippebout [Cop] weg  
   [Det] drumstick [Cop] gone  
   “the drumstick is gone”  
   S - [Cop] - Adj

c. die Abgase [Cop] nicht desund  
   the exhaust-fumes [Cop] not healthy  
   “the exhaust fumes were not healthy”  
   S - [Cop] - Neg - Adj

d. les (mes) souvenirs [Cop] flous  
   the (my) memories [Cop] vague  
   “my memories were vague”  
   S - [Cop] - Adj

e. la nonna e Cappuccetto Rosso [Cop] salve  
   the grandmother and LRRH [Cop] safe:F-Pl  
   “the grandmother and LRRH were safe”  
   S - [Cop] - Adj

In (8), subjects correctly precede predicate nominals. The required order for each of the languages is: S-Cop-NP (NP=noun phrase).

(8) Agrammatic Clause Order: Subject Precedes Predicate Nominal

a. RRH [Cop] [Det] pretty girl  
   “LRRH is a pretty girl”  
   S - [Cop] - NP

b. ik [Cop] automonteur  
   I [Cop] motor-mechanic  
   “I was an automechanic”  
   S - [Cop] - NP

c. der (das) erste Wort [Cop] Scheisse  
   the:Nom-M-Sg (the:N) first word:N [Cop] shit  
   “the first word was shit”  
   S - [Cop] - NP

d. c’était une petite fille  
   it be:Impf-3Sg a little girl  
   “it was a little girl”  
   S - Cop - NP
Agrammatics also correctly produce non-canonical word orders. First, agrammatic production includes Wh-questions, as illustrated below.

(9) Agrammatic Clause Order: Wh-word in Initial Position

a. no examples in the database
   English

b. hoe heet dat
   how call:1Sg that
   “how do you call that?”
   Wh - V - O
   Dutch

c. warum hast du [Adv] [Adj] Ohren
   why have:Prs-2Sg you [Adv] [Adj] ears
   “why do you have such big ears?”
   Wh - V - S - [Adv] - O
   German

d. où [DP] [Modal] voir [Det] cardiologue
   where [DP] [Modal] see:Inf [Det] cardiologist
   “where I would see a cardiologist”
   Wh - [S] - [Mod] - V - O
   French

e. dove [Cop] la foccacia
   where [Cop] the cake
   “where is the cake?”
   Wh - [Cop] - S
   Italian

For each sentence in (9), the Wh-phrase is in the expected initial position. Moreover, for Dutch and German, the verb is in the required second position. The next set of non-canonical word orders are specific to Dutch and German. Both languages allow non-subjects in initial position, with tensed verbs in second position. This order is illustrated with the following examples. For more examples of non-subjects in initial position, see Appendix (6).

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7 This is an example of an embedded question.
(10) Agrammatic Dutch and German: Non-Subjects in Initial Position

a. [Det] kippebout [Aux] [Det] hond gepakt
   “the dog takes the drumstick”
   O - [Aux] - S - V

b. später begutachtet [DP] seinen Kukuruz
   “later he examines his corn”
   Adv - V - [S] - O

The Dutch sentence has the object in initial position. The German sentence has an adverb in initial position. Both examples are licit structures. Dutch and German also display an alternate word order in embedded clauses: tensed verbs and tensed auxiliaries must be in final position. This order is also attested in agrammatic production. For more examples of embedded clauses, see Appendix (7).

(11) Agrammatic Dutch and German: Embedded Clauses with Final Tensed Verb/Auxiliary

a. no examples in the database
   Dutch

b. damit ich besser hören kann
   “so that I can hear better”
   Comp - S - Mod - V - Aux

French and Italian also display word orders that differ from those presented in (5). Both languages make use of object clitics (Cl). The required word order is: S-Cl-V. This contrasts with the canonical order where the object follows the verb. The clitic word order is attested in German displays a single apparent counter-example to correct Vtns placement, in (i).

(i) der Wolf fragt sie ah wo geht sie hin
   “the wolf asks her where she’s going”

   The apparent correct word order is *der Wolf fragt sie ah wo sie hin-geht*. The sequence *wo geht sie hin* in (i) is interpreted as an indirect question. The word order of indirect questions is like that of embedded clauses, with Vtns in final position. But Vtns in the sequence is in second position. However, this utterance can be analyzed as a direct question, with the formal *Sie*:

(ii) der Wolf fragt sie ah: “Wo geht Sie hin?”
    “the wolf asks her: “Where are you going?””

With the sequence interpreted as a direct question, there is no word order violation.
agrammatic speech, as illustrated below. For more examples of agrammatic clauses with clitics, see Appendix (8).

(12) Agrammatic French and Italian: Clitics

a. elle la (le) réveille
   she her (him) wakes
   “she wakes him up”
   S - Cl - V

b. [Det] ragazzo li prende
   [Det] boy them gets
   “the boy gets them”
   S - Cl - V

As stated above, the canonical word order for Italian is V-O-S. However, S-V-O is also fairly common. The latter is attested in agrammatic speech as well. For more examples of SVO order in Italian agrammatic clauses, see Appendix (9).

(13) Agrammatic Italian: SVO Order

io ho visto [Det] sala da operazione
I have:1Sg see:PastPart [Det] room of operation
“l saw the operating room”
S - V - O

Thus both canonical and non-canonical word orders are preserved in agrammatic speech. These orders are identical to those produced by normals, whose production is governed UG. If the principles governing agrammatic utterances (AG) are independent of UG, they must mimic every structure produced by UG.

3.1.1.2 Word Order Within Constituents

Word order internal to constituents is preserved. Within major phrasal constituents such as DP and VP, the syntactic categories that are produced are appropriately ordered with respect to each other. Within nominal constituents, determiners are appropriately ordered with respect to
nouns (Friederici & Saddy, 1991), as are adjectives (Sanchez, 1992b; Grodzinsky, 1984ab). Within verbal constituents, objects are appropriately ordered with respect to verbs (Goodglass et al., 1972) and auxiliaries are appropriately ordered with respect to verbs.

I begin with DP. The DP-internal order is {Det N} for all languages. This is the order that is produced, as illustrated in (14). In each case, the determiner precedes the noun that it specifies. For the sentences that follow in this section I underline the category under discussion (here it is the determiner) and place the relevant categories within curly brackets “{ }”. The last line of each example displays the categories contained within the curly brackets.

(14) Agrammatic Nominal Constituents: {Det N}

a. {the girl} asked {the boy} [P] [Det] cookie [P] [Det] jar
   “the girl asked the boy for a cookie from the jar”
   {Det N} ... {Det N}

b. en dan [Det] agent pakt {de dief}
   and then [Det] policeman catch:3Sg the thief
   “and then a/the policeman catches the thief”
   {Det N}

c. {die Frau} weckt [DP] wieder
   the woman wakes [DP] again
   “the woman wakes him again”
   {Det N}

d. {les enfants} cherchent {les gâteaux}
   the children look:Prs-3Pl the cakes
   “the children are looking for the cakes”
   {Det N} ... {Det N}

e. {il ragazzo} prende [Det] biscotti
   the boy gets [Det] cookies
   “the boy is getting some cookies”
   {Det N}

Adjectives and nouns are appropriately ordered with respect to each other. The required order for adjectives and the nouns they modify are as follows: {Adj N} for English, Dutch, and...
German; \{Adj N\} or \{N Adj\} for French (depending on the subclass of adjective); \{N Adj\} for Italian. These are the orders that are produced, as illustrated in (15)\(^{11}\). For every sentence I have underlined the adjective and placed the relevant categories within curly brackets "\{"\}". Notice that for French both orders are attested, with the correct subclasses of adjectives. For more examples of Adjectives modifying nouns in agrammatic clauses, see Appendix (10).

(15) Agrammatic Nominal Constituents: Adjective and Noun

a. my \{right side\} was limp
   \{Adj N\}

b. ja de \{oude vrouw\} is ook woedend
   yes the old woman is also furious
   "the old woman is also furious"
   \{Adj N\}

c. das Paar steht voll vor [Det] \{leeren Korb\}
   the couple stands full in-front-of [Det] empty basket
   "the couple stands in front of the/ an empty basket"
   \{Adj N\}

d. [Det] \{grands yeux\}, les \{yeux percants\}
   big eyes, the eyes piercing
   "big eyes, piercing eyes"
   \{Adj N\} ... \{N Adj\}

e. solanto l'\{occhio sinistro\} [CL] [Aux] aperto
   only the eye left [CL] [Aux] open:PastPart
   "only my left eye was torn open"
   \{N Adj\}

Thus the order within nominal constituents is preserved in agrammatic production. I now turn to VP. Objects are appropriately ordered with respect to their verbs\(^{12}\), as shown in (16).

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\(^{11}\) French displays a single apparent counter-example with respect to correct adjective placement. The utterance in (ia) should have the order in (ib).

(i) a. et Grand-mère comme vous les avez euh les \{grands \{grandes\} dents\}
   and Grandmother how you them have um the \{big:bare \{big:F\} teeth:F\}
   "and Grandmother, what big teeth you have"

b. et Grand-mère comme vous les avez grandes les dents
   and Grandmother how you them have big:F the teeth:F

There are two possible interpretations of this example. First, there is a hesitation ("euh") between the verb \textit{avez} "have" and the determiner \textit{les} "the". This may indicate an omitted adjective. Second, the first instance of \textit{les} is interpreted as the clitic "them". It may be an anticipatory error: the anticipation of the determiner \textit{les} "the".

\(^{12}\) English displays an apparent word order problem with respect to direct and indirect objects. Consider the example in (i).
(16) Agrammatic VP Order: Object is Adjacent to Verb

a. [DP] spread [Det] cloth, napkin (napkins), dish (dishes)  
   “they spread a cloth, napkins, dishes”  
   [S] - V - O  
   English

b. [DP] [Aux] [Det] gas uit-gedaan  
   [DP] [Aux] [Det] gas off-turned:Part  
   “she turned off the gas”  
   [S] - [Aux] - O - V  
   Dutch

c. [DP] hatte einen (einen) Korb gepackt  
   [DP] have:Pst-3Sg a:Dat-M-Sg (a:Acc-M-Sg) basket pack:Part  
   “she had packed a basket”  
   [S] - Aux - O - V  
   German

d. je [Aux] perdu la parole  
   I [Aux] lose:Part the speech  
   “I lost my speech”  
   S - [Aux] - V - O  
   French

e. il ragazzo prende [Det] biscotti  
   the boy gets [Det] cookies  
   “the boy is getting some/the cookies”  
   S - V - O  
   Italian

Objects follow their verbs in English, French and Italian. For Dutch and German, objects precede the main verbs, but follow the auxiliaries. Thus canonical word order is preserved in agrammatic speech.

Next, auxiliaries and modals are appropriately ordered with respect to verbs\(^\text{13}\). For matrix clauses the required order for each of the languages is \{Aux/Mod V\}. This order is attested for each language, as illustrated in (17). I have underlined the auxiliary and placed the relevant categories within curly brackets “\{\}”. For each example except German, the auxiliary and the verb are neighboring categories. For German, the object intervenes, resulting in the following order: \{Aux O V\}. Although this is the expected order, what is relevant is that the auxiliary precedes the verb.

(i) the boy give (gives) to the girl a cookie  
   “the boy gives a cookie to the girl”  
   The appropriate word order is the boy gives a cookie to the girl. However, with focus NP shift, (i) is a legitimate structure (note: pauses are present preceding and following the girl).
(17) Agrammatic Verbal Constituents: \{Aux Vpart\} or \{Mod Vinf\}

a. the wife \{was showing\} [DP] the clock
   “the wife was showing him the clock”
   \{Aux Vpart\}

b. [DP] \{moet lopen\}
   [DP] must:Prs-lSg walk:Inf
   “I must walk”
   \{Mod Vinf\}

c. [DP] \{hatte einem (einen) Korb gepackt\}
   [DP] have:Pst-3Sg a:Dat-M-Sg (a:Acc-M-Sg) basket pack:Part
   “she had packed a basket for grandmother”
   \{Aux O Vpart\}

d. je [CI] \{suis occupé\} à faire à manger
   I [CI] am occupy:PastPart to make:Inf to eat:Inf
   “I busied myself with getting smething to eat”
   \{Aux Vpart\}

e. Giovedi \{sono andato\} sotto \[per\] [V] la TAC
   Thursday am go:PastPart downstairs [to] [V] the CT-scan
   “Thursday I went down for a CT-scan”
   \{Aux Vpart\}

There is a different order for Dutch and German embedded clauses: \{V Aux/Mod\}. For more examples of embedded clauses in agrammatic production, see Appendix (7).

(18) Agrammatic Dutch and German: \{V Aux\} in Embedded Clause

a. no examples in database
   Dutch

b. weil sie (es) wa’ [zu] \{essen haben (hat)\}
   because they (it) something [to] eat:Inf have:3PUInf (have:3Sg)
   “because they have something to eat”
   \{Vinf Aux\}

Further evidence for intact word order lies with the correct ordering of adverbs and negation with respect to verbs. Adverbs follow tensed verbs, copulas and auxiliaries, but precede untensed verbs (like participials Vpart and infinitivals Vinf)\(^1\). I illustrate the \{Vtms Adv\}

\(^1\) I recognize that auxiliaries and modals are not necessarily in VP. What is relevant here is that auxiliaries and modals are appropriately ordered with respect to main verbs.

\(^1\) German and Dutch each display an apparent counter-example to correct word order. I begin with Dutch Vpart-Vinf structures, in (i).
order in (19) and the \{Adv Vpart/inf\} order in (20). For more examples of adverbs in agrammatic clauses, see Appendix (11).

(19) Agrammatic Verbal Constituents: \{Vtns Adv\}, \{Cop Adv\} or \{Aux Adv\}

a. it (‘s just) foolish
   \{Cop Adv\}

b. aber die Oma \{liegt noch immer\} im Bett
   “but the grandma is still lying in bed”
   \{Vtns Adv\}

c. und [DP] \{vergisst ganz\}
   “and she completely forgets”
   \{Vtns Adv\}

d. j’ai encore \{été suffocant\}
   “I suffocated still and all”
   \{Aux Adv\}

(i) a. inbreker binnen-stappen
    “the burglar stepped inside”
    Dutch

b. thuis-komen
   “they came home”
    Dutch

These examples supposedly violate verb compounding. The appropriate word order are as follows.

(ii) a. stapt binnen
    step:3Sg inside
    Dutch

b. komen thuis
   come:3Pl home
   Dutch

Compound verbs are composed of a particle and a verb stem. If the V is in the infinitive or past participial form, the particle is prefixed to the stem: Particle+Vinf. Otherwise, the particle follows the verb as an independent word: Vtns Particle. The Particle+Vinf is exactly what we have in (i). These examples are not instances of word order violations. Rather, they are instances of agrammatic untensed clauses.

Now consider the German apparent counter example to correct adverb placement, in (iii).

(iii) en eten vlug
    “and (he) ate quickly”
    German

The correct word order is \textit{en vlug eten}. Thus (iii) consists of a misplaced Adv. This interpretation is based on the assumption that \textit{eten} is in fact the infinitival form. However, dialectal variation allows for \textit{eten} to be interpreted as 3Pl as well as infinitival variation (pc from various native German speakers). If \textit{eten} is 3Pl, then the order in (133a) is the correct order. The tensed 3Pl verb raises to C, past the Adv. This utterance is not counter-evidence to intact word order production.
e. io {parlo assai}  
   I talk:Prs-lSg much  
   "I talk a lot"  
   {Vtns Adv}  

(20) Agrammatic Verbal Constituents: {Adv Vpart} or {Adv Vinf}

a. no examples in database  

b. en [DP] [Modal] gauw eten  
   and [DP] [Modal] quickly eat:Inf  
   "and he ate quickly"  
   {Adv Vinf}  

c. no examples in database  

d. [c’est] pour mieux t’entendre l’ (mon) enfant  
   [it’s] to better you hear the:Sg (my:Sg) child  
   "Better to hear you with, my child"  
   {Adv Vinf}  

e. no examples in database  

Lastly, I consider negation (Neg). For all but Italian, negation follows tensed verbs, auxiliaries and modals, but precedes untensed verbs (like participials Vpart and infinitivals Vinf). The orders are schematized as follows: {Vtns Neg}, {Aux Neg}, {Mod Neg}, {Neg Vpart} or {Neg Vinf}. Italian requires that negation precede the verb, whether tensed or untensed, with the resulting {Neg V} order. These are the orders that are attested in agrammatic speech, as illustrated below. For both German and Italian, other categories intervene between the verb and negation. However, these are appropriate orders. For more examples of negation in agrammatic clauses, see Appendix (12).

(21) Agrammatic Verbal Constituents: {Vtns Neg}, {Aux Neg} or {Mod Neg}

a. I {can’t} speak  
   {Mod Neg}  

b. nou ik {weet niet} hoor maar het {is niet} goed  
   well I know:Prs-lSg not you-know but is not right  
   "well, I don’t know but it’s not right"  
   {Vtns Neg} and {Aux Neg}
Thus the order within verbal constituents is preserved in agrammatic production.

Agrammatic speakers can produce clauses that are intact. Moreover, all constituents (and individual words) that are produced are in the order appropriate to the speaker's language. If AG consists of a series of semantic rules independent of the principles of UG, these rules must be extremely sophisticated and must very suspiciously mimic all of the language-specific ordering constraints, which are governed directly by UG (or indirectly, via NG). Not only must they
account for all the correct word orders, they must also be able to match up non-canonical word orders to appropriate discourse situations. Moreover, if purely semantic rules govern agrammatic production, it is coincidental that agrammatic utterances match consistently strings that are normally derived by syntactic projection and movement, governed by UG. Such systematic coincidence is unlikely. It must thus be the case that AG and UG share some principles.

3.1.2 Agrammatic Grammar is Constrained by Universal Grammar

The second possible relationship between AG and UG is that they intersect, sharing some principles but not others. The implication is that some of the agrammatic utterances are governed by UG while others are governed by principles independent of UG. We then expect to find agrammatic utterances that do not pattern like those governed by UG. However, I have argued that all agrammatic word orders conform to normal word orders. Thus whatever is produced by an agrammatic falls within the confines of UG.

That being the case, it seems odd to assume that agrammatic speakers, who have difficulty with language production, must control two language systems (UG and an independent set of semantic rules), while non-pathological speakers, who do not have these difficulties, simply use one grammar. Agrammatic speakers are suffering from reduced language ability yet they would be expected to control an added grammar with principles independent of the normal grammar. Also, it is unclear how the two systems would combine when agrammatic utterances start off as non-pathological but end up with missing elements. Following Occam’s razor, I assume that the system underlying language production for both the agrammatic and the normal speaker is the same grammatical system. Both are governed by the principles of UG. In other words, AG is constrained by UG. Two alternatives remain. Either AG is identical to the normal grammar NG, or AG is different from NG. The question to answer is the following: Are agrammatics working with a grammar that is identical to that of their native language or not? A
first step is determining what and how much structure is projected in agrammatic clauses. This is the issue to which I turn in the following sections.

3.2 FUNCTIONAL PROJECTIONS IN AGRAMMATIC PRODUCTION

As illustrated in (23), most agrammatic utterances are syntactically impoverished in that not all the words that are required of a normal utterance are present. For each of the following sentences, at least one lexical item is missing.

(23) Agrammatic Clauses with Omissions

a. the wife was showing [DP] the clock
   “the wife was showing him the clock”

b. zondagochtend [Aux] [DP] gewerkt
   Sunday-morning [Aux] [DP] work:Part
   “Sunday morning I had worked”

c. später begutachtet [DP] seinen Kukuruz
   later examines [DP] his corn
   “later he examines his corn”

d. et peu après [DP] contemple [Det] récolte
   and little after [DP] gazes at [Det] harvest
   “and a little later he considers the harvest”

e. i (gli) uccelli non mangiano [DP]
   the:M-Pl (the:M-Pl) birds not eat:3Pl [DP]
   “the birds don’t eat the seeds”

The agrammatic data is quite similar to data from language acquisition, examples of which are presented below. Example (24a) is from Weverink (1990), (24b) from Wagner (1985), (24c) from Pierce (1989), and (24d) from Guasti (1992).

(24) Acquisition clauses

a. ik paf’t [DP] op
   I pack:Psr-1Sg [DP] prt
   “I pack it”
Both agrammatic and acquisition data include strings that have 'missing' lexical items compared to the non-pathological adult. Researchers in both fields wish to determine what structures underlie these strings and whether they are the same structures as adults (for acquisition) and normals (for agrammatism).

Despite the similarities, there are some differences between acquisition and agrammatism. With acquisition the system under study is one that is developing, whereas the agrammatic system is a fully developed adult system that has 'gone wrong'. This distinction becomes relevant when we consider the evidence that runs through the acquisition literature. One of the goals of acquisition research is to establish which projections are present in early language production. One type of evidence lies in establishing whether or not the child can distinguish between tensed and untensed verbs. The assumption made in the acquisition literature is that if children can distinguish between tensed and untensed clauses, UG will force the required movement(s). Thus, if children can distinguish between tensed and untensed verbs, head-movement to a functional projection (FP) is available in early acquisition (specifically V-to-I movement). That being the case, the relevant FPs must also be present\(^\text{15}\). However, I argued above that agrammatics produce normal clauses which by definition include FPs. Thus, simply

\(^{15}\) In addition to lexical categories projecting structures in the syntax (i.e. noun and verb projecting NP and VP, respectively), functional categories are argued to project syntactic structures as well. Thus verbal inflection projects an IP; complementizers project a CP; and determiners project a DP. There is much debate about how many functional projections are available to the syntax. Some have proposed splitting IP into an agreement phrase (AgrP) and a tense phrase (TP or TP, depending on one’s theoretical bent) (Pollock, 1989; Chomsky, 1991; among others). And the numbers grow from there, with aspect phrases (AspP), agreement
the presence of a tensed V or Aux (in the correct position) is arguably evidence for an FP. We want to establish what FPs are present when there is no lexical evidence for them. In other words, if the clause in question is untensed, is there an IP, a CP or any other FP? Since the presence of a tensed verbal element (in the correct position) is itself evidence for an FP, the relevant data for our current purposes are restricted to clauses that do not contain items that display tense (present, past or future), examples of which I present below. I refer to these types of clauses as untensed clauses. Untensed verb forms therefore include participial and infinitival verbs. For my present purposes I ignore the distinction between inflected and uninflected untensed verb forms, where English bare verbs are an example of uninflected forms and English participials illustrate inflected forms.

(25) Agrammatic Untensed Clauses

a. the thief [Aux] arrested
   "the thief is arrested"

b. net boven [Aux] [DP] gehaald
   just upstairs [Aux] [DP] reach:Part
   "I had just reached upstairs"

c. mir [Aux] auch passiert
   me:Dat [Aux] also happen:Part
   "that has also happened to me"

d. je [Aux] perdu la parole [P] trois minutes
   I [Aux] lose:Part the speech [P] three minutes
   "I lost my speech within three minutes"

e. [CI] [Aux] mangiato il cane
   [CI] [Aux] eat:Part-M-Sg the dog
   "the dog has/had eaten it"

These agrammatic untensed clauses find their counterparts in early acquisition. Around the age of 2, children frequently produce main clauses with infinitival verbs (henceforth root infinitives), where this option is disallowed in the target languages. This is often referred to as the optional infinitive stage. Examples are shown in (26). Example (a) is from Klima & Bellugi phrases specific to subjects (AgrSP) and objects (AgrOP), and so on. As much as possible, I will use the neutral FP (=functional projection) to refer to functional projections in general.
(1966) in Guasti (1992), (b) from Weverink (1990), (c) from Wagner (1985), (d) from Pierce (1989), and (e) from Guasti (1992).

(26) Acquisition Clauses with Infinitival Verb

a. he no bite you  
   English

b. pappa schoenen wassen  
   daddy shoes wash:Inf  
   Dutch

c. Zahne pussen  
   teeth brush:Inf  
   German

d. pas manger la poupée  
   not eat:Inf the doll  
   French

e. lavare i piatti  
   wash:Inf the dishes  
   Italian

Recent work in syntactic acquisition has focused on the grammatical principles and structures that govern the production of root infinitives\(^\text{16}\). The debate is about how much structure is actually present in these acquisition data. At one end of the debate, it is claimed that only lexical categories (and their projections) are available in child language production (Parodi, 1990; Radford, 1990; Ouhalla, 1991; Meisel, 1994). At the other end, it is claimed that the same projections exist in both adult and child production (Weissenborn, 1990; Boser, Lust, Santelmann & Whitman, 1992; Poeppel & Wexler, 1993, 1994).

Similar issues are found in the study of agrammatic production data. Agrammatic production includes clauses with missing tensed verbs (or auxiliaries and modals). How much structure is present in these clauses? There are four possibilities. These are as follows.

(27)  
a. There is no structure.  
b. There is a minimal amount of structure.  
c. There is a substantial amount of structure, but not the full array of projections.  
d. The structure is complete.

\(^{16}\) For detailed discussions and analyses, please see the following references: Lebeau, 1988; Clahsen, 1990; Platzack, 1990; Radford, 1990; Weissenborn, 1990; Guilfoyle & Noonan, 1992; Poeppel & Wexler, 1993; Wexler, 1993; Rizzi, 1994ab; Ingram & Thompson, 1996; and many others.
As argued above, the first possibility can be easily dismissed.

The rest of this section is spent determining how much structure is present in agrammatic untensed clauses. To this end, I draw from the acquisition literature, focusing on three proposals: The Lexical Projection Hypothesis, The Truncation Hypothesis, and the Optional Tense Hypothesis. Radford (1990) proposes that only lexical projections are present (also see Lebeaux, 1988). I label this the Lexical Projection Hypothesis. Rizzi (1994a,b) offers the Trucation Hypothesis. He proposes that children in the optional infinitive stage produce a truncated syntactic structure. Specifically, children strip off the outer clausal layers (for his structure that means CP, AgrSP and TP). In other words, they retain everything below TP (for our purposes, that means they retain a single FP). Poeppel & Wexler (1993) propose the Optional Tense Hypothesis (also see Wexler, 1994) whereby these same children retain everything but TP for untensed clauses (for our purposes, that means they are missing only one FP). Although there is a gradation of FPs from Radford through Rizzi to Wexler, all three propose that untensed clauses are incomplete structures, missing all to one FP. I work through each proposal in turn, comparing the early acquisition and the agrammatic data.

3.2.1 Agrammatic Clauses Are More than Lexical Projections

I now consider the Lexical Projection Hypothesis. To derive basic word order we must have minimally the lexical projections NP and VP. Radford (1990) argues that only lexical projections are available in early production (the Lexical Projection Hypothesis or LPH). The implication of such an approach is that early acquisition will neither contain functional projections nor display movement that requires the presence of functional projections (FP).

Extending a Lexical Projection Hypothesis to agrammatic production would predict that agrammatics retain lexical projections (LPs), but not FPs. I argued above that the data required to test for the presence of FPs must display no lexical evidence of such projections. For verbal FPs, the data is reduced to untensed clauses. For nominal FPs, we must consider determiner
phrases (DPs) without determiners. It is difficult to show any evidence for nominal functional projections\(^\text{17}\). Consequently, the strength of my argument is determined by verbal functional projections. I begin the discussion of FPs with the nominal functional projection DP.

3.2.1.1 Nominal Functional Projections

I now address the existence of nominal FPs, in particular DP. The constructions under scrutiny are those that are missing the head D. If these missing items are in fact absent from the syntax, projecting no syntactic structure, then they cannot enter into any relations, whether syntactic or semantic. I will discuss two missing Ds: articles and English possessor 'x.

3.2.1.1.1 Missing Articles

In the languages under study, determiners encode the novel-familiar distinction. Indefinite articles generally introduce new discourse referents, while definite articles indicate familiar discourse referents. If determiners are missing, we do not expect to retrieve this distinction. However, the novel-familiar distinction is available even when determiners are missing. In each of the following sentences, the referent is novel, being introduced into the discourse. The missing determiner is thus interpreted as the indefinite article. I have underlined the relevant determiner. Below each sentence I give the relevant context, showing that the referent is indeed novel.

\begin{quote}
\textbf{(28) Agrammatic clauses: Null Determiner with Novel Interpretation}
\begin{align*}
a. \text{Red Riding Hood [Cop] [Det] pretty girl} & \quad \text{English} \\
& \quad \text{"LRRH was a pretty girl"}
\end{align*}
\end{quote}

\textbf{Context:} This is the introductory sentence to the story of LRRH.

\(^\text{17}\) Evidence for nominal FPs relies on movement within the DP (Giorgi & Longobardi, 1991). However, such strings are not available in the agrammatic database under study.
b. [Det] boer [Cop] [P] [Det] zaaien
[Det] farmer [Cop] [P] [Det] sow
“A farmer is sowing”

Context: This is the introductory sentence to a picture description about a farmer planting, and harvesting corn.

c. das Mädchen hatte sie immer [Det] rote Kappe auf ‘m Kopf
the girl have:Prs-3Sg she always [Det] red cap on the head
“the girl alwasy has a red cap on her head”

Context: The story is LRRH. The subject has introduced LRRH and is explaining why her name is L Red RR. This is the first mention of the cap.

d. y fouille les meubles
he search:Prs-3Sg the furniture

et prend un (une) montre et [P] [Det] argent
and take:Prs-3Sg a:M (a:F) watch and [P] [Det] money

“he searches the furniture and takes a watch and some money”

Context: The description is of a thief stealing. The subject has described the thief entering the apartment. This is the first mention of what the thief is actually taking.

e. [Det] assessore sanitario dice:
[Det] assessor sanitary say:Prs-3Sg:

“subito, subito, subito, [V] [Det] ambulanza!”
“quick, quick, quick,[V] [Det] ambulance!”

“The health inspector sasys: “Quick, get an ambulance!””

Context: The subject is describing the scene of his stroke. He was at a council meeting, had had a headache and then had fainted. This is the first description of the people around him calling for an ambulance.

For each of the following sentences, the referent is familiar, having been introduced earlier in the discourse. The missing determiner is thus interpreted as the definite article. I have underlined the relevant determiner. Below each sentence I give the relevant discourse context, showing that the referent is indeed familiar.

(29) Agrammatic Clauses: Null Determiner with Familiar Interpretation

a. and [Det] wolf says: “Better smell”
“and the wolf says: “The better to smell you with””

Context: The story is LRRH. The wolf has already been introduced and is now a familiar character.
b. [Det] meisje [Mod] lachen  
   [Det] girl [Mod] laugh:Inf  
   "the girl must laugh"

_Dutch_

_Context:_ The description is of the Cookie Theft Picture. The girl is introduced two sentences earlier.

c. no (clear cut) examples in database  
_German_

d. peu après [DP] contemple [Det] récolte  
   little after [DP] gaze:Prs-3Sg [Det] harvest  
   "a while later he gazes at the harvest"

_French_

_Context:_ The description is of a farmer planting and harvesting. The subject has described the farmer planting and the corn growing. The harvest is thus a familiar referent, even if the word itself has not been used before in the discourse.

e. [Det] ragazzo li prende  
   [Det] boy them take:Prs-3Sg  
   "the boy is taking them (the cookies)"

_Italian_

_Context:_ The description is of the Cookie Theft Picture. Both the boy and the cookies have been introduced two sentences earlier. The subject is clarifying that it is the boy who is taking the cookies and the girl who is eating them.

Since sentences exhibit the novel-familiar distinction, some (null) determiner must be present. Moreover, the behavior of null determiners is identical to that of overt determiners. There is then no reason to assume that the Agrammatic Grammar is deviant with respect to determiners. These data argue for a DP projection with a phonologically null determiner in D$^{18}$.

Further evidence for the presence of DP are replacement sequences. Agrammatics occasionally repeat a failed sequence. The second attempt frequently displays words that were missing in the first attempt. Examples are presented below. I have underlined in the second attempt of the word that is missing from the original attempt. For more examples of replacement sequences for determiners, see Appendix (13).

$^{18}$ Please note that I am not implying that null determiners in child language acquisition follow the pattern described here. I maintain that acquisition and agrammaticism are not mirror images of each other.
Agrammatic Clauses: Replacement Sequences for Determiners

a. the dog sniffs [Det] chicken
"the dog sniffs the chicken"

a'. the dog steals the chicken

b. [Det] boer [V] [P] [Det] vogelverschrikker
[Det] farmer [V] [P] [Det] scarecrow
"the farmer is looking at a scarecrow"

b'. de boer [V] mai-
the farmer [V] cor-
"the farmer wants corn"

c. [Det] Mutter [Cop] verliebt
[Det] mother [Cop] in+love:Prt
"the mother is in love"

c'. die Mutter ist verliebt
the mother is in+love:Prt
"the mother is in love"

d. un chien suit un couple pendant [Det] trajet
a dog follow:Prs a couple during [Det] trip
"a dog follows a couple during a trip"

d'. un trajet pour pique-niquer
a trip to picnic:Inf
"a picnic trip"

e. [Det] marito sta [V] [Det] sveglia
[Det] husband be:Prs-3Sg [V] [Det] alarm+clock
"the husband putting the alarm clock"

e'. l'uomo sta posando no prendere (prendendo) la sveglia
the man be:Prs-3Sg putting no take:Inf (taking) the alarm clock
"the man is putting the alarm clock"

These repetition sequences are evidence that the determiner is present underlyingly. A DP must therefore be projected.

3.2.1.1.2 Missing Possessor

A second construction that requires the presence of D is possession. There are two different types of constructions to consider: possessive determiner (my, your, and the like) and the English possessor marker 's. Following a substantial body of research (Abney, 1987; Ritter,
1988, 1989; Drijkoningen, 1990; Tang, 1990; Giorgi & Longobardi, 1991; Vergnaud & Zubizaretta, 1992; and many others) I assume a DP structure for arguments. The structures for possessives are not uncontroversial. What is consistently argued, however, is that possessives are nominal FPs of some sort. So even if they are not DPs, some nominal FP must be present. I adopt the DP structure for expository purposes (and to avoid confusion with the use of FP in later discussions). Consider the strings and structures presented below.

(31) a. the cookie
b. her cookie
c. Carmina’s cookie

(32) a. DP b. DP c. DP
   D' D' Carmina D'
   D NP D NP D NP
   D the NP cookie D her NP cookie D 's NP cookie

The definite article the occupies the head D (32a), as does the possessive her (32b). In (32c), the possessor Carmina is in [Spec DP], with the possessor marker ‘s in D. If possessive Ds are absent from the syntax, we do not expect a possessive reading of the arguments with the missing determiners. However, examples of this sort exist. These are illustrated in (33-34). For more examples of null possessive determiners in agrammatic clauses, see Appendix (14). For more examples of null possessive morphemes, see Appendix (15).

(33) Agrammatic Clauses: Null Determiner with Possessive Interpretation

a. the thief lifts [Poss] body
   “the thief lifts his body”

b. no examples in database

c. ihr Schpuck nein Schmuck und [Poss] Geld versteckt
   theirN ‘jewelry’ no jewelry and money hide:Part
   “(the family has hidden) their jewelry and their money in the oven”

19 This possessive structure has the following replacement sequence.

   a. the thief lifts his [N]
      “the thief lifts his body”
   a’. the thief lifts [Det] body
      “the thief lifts his body”
d. après, j'[Aux] attendu [Poss] sortie
   "afterwards, I waited for my discharge"

e. no examples in database

(34) Agrammatic Clauses: Null Possessive Morpheme

a. LRRH go (goes) to see grandma[‘s] house
   “LRRH goes to grandma’s house”

b. the wolf is running to LRRH[‘s] gramma
   “the wolf is running to LRRH’s gramma”

Like sentences with their overt counterparts, these sentences exhibit a possessive interpretation. There is then no reason to assume that the Agrammatic Grammar is deviant with respect to possession. Thus, some phonologically null possessive determiner in D (or at least some nominal FP) must be projected.

3.2.1.2 Verbal Functional Projections

For the domain that I am considering, all movement is to a verbal FP. If verbal FPs are not projected the only agrammatic word orders that will be produced are the underlying word orders i.e. those not requiring movement. I will refer to the structures underlying these orders as underlying structures (and where appropriate, D-Structure). The underlying structure of English and French is shown in (35), that for Dutch and German in (36), and that for Italian in (37).

Note that I have adopted VP-internal subjects (Fukui & Speas, 1986; Kitagawa, 1986; Koopman & Sportiche, 1988; Kuroda, 1988). The other option is to base-generate subjects in specifier position of an FP, [Spec FP]. If subjects are base-generated in [Spec FP], the presence of a subject is itself evidence for an FP. Thus any early acquisition or agrammatic clause with a subject would have to project (at least) one FP.

---

20 For discussions of word order, see Haegeman (1992, 1994) for German and Dutch SOV.
(35) English and French Underlying Structure: SVO

```
  VP
 /     
SUBJECT V' 
   
   VERB OBJECT
```

(36) German and Dutch Underlying Structure: SOV

```
  VP
 /     
SUBJECT V' 
   
   OBJECT VERB
```

(37) Italian Underlying Structure: VOS

```
  VP
 /     
  V' SUBJECT 
   
   VERB OBJECT
```

English and French are underlyingly SVO, Dutch and German are underlyingly SOV, and Italian is underlyingly VOS. This is summarised in the following list.

(38) Underlying Word Orders

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>English</td>
</tr>
<tr>
<td>b.</td>
<td>Dutch</td>
</tr>
<tr>
<td>c.</td>
<td>German</td>
</tr>
<tr>
<td>d.</td>
<td>French</td>
</tr>
<tr>
<td>e.</td>
<td>Italian</td>
</tr>
</tbody>
</table>

If early acquisition and agrammatic untensed clauses involve no movement, we expect the following underlying orders: SVO for English and French, SOV for Dutch and German, and VOS for Italian. These orders are in fact attested for both early acquisition (39) and agrammatism (40), as the following examples illustrate ((39a) from Klima & Bellugi (1966) in Guasti, 1992; (39b) from Weverink, 1990; (39c) from Wagner, 1985; (39d) from Pierce, 1989; (39e) from Guasti, 1994).
(39) Early Acquisition Clauses: Underlying Word Order

a. he [Aux] no bite you  
"he doesn’t bite you"  
S - [Aux] - Neg - V - O  

b. pappa [Mod] [Det] schoen wassen  
daddy [Mod] [Det] shoes wash:Inf  
"Daddy is washing his shoes"  
S - [Mod] - O - V  

c. Thorsten das haben  
Thorsten this have:Inf  
"Thorsten has this"  
S - O - V  

d. [DP] [Aux] pas attrapé/er une fleur  
[DP] [Aux] not catch:Part/Inf a flower  
"I/she hasn’t caught a flower"  
[S] - [Aux] - Neg - V - O  

e. per lavale i piatti  
in-order-to wash:Inf the dishes  
"so that she can wash the dishes"  
Comp - V - O  

(40) Agrammatic Clauses: Underlying Word Order

a. he open the doors  
"he opens the doors"  
S - V - O  

b. [Det] moeder [Modal] [Det] afwas doen  
[Det] mother [Modal] [Det] dishes do:Inf  
"the mother is doing the dishes"  
S - [Mod] - O - V  

c. und dann Garag(e) gearbeit[et]  
and then garage work:Part  
"and then I worked in a garage"  
Conj - Temp - S - [Mod] - O - V  

d. je [Aux] perdu la parole [P] trois minutes  
I [Aux] lose:Part the speech [P] three minutes  
"I lost my speech within three minutes"  
S - [Aux] - V - O - TimePP  

e. [CI] [Aux] mangiato il cane  
[CI] [Aux] eat:PastPart-M-Sg the dog  
"the dog has/had eaten it"  
[CI] - [Aux] - V - S
The constituent order for English and French is SVO\(^{21}\). The constituent order for Dutch and German is SOV. The constituent order for Italian is VOS. The specific orders illustrated above for the acquisition clauses are the following: SVO for English; SOV for Dutch; SOV for German; VO for French; and VO for Italian. The specific orders illustrated above for the agrammatic clauses are the following: SVO for English; SOV for Dutch; OV for German; SVO for French; and SV for Italian. Each of these orders are predicted by LPH since none involves movement to an FP.

However, these word orders are not the only ones produced in early acquisition and agrammatic utterances. The other word orders are derived via movement to FPs, and thus require the presence of those FPs. For the relevant constructions I turn to the distribution of negation. There has been some debate about the structure and position of Neg (Déchaine, 1995; Kayne, 1989; Laka, 1990; Ouhalla, 1991; Zanutinni, 1990). With respect to the identity of Neg, there are two main schools of thought. Either Neg is a head (Pollock, 1989; Rizzi, 1990) or it is an adjunct (Webelhuth & den Besten, 1987; Clahsen, 1988a)\(^{22}\). If it is a head, it projects its own phasal structure, as shown in (41a). If it is an adjunct, it adjoins to VP. The resulting structure is illustrated in (41b).

---

\(^{21}\) I have presented French examples where the verb is unambiguously in its participial form. The participial is not always morphologically distinct from the infinitival. The following examples illustrate this ambiguity.

(i) Tenseless clauses: French participial or infinitival Verb

a. ma femme appelé/er un ami et les pompiers
   "my wife call:Part/Inf a friend and the firemen"
   "my wife called a friend and the firemen to drive me to the clinic"

b. la femme réveille/er l’homme entre temps
   "the woman wake:Part/Inf the man in the meantime"
   "the woman woke the man up in the meantime"

In (a) the phonological form of the verb is [aepɔle]. This can be interpreted as the participial appelé or the infinitival appeler. The same holds for the other two examples. Putting aside such examples, the point remains: the agrammatic word order is the same as the D-Structure word order.

\(^{22}\) Bayer (1990a) argues that Neg left-adojnts to V in German.
Notice that if Neg is a functional head that projects its own phrasal structure, NegP is an FP. The Lexical Projection Hypothesis would then predict that Neg is not produced. The only way that LPH can accommodate negation is to assume that Neg is a lexical category that adjoins to the VP structure, like the structure in (41b). I therefore assume the structure in (41b) (for this section). If we include subjects and objects, the following structures result. The structure for English and French is (42a), for Dutch and German is (42b), for Italian is (42c).

The structures in (42) are those allowed by LPH. Assuming that Neg (and Adv) are anchors that indicate which constituents have moved (Pollock, 1989), any orders deviating from those in (42) require movement. Thus the word orders are predicted to be the following: Neg-S-V-O for English and French; Neg-S-O-V for Dutch and German; and Neg-V-O-S for Italian. The Lexical Projection Hypothesis predicts that no other orders will be attested. Because the word orders in the following list require movement to an FP, they are predicted not to arise. I repeat in (43’) the underlying word orders for the languages under study.

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23 See Iatridou (1994) and Williams (1994) for arguments against this assumption.
(43) Word Orders Predicted to Be Unattested by the Lexical Projection Hypothesis

a. S - Neg
b. V - Neg
c. O - Neg
d. V - S (for SVO and SOV languages)
e. S - V (for VOS languages)
f. O - V (for SVO and VOS languages)
g. V - O (for SOV languages)
h. O - S (for SVO and SOV languages)
i. S - O (for VOS languages)

(43’) Underlying Word Orders

a. English SVO
b. Dutch SOV
c. German SOV
d. French SVO
e. Italian VOS

Early acquisition and agrammatic clauses display many of the word orders listed in (43). However, not all appear in untensed clauses. This is the case for word orders that require the verb to move from its underlying position. A verb moves from its underlying position in order to check its tense features (among other features). Consequently, if a verb moves, it will be tensed. The orders that involve a tensed verb (Vtns) are the following.

(44) Word orders that Require a Tensed Verb

a. V - S (for SVO and SOV languages)
b. V - O (for SOV languages)
c. V - Neg

These orders are attested in both early acquisition and agrammatism. We find subjects in postverbal position for acquisition (45) and agrammatism (46)24, as shown below ((45a) from Pierce, 1992; (45b) from Weissenborn, 1990; (45c) from Pierce, 1989).

---

24 We also find one instance of the V-S order for English shaved me, nurse "she shaved me, the nurse"

This is arguably a dislocated argument rather than the D-Structure subject, given the pause between me and nurse.
(45) Early acquisition: \{V-S\}

a. came a man
   "a man came"
   V - S

b. kauft Angela
   buy:3Sg Angela
   "Angela buys"
   V - S

c. lit maman
   read:Prs-3Sg mommy
   "Mommy reads"
   V - S

(46) Agrammatic clauses: \{V-S\}

a. horloge en andere spullen {pakt hij}
   clock and other things take:3Sg he
   "he takes a clock and other things"
   O - \{V - S\}

b. und wegen der Vögel steht Kraus (Vogelscheuche)
   and because of+the birds stands crow (scarecrow)
   "and because of the birds, there's a scarecrow"
   Conj - AdvP - \{V - S\}

The V-S order requires that V move from its underlying position. This movement is possible only if an FP is present to offer a landing site. This movement is schematized in the following diagrams, (47a) for SVO languages (for acquisition, in our case) and (47b) for SOV languages).

(47) a.
Next we find verbs preceding the object (in languages that are otherwise O-V) in data from acquisition (48) and agrammatism (49) as shown below ((48a) from Weverink (1990); (48b) from Wagner (1985))

(48) Early acquisition clauses: {V-O}

a. ik {pakt 't} op
   I pack it up
   "I am packing it up"
   S - {V - O} - Prt

b. mein Hubsabe {had Tiere} din
   my helicopter has animals in+it
   "my helicopter has animals in it"
   S - {V - O} - PP

(49) Agrammatic Dutch and German: {V-0}

a. en dan agent {pakt de dief}
   and then policeman catch:3Sg the thief
   "and then a/the policeman catches the thief"
   Conj - Adv - S - {V - O}

b. später {begutachtet [DP] seinen Kukuruz}
   later examines his corn
   "later he examines his corn"
   Adv - {V - [S] - O}

The V-O order requires that V move from its underlying position (in an O-V system). This movement is possible only if an FP is present to offer a landing site. This movement is schematized in the following diagram (this is relevant to SOV languages only).
Last with respect to tensed verbs, we find verbs preceding Neg for acquisition (51) and agrammatism (52), as shown below ((51a) from Vainikka (1993); (51b) from Wagner (1985) in Wexler (1994); (51c) from Déprez & Pierce (1993))

### (51) Early Acquisition: \{Vtns Neg\} or \{Mod Neg\}

- a. I \{can't\} wear it  
  \[S - \{Mod - .Neg\} - V - O\]  
  **English**

- b. Caesar \{tieg e nich\}  
  Caesar gets he not  
  "Caesar doesn't get it"  
  Top - \{Vtns - S - Neg\}  
  **German**

- c. [DP] \{veux pas\} lolo  
  [DP] want not milk  
  "I don't want milk"  
  S - \{Vtns - Neg\} - O  
  **French**

### (52) Agrammatic Clauses: \{Vtns Neg\}, \{Aux Neg\} or \{Mod Neg\}

- a. I \{can't\} speak  
  S - \{Mod - Neg\} - V  
  **English**

- b. ik \{weet niet\} hoor maar het \{is niet\} goed  
  I know:Prs-1Sg not you-know but is not right  
  "I don't know but it's not right"  
  S - \{Vtns - Neg\} - "filler" - Conj - \{Aux - Neg\} - Adj  
  **Dutch**

---

\[25\] Italian negation always precedes V. Therefore Italian does not provide any evidence for movement to an FP. The French data displays an interesting property. French negation consists of \textit{ne pas}. In the agrammatic and acquisition data, the \textit{ne} drops out. This is also true of certain dialects of French. One possible explanation is that \textit{ne} is an unstressed morpheme that must cliticize to the verb, and consequently drops out easily.
c. das {weiss ich nicht}
   that know:Prs I not
   "that I do not know"
   O - {Vtns - S - Neg}

To derive the V-Neg order, the V must move from its underlying position. This movement is possible only if an FP is present to offer a landing site. This movement is schematized in the following diagrams, (53a) for SVO language and (53b) for SOV languages.

Recall however, that these 3 sets (V-S, V-O and V-Neg) involve tensed verbs. The presence and correct placement of a tensed verb (or Aux/Mod) is itself evidence for an FP (most
likely IP/TP). I now turn to the untensed constructions that the Lexical Projection Hypothesis predicts not to arise. They are listed below.

(54) Word Orders Predicted to Be Unattested by the Lexical Projection Hypothesis

a. S - Neg
b. O - Neg
c. S - V (for VOS languages)
d. S - O (for VOS languages)
e. O - V (for SVO and VOS languages)
f. O - S (for SVO and SOV languages)

Each of these orders requires an argument (subject or object) to move to the specifier position of an FP, [Spec FP]. Some of these orders are attested in early acquisition and agrammatism. First, we find subjects preceding Neg for acquisition (55) and agrammatism (56), as shown below ((55a) from Bellugi (1967) in Déprez & Pierce (1993); (55b) from Clahsen et al. (1994)). The German example has an adverb instead of a negation. The same principle holds, with adverbs adjoining to VP and the subject having to move out of the VP. For more examples of Subject-Neg/Adv in agrammatic clauses, see Appendix (16).

(55) Early Acquisition Clauses: S-Neg

a. {he no} bite you
   "he isn’t biting you"
   {S - Neg} - V - O

b. {du nich} kochen
   you not cook:Inf
   "you are not cooking"
   {S - Neg} - V

(56) Agrammatic Clauses: S-Neg or S-Adv

a. no examples in database

b. {[Poss] vrouw [Mod] toevallig} eventjes thuis-komen
   [Poss] wife [Mod] accidentally for-a-while home-come:Inf
   "my wife accidentally came home for a while"
   {S - [Mod] - Adv} - PP - V
c. drei Monate [Mod] ich überhaupt nicht reden
   three months I at-all not speak:Inf
   "for three months I couldn't speak at all"
   PP - [Mod] - {S - Neg} - V

To derive the S-Neg order, the S must move from its underlying position to a specifier position higher than the VP. This movement is possible only if an FP is present to offer a landing site. This movement is schematized in the following diagrams, (57a) for SVO languages and (57b) for SOV languages.

(57) a.

\[\text{Specifier} \quad \text{FP} \quad \text{F'} \quad \text{F} \quad \text{VP} \quad \text{Neg} \quad \text{VP} \quad \text{SUBJECT} \quad \text{V'} \quad \text{VERB} \quad \text{OBJECT}\]

b.

\[\text{Specifier} \quad \text{FP} \quad \text{F'} \quad \text{F} \quad \text{VP} \quad \text{Neg} \quad \text{VP} \quad \text{SUBJECT} \quad \text{V'} \quad \text{OBJECT} \quad \text{VERB}\]

The next set of word orders are S-V and S-O, for Italian. I present the examples below.

For more examples of subject-initial Italian agrammatic clauses, see Appendix (17).
(58) Agrammatic Italian: \{S-V\} and \{S-O\}

a. \{il signore e la signora [Aux] meravigliati\}  
   the gentleman and the lady [Aux] astonish:Part-Pl  
   “the gentleman and the lady are astonished”  
   \{S - [Aux] - V\}  

b. \{io [Cop] assessore\} pure  
   I [Cop] member too  
   “I am a member too”  
   \{S - [Cop] - O\} - Adv

To derive both the S-V and the S-O orders, the S must move from its underlying post-verbal position to a specifier position higher than the VP. This movement is possible only if an FP is present to offer a landing site. This movement is schematized in the following diagram.

(59)

```
FP
   Specifier
     F'
     F
     VP
     V'
     SUBJECT
     OBJECT
     VERB
```

We are left with the following 3 word orders: O-Neg, O-V and O-S. All 3 word orders involve moving the object. Other than topicalization (and the like), object fronting is common only in Dutch and German. The O-V order is not relevant to the Dutch and German data since they are SOV (so OV is the Underlying-Structure order). However, Dutch and German do display the O-S and O-Neg orders, which cannot be underlying orders. O-S order is illustrated in (60). O-Neg order is illustrated in (61) and (62) ((61a) from Clahsen et al. (1994)). Once again, the Dutch and German agrammatic sentences in (62) have adverbs instead of negation, with the structures being the same.
(60) Agrammatic Clauses: \{O-S\}

a. \{[Det] kippebout [Aux] [Det] hond\} gepakt
   \{Det\ drumstick [Aux] [Det] dog take:Part\}
   \{O - [Aux] - S\} - V
   "the dog has taken the drumstick"

b. no examples in database

(61) Early Acquisition Clauses: \{O-Neg\}

da \{Auto nicht\} fahren
   there car not drive
   Adv - \{O - Neg\} - V

(62) Agrammatic untensed clauses: O-Adv

a. en \{kantoor [Mod] verder\} slapen
   and office [Mod] further sleep:Inf
   "and (he) can sleep some more at the office"
   Conj - \{O - [Mod] - Adv\} - V

b. \{mir [Aux] auch\} passiert
   me:Dat [Aux] also happen:Part
   "that has also happened to me"
   \{O - [Aux] - Adv\} - V

To derive both the O-S and the O-Neg/Adv orders, the S must move from its underlying position to a specifier position higher than the VP. This movement is possible only if an FP is present to offer a landing site. This movement is schematized in the following diagram.

(63)

```
Specifier     
      FP       
      |        
      F'      
      |   
      F     
      | 
      VP   
      | 
Neg/Adv     
      |   
      VP   
      | 
      V'   
      |   
OBJECT     SUBJECT 
      |   
      VERB
```

The Lexical Projection Hypothesis (LPH) cannot account for the presence of FPs nor can it derive any word orders requiring movement of a head (eg. V°) to a higher F° position, or of a
phrase (eg. DP) to [Spec FP]. Since both of these are in evidence in agrammatic speech, FPs
must be present. The Lexical Hypothesis therefore does not hold for agrammatic speech.

I have summarized the (lack of) evidence for LPH in the chart below. The chart should
be read as follows. The leftmost column lists various word orders. The second column indicates
if the word orders are attested in early acquisition. The third column indicates if the word orders
are attested in agrammatic production. And the last column indicates whether or not these word
orders are predicted by the Lexical Projection Hypothesis (LPH). Predicted or attested word
orders are indicated by "√". Word orders that are predicted not to occur and those that are
unattested are indicated by "*". For example, consider the second row (excluding the title row).
The order in question is S-Neg/Adv. It is predicted by Lexical Projection Hypothesis not to
occur, hence "*" under LPH Prediction. However, this word order is attested in both early
acquisition and agrammatic production, hence "√" under their respective columns.

Table 1: Evidence for the Lexical Projection Hypothesis (LPH)

<table>
<thead>
<tr>
<th></th>
<th>Acquisition Data</th>
<th>Agrammatism Data</th>
<th>LPH Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>V - Subject (all but I)</td>
<td>√</td>
<td>√</td>
<td>*</td>
</tr>
<tr>
<td>V - Object (D &amp; G)</td>
<td>√</td>
<td>√</td>
<td>*</td>
</tr>
<tr>
<td>V - Neg/Adv</td>
<td>√</td>
<td>√</td>
<td>*</td>
</tr>
<tr>
<td>Subject - Neg/Adv</td>
<td>√</td>
<td>√</td>
<td>*</td>
</tr>
<tr>
<td>Subject - V (I)</td>
<td>?</td>
<td>√</td>
<td>*</td>
</tr>
<tr>
<td>Subject - Object (I)</td>
<td>?</td>
<td>√</td>
<td>*</td>
</tr>
<tr>
<td>Object - Subject (D &amp; G)</td>
<td>*</td>
<td>√</td>
<td>*</td>
</tr>
<tr>
<td>Object - Neg/Adv (D &amp; G)</td>
<td>√</td>
<td>√</td>
<td>*</td>
</tr>
</tbody>
</table>
Note that for the table above E=English, D=Dutch, G=German, F=French and I=Italian.

The Lexical Projection Hypothesis states that there are no FPs. If no FPs are present, all
the syntax is done within the confines of lexical projections. We then would not expect to find
any word orders that must be derived by movement to FPs. In other words, we expect to find
word orders identical to the D-Structure word order, excluding the possibility of movement by
adjunction to a lexical projection. However, both early acquisition and agrammatic clauses
display orders other than D-Structure. These orders require movement of various constituents. It
cannot be the case that only lexical projections make up the structure of the untensed acquisition
and agrammatic clause. The Lexical Projection Hypothesis therefore does not hold. Functional
projections are indeed present. But how many, and which ones?

3.2.2 Agrammatic Clauses Have at Least Two Functional Projections

I have argued that untensed agrammatic clauses involve more than lexical projections. I
now turn to the next logical possibility: agrammatic clauses have a substantial amount of
structure, but not the full array of projections. Within the acquisition literature there are two such
proposals: Rizzi's (1994a,b) Truncation Hypothesis (TH) and Poeppel & Wexler's (1993)
Optional Tense Hypothesis (OTH). Rizzi argues that root infinitives in early acquisition arise
from truncating the adult structure: children project everything below TP. Poeppel & Wexler
argue that TP is missing in root infinitives, but that everything else is present. The implications
for these two hypotheses depend on the structures that one adopts. Consider the following two
structures. The general phrase structure #1 in (65) is that assumed by Poeppel & Wexler
(1993)\textsuperscript{26}. The general phrase structure #2 in (66) is that assumed by Rizzi (1994a,b).

\textsuperscript{26} Where Poeppel & Wexler (1993) use IP, I substitute TP for consistency.
The Truncation Hypothesis predicts that everything lower than TP is projected. The resulting structures are as follows. The structure in (67) assumes the general phrase structure #1 in (65). The structure in (68) assumes the general phrase structure #2 in (66).

If the only functional projections higher than VP are CP and TP, the Truncation Hypothesis predicts that no FPs are present in truncated structures. This is equivalent to the Lexical Projection Hypothesis, for tenseless clauses. As argued above, there is indeed movement to FPs, even in clauses with no functional inflection: consequently, the structure in (67) is not viable. If, however, the general phrase structure is expanded, the Truncation Hypothesis predicts
the presence of one FP higher than VP, as proposed by Rizzi himself\(^{27}\).

I now consider the predicted structures for the Optional Tense Hypothesis, which predicts that everything except TP is projected. The resulting structures are as follows. The structure in (69) assumes the general phrase structure \(\#1\) in (65). The structure in (70) assumes the general phrase structure \(\#2\) in (66).

(69) Phrase Structure \(\#1\) Predicted by the Optional Tense Hypothesis

```
CP
   \^ VP
```

(70) Phrase Structure \(\#2\) Predicted by the Optional Tense Hypothesis

```
CP
   \^ AgrSP
      \^ AgrOP
         \^ VP
```

If the only functional projections higher than VP are CP and TP, the Optional Tense Hypothesis predicts the presence of one FP higher than VP. This is the same prediction as the Truncation Hypothesis \(\#2\). If the general phrase structure is expanded, the Optional Tense Hypothesis predicts the presence of three FPs higher than VP. The former corresponds to Poeppel & Wexler's original version of the Optional Tense Hypothesis. Thus both the Truncation Hypothesis and the Optional Tense Hypothesis predict the presence of a single FP higher than VP. However, allowing for a broader interpretation (i.e. the use of general phrase structure \(\#2\) for both hypotheses), the two hypotheses contrast: the Truncation Hypothesis predicts a maximum of one FP higher than VP, whereas the Optional Tense Hypothesis allows for more than one FP higher than VP. The two hypotheses contrast further: the Truncation

\(^{27}\) Neither of the structures in (67-68) allows for object shift in German and Dutch, since object shift requires the presence of \([\text{Spec CP}]\). However, object shift is attested in agrammatic Genral
Hypothesis predicts CP to be absent; the Optional Tense Hypothesis predicts CP to be present.

I begin with a general investigation of the syntactic structures underlying agrammatism by determining the number of FPs required to account for the agrammatic data. I then consider more specifically the two hypotheses discussed above, the Truncation Hypothesis and the Optional Tense Hypothesis, comparing acquisition and agrammatic data. I conclude that neither hypothesis, as formulated by their authors, can account for the agrammatic data.

3.2.2.1 How Much Structure Is in Agrammatic Clauses?

The two hypotheses predict a different number of FPs in untensed clauses: the Truncation Hypothesis predicts the existence of only one FP higher than VP whereas the Optional Tense Hypothesis predicts more than one. I begin by revisiting the underlying structures of the languages in question. The underlying structure for English and French presented in (71), that for Dutch and German in (72), and that for Italian in (73).

(71) English and French Underlying Structure: SVO

```
VP
  SUBJECT  V'
   VERB      OBJECT
```

(72) German and Dutch Underlying Structure: SOV

```
VP
  SUBJECT  V'
   OBJECT   VERB
```

(73) Italian Underlying Structure: VOS

```
VP
  V'      SUBJECT
    VERB  OBJECT
```

and Dutch, as discussed below.
Movement to an FP constitutes evidence for that FP. Any order that differs from the underlying orders presented above requires movement to an FP. Moreover, if any of the constituents move past a 'fixed structure', that too constitutes evidence for FPs. The 'fixed structures' I consider are adverbs and negation (Pollock, 1989).

Some adverbs adjoin to VP. Adding adverbs to the structures above results in the following.

(74) English and French Underlying Structure: Adv-S-V-O

```
        VP
       /\  
      Adv  VP
     /\    \  
    SUBJECT V'  
     \       \ 
      VERB   OBJECT
```

(75) German and Dutch Underlying Structure: Adv-S-O-V

```
        VP
       /\  
      Adv  VP
     /\    \  
    SUBJECT V'  
     \       \ 
      OBJECT VERB
```

(76) Italian Underlying Structure: Adv-V-O-S

```
        VP
       /\  
      'Adv  VP
     /\    \  
    V'   SUBJECT  
     \       \ 
      VERB   OBJECT
```

The underlying orders with Adv is the following: Adv-S-V-O for English and French, Adv-S-O-V for Dutch and German, and Adv-V-O-S for Italian. Adverbs are adjuncts. They do not provide landing sites for moving constituents. As such, for every constituent that moves past
Adv there must be one FP. If two constituents move past Adv, there must be (at least) two FPs to provide the appropriate docking sites.

I now turn to the second construction: negation. When discussing negation in the section 3.2.1.2 (when arguing against the Lexical Projection Hypothesis), I assumed that negation was adjoined to VP, like adverbs are here. The alternative is to have negation as a functional head that projects NegP. I repeat the two structures below, (77a) illustrates negation as a functional head, and (77b) negation as an adjunct.

(77) a. \[
\text{NegP} \\
\text{Neg'} \\
\text{Neg} \quad \text{VP}
\]

b. \[
\text{VP} \\
\text{Neg} \quad \text{VP}
\]

If negation is an adjunct, it provides no landing site for moving constituents. If negation is a functional head, it does. Although the debate between adjunct and functional head allows me to choose either alternative, for purposes of illustration I assume negation to be a functional head. Negation therefore offers a landing site for constituent movement; the site is [Spec NegP]. In order to show that there is at least one FP above NegP, two constituents must move, one docking in [Spec NegP] and one landing in [Spec FP]. This choice thus places a heavier burden on the data. Adding NegP to the underlying structures in (71)-(73) results in the following.

(78) English and French Underlying Structure: Neg-S-V-O

\[
\text{NegP} \\
\text{Neg'} \\
\text{Neg} \quad \text{VP} \\
\text{SUBJECT} \quad \text{V'} \\
\text{VERB} \quad \text{OBJECT}
\]
The word orders that can only be accounted for by the presence of FPs require movement out of the VP. Recall that the relevant data are untensed clauses. The absence of tense can be achieved in two ways. First, if a verb is present it must be untensed (infinitival or participial) (note that no tensed auxiliary or modal can be present either). Second, a clause may simply be lacking any verbal element. Contra Pollock (1989), I assume that untensed verbs (infinitivals as well as participials) are licit in their underlying position and so do not (need to) move overtly.28 I now turn to the various word orders that require movement and their implications for FPs. I consider three types of movement: those requiring only NegP, those requiring one FP other than NegP, and those requiring two FPs other than NegP.

3.2.2.1.1 Movement Requiring Only NegP.

Consider the following list of word orders. I have restricted the list to orders that can actually be produced in the respective languages. I indicate word orders that are attested in the

28 I assume that participials do not project a participial phrase (PartP).
database with a check mark ‘√’ to the left of the string. Unattested word orders I leave bare. This presentation is adopted throughout the rest of this section (3.2.2.1). More studies are required to determine whether or not these unattested orders are accidental gaps. This proviso holds for all unattested word orders under discussion.

(81) Word Orders Requiring Movement but No Functional Projections other than NegP

- a. S - Neg - (V) - O for SVO and VOS languages
- b. √ S - Neg - O - (V) for SOV languages
- c. O - Neg - S - (V) for SOV languages

Subjects raise past Neg, as illustrated in (82). The last line of each example displays the word order. I include in curly brackets the portion of the utterance that is relevant to movement. This presentation is maintained throughout section 3.2.2.1. For more examples see Appendix (16).

(82) Agrammatic Clauses: {S-Neg}

- a. no examples in database
- b. {ik [Cop] niet} bij
  I [Cop] not with
  "I was not conscious"
  {S - [Cop] - Neg} - P
- c. und {die Abgase [Cop] nicht} desund
  and the exhaust-fumes [Cop] not healthy
  "and the exhaust fumes were not healthy"
  Conj - {S - [Cop] - Neg} - Adj
- d. no examples in database
- e. no examples in database

For each of the examples, the subject moves past Neg and lands in [Spec NegP]. This is schematized below.
3.2.2.1.2 Movement Requiring One Functional Projection

The following sets of word orders each require one FP other than NegP. There is a large range of possible word orders; however, only a few are attested in the database. I suggest that paucity of evidence is a function of the nature of the data, not the grammar. First, the required data consists of untensed clauses, which immediately reduces the selection. Second, agrammatics omit all categories; however, omissions are only counted for items that are missing from obligatory contexts. This hides the fact that optional categories are omitted, probably much more frequently; adverbs and negation are two such optional categories (given the production tasks at hand). Since discerning many of the word orders is dependent on the presence of these optional elements, it is not surprising that these orders are rare or unattested on the basis of surface distribution. Third, while agrammatics do produce correct non-canonical word orders in appropriate discourse contexts, they prefer canonical word orders. Many of the word orders that display movement are non-canonical. Once again, it is not surprising that the evidence is limited. The clauses that constitute evidence for movement thus require the following combination of

\[ (83) \]

\[
\text{SUBJECT} \quad \text{NegP} \quad \text{Neg'} \quad \text{Neg} \quad \text{VP}
\]

Subject movement past Neg does not require any FP other than NegP\(^{29}\).

---

\(^{29}\) Note that if the debate favors negation as adjunct, subject/object movement past Neg is evidence for one FP higher than Neg, as schematized in (i). If two constituents move past Neg, then two FPs are required, and so on.

\[ (i) \]

\[
\text{FP} \quad \text{SUBJECT or OBJECT} \quad \text{VP} \quad \text{Neg} \quad \text{VP}
\]
characteristics: the presence of the right obligatory constituents, the presence of optional categories, the absence of tense, and non-canonical word orders. The production tasks that the agrammatic subjects are required to perform for this database are not particularly rich. For example, a picture description does not necessarily encourage the production of negation or adverbs\(^{30}\). It is surprising that any clauses with the appropriate characteristics are produced. Therefore, even if the tokens are few, they must be taken seriously and be accounted for.

(84) Word Orders Requiring One Functional Projection Higher than NegP

\begin{itemize}
  \item a. \(O - S - (V)\) for SOV languages
  \item b. Subject-initial for VOS languages
\end{itemize}

(85) Word Orders Requiring One Functional Projection Higher than NegP

\begin{itemize}
  \item a. \(S - \text{Adv} - (V) - O\) for SVO and SOV languages
  \item b. \(S - \text{Adv} - O - (V)\) for SOV languages
  \item c. \(O - \text{Adv}\) for SOV languages
  \item d. \(\text{PPloc} - \text{Adv}\) for SOV languages
  \item e. \(\text{Predicate} - \text{Adv}\) for SOV languages
  \item c. \(S - O - \text{Neg} - (V)\) for SOV languages
  \item d. \(O - S - \text{Neg} - (V)\) for SOV languages
\end{itemize}

(86) Word Orders Requiring One Functional Category Lower than NegP

\(S - \text{Neg} - O - (V)\) for VOS languages

I now discuss the derivation of each attested word order. In non-pathological Dutch, objects may raise past subjects. For each of the examples, the object moves past the subject and thus out of the VP. Since NegP is not present, another FP must supply its specifier position as a landing site. The examples are illustrated in (87). The movement is schematized in (88).

(87) Agrammatic Dutch and German: \{O-S\}

\begin{itemize}
  \item a. \{[Det] kippebout [Aux] [Det] hond\} gepakt…
  \item Dutch
  \item [Det] drumstick [Aux] [Det] dog take:Part
  \item “the dog takes the drumstick”
  \item \{O - [Aux] - S\} - Vpart
\end{itemize}

\(^{30}\) What is required is a battery of production tasks that focus on adverbs, prepositions, questions, and any other construction that requires movement.
b. {Det} man [Modal] {Det} wekker\} roepen
   {Det} man [Modal] {Det} alarm call:Inf
   "the alarm clock is calling/waking the man"
   \{O - [Mod] - S\} - Vinf

c. no examples in database

(88) Derived Syntactic Structure for Sentence (87a)

Next, Italian subjects surface in clause-initial position. This ordering requires the subject
to move out of the VP and into the specifier of a dominating FP. The construction is illustrated in
(89). The derivation is schematized in (90).

(89) Agrammatic Italian Subject-Initial Clauses: a.\{S-V\}, b.\{S-Adj\}, c.\{S-N\}
    and d.\{S-PP\}

a. \{la signora [Aux] scocciata\}
   the lady [Aux] annoy:Part
   "the lady is annoyed"
   \{S - [Aux] - Vpart\}

b. e \{la nonna e Cappuccetto Rosso [Cop] salve\}
   and the grandmother and LRRH [Cop] safe:F-Pl
   "and the grandmother and LRRH were safe"
   Conj - \{S - [Cop] - Adj\}

c. e \{io [Cop] assessore\} pure
   and I [Cop] member too
   "and I am a member too"
   Conj - \{S - [Cop] - N\} - Adv

d. {Det} acqua [V] sotto (sul) \{Det\} pavimenti (pavimento)\}
   [Det] water [V] under (on) \{Det\} floor:Pl (floor:Sg)
   "the water goes on the floor"
   \{S - [V] - PP\}
(91) Agrammatic Clauses: \{S-Adv\}

a. no examples in database  

b. [Adv] [Modal] [Det] \{vrouw toevallig\} eventjes thuis-komen Dutch  
   “then my wife accidentally came home for a while”  

c. und \{der Wolf [V] inzwischen\} die Grossmutter ah im Bauch  
   and the wolf [V] meanwhile the grandmother uh in+the belly  
   “and in the meantime the wolf has the grandmother in its belly”  
   Conj - \{S - [V] - Adv\} - O - PP

d. no examples in database  

e. no examples in database
(92) Agrammatic Dutch and German: \{O-Adv\}

a. no examples in database

b. [DP] [Aux] \{mir auch\} passiert
   [DP] [Aux] me:Dat also happen:Part
   "that has also happened to me"

(93) Agrammatic Dutch and German: \{PPloc-Adv\}

a. en [DP] [Modal] hard lopen en \{[P] kantoor verder\} slapen
   and [DP] [Modal] fast run:Inf and [P] office further sleep:Inf
   "and he must run fast and can sleep some more at the office"

b. \{[P] kantoor [V] [DP] eindelijk\} rust
   [P] office [V] [DP] finally peace
   "at the office he finally has some peace"
   \{PPloc - [V] - [DP] - Adv\} - Adj

c. no examples in database

(94) Agrammatic Clauses: \{AP-Adv\} or \{DP-Adv\} (Predicate movement)

a. nou ja {moeilijk [Modal] [Pleo] altijd} blijven
   well yes difficult [Modal] [Pleo] always remain:Inf
   "well yes, it will always remain difficult"

b. \{verdwenen [Cop] de kip\}
   disappeared [Cop] the chicken
   "the chicken has disappeared"
   \{AP - [Cop] - S\}

c. \{acht uur [Cop] pas (al)\}
   eight o’clock [Cop] only (already)
   "it’s already eight o’clock"
   \{DP - [Cop] - Adv\}

d. no examples in database
All of the agrammatic clauses presented above have required the presence of an FP other than NegP. Thus agrammatic untensed clauses require at least one FP above NegP.

3.2.2.1.3 Movement Requiring Two Functional Projections

The word orders reflecting two FPs other than NegP are few. I present them below.

(96) Word Orders Requiring Two Functional Projections above NegP

a. √ S - O - Adv - (V) for SOV languages
b. O - S - Adv - (V) for SOV languages

The following sentence involves movement past Adv of both the subject and the object. Two FPs are required. The sentence is presented in (97). Its derivation is schematized in (98).

(97) Agrammatic Dutch: {S-O-Adv}³¹ 

maar {ik [V] [Det] auto graag} 
but I [V] [Det] car happily 
"but I happily drive the car" 
Conj - {S - [V] - O - Adv} 

³¹ Note that the adverb graag "happily" cannot be a main predicate adjective since cross-categorial substitution does not occur (see section 4.1.1).
Both the subject and the object move from their VP-internal positions past Adv to specifier positions of functional projections higher than the VP. Since each argument requires its own landing site, two functional projections must be present. Thus agrammatic (untensed) clauses must include at least two functional projections (other than NegP). Neither the Truncation Hypothesis nor the Optional Tense Hypothesis accounts for this agrammatic production data.

I now return to the specific analyses entailed by the Truncation Hypothesis and the Optional Tense Hypothesis. I begin with Rizzi’s (1994b) Truncation Hypothesis.

3.2.2.2 (More) Arguments Against the Truncation Hypothesis

I have argued that two FPs higher than VP are required to account for the agrammatic data. This alone is counter-evidence for the Truncation Hypothesis. However, Rizzi provides 5 other arguments in support of the Truncation Hypothesis. The Truncation Hypothesis predicts the following.
(i) Vtns appears in clause-final position in early Dutch and German (for matrix clauses)
(ii) Wh-elements do not co-occur with Vinf
(iii) Subject pronouns rarely co-occur with Vinf
(iv) Root infinitives do not involve infinitival Aux or Modal
(v) Root infinitives are rare in early Italian.

I present each of the five predictions for the acquisition data and in turn address each one to the agrammatic data, showing that only one is borne out.

3.2.2.2.1 Clause-Final Tensed Verbs

Although the tensed-untensed distinction is fairly well established in earlier acquisition (Déprez & Pierce, 1993; Poeppel & Wexler, 1993; Guasti, 1992; Wexler, 1994), with Vtns in second position and untensed V in clause-final position, Rizzi argues that Vtns can occasionally be found in clause-final position. Consider the early German clauses Rizzi cites from Park (1981, in Déprez & Pierce (1993)) (99a) and Clahsen et al. (1994) (99b-c).

(99) Early German: Vtns in clause-final position
   a. da Bela Kuche-backe macht
      there Bela cake-baking does
      “Bela is baking a cake”
      Adv - S - O - Vtns
   b. der Hahn nich macht
      the rooster not does
      “the rooster is not doing (anything)”
      S - Neg - Vtns
   c. Julia Schere nicht darf
      Julia scissors not may
      “Julia may not have the scissors”
      S - O - Neg - Vtns

Rizzi proposes a transition stage where TP is operational, but CP is not. The tensed V raises to T, but since TP is right-headed (in Dutch and German), Vtns remains clause-final. Let us run through the derivation of each sentence in (99). First, Rizzi (1994b) assumes the following clause structure from Belletti (1990).
Note that sentence (99a) has the word order Adv-S-O-V. This is the underlying order and so does not require any movement other than string-vacuous V-to-T.

Both (99b) and (99c) include negation. They have the orders S-Neg-Vtns and S-O-Neg-Vtns, respectively. Both of these sentences involve movement of the subject past (or to) NegP. If this is a transitional stage, then CP is absent. Given the structure in (100), these orders can only be derived if S and O each move into one of [Spec NegP] or [Spec AgrSP]. As long as both of these are present, then these orders are derivable.

Although early acquisition may go through a transition period that reflects a missing CP, this data is unattested in agrammatic German (and Dutch). Vtns appears in clause-final position.

---

32 Friedeman (1993) argues that the few examples of negated untensed sentences in early French (7 out of 137) are instances of constituent negation. If NegP is higher than TP, then the truncation account predicts the rarity of Neg in untensed clauses in French acquisition. However, there seems to be much debate about (i) the placement of NegP (see Pollock (1989) for below TP; Belletti (1990) for above TP; among others), and (ii) the importance of Neg in early acquisition (see Déprez & Pierce (1993) for arguments using NegP in early acquisition). Regardless, the following predictions result from the Truncation Hypothesis:
1. If NegP is higher than TP, NegP should be omitted; negated root infinitives being rare.
2. If NegP is lower than TP, NegP should be available; negated root infinitives being frequent.
3. If the position of NegP is parametrized, then the child data will be dependent on the particular setting.
in only two contexts: embedded clauses or V2. When in embedded clauses, Vtns is supposed to appear clause-finally. When clause-final and V2 positions are one and the same, no argument can be made. Crucially, clause-final Vtns in utterances of more than two constituents are unattested in agrammatic German and Dutch. Thus this particular prediction does not hold for agrammatism.

3.2.2.2 Wh-Elements Do Not Co-Occur with Infinitive Verbs

Rizzi’s second argument for the Truncation Hypothesis is that Wh-elements do not co-occur with infinitival verbs (Vinf) (also see Crisma (1992) for French; Weissenborn (1992a) for German). If root infinitives lack CP (as is predicted by the Truncation Hypothesis), we would not expect to find Vinf with Wh-elements, since Wh-elements are in [Spec CP]. As predicted by the Truncation Hypothesis, we do not find the following in early acquisition.

(101) Unattested child utterances: Wh-elements with Vinf

*was Hans essen
what Hans eat:Inf

Agrammatic speech, on the other hand, does have Wh-phrases in untensed clauses. These are shown in (102).

(102) Agrammatic clause: Root infinitive with Wh-element

ôù [DP] [Mod] voir cardiologue
where [DP] [Mod] see:Inf cardiologist
“where I had to see a cardiologist”

The Truncation Hypothesis does not hold for agrammatic data.

3.2.2.2.3 Subject Clitics Do Not Co-Occur with Untensed Verbs

Rizzi’s third argument for the Truncation Hypothesis is that, in early French, subject clitics rarely co-occur with untensed verbs, such as Vinf and Vpart (Rizzi cites Pierce (1989:45) for French and Haegeman (1994) for Dutch). The argument is the following. The Truncation Hypothesis states that root infinitives only have projections lower than TP. Subject clitics (in
French, at least) require AgrSP\(^{33}\); but AgrSP is higher than TP. Thus root infinitives are predicted not to include subject pronouns. This prediction is borne out in the early acquisition data.

However, this is not the case with the agrammatic data. Although agrammatic French does not display subject clitics with Vinf, we do find subject clitics with Vpart, as illustrated in (103).

(103) Agrammatic French: Subject Clitics in Untensed Clauses

a. je [Aux] perdu la parole [P] trois minutes
   I [Aux] lose:Part the speech [P] three minutes
   “I lost my speech within three minutes”

b. après, j’ [Aux] attendu [Poss] sortie
   “afterwards, I waited to be discharged”

Rizzi argues that the presence of a subject clitic entails the projection of AgrSP. These untensed clauses have subject pronouns. Their structure must therefore include AgrSP. AgrSP is above TP. This is contrary to the Truncation Hypothesis prediction that untensed clauses do not co-occur with subject clitics since all projections above and including TP are absent. The Truncation Hypothesis therefore does not hold for agrammatics.

Further evidence is provided by the following example.

(104) Agrammatic French: Subject Clitics in Verbless clause

je [CI] [V] peu (pas) du tout le voyage
I [CI] [V] little (not) at all the trip
“I don’t remember the trip at all”

In (104) the verb is missing. For all intents and purposes, this ought to be a truncated structure, in the sense of the Truncation Hypothesis. As I will argue below, a missing lexical category does not entail a missing lexical projection. Both subject and object are present and

\(^{33}\) Rizzi (1986) argue that subject pronouns cliticize onto AgrS; Pierce (1989) reasons that subject pronouns are AgrS markers; and Cardinaletti & Starke (1993) maintain that subject pronouns are
interpretable. However, these arguments could be within the confines of a VP if it were not for two other facts. First, the clause includes a subject clitic. Following Rizzi, this entails the projection of AgrSP. Moreover, the clause in question includes Neg. Since the subject pronoun is to the left of Neg, and assuming the subject is underlyingly VP-internal, minimally it moves into [Spec NegP]. The Truncation Hypothesis assumes that only projections lower than TP are present. However, this untensed clause has both AgrSP and NegP, both of which are higher than TP. The Truncation Hypothesis therefore does not hold.

3.2.2.2.4 No Infinitival Auxiliaries or Modals

Rizzi's fourth argument for the Truncation Hypothesis is that infinitival Aux or Modal is unattested. Untensed clauses involve lexical verbs and not modals or auxiliaries. We do not find the following (egs from Wexler (1994)).

(105) Unattested structures: Infinitival auxiliaries

a. *avoir mangé  
   have:Inf eat:Part  
   "to have eaten"  
   French

b. *être venu  
   be:Inf come:Part  
   "to have come"  
   French

c. *gefaut haben  
   buy:Part have:Inf  
   "to have bought"  
   German

Rizzi (1994a) argues that Aux is either generated in T, or heads its own VP but is inherently specified for T features, which it must check by moving to T. In either case, the presence of Aux implies the presence of T, and thus a tensed Aux. The prediction that results from the Truncation Hypothesis is the following. Since root infinitives have no TP or higher projections, root infinitives will never include Aux or Modals. Specifically, we ought never to weak and must be licensed by AgrS. In each case, the relationship is such that the presence of a subject pronoun requires that AgrSP be projected.
find untensed Aux or Modals. This prediction is borne out in both early acquisition and agrammatic speech.

3.2.2.2.5 Few Root Infinitives in Italian

Rizzi’s final argument for the Truncation Hypothesis is the virtual non-occurrence of root infinitives in Italian (Guasti, 1992; Cipriani et al., 1993). Root infinitives are frequent in early French (Pierce, 1989) and early German, but not in early Italian. Rizzi attributes this to the differing role of TP for Vinf in the various languages. Compare the following two paradigms.

(106) French

a. Jean n’a pas lu le livre
b. *Jean ne pas a lu le livre
c. Jean ne lit pas le livre
d. *Jean ne pas lit le livre
e. n’avoir pas lu le livre
f. ne pas avoir lu le livre
g. *ne lire pas le livre
h. ne pas lire le livre

(107) Italian

a. Gianni non ha più letto il libro
b. *Gianni non più ha letto il libro
c. Gianni non legge più il libro
d. *Gianni non più legge il libro
e. non aver più letto il libro
f. *non più aver letto il libro
g. non leggere più il libro
h. *non più leggere il libro

(108) English translation of the paradigms above

a. John has not read the book
b. John not has read the book
c. John reads not the book
d. John not reads the book
e. to have not read the book
f. not to have read the book
g. to read not the book
h. not to read the book

In French both Aux and V must raise to T when they are tensed, as shown in (106a-d). This is true for Italian as well, as shown in (107a-d). The derivations for (106c) and (107c) are schematized below.

(109) Derivation for French sentence (106c)

(110) Derivation for Italian sentence (107c)

34 [Spec VP] is to the right in Italian according to previous discussion.
The behavior of infinitivals is where the two languages differ. In French, infinitival Aux may but need not raise to T (106e-f), and infinitival V must not raise to T (106g-h). In Italian, however, both infinitival Aux and V must raise to T (107e-h), shown in (111)

(111) Derivation for French sentence (106g)

```
TP
  \--- T'
   \--- T
     \--- VP
       \--- Neg
         \--- ne pas
           \--- VP
             \--- V'
               \--- lire
                 \--- DP
                   \--- le livre
```

(112) Derivation for Italian sentence (107g)

```
TP
  \--- T'
   \--- T
     \--- VP
       \--- Neg
         \--- più
           \--- VP
             \--- V'
               \--- tV
                 \--- DP
                   \--- il libro
```

The Truncation Hypothesis states that TP is absent from root infinitives. This is of no concern to French, since V inf must not raise to T. However, Italian V inf moves to T. So if no TP is available, V inf is not licensed and will not be produced. Thus the absence of root infinitives in early Italian argues against the presence of TP in such clauses.

In agrammatic Italian, root infinitives are rare. This parallels the early Italian data. However, root infinitives are also rare in agrammatic French. This is in contrast to the frequent production of root infinitives in early French. The languages that display the largest number of untensed clauses are Dutch and German. Thus, in the agrammatic data the contrast is between
French and Italian, on the one hand, and Dutch and German, on the other. This contrast is not predicted by the Truncation Hypothesis.

I summarize the evidence for the Truncation Hypothesis in the chart below.

Table 2: Evidence for the Truncation Hypothesis (TH)

<table>
<thead>
<tr>
<th></th>
<th>Acquisition Data</th>
<th>Agrammatism Data</th>
<th>TH Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transition Clause-final Vtns</td>
<td>√?</td>
<td>*</td>
<td>√</td>
</tr>
<tr>
<td>Wh &amp; Vinf/part</td>
<td>*</td>
<td>√</td>
<td>*</td>
</tr>
<tr>
<td>Subject clitic &amp; Vinf/part</td>
<td>*</td>
<td>√</td>
<td>*</td>
</tr>
<tr>
<td>Infinitival Aux or Modal</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Root infinitives in Italian &amp; French</td>
<td>*</td>
<td>√</td>
<td>*</td>
</tr>
</tbody>
</table>

The Truncation Hypothesis states that root infinitives only project structures lower than TP. The implication for this proposal is that untensed clauses only exhibit movement to positions below TP. Moreover, we do not expect to find untensed verbs (whether Vinf or Vpart) co-occurring with elements that require these outer-layer F-projections. Although the Truncation Hypothesis appears to be consistent with the acquisition data, these co-occurrence restrictions cannot be extended to agrammatism. While it is true that auxiliaries and modals do not appear in infinitival form, no other predictions from the Truncation Hypothesis are borne out. The Truncation Hypothesis therefore does not hold for agrammatic production.
3.2.2.3 Arguments Against the Optional Tense Hypothesis

Poeppel & Wexler argue for the existence of TP and CP in early acquisition based on the following distributional facts. First, early German displays the V2 construction. Regardless of what appears in first position, German-speaking children place Vtns in second position and Vinf in clause-final position. Second, early French displays correct Neg distribution: Neg follows Vtns but precedes Vinf. Further, early Italian displays appropriate clitic placement: clitics precede Vtns and follow Vinf (Guasti, 1992). These three facts argue that children can distinguish between tensed and untensed verbs. Moreover, Vtns bears appropriate agreement. The conclusion is that Vtns must move to T, for French and Italian, and then into C for German. Therefore, the functional projections TP and CP are present in tensed clauses in early acquisition.

However, each of these arguments applies to tensed verbs. As argued previously for agrammatic utterances, the presence of a correctly positioned tensed element itself implies the presence of TP. I am concerned with the presence of FPs in untensed clauses.

Poeppel & Wexler do address the issue of untensed clauses in early acquisition. This is the purpose of the Optional Tense Hypothesis. The Optional Tense Hypothesis states that untensed clauses project all functional projections except TP. This means that the only FP in untensed clauses is CP. Consider the relevant structures. Poeppel & Wexler assume the following: Neg is an adjunct (like Adv), and only two FPs dominate VP (and Neg), these being CP and TP (my arguments against the Optional Tense Hypothesis assumes their structures). The structure is presented below (with subject, object and verb included in their underlying positions). German is underlingly SOV, with both VP and TP being right-headed (Vikner & Schwartz, 1992; Vikner, 1990; Haegeman, 1992).

\[35\] Where Poeppel & Wexler (1993) use IP, I have TP for consistency.
(113) German (and Dutch): Structure Assumed by Poeppel and Wexler

If TP is absent from untensed clauses, the structure is the following.

(114) Structure Predicted by the Optional Tense Hypothesis (for German and Dutch)

With the Optional Tense Hypothesis structure, there is only one landing site for moving arguments, [Spec CP]. Therefore only one constituent can move past Neg or Adv. Specifically, we do not expect to find O-S-Neg/Adv-V. This construction requires two landing sites, one for the subject and one for the object, as schematized below.
The Optional Tense Hypothesis therefore predicts the order O-S-Neg/Adv to be unattested. This order is indeed unattested in both early German and agrammatic German and Dutch (see previous section for why this might be an accidental gap). However, the Optional Tense Hypothesis makes a further prediction: the order S-O-Neg/Adv should be unattested as well. I am unaware if this order appears in early German, but agrammatic Dutch displays such a structure (116).

(116) Agrammatic Dutch: S-O-Adv

maar ik auto graag
but I car happily
"but I like to drive the car"
Conj - S - O - Adv

The underlying order for (116) is Adv-S-O: graag ik auto. However, we have S-O-Adv. This means that both the subject and the object have moved past Adv. As such two FPs above VP are required to accommodate the movement. The Optional Tense Hypothesis cannot account for such a sentence. Furthermore, even with TP present, the structure that Poeppel & Wexler adopt cannot accommodate such a string. Following Poeppel & Wexler, the functional projections are TP and CP. To derive the sentence in (116), the subject would have to move to
[Spec CP] and the object to [Spec TP]. The derivation is schematized below.

(117) Derivation of O-S-Neg/Adv-V (for German and Dutch)

This derivation is not licit. The subject must move to [Spec TP] to be assigned Case (it can then move to [Spec CP]). The CP-TP structure cannot account for this order. The Optional Tense Hypothesis, with its missing TP, cannot account for the full array of agrammatic clauses; moreover, neither can a model that is restricted to the functional projections CP and TP.

The evidence for the Optional Tense Hypothesis is summarized in the table below.

Table 3: Evidence for the Optional Tense Hypothesis (OTH)

<table>
<thead>
<tr>
<th></th>
<th>Acquisition Data</th>
<th>Agrammatism Data</th>
<th>OTH Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>O - S - Adv</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>S - O - Adv</td>
<td>*</td>
<td>✓</td>
<td>*</td>
</tr>
</tbody>
</table>

Extending the Optional Tense Hypothesis to agrammatic production results in the following: only one functional projection is available in agrammatic untensed clauses. The
prediction from such a structure is that only one constituent can move out of VP, and higher than Adv. Agrammatic Dutch displays the order S-O-Adv, where two constituents move past Adv. Two functional projections higher than VP are therefore required. The Optional Tense Hypothesis cannot account for this construction.

3.2.3 *Agrammatic Clauses Have the Full Array of Syntactic Projections*

I have argued for the existence of two FPs based on the number of constituents that move out of VP. I now turn my argument in a different direction. First, I adopt an analysis that motivates movement to specific syntactic positions: V-to-T, subject-to-[Spec TP], object-to[AgrOP], and so forth. Second, I assume that each FP in agrammatic clauses behaves as it would in a normal clause. Under such assumptions, we will not find subjects perched in [Spec AgrOP], or TP hosting objects, and so on. In other words, movement of an object is evidence for AgrOP (or CP, depending what else is present in the sentence), movement of a subject is evidence for TP, initial Wh-phrases are evidence for CP, and so forth. If only two FPs are present, we expect only two types of movement. I argue that agrammatic clauses display a larger inventory of movement and, consequently, require a larger set of FPs. I propose that the full array of projections is present in agrammatic clauses. Consider the following general phrase structure 36.

36 I recognize that AgrSP is another FP that many would include in such a structure. Both AgrSP and TP host subject. I collapse the two into TP for expository purposes. The data display movement to only a single FP that hosts a subject, so evidence for one or the other is difficult to tease apart. Why favor TP? AgrSP exists to provide the Spec-head relationship for subject-verb agreement. TP also affords this relationship and is required for nominative Case-assignment (to the subject) by T. Moreover, the most recent trend (Chomsky, 1993, 1995) is to do away with AgrPs altogether. While I am not prepared to rid myself of AgrOP, I do my part by eliminating AgrSP.
This structure displays three FPs other than NegP: CP, TP and an FP between TP and VP. I consider movement to each of these projections in turn, beginning with movement to CP.

3.2.3.1 Movement to CP

The first set of constructions are those that require CP. In normal German and Dutch, any constituent can move into sentence initial position (Haegeman, 1994). The position they move to is \([\text{Spec CP}]\). Both subjects and objects may move to \([\text{Spec CP}]\). However, in the agrammatic data under scrutiny this movement is indistinguishable from their respective movements to \([\text{Spec TP}]\) and \([\text{Spec AgrOP}]\). To indentify movement to \([\text{Spec CP}]\), other constituents must be considered. The agrammatic data offers four such cases: fronting of locative prepositional phrases (PPloc), predicate-fronting, object-fronting and Wh-phrases in initial position. The sentences in (119) are examples of locative prepositional phrases in initial position.

(119) Agrammatic Clauses: PPloc-Adv

a. \([P]\) kantoor \([\text{Mod}]\) verder slapen
\([P]\) office \([\text{Mod}]\) further sleep:Inf
"(he) can sleep some more at the office"
\((S) - \text{PPloc} - [\text{Mod}] - \text{Adv} - \text{Vinf}\)

b. \([P]\) kantoor \([V]\) [DP] eindelijk rust
\([P]\) office \([V]\) [DP] finally peace
"at the office he finally has some peace"
\(\text{PPloc} - [V] - [\text{DP}] - \text{Adv} - \text{Adj}\)
In (119), the locative PP ("at the office") precedes Adv. The derivation of the surface order is the following. The PP is underlyingly VP-internal, which means that it starts off to the right of Adv. The PP must then move to an FP dominating VP. This cannot be AgrOP, which hosts the object. Nor can it be TP, which host the subject. The landing site is [Spec CP]. Agrammatic clauses require CP. The derivation is schematized in (120).

(120) Derivation of Sentence (119a): PP-Fronting

Next, the sentences in (121) illustrate predicate fronting. The predicates in question are the adjective phrases (AP) "difficult" (121a) and "disappeared" (121b) as well as the DP "eight o’clock" (121c).

(121) Agrammatic Dutch and German: Predicate-Adv

a. moeilijk [Modal] [Pleo] altijd blijven
difficult [Modal] [Pleo] always remain:Inf
"it will always remain difficult"

b. verdwenen [Cop] de kip
disappeared [Cop] the chicken
"the chicken has disappeared"
AP - [Cop] - S
In (121), the predicates precedes Adv. The derivation matches that of the locative PPs. The predicates are underlyingly VP-internal, starting off to the right of Adv. They then move to an FP dominating VP. Once again, the landing site is [Spec CP]. Agrammatic clauses require CP. The derivation is schematized in (122).

(122) Derivation of Sentence (121a): Predicate Fronting

An alternate interpretation for (121bc) is the following: the whole VP moves to [Spec CP] rather than just the AP/DP. The derivation would result in the following structure.

(123) Derivation of Sentence (121c): VP-Fronting
Next, we find object-shift in Dutch, where the object precedes the subject. Examples are presented below.

(124) Agrammatic Dutch and German: Object-Subject

a. [Det] kippebout [Aux] [Det] hond gepakt
   [Det] drumstick [Aux] [Det] dog take:Part
   "the dog takes the drumstick"
   O - [Aux] - S - V

b. [Det] man [Modal] [Det] wekker roepen
   [Det] man [Modal] [Det] alarm call:Inf
   "the alarm clock is calling/waking the man"
   O - [Mod] - S - V

Although there is no overt evidence for subject movement, I have assumed in this derivation that the subject does indeed raise to [Spec TP] (as it should to receive nominative Case), the surface position of the object is [Spec CP]. The derivation is shown in (125).

(125) Derivation for Sentence (124a): Object-Subject-V

The object first raises to [Spec CP]. This derivation requires TP and CP (even if the subject does not raise, the object still moves to [Spec CP] since that is the focus position).

Next, Wh-phrases surface clause-initially. This ordering requires the Wh-phrase to move out of the VP and into the specifier of a dominating FP. The construction is illustrated in (126). The derivation is schematized in (127).
(126) Agrammatic Clause: Wh-element in Clause-Initial Position

a. où [DP] [Mod] voir cardiologue
   where [DP] [Mod] see: Inf cardiologist
   "where I had to see a cardiologist"

b. dove [Cop] la foccacia
   where [Cop] the cake
   "where is the cake?"

(127) Derivation of (126b): Wh-Phrases

Raised Wh-phrases are always in [Spec CP]. In (127) the Wh-phrase is underlyingly internal to VP, then raises to [Spec CP]. Once again, agrammatic clauses require CP.

Evidence for movement to [Spec CP] is fairly robust. The evidence includes PP-fronting in Dutch, predicate-fronting in Dutch and German, and Wh--phrases.

3.2.3.2 Movement to TP

The second set of constructions are those that require TP: subject-initial clauses in Italian and subjects preceding Adv and Neg in Dutch and German. In Italian, subjects underlyingly follow their predicate. Thus, any sentence that is subject-initial requires that the subject move out of the VP. The position they move to is [Spec TP]. Subject-initial clauses are presented in (128).
(128) Agrammatic Italian Subject-Initial Clauses

a. la signora [Aux] scocciata
   the lady [Aux] annoy:Part
   “the lady is annoyed”
   S - [Aux] - Vpart

b. la nonna e Cappuccetto Rosso [Cop] salve
   the grandmother and LRRH [Cop] safe:F-Pl
   “the grandmother and LRRH were safe”
   S - [Cop] - Adj

c. io [Cop] assessore pure
   and I [Cop] member too
   “and I am a member too”
   S - [Cop] - N - Adv

d. [Det] acqua [V] sotto (sul) [Det] pavimenti (pavimento)
   [Det] water [V] under (on) [Det] floor:Pl (floor:Sg)
   “the water goes on the floor”
   S - [V] - PP

In (128), the subjects precede their predicates, whether they are verbs (128a), adjectives (128b), nouns (128c), or PPs (128d). The derivation is as follows. The subject is underlingly VP-internal, starting off to the right of the predicate. The subject then moves to an FP dominating VP. It lands in [Spec TP] to receive nominative Case (and check agreement with the verb/copula). Agrammatic clauses therefore require TP. The derivation is schematized in (129).

(129) Derived Syntactic Structure for Sentence (128a)
The next set of constructions I consider are Dutch and German clauses where the subject precedes Adv. Examples are presented in (130).

(130) Agrammatic Clauses: Subject-Adv

a. [Adv] [Modal] [Det] vrouw toevallig eventjes thuis-komen Dutch
   “then my wife accidentally came home for a while”

b. ik [Aux] nou 21 jaar gewerkt Dutch
   “I have worked for 21 years”
   S - [Aux] - Adv - Vpart

c. der Wolf [V] inzwischen die Grossmutter ah im Bauch German
   “in the meantime the wolf has the grandmother in its belly”
   S - [V] - Adv - O - PP

d. das Kind und ihre (seine) Grossmutter [Cop] wieder normal German
   “the child and her grandmother were normal again”
   S - [Cop] - Adv - Adj

In (130), the subjects precede Adv. The derivation, schematized in (131), parallels that of clause-initial subjects in Italian. Subjects are underlyingly VP-internal, starting off to the right of Adv. The subjects then move to an FP dominating VP. They land in [Spec TP] to receive nominative Case (and check agreement with the verb/copula). Agrammatic clauses require TP.

(131) Derivation for Sentence (130d): Subject-Adv

```
  TP
   |   
  DP       T'
   |   
  das Kind und ihre Grossmutter (the child and her grandmother)
   |   
  ADV wieder (again)
   |   
  VP
    |   
  AP
    |   
  V
          |   
  V'
```
The last set of constructions exemplifying movement to [Spec TP] are Dutch and German clauses where subjects precede Neg, as in (132). Earlier I argued that subjects land in [Spec NegP]. The purpose then was to determine how many FPs are required in agrammatic clauses. Having established the number of FPs, I am now investigating the nature of these FPs. Whether or not these subjects move to [Spec NegP], they must move to [Spec TP] to receive Case.

(132) Agrammatic Clauses: Subject-Neg

a. ik [Cop] niet bij
   I [Cop] not with
   “I was not conscious”
   S - [Cop] - Neg - P

b. das [Cop] nicht gut
   that [Cop] not good
   “that’s not good”
   S - [Cop] - Neg - Adj

c. die Abgase [Cop] nicht desund
   the exhaust-fumes [Cop] not healthy
   “the exhaust fumes were not healthy”
   S - [Cop] - Neg - Adj

In (132), the subjects precede Neg. The derivation matches that of the previous set. Subjects are underlyingly VP-internal, starting off to the right of Neg. The subjects then move to [Spec TP] to receive their nominative Case (and check agreement with the verb/copula). Once again, agrammatic clauses require TP. The derivation is schematized in (133).

(133) Derivation of Sentence (132b): Subject-Neg
All three sets have displayed subject movement. Subjects move into [Spec TP]. Agrammatic clauses thus require TP.

Evidence for movement to [Spec TP] is substantial. The evidence includes subject-initial sentences in Italian, and clauses that display subjects preceding negation and adverbs.

3.2.3.3 Movement to a Functional Projection between TP and VP

The following two sets of constructions are those that require a functional projection between TP and VP, possibly AgrOP\textsuperscript{37}: the Subject-Object-Adv construction and objects preceding Adv in German. Evidence for such an FP is thus based on object-shift (Homberg, 1986)\textsuperscript{38}. The Subject-Object-Adv construction is illustrated in (134). The derivation is schematized in (135).

(134) Agrammatic Clause: Subject-Object-Adv

\[
\text{Dutch} \\
\text{ik [V] [Det] auto graag} \\
\text{I [V] [Det] car happily} \\
\text{“I happily drive the car”} \\
\text{S - [V] - O - Adv}
\]

\textsuperscript{37} Chomsky’s (1995) Minimalist framework does away with Agr projections, including AgrOP. Instead, movement to the specifier of a projection headed by a “small v”, [Spec vP], takes place.

\textsuperscript{38} Homberg’s generalization (1986) states that if the object shifts, the verb also moves. Thus object shift is a diagnostic for V-movement and hence evidence for whatever projection V moves to.
Both the subject and the object precede Adv. But the subject precedes the object. The object must be in [Spec FP] (possibly [Spec AgrOP]), with the subject in [Spec TP] (and possibly having subsequently moved to [Spec CP]). Agrammatic clauses thus require require a functional projection between TP and VP, possibly AgrOP.

Next, agrammatic German displays object shifting. This is illustrated in (136) and (137).

(136) Agrammatic German: Object-Adv

[DP] [Aux] mir auch passiert
[DP] [Aux] me:Dat also happen:Part
"that has also happened to me"

(137) Derived Syntactic Structure for Sentence (136)
The object precedes Adv. The object is underlyingly VP-internal, starting off to the right of Adv. It then moves to [Spec FP], passing Adv. Again, agrammatic clauses require an FP which dominates VP. I propose that the FP is AgrOP since the movement involves object shifting. However, this utterance has an alternative interpretation, presented in (138).

(138) Agrammatic German: Object-Adv

mir [Aux] [DP] auch passiert
me:Dat [Aux] [DP] also happen:Part
“that has also happened to me”

Here, the object is focused and moves to [Spec CP]. The derivation is schematized in (139).

(139) Derived Syntactic Structure for Sentence (138)

Object fronting in (139) consists of focus NP shift to [Spec CP]. The object thus raises past Adv to [Spec CP]. Given this interpretation of the movement, agrammatic clauses require CP.

I have argued that agrammatic clauses display movement to [Spec AgrOP], [Spec TP] and [Spec CP]. Consequently, AgrOP, TP and CP are required in agrammatic clauses. Evidence for movement to [Spec TP] and [Spec CP] is substantial. However, evidence is weaker for movement to [Spec AgrOP].
There is much debate about how many FPs are projected in the syntax of normals. The debate has lead to an ever increasing inventory of FPs, ranging from the now familiar CP and TP, to AgrOP and AgrSP, to AspektP, NumP, KaseP and on from there. Arguing for the full array of FPs in agrammatic clauses is a rather difficult, if not impossible task. Nevertheless, I propose exactly that: agrammatic clauses consist of the full array of FPs available in the speaker's language i.e. agrammatism does not target any specific syntactic structure. The prediction is that whatever word orders result from these FPs will be in evidence in agrammatic clauses (tensed and untensed). In other words, no possible word order should be systematically missing. The tasks that make up the database for this thesis consists of fairly unconstrained production tasks: personal history (of illness), picture descriptions, and story telling. A database resulting from a battery of specialized production tasks is now needed to test for the various constructions and predicted word orders. I leave this for further research.

3.3 LEXICAL PROJECTIONS IN AGRAMMATIC PRODUCTION

I have focused on whether or not functional projections are present in the syntactic structure of agrammatic clauses. I have yet to address the issue of missing lexical projections. I now turn to two sets of data: missing lexical categories (specifically verbs and nouns) and missing arguments. With cumulative arguments based on plausibility, I maintain that lexical categories project phrasal structure in agrammatic clauses.

3.3.1 Missing Lexical Categories

What occurs when lexical categories, i.e. nouns and verbs, are omitted? Do they have projections without phonetic content (eg. [vp e] and [np e])? Or are they simply absent, not projecting any syntactic structure in the syntax? Let us assume for the moment that Ns and Vs that are omitted are absent from the syntax. That being the case, these categories are not able to
function within the syntax (i.e. $V_{vp}$ and $V_{np}$). Specifically they cannot be involved in theta-assignment or Case-assignment\(^{39}\). I will consider the two projections of lexical categories: verb and noun.

3.3.1.1 Missing Verb

If V is absent from the syntax, theta-roles and (objective) Case cannot be assigned. We therefore do not expect to find utterances that have verbs missing but where the thematic role of the arguments are interpreted or where objective Case is assigned. Consider the following agrammatic clauses with missing verbs. For more examples of missing verbs in agrammatic clauses, see Appendix (18).

(140) Agrammatic Clauses: Missing Verb

a. the wife is [V]: “Hurry up!”
   “the wife is saying: “Hurry up!””

b. de man en een vrouw [V] in de mand
   the man and a woman [V] in the basket
   “the man and a woman look in the basket”

c. und der Wolf [V] inzwischen die Grossmutter ah im Bauch
   and the wolf [V] meanwhile the grandmother uh in+the belly
   “and in the meantime the wolf has the grandmother in its belly”

d. la grand-mère [V]: “Ouvre, la chevilllette cherra”
   the grandmother [V]: “Open, the latch will lift”
   “the grandmother says: “Open, the latch will lift””

e. marito sta [V] [Det] sveglia
   husband is [V] [Det] alarm-clock
   “the husband is turning off the alarm clock”

In each of the above examples, the arguments and their relationships are clear given the context. If the arguments are receiving their theta-roles, then some form of the V must be present to assign them. Thus V and its projections, V' and VP, are present.

\(^{39}\) The issue of agreement relationships was addressed in the preceding section.
Further evidence for the presence of \( V \) are replacement sequences, as described in section 3.2.1.1.1. In the second attempt I have underlined the word that is missing from the original attempt. For more examples of replacement sequences for verbs in agrammatic production, see Appendix (19).

(141) Agrammatic Clauses: Replacement Sequences for Verbs

a. no examples in database  
   English

b. no examples in database  
   Dutch

c. einmal [\( V \)] die Mutter ...  
   once [\( V \)] the mother ...  
   "once the mother wanted ..."
   German

c'. einmal wollte [DP] ...  
   once want:Pst [DP] ...  
   "once the mother wanted ..."
   German

d. no example in database  
   French

e. [Det] marito sta [\( V \)] [Det] sveglia  
   [Det] husband be:Prs-3Sg [\( V \)] [Det] alarm+clock  
   "the husband putting the alarm clock"  
   Italian

e'. l'uomo sta posando no prendere (prendendo) la sveglia  
   the man be:Prs-3Sg putting no take:Inf (taking) the alarm clock  
   "the man is putting the alarm clock"  
   Italian

These replacement sequences are indirect evidence that the verb is present underlingly. A VP must therefore also be projected.

3.3.1.2 Missing Noun

I now turn to missing nouns. If a noun is missing, and consequently not projected, then there is no argument to receive a theta-role. However, thematic roles are interpreted even when the noun is absent. These omissions show up as missing subject nouns (142) and missing object nouns (143). For more examples of missing subject nouns, see Appendix (20). For more examples of missing object nouns, see Appendix (21).
Agrammatic Clauses: Missing Subject Noun

a. the [N] [V]: “[Det] better [to] eat you all up”
   “the wolf says: ‘The better to eat you all up’”
   ≠ the someone says: “The better to eat you all up”

b. en dan [Modal] de [N] opstaan
   and then [Modal] the [N] up-get:Inf
   “and then the man must get up”
   ≠ the someone must get up

c. so [Cop] die [N] so gut
   so [Cop] the [N] so good
   “thus the (parts of the) body is/are good”
   ≠ the something is good

Agrammatic Clauses: Missing Object Noun

a. the thief lifts his [N]
   “the thief lifts his body”
   ≠ the thief lifts his something/someone

b. [DP] [Aux] de ‘t [N] vergeten
   [DP] [Aux] the:M/F the:N [N] forgotten:Part
   “she had forgotten the gas”
   ≠ she had forgotten the something

c. ein Einbrecher nutzt die [N]
   a thief uses the [N]
   “a thief uses the opportunity”
   ≠ a thief uses the something/someone

d. puis les meubles modernes garnissent les [N]
   and the furniture modern decorate the [N]
   “and the modern furniture decorates the rooms”
   ≠ the modern furniture decorates the something

   “I went with the orderly to the third floor downstairs”
   ≠ I went with the orderly the third something downstairs

Each of the utterances in (142) and (143) is missing the N of the DP, leaving a stranded Determiner. These missing Ns receive specific interpretations. In other words they do not have an indefinite meaning of “something” or “someone”. In the case of missing subjects, if there is no NP projection, the constructions are not licit. If however, N is syntactically active but
phonologically null, V assigns its theta-role, DP receives a theta-role, and the specific
interpretation is accounted for.

In the case of missing objects, if no NP is present conceivably the verbs in question have
an intransitive variant in the Agrammatic Grammar (AG). However, with an intransitive form of
the verb, only an activity reading should result. As argued above, the interpretations are not
general activity readings. Further, if nouns are absent from the syntax, then AG contains
intransitive determiners that are homophonous with the regular determiners in both NG and in
other utterances of AG. This is unlikely. Thus the missing noun must be syntactically active,
with an NP projected in the syntax.

Further evidence for the presence of N are replacement sequences, as described in section
3.2.1.1.1. I have underlined in the second attempt the word that is missing from the original
attempt. For more examples of replacement sequences for nouns, see Appendix (22).

(144) Agrammatic Clauses: Replacement Sequences for Nouns

a. the thief lifts his [N]
   “the thief lifts his body”

a’. the thief lifts [Det] body
   “the thief lifts his body”

b. en dan [Mod] de [N] opstaan
   and then [Mod] the [N] up+get
   “and then the man must get up”

b’. de man begint met opstaan
   the man begin:Prs-3Sg with up+get
   “the man starts to get up”

c. no examples in database

d. dans son jardi pour faire [N]
   in his garden to give [N]
   “in his garden to frighten”

d’. pour [V] peur aux moineaux
   to [V] fright to+the birds
   “to frighten the birds”

e. no examples in database
These repetition sequences are evidence that the noun is present underlyingly. A NP must therefore also be projected.

3.3.2 Missing Arguments

As we saw above Ns and Vs can be phonologically null. So too can full subject and object arguments. There are two issues that must be addressed with respect to null arguments: is an argument projected and if so, what is the nature of it? First, I establish the syntactic presence of null arguments by addressing the issues of theta-roles and subject-verb agreement. I then turn to the nature of null arguments: are these arguments instances of pro or are they non-pronominal DPs with no phonetic content (DP-Ø)? I address the licensing and identification conditions of these null arguments to see if they match those of pro. I conclude that null arguments are DP-Øs rather than pro.

3.3.2.1 Missing Subjects and Objects

Do missing arguments project syntactic structures in agrammatic utterances? First, consider missing subjects. If subjects are radically missing i.e. no syntactic projection, then the Extended Projection Principle (EPP) is violated. I have argued that the Agrammatic Grammar is governed by the principles of UG. One of those principles is the EPP, which requires the presence of a subject position (the subject need not be phonologically overt, as in the case of pro). AG must therefore project a subject position.

If a noun is produced in argument position then a DP must be present in the syntax to receive the theta-role that a predicate assigns. But what if the whole DP is omitted? Is an argument projected? As with the missing Ns above, these missing DPs are interpretable and receive appropriate theta-roles. If the argument is absent, and consequently not projected, then there would be no argument to receive a theta-role. However, thematic roles are interpreted even
when the argument is absent. These omissions show up as missing subjects (145) and missing objects (146). For more examples of missing subject arguments, see Appendix (23-29). For more examples of missing object arguments, see Appendix (30-33).

(145) Agrammatic Omissions: Missing Subject DP

a. [DP] pass (passed) out  
   "I passed out"

b. en [DP] kom later 
   and [DP] come:Prs-1Sg later 
   "and I will come later"

c. Grossmutter warum hast [DP] [Det] [Adv] grossen Mund 
   grandmother why have:Psr-2Sg [DP] [Det] [Adv] big mouth 
   "grandmother, why do you have such a big mouth?"

d. [DP] [Aux] mis un épouvantail pour chasser les oiseaux 
   [DP] [Aux] put:PastPart a scarecrow to chase the birds 
   "he put in a scarecrow to chase the birds away"

e. [DP] sta per scivolare sulla (dal)lo sgabello 
   [DP] is about slip:Inf on+the:F-Sg (from+the:M-Sg) stool:M-Sg 
   "the boy is about to slip off the stool"

(146) Agrammatic Omissions: Missing Object DP

a. [Poss] wife, Rosa, take (took) [DP] [P] Loveladies 
   "my wife Rosa took me to Loveladies"

b. midden in het bos pakte de heks nee [Det] wolf [DP] 
   middle in the forest caught the witch no [Det] wolf [DP] 
   "in the middle of the forest the witch, no the wolf caught her"

c. die Frau weckt [DP] wieder 
   the woman wakes [DP] again 
   "the woman wakes him again"

d. ma femme [Aux] appelé/er un ami et les pompiers 
   my wife [Aux] call:Part/Inf a friend and the firemen 
   pour [CL] conduire à la clinique 
   to [CL] drive:Inf to the clinic 
   "my wife called a friend and the firemen to drive me to the clinic"

e. un poliziotto [CL] aspetta 
   a policeman [CL] waits 
   "a policeman waits for him"
In each case V is present and the thematic roles it assigns to subject and object are interpretable, given the context. V must assign its theta-roles. Consequently, some argument must be present to receive these theta-roles. A possible alternative is that the theta-roles are somehow assigned internally. In other words, the theta-roles could be satisfied within the lexicon i.e. verbs are reclassified to optionally assign theta-roles. In such a situation the arguments would not be required to be projected in the syntax. However, since no DPs with a specified set of features is assigned the theta-roles, we expect the internalized arguments to receive a generic/non-specific interpretation. This is is not the case. Both subjects and objects receive specific interpretations. I begin with the objects in (146). For the English (146a) and French (146d) sentences, the speaker (1Sg) is the object. For the Dutch (146b) clause, the object her indicates Little Red Riding Hood (LRRH). For the German 146(c) sentence, the object him refers to the man in the picture. And lastly, for the Italian utterance in (146e) the object him is interpreted as the burglar. With internalized objects we expect a generic reading of ‘someone’, rather than the specific readings described above. The only alternative is to have an argument in the syntax i.e. the predicates are not reclassified as intransitive.

A similar argument holds for null subjects. There are two possible approaches to internalized subjects. The first parallels that of objects: the subjects are interpreted as an indefinite ‘someone’. Clearly this is not the case, as can be seen by the specific interpretation of each of the subjects in (145): the English (145a) and Dutch (145b) subjects are both 1Sg; the German (145c) is 2Sg; the French (145d) is the farmer in the picture; and the Italian (145e) is the boy in the picture.

There is a second possibility, however. Semantic principles independent of the normal grammar may allow subjects (and objects) to receive default interpretations: that of the speaker, 1Sg, or that of the topic, 3Sg. While semantic principles form part of the interpretation of arguments, I assume that these principles are governed by UG. The alternative is a set of semantic heuristics that are independent of UG. There are three reasons to reject a UG-independent semantic solution to null subjects. First, this strategy once again involves
manipulating two sets of principles for what is a single structure: semantic principles and syntactic principles. In pro-drop languages such as Italian, subjects are standardly phonologically absent. The production/interpretation of these null subjects is done through syntactic means (namely the projection of 'little pro')⁴⁰. In other words, non-pathological speakers of languages like Italian use syntactic principles to produce/interpret null arguments. These syntactic principles result from UG and are thus independently available to agrammatic speakers. If agrammatics are adopting a semantic set of heuristics when producing null arguments, they are in fact manipulating two sets of principles. They use the normal syntactic principles when producing overt arguments, and the semantic principles when producing null arguments. This account sets up a rather odd system. Normal speakers use a single (syntactic) system to produce overt and null arguments, whereas agrammatic speakers manipulate two systems to produce these same structures. As argued above, if one system can do the job, why posit the existence of a second?

The second argument against a semantic account of null arguments lies in the fact that agrammatics do not simply omit 1Sg and 3Sg persons. Although 1Sg and 3Sg are the majority of null arguments, we see omission of a variety of person specifications. These are illustrated below. For more examples of missing 1Sg subjects, see Appendix (23); for missing 2Sg subject, Appendix (24); for 3Sg referential subjects, Appendix (25); for expletive subjects, Appendix (26-27); for 1Pl subjects, Appendix (28); and for 3Pl subjects, Appendix (29).

(147) Agrammatic Omissions: Missing Subject - 1Sg

a. [DP] pass (passed) out  
   “I passed out”  English

b. maar [DP] [Aux] begonnen van [met] boodschappen doen  
   but [DP] [Aux] start:PrsPart well [to] errands do:Inf  
   “but I have started to do errands”  Dutch

c. [DP] war nicht mehr da  
   [DP] be:Pst-1Sg not more there  
   “I wasn’t there anymore”  German

---

⁴⁰I assume a model of grammar that incorporates empty categories. The argument above would be different for models without empty categories, such as LFG, HPSG, categorial grammar.
(148) Agrammatic Omissions: Missing Subject - 2Sg

a. no examples in database

b. en ja [DP] moet praten [P] [Det] maatschappij
   and yes [DP] must:Prs talk:Inf [P] [Det] society
   “you must talk in company”

c. Grossmutter warum hast [DP] [Det] [Adv] grossen Mund
   grandmother why have:Psr-2Sg [DP] [Det] [Adv] big mouth
   “grandmother, why do you have such a big mouth?”

(149) Agrammatic Omissions: Missing Subject - 3Sg Referential

a. [DP] forgot the wash, the dishes
   “she forgot the wash, the dishes”

b. of [DP] [Aux] [Det] gas uit-gedaan
   or [DP] [Aux] [Det] gas off-turned:Part
   “or she turned off the gas”

c. später begutachtet [DP] seinen Kukuruz
   later examines [DP] his corn
   “later he examines his corn”

d. peu après [DP] contemple [Det] récolte
   little after [DP] consider:Prs-3Sg [Det] harvest
   “a little later he considers the harvest”

e. [DP] trova un poliziotto e [DP] l’arresta
   [DP] finds a policeman and [DP] him arrests
   “the thief finds a policeman and the policeman arrests him”

(150) Agrammatic Omissions: Missing Subject - Expletive

a. [Pleo] [Cop] a view [P] shrubs, trees [Conj] grass
   “there is a view of shrubs, trees and grass”

b. [Pleo] [Cop] duidelijk te zien
   [Pleo] [Cop] clear to see:Inf
   “it is clear to see”

---

41 Normally Italian does not require overt subjects, since it is pro-drop. However, overt subjects are required in this utterance to clarify the agents of each verb.
c. [Pleo] fehlt was
   [Pleo] miss:Prs-3Sg something
   there is something missing”

   d. [Pleo] [Cop] pour mieux t’entendre l’ (mon) enfant
   [Pleo] [Cop] to better you hear the:Sg (my:Sg) child
   “The better to hear you with, my child”

   e. structure not relevant since Italian is pro-drop

(151) Agrammatic Omissions: Missing Subject - 1Pl

   a. no examples in database

      [DP] [V] this room and [Det] shower-bath and [Adv] nothing more
      “we have this room and a shower and then nothing more.

   c. no examples in database

   d. no examples in database

   e. structure not relevant since Italian is pro-drop

(152) Agrammatic Omissions: Missing Subject - 2Pl

   No examples found in the data.

(153) Agrammatic Omissions: Missing Subject -3Pl

   a. [DP] spread [Det] cloth, napkin[s], dish[es], forks, spoons
      “they spread a cloth, napkins, dishes, forks, spoons”

   b. [DP] [Modal] thuis-komen
      [DP] [Modal] home-come:Inf
      “they had come home”

   c. [DP] [Cop] normal (normaux)
      [DP] [Cop] normal:Sg (normal:Pl)
      “they were normal”

   d. no examples in database

   e. structure not relevant since Italian is pro-drop

It is true that the majority of the subjects are 1Sg or 3Sg. However, I argue that this results from the production tasks. Recall that the agrammatics' production tasks involve conversing about their illness, picture descriptions and the telling of LRRH. The nature of the production tasks is such that the most frequently used subjects are 1Sg (recounting of illness) and
3Sg (picture description and story telling). Consequently the most frequent null subjects are 1Sg and 3Sg. Nevertheless, other person interpretations are attested. Subjects receive a variety of interpretations: 1Sg, 2Sg, 3Sg referential, 3Sg expletive, 1 Pl and 3Pl (2Pl being unattested in the data I have analyzed). A semantic account must be discarded.

Further evidence for the presence of DP are replacement sequences, as described in section 3.2.1.1.1. I have underlined in the second attempt the word that is missing from the original attempt. For more replacement sequences for arguments, see Appendix (34).

(154) Agrammatic Clauses: Replacement Sequences for Arguments

a. [DP] shaved [DP]
   “the nurse shaved me”  
   [Det1 nurse shaved me
   “the nurse shaved me”

b. no examples in database

c. no examples in database

d. y fait la sieste [P] rattraper [DP] perdu
   he take:Prs the nap [P] catch [DP] lost
   “he takes a nap the make up for wasted time

d’. le temps perdu de sommeil
   the time lost of sleep
   “the lost sleeping time”

e. no examples in database

These repetition sequences are indirect evidence that the argument is present underlyingly. A DP must therefore be projected.

The third argument against a purely semantic account of null subjects involves subject-verb agreement, which I discuss in more detail below. If null subjects are absent from the syntax and receive their interpretation from a set of semantic heuristics, we do not expect them to have syntactic reflexes. However, they trigger subject-verb agreement, a canonically syntactic relation. A semantic solution must therefore be discarded.
Further evidence for the syntactic presence of a (phonologically null) argument comes from agreement markings on the verb. If omission entails the absence of projections, then when arguments are omitted, they should project no structure. This means that any other categories that are produced and that are dependent upon the null argument for their featural identity will suffer. Verbal agreement is a case in point. Verbal agreement is realized through a local relation with the subject argument, the Spec-head relation (Chomsky, 1993, 1995). This structural relation is schematized below. I adopt FP as the generic Functional Projection.

(155) Structure for Subject-Verb Agreement

```
FP
  DP "^^^^ F
  F
  F' ...
  V
```

The subject DP is in [Spec FP], and the V is in the head position of FP. Subject-verb agreement is achieved through this Spec-head relation. If the DP is absent, then agreement is predicted to go awry. If the DP is present, agreement should be fine. While agreement does suffer from substitution errors, these errors are not the result of DP omission. DP omission is correlated neither negatively nor positively with the presence of agreement. First, agreement errors occur when DP is present, as illustrated in (156). This is the opposite of what is predicted. For more examples of agreement errors on verbs with overt subjects, see Appendix (35).

(156) Agrammatic Errors on Verb with Overt Subject

- a. RRH says: “My, your ears is (are) larger”
  “RRH says: “My, you ears are larger”
- b. van [Det] hond ruiken (ruikt)
  well [Det] dog smell:3Pl (smell:3Sg)
  “a/the dog smells something”
Second, absence of DP is not (necessarily) accompanied by substitution errors on the verb, as shown in (157). When the subject argument is missing, agreement on the verb is not random. Agrammatic speakers generally produce the correct agreement even if the Lexical Item is not phonologically present in the utterance. For more examples of agreement on verbs with null subjects, see Appendix (36).

(157) Agrammatic Clauses: Agreement on Verb with Null Subject

<table>
<thead>
<tr>
<th>Language</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>a. [DP] likes grandmother’s voice</td>
</tr>
<tr>
<td></td>
<td>“she likes grandmother’s voice”</td>
</tr>
<tr>
<td>Dutch</td>
<td>b. ja [DP] dacht van</td>
</tr>
<tr>
<td></td>
<td>yes [DP] think:Pst-1Sg well</td>
</tr>
<tr>
<td></td>
<td>“I thought so”</td>
</tr>
<tr>
<td>German</td>
<td>c. [DP] war nicht mehr da</td>
</tr>
<tr>
<td></td>
<td>[DP] be:Pst-1Sg not more there</td>
</tr>
<tr>
<td></td>
<td>“I wasn’t there anymore”</td>
</tr>
<tr>
<td>Italian</td>
<td>d. [DP] trova un poliziotto e[DP] l’arresta</td>
</tr>
<tr>
<td></td>
<td>[DP] find:Prs-3Sg a policeman and [DP] him arrest:Prs-3Sg</td>
</tr>
<tr>
<td></td>
<td>“the thief finds a policeman and the policeman arrests him”</td>
</tr>
</tbody>
</table>

Even if the subject is phonologically null, the appropriate projection must be available for the Spec-head agreement relation of subject and verb. Moreover, the agreement features that are assigned during the derivation must be present, even if the phonological matrix of the Lexical Item is not. Thus the grammatical structure must include the projections of the null subject.

---

42 Italian is a pro-drop language which means that subjects need not be overt unless the discourse requires it. This example is one such case.
3.3.2.3 The Nature of Null Arguments

Some languages like Italian allow subjects to be phonologically null, where languages like English do not allow this option. Consider the following sentences.

(158) a. lui ha telefonato
    he have:3Sg telephone:Part
    "he has telephoned"

b. ha telefonato
    have:3Sg telephone:Part
    "he has telephoned"

(159) a. he has telephoned

b.*has telephoned

Italian is referred to as pro-drop language, where the subject (pronoun) can drop. English is a non-pro-drop language. In order to interpret the phonologically null subject, it must be recoverable or identifiable (Taraldsen, 1978; Chomsky, 1981, 1982; Jaeggli, 1982; Huang, 1984, 1987, 1989).

This distinction becomes relevant when we consider agrammatic sentences with null arguments. Are null subjects in agrammatic production pro, or are they non-pronominal DPs with no phonetic content, which I label DP-Ø? In other words, have non-pro-drop languages reverted to being pro-drop, or are null subjects full DPs that are missing their phonological specifications? The empirical distinction between the two may seem negligible, but they afford different predictions. If null arguments are in fact pro, they must be licensed and identified as such. If null arguments are full DPs, then their licensing conditions will match that of DPs.

What licenses pro? And how is pro identified? There are two types of languages that license pro, languages with rich agreement (eg. Italian) and languages with no agreement (eg. Chinese). I begin with the licensing and identification conditions of pro for Italian-type languages and then address those for Chinese-type languages. If we compare Italian and English
once again, we notice a marked difference in the agreement morphology of the verb. English has an impoverished verbal paradigm whereas Italian verbal agreement is rich. The following two paradigms for the verb eat illustrate my point.

(160) English and Italian Paradigms for the Verb *Eat*

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>Italian</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>eat</td>
<td>mangio</td>
</tr>
<tr>
<td>you</td>
<td>eat</td>
<td>mangi</td>
</tr>
<tr>
<td>she/he</td>
<td>eats</td>
<td>mangia</td>
</tr>
<tr>
<td>we</td>
<td>eat</td>
<td>mangiamo</td>
</tr>
<tr>
<td>you</td>
<td>eat</td>
<td>mangiate</td>
</tr>
<tr>
<td>they</td>
<td>eat</td>
<td>mangiano</td>
</tr>
</tbody>
</table>

Whereas Italian has a different agreement morpheme for each person (-o for “I”, -Ø for “you”, -a for “she/he”, and so forth), English only identifies 3Sg with -s. It therefore looks as though rich agreement systems license the use of *pro*, whereas impoverished systems do not. While this characterization may work for subject *pro*, it does not hold for object *pro*. Again Italian and English contrast: Italian has object *pro*, whereas English does not. Consider the following sentences discussed in Rizzi (1986a).

(161)  

a. questo conduce la gente a concludere quanto segue  
  "this leads the people to conclude what follows"

b. questo conduce *pro* a concludere quanto segue  
  "this leads *pro* to conclude what follows"

(162)  

a. this leads people to conclude what follows  

b.*this leads to conclude what follows

Although Italian has *pro*, as in (161b), there is no object agreement on the verb that parallels the subject agreement discussed above. It cannot be the case that *pro* is licensed by rich
agreement. Moreover, the interpretation of the two pros is different. Subject pro is specific whereas object pro is arbitrary. In (161b) there is no specific individual that is being referred to. Rather, an arbitrary ‘someone’ is the object. Perhaps object pro is different from subject pro? If we compare null objects in Chichewa to those of Italian, we see this is not so. Consider the following sentences from Baker (1988). SAg r indicates ‘subject agreement’. OAg r indicates ‘object agreement’.

(163) a. mikango yanu i-na-thamangits-a mbuzi zathu
   lions your SAg r-Past-chase-Aspect goats our
   “your lions chased our goats”

   b. mikango yanu i-na-zi-thamangits-a mbuzi zathu
   lions your SAg r-Past-OAg r-chase-Aspect goats our
   “your lions chased our goats”

   c. mikango yanu i-na-zi-thamangits-a pro
   lions your SAg r-Past-OAg r-chase-Aspect
   “your lions chased them (our goats)”

In (163a) no object agreement is marked on the verb, but the object DP mbuzi zathu “our goats” is overt. In (163b) both object agreement-zi- and the object DP mbuzi zathu “our goats” are present. In (163c) only object agreement-zi- is overt, with an object pro as object argument. In Chichewa, object pro (as in (163c)) receives a specific interpretation. This differs from the Italian object pro that receives an arbitrary interpretation. But note the morphological difference: Chichewa has object agreement marked on the verb, Italian does not. Agreement morphology certainly plays a role with respect to pro. However, we must conclude that agreement morphology identifies pro, but does not license it. What then licenses pro? Rizzi (1986a) separates licensing from identification and proposes the following.

(164) Pro-drop Parameter

   pro is governed by a designated X°.

(165) Identification Convention

   pro has the feature complex specified on X°; otherwise, it has arbitrary features.
The class of heads that may license pro under government vary from language to language. In Italian, V and T license pro. Hence Italian has both subject and object pro. Subject pro is identified in the following manner: it has the feature complex that is specified on the verbal head. This feature complex includes person and number specifications. Consequently, subject pro receives a specific interpretation. However, neither V nor T bear object agreement markings. Consequently, object pro must have arbitrary features and hence an arbitrary interpretation. In English, no head licenses pro\(^{43}\), so neither subject nor object pro can appear.

If the agrammatic speakers of non-pro-drop languages have adopted a pro-drop strategy for null arguments, the licensing and identification conditions of these elements should be the same as those discussed above (or as those discussed for Chinese, below). If not, we either have a new type of pro with its own set of conditions or we are witnessing DP-∅. Four of the five languages under study are non-pro-drop\(^{44}\), Italian being the one pro-drop language. If each instance of null arguments in English, Dutch, German and French agrammatic utterances is in fact an instance of pro, we should find that subject pro is licensed by a governing Functional head and object pro is licensed by V. Further, if no indentification features on either of these licensers are present, the null arguments should receive an arbitrary interpretation.

I begin with null objects. Each null object receives a specific interpretation, as illustrated in the following examples (recall that I also argued for specific interpretation of null objects above).

(166) Agrammatic Omissions: Null Objects

a. the wife was showing [DP] the clock
   "the wife was showing him the clock"

b. en [Det] hond [Modal] [DP] op-etan
   and [Det] dog [Modal] [DP] up-eat:Inf
   "and the dog has eaten the chicken up"

\(^{43}\)This is not quite accurate. English does display pro in a very restricted environment: we find pro in impersonal constructions (Roberge & Vinet, 1989).

\(^{44}\)Roberge & Vinet (1989) argue that French is a pro-drop language, with subject pro being identified by the subject clitic and object pro identified by the object clitic.
If the null objects are in fact object pro, the only way they can receive a specific identification is if the licensing head bears the appropriate features. However, none of the four languages in question displays object agreement. This means that each instance of a null object should have an arbitrary interpretation. This prediction is not borne out. Thus null objects cannot be pro.

A similar argument can be made for null subjects. Each null subject receives a specific interpretation, as illustrated in the following examples (recall that I also argued for specific interpretation of null subjects above). For more examples of null subjects, see Appendix (23-29).

(167) Agrammatic Omissions: Null Subjects

a. [DP] pass (passed) out English
   “I passed out”

b. zaterdag [Modal] [DP] slecht praten Dutch
   Saturday [Modal] [DP] badly talk:Inf
   “Saturday I could only talk badly”

c. also [DP] [Modal] Buchstaben aus-lassen German
   thus [DP] [Modal] letter:Pl out-leave:Inf
   “so I leave out letters”

d. [DP] [Aux] mis un épouvantail pour chasser les oiseaux French
   [DP] [Aux] put:PastPart a scarecrow to chase the birds
   “he put in a scarecrow to chase the birds away”

If the null subjects are in fact subject pro, the only way they can receive a specific identification is if the licensing head bears the appropriate features. Each of the languages in question does indeed have subject-verb agreement. Thus, they should allow a specific interpretation of subject pro. However, as the above examples show, the agreement markings are
not always present. In (167), the clauses do not have any tense or agreement morphemes. With no agreement features present we expect the null subjects to receive an arbitrary interpretation. This prediction is not borne out. Thus null subjects cannot be pro.

In summary, null arguments in agrammatic production cannot be instances of pro that are identified as in rich-agreement languages like Italian. I now consider the identification conditions of pro in Chinese-type languages. Unlike Italian, Chinese does not display rich agreement. It nevertheless licenses pro. Huang (1989) argues that Chinese has subject pro but not object pro. Both subjects and objects drop in Chinese, as illustrated in the following examples (all Chinese data is from Huang (1989)). Asp indicates ‘aspect marker’, Perf indicates ‘perfective’ and Q indicates ‘question morpheme’.

(168) a. Zhangsan kanjian Lisi le ma?
   Zhangsan see Lisi Asp Q
   “Did Zhangsan see Lisi?”

b. (ta) kanjian (ta) le-
   (he) see (he) Perf
   “(he) saw (him)”

c. wo xiang (ta) kanjian (ta) le
   I think (he) see (he) Perf
   “I think (he) saw (him)”

In (168a) both arguments are overt. In (168b-c) both subject and object may be phonologically null. However, null subjects and null objects are not identified in the same way. For example, an embedded object cannot be A-bound by the matrix subject, whereas an embedded subject can. This is illustrated below. The null arguments are represented as [e].

(169) a. Zhangsan shuo [ [e] hen xihuan Lisi ]
   Zhangsan say [e] very like Lisi
   “Zhangsan said that [he] liked Lisi”

b. Zhangsan shuo [ Lisi hen xihuan [e] ]
   Zhangsan say Lisi very like [e]
   “Zhangsan said that Lisi liked [him]”
In (169a) the null subject [e] may either refer to Zhangsan or to someone else who is the discourse topic. In (169b) the null object [e] can only refer to the discourse topic, and not to Zhangsan. Huang (1984) proposes that null objects in Chinese are variables that are A-bar bound by an empty operator (Op). Since variables must be A-free, they cannot be A-bound by the matrix subject Zhangsan. Instead they receive their interpretation via the operator Op from an antecedent in the discourse, specifically the discourse topic. Null subjects, on the other hand, are identified via Huang’s (1989) Generalized Control Rule, presented below.

(170) Generalized Control Rule (GCR)

An empty pronominal is controlled in its control domain (if it has one).

Huang defines a control domain as the following (also see Manzini, 1983; Nishigauchi, 1984).

(171) \( \alpha \) is the control domain for \( \beta \) iff it is the minimal category that satisfies both (a) and (b):

(a) \( \alpha \) is the lowest S or NP that contains (i) \( \beta \), or (ii) the minimal maximal category containing \( \beta \) (henceforth MMC(\( \beta \))).

(b) \( \alpha \) contains a SUBJECT accessible to \( \beta \).

A ‘SUBJECT’ can either be an actual subject argument or (rich) Agr(eement). If \( pro \) has a control domain, then it must have a “local, unique, non-arbitrary antecedent” (Huang, 1989:194). This is the controller, which gives \( pro \) its reference. If \( pro \) has no control domain, then its antecedent may be in the discourse. There are two possible control domains: the lowest NP/S (or DP/TP) containing \( pro \), or the lowest NP/S (or DP/TP) containing MMC(\( pro \)). Combining variation in accessible SUBJECTS and variation in control domains leaves us with the following six scenarios.

Let us consider each of the possibilities in (172). If pro is the matrix subject of a clause with Agr rich enough to control it (as in (172a)), its control domain is the matrix clause, with Agr as the controller. If however, pro is the matrix subject of a clause with poor Agr (as in (172b)), it does not have a control domain and may receive its interpretation from an antecedent in the discourse. The same holds for pro as the matrix subject of an untensed clause (as in (172c)): pro receives its interpretation from an antecedent in the discourse. If pro is an embedded subject, there are three possible situations. If the embedded clause is tensed and has rich Agr (as in (172d)), then the embedded clause itself is the control domain, with Agr being the controller (this parallels the situation in (172a)). If the embedded clause is tensed but has poor Agr (as in (172e)), then the matrix clause is the control domain, with the matrix subject as the controller. Lastly, if the embedded clause is untensed (as in (172f)), the matrix clause is the control domain, once again with the matrix subject acting as controller.

I argued above that null arguments in agrammatic production are not identified like pro in Italian. I now consider if they are identified like pro in Chinese: do agrammatic null arguments follow the Generalized Control Rule? To begin, the only language under study that has rich agreement is Italian. Of the five languages, Italian is the only pro-drop language. I focus on the four non-pro-drop languages for the moment. These all have poor Agr. The inventory of environments for pro, as presented in (172), is therefore reduced: (172a) and (172d) are excluded, since they involve clauses with rich Agr. Further, with the exception of one example from German, there are no instances of null arguments in embedded clauses. I therefore set aside (172e) and (172f). The environments that remain involve a null argument in tensed clauses with poor Agr or a null argument in untensed clauses. The result is the same: if the null argument is
pro, it must receive its reference from an antecedent in the preceding discourse. Specifically, pro must receive its reference from the preceding discourse topic. If agrammatic null arguments are indeed pro, we do not expect to find them introducing new topics. However, this is exactly the case, as illustrated below. More examples are presented in Appendix (37).

(173) Agrammatic Clauses: Null Arguments with no Antecedents in the Discourse and/or That Introduces New Discourse Topic

a. [DP] shaved [DP]
   “the nurse shaved me”

   Context: The preceding discourse topic revolves around patients in general and the speaker’s position (flat on his back).

b. [DP] [V]: “Ga maar maar ik kom later”
   [DP] [V]: “go:Imp just but I come:Prs-1Sg later”
   “I said: “You can go but I will come later on!””

   Context: The preceding discourse topic revolves around the activity of the speaker’s wife and children (and St. Nicholas).

c. einmal wollte [DP] [Comp] [DP] der Grossmutter [DP] [V]
   once want:Pst [DP] [Comp] [DP] the grandmother [DP] [V]
   weil die Grossmutter krank gewesen ist
   because the grandmother sick be:Part be:Prs-3Sg
   “once the mother wanted LRRH to take a basket to grandmother because grandmother was sick”

   Context: The preceding discourse topic was LRRH and why her name was L Red RH. The was no previous mention of a basket.

d. et aprè{'es} [DP] fini
   and after [DP] ended
   “and once the movie was over”

   Context: The preceding discourse sets up the activity (watching television) but does not mention movie explicitly.

Even Italian, a pro-drop language, displays ‘missing’ arguments, as shown in (174).
In each case, the subject should be overt since it introduces a new topic. The null arguments in (173) and (174) do not receive their interpretation from the preceding discourse topics. They do not pattern with Chinese-type pro. I conclude therefore that agrammatic null arguments are not pro. Rather, agrammatic null arguments are full DPs that are lacking their phonological features: DP-Ø.

I now return to a question left unresolved. The first issue I addressed was the relationship between the Agrammatic Grammar and UG. I concluded that AG is constrained by UG, leaving undecided the issue of whether AG is identical to the Normal Grammar or different from it. I argue that AG and NG are identical based on missing arguments.
3.4 THE DISTRIBUTION OF OMISSIONS

I will now discuss the rate and distribution of omissions. Although any syntactic category may be omitted, not all categories are omitted with the same frequency. What determines rate of omission? First I must distinguish between absolute rate of omission and relative rate of omission. I will establish that two factors affect these rates: severity of deficit and categorial identity. Severity of deficit influences the absolute rate of omission: the more severe the deficit, the higher the rates of omission. Categorial identity influences the relative rates of omissions. In other words, the identity of the syntactic category, whether N or V or D and so on, has consequences for omission. I develop a Principle of Robustness that accounts for the relative rates of omission.

3.4.1 Are Rates of Omission a Measure of Severity?

I begin with the role that the severity of the deficit plays in determining rates of omission. Severity of deficit can be estimated by Mean Length of Utterance (MLU) and Mean Rate of Production (MRP). MLU is measured in words/phrase; MRP is measured in words/minute. Lower MLU and MRP indicates fewer words per phrase and fewer words per minute, respectively. Hence lower MLU and MRP indicate a more severe impairment. Consider the following measure of severity for the two English-speaking agrammatics. The following table indicates the MLU and MRP for each agrammatic speaker and for their respective controls (each agrammatic requires a control matched for age, handedness, education, etc.).

---

46 Absolute rates of omission are the rates of omission of a specific category (across the five languages and/or across the various agrammatic speakers). Relative rates of omission are the rates of omission of the various categories within a given language and/or speaker.
Table 4: Agrammatic English Mean Length of Utterance and Mean Rate of Production

<table>
<thead>
<tr>
<th></th>
<th>EF</th>
<th>Control</th>
<th>EE</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLU (word/phrase)</td>
<td>2.8</td>
<td>10.0</td>
<td>2.3</td>
<td>15.0</td>
</tr>
<tr>
<td>MRP (words/min)</td>
<td>18.8</td>
<td>176.4</td>
<td>14.4</td>
<td>151.2</td>
</tr>
</tbody>
</table>

First, each measurement (MLU and MRP) is dramatically lower for the agrammatic as compared to the control. This is to be expected considering that agrammatics have a language deficit, whereas the controls do not. This difference is observable for each of the languages under study. The range for MLU of the agrammatic speakers is 2.3 to 6.0. The range for MLU of the normal speakers is 7.8 to 15.0. The range for MRP of the agrammatic speakers is 10.6 to 70.2. The range for MRP of normal speakers is 110.9 to 176.4. These ranges are displayed in the table and figures below.

Table 5: Mean Length of Utterance (MLU) and Mean Rate of Production (MRP)
- Ranges for Agrammatics and Controls

<table>
<thead>
<tr>
<th></th>
<th>Agrammatic</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLU (word/phrase)</td>
<td>2.3 - 6.0</td>
<td>7.8 - 15.0</td>
</tr>
<tr>
<td>MRP (words/min)</td>
<td>10.6 - 70.2</td>
<td>110.9 - 176.4</td>
</tr>
</tbody>
</table>
Second, there is a distinction between the two English agrammatics: EE’s deficit is more severe than EF’s. Consider now their rates of omissions. The table (and all subsequent tables)
must be read as follows. The EF’s omission figure for N is 1/92 - 1.1%. “92” indicates the number of obligatory contexts for N. “1” indicates the number of omissions. And “1.1%” indicates the percentage of omission for N.

Table 6: Agrammatic English Rates of Omission

<table>
<thead>
<tr>
<th></th>
<th>EF</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>EE</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>2</td>
<td>92</td>
<td>2.2%</td>
<td>3</td>
<td>139</td>
<td>2.2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>3</td>
<td>69</td>
<td>4.3%</td>
<td>6</td>
<td>51</td>
<td>11.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>7</td>
<td>99</td>
<td>7.0%</td>
<td>58</td>
<td>105</td>
<td>55.2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aux/Modal</td>
<td>8</td>
<td>55</td>
<td>14.6%</td>
<td>21</td>
<td>23</td>
<td>91.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average omission rate</td>
<td>7.0%</td>
<td></td>
<td></td>
<td>40.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity of deficit</td>
<td>deficit EF &lt; deficit EE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EE’s omission rates are higher than EF’s. This is true for almost syntactic category: V - 11.8% versus 4.3%, D - 55.2% versus 7.0%, and Aux/Modal - 91.3% versus 14.6%. This is reflected in the average omission rates: for EE it is 40.1%, and for EF it is 7.0%. From this we can conclude that severity of deficit (as established above and in chapter 2) influences rate of omission: the more severe the deficit, the higher the rates of omission.

However, equating severity of deficit with a specific average omission rate is not possible. First, as discussed in chapter 2, individuals adopt varying compensatory strategies. These diverse strategies influence rates of omission both across languages and within a given language. Second, other factors, such as agreement and Case features, influence omission rates. Since languages encode these features differently, rates of omission vary accordingly. Thus, the
severity-omission match is not stable across languages. What we must therefore focus on is inter-language variation.

Although this severity-omission correlation does not consistently carry through each of the languages under study, the pattern holds generally. The following table displays the Mean Length of Utterance, the Mean Rate of Production and the average percentage of omission. The first initial for each of the agrammatics indicates the speaker’s language: E = English, D = Dutch, G = German, F = French, and I = Italian.

Table 7: Summary of Agrammatic MLU, MRP and Average Omission

<table>
<thead>
<tr>
<th></th>
<th>MLU</th>
<th>MRP</th>
<th>Omission</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF</td>
<td>2.8</td>
<td>18.8</td>
<td>7.0%</td>
</tr>
<tr>
<td>EE</td>
<td>2.3</td>
<td>14.4</td>
<td>40.1%</td>
</tr>
<tr>
<td>DB</td>
<td>2.8</td>
<td>41.1</td>
<td>47.0%</td>
</tr>
<tr>
<td>DH</td>
<td>2.8</td>
<td>38.6</td>
<td>38.8%</td>
</tr>
<tr>
<td>GB</td>
<td>3.8</td>
<td>28.3</td>
<td>9.3%</td>
</tr>
<tr>
<td>GM</td>
<td>3.9</td>
<td>31.6</td>
<td>17.2%</td>
</tr>
<tr>
<td>FC</td>
<td>6.0</td>
<td>43.0</td>
<td>19.1%</td>
</tr>
<tr>
<td>FA</td>
<td>5.8</td>
<td>70.2</td>
<td>4.1%</td>
</tr>
<tr>
<td>IR</td>
<td>2.4</td>
<td>19.3</td>
<td>23.7%</td>
</tr>
<tr>
<td>IV</td>
<td>3.5</td>
<td>31.2</td>
<td>9.4%</td>
</tr>
</tbody>
</table>

The English agrammatics follow the severity-omission correlation. The same holds for the French and Italian agrammatics. In each of these three languages, the higher the severity of
the deficit (as measured by shorter MLU and slower MRP), the higher the average omission rate. The French rates of omission are presented in Table 8, the Italian in Table 9.

Table 8: Agrammatic French Rates of Omission

<table>
<thead>
<tr>
<th></th>
<th>Tokens</th>
<th>Context</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>5</td>
<td>196</td>
<td><strong>2.6%</strong></td>
</tr>
<tr>
<td>V</td>
<td>7</td>
<td>131</td>
<td><strong>5.3%</strong></td>
</tr>
<tr>
<td>D</td>
<td>52</td>
<td>284</td>
<td><strong>18.3%</strong></td>
</tr>
<tr>
<td>Aux/Modal</td>
<td>16</td>
<td>32</td>
<td><strong>50.0%</strong></td>
</tr>
<tr>
<td><strong>FA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1</td>
<td>104</td>
<td><strong>1.0%</strong></td>
</tr>
<tr>
<td>V</td>
<td>1</td>
<td>96</td>
<td><strong>1.0%</strong></td>
</tr>
<tr>
<td>D</td>
<td>9</td>
<td>217</td>
<td><strong>4.2%</strong></td>
</tr>
<tr>
<td>Aux/Modal</td>
<td>6</td>
<td>60</td>
<td><strong>10.0%</strong></td>
</tr>
</tbody>
</table>

Average omission rate

| **FC** | **19.1%** |
| **FA** | 4.1%      |

Severity of deficit

deficit FC > deficit FA
Table 9: Agrammatic Italian Rates of Omission

<table>
<thead>
<tr>
<th></th>
<th>IR</th>
<th></th>
<th>IV</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
<td>Tokens</td>
</tr>
<tr>
<td>N</td>
<td>7</td>
<td>93</td>
<td>7.5%</td>
<td>4</td>
</tr>
<tr>
<td>V</td>
<td>20</td>
<td>101</td>
<td>19.8%</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>44</td>
<td>175</td>
<td>25.1%</td>
<td>15</td>
</tr>
<tr>
<td>Aux/Modal</td>
<td>25</td>
<td>59</td>
<td>42.4%</td>
<td>5</td>
</tr>
</tbody>
</table>

Average omission rate

<table>
<thead>
<tr>
<th></th>
<th>IR</th>
<th></th>
<th>IV</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td></td>
<td></td>
<td>23.7%</td>
<td>9.4%</td>
</tr>
<tr>
<td>V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aux/Modal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Severity of deficit
deficit IR > deficit IV

This pattern holds for each syntactic category. For French, FC is more severely impaired than FA, based on MLU and MRP. The omission rates reflect this: N - 2.6% versus 1.0%, V - 5.3% versus 1.0%, D - 18.3% versus 4.2%, and Aux/Modal - 50.0% versus 10.0%. This is further reflected in the average omission rates: for FC it is 19.1%, and for FA it is 4.1%. For Italian, IR is more severely impaired than IV. The omission rates reflect this: N - 7.5% versus 2.2%, V - 19.8% versus 4.2%, D - 25.1% versus 14.3%, and Aux/Modal - 42.4% versus 16.7%. This is further reflected in the average omission rates: for IR it is 23.7%, and for IV it is 9.4%. The higher the severity of deficit, the higher the omission rates.

For the Dutch and German agrammatics, the average omission rates appear to indicate the opposite, namely that their average omission rate is higher for the less severely impaired agrammatic. Let us look at the specific omission rates for these two languages. The Dutch rates of omission are present in Table 10, the German rates of omission in Table 11.
Table 10: Agrammatic Dutch Rates of Omission

<table>
<thead>
<tr>
<th></th>
<th>DB</th>
<th></th>
<th></th>
<th>DH</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
<td>Tokens</td>
<td>Context</td>
</tr>
<tr>
<td>N</td>
<td>2</td>
<td>104</td>
<td>1.9%</td>
<td>4</td>
<td>148</td>
</tr>
<tr>
<td>V</td>
<td>16</td>
<td>91</td>
<td>17.6%</td>
<td>31</td>
<td>81</td>
</tr>
<tr>
<td>D</td>
<td>132</td>
<td>162</td>
<td>81.5%</td>
<td>85</td>
<td>154</td>
</tr>
<tr>
<td>Aux/Modal</td>
<td>66</td>
<td>76</td>
<td>86.8%</td>
<td>39</td>
<td>66</td>
</tr>
<tr>
<td>Average omission rate</td>
<td>47.0%</td>
<td></td>
<td></td>
<td>38.8%</td>
<td></td>
</tr>
<tr>
<td>Severity of deficit</td>
<td>deficit DB &lt; deficit DH</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11: Agrammatic German Rates of Omission

<table>
<thead>
<tr>
<th></th>
<th>GB</th>
<th></th>
<th></th>
<th>GM</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
<td>Tokens</td>
<td>Context</td>
</tr>
<tr>
<td>N</td>
<td>2</td>
<td>170</td>
<td>1.2%</td>
<td>4</td>
<td>138</td>
</tr>
<tr>
<td>V</td>
<td>6</td>
<td>103</td>
<td>5.8%</td>
<td>8</td>
<td>97</td>
</tr>
<tr>
<td>D</td>
<td>39</td>
<td>211</td>
<td>18.5%</td>
<td>30</td>
<td>194</td>
</tr>
<tr>
<td>Aux/Modal</td>
<td>5</td>
<td>43</td>
<td>11.6%</td>
<td>16</td>
<td>38</td>
</tr>
<tr>
<td>Average omission rate</td>
<td>9.3%</td>
<td></td>
<td></td>
<td>17.2%</td>
<td></td>
</tr>
<tr>
<td>Severity of deficit</td>
<td>deficit GB &gt; deficit GM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
For Dutch, based on MLU and MRP, DH is more severely impaired than DB. However, DH’s omission rates are not consistently higher than DB’s. This pattern only holds for N and V: N - 2.7% versus 1.9% and V - 38.3% versus 17.6%. The categories D and Aux/Non-lex show the opposite pattern: D - 55.2% versus 81.5% and Aux/Modal - 59.1% versus 86.8%. Notice that (i) DH’s and DB’s MLU’s are identical (2.8), and (ii) their MRP’s are close (41.1 versus 38.6, respectively). It is therefore possible that their deficits are of approximately equal severity and that the unexpected rates of omissions are due to differing compensatory mechanisms.

For German, again based on MLU and LRP, GB is more severely impaired than GM. However, the only category that follows the established pattern is D: 18.5% versus 15.5%. Each of the other categories shows the opposite pattern: N - 1.2% versus 2.9%, V - 5.8% versus 8.3%, and Aux/Modal - 11.6% versus 42.1%. This is further reflected in the average omission rates: for GB it is 9.3%, and for GM it is 17.2%. As with the Dutch agrammatics, GB and GM have similar MLUs (3.8 and 3.9, respectively) and MRPs (28.3 and 31.6, respectively). Moreover, the only truly dramatic distinction in rates of omission is for Aux/Modal (albeit in the unpredicted direction). Once again, the unexpected rates of omissions could be due to disparate compensatory mechanisms.

I have shown that for three of the five languages the correlation is the following: the more severe the deficit, as measured by MLU and MRP, the higher the rates of omission for each syntactic category under study. The omission-deficit correlation is indirect rather than direct. Although the pattern is not absolute, other factors impinge on omission rates, thus altering the pattern. These factors include (i) compensatory mechanisms, (ii) language-specific constraints on omission, and (iii) consistency in testing conditions (see section 2.2.1 for a discussion on factors affecting variability).

3.4.2 Which Syntactic Categories Get Omitted?

All syntactic categories get omitted. What is of interest, however, is that syntactic
categories do not all have the same rates of omission. I showed above that a specific level of
deficit (if indeed that can be accurately determined) cannot be associated with an absolute rate of
omission. This is also true for individual syntactic categories. Any given category cannot be
associated with a specific rate of omission. In other words, the category D cannot be equated
with a specific omission rate either across languages or across speakers within a language.
Several factors affect the omission rate of a given category: severity of deficit (as discussed
above), compensatory mechanisms (as discussed in chapter 2), and encoding of agreement and
Case features (as discussed in chapter 4). The severity of deficit and compensatory mechanisms
alter the omission rate of a category both across languages and within a language. Feature
encoding affects the omission rate of a category across languages. We must therefore focus on
relative rates of omission. The questions I address in this section are the following. Is there a
general hierarchy of omission (or retention)? Does this hierarchy hold across speakers of a given
language? Does it hold across languages? What factors determine or influence the hierarchy?

3.4.2.1 The General Retention Hierarchy

Before delving into specific distinctions, I briefly discuss the relative rates of omission in
general terms. Four syntactic categories are included in the omission charts above: N, V, D,
Aux/Modal. No absolute omission rate can be associated with any given category. Moreover,
factors like compensatory mechanisms can affect omission rates such that they go opposite what
the severity of the deficit would predict. But what about the omission rate of one category with
respect to the omission rate of another for the same agrammatic speaker? In other words, do Ds
have a consistently higher/lower rate of omission than say Vs? Compiling the omission rates
from all the above tables results in the following Retention Hierarchy, where “>“ means “better
retained than”.

(175) Retention Hierarchy
   \[ N > V > D > \text{Aux/Modal} \]
This Retention Hierarchy holds for each individual under study, with the one exception of GB. GB's retention is as follows.

(176) GB's Retention Hierarchy

N > V > Aux/Modal > D.

The only difference between GB's retention hierarchy and the general Retention Hierarchy is that GB retains fewer Ds than Aux/Modals. GB maintains the N/V distinction, where N is better retained than V. GB also maintains the N-V/D-Aux(Modal) distinction: both N and V are better retained than either D or Aux/Modal.

I now turn to specific oppositions within the hierarchy.

3.4.2.2 Lexical versus Functional Categories

Agrammatic speech has traditionally been characterized as omitting closed class items and grammatical morphemes, which make up the syntactic set called functional categories. In this section, I discuss agrammatic production of functional categories (F-categories) and lexical categories (L-categories).

Let us consider the agrammatic production of these categories. The table shows the omission rates of all the agrammatic speakers. For each individual, F-categories have a higher rate of omission than L-categories.
Table 12: Agrammatic Omission Rates of Functional versus Lexical Categories

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<thead>
<tr>
<th></th>
<th>Functional categories</th>
<th>Lexical categories</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Tokens</td>
<td>Context</td>
</tr>
<tr>
<td>EF</td>
<td>28</td>
<td>260</td>
</tr>
<tr>
<td>HE</td>
<td>133</td>
<td>231</td>
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<tr>
<td>DB</td>
<td>246</td>
<td>421</td>
</tr>
<tr>
<td>DH</td>
<td>156</td>
<td>411</td>
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<tr>
<td>GB</td>
<td>44</td>
<td>356</td>
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<tr>
<td>GM</td>
<td>54</td>
<td>385</td>
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<tr>
<td>FC</td>
<td>86</td>
<td>445</td>
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<tr>
<td>FA</td>
<td>14</td>
<td>343</td>
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<tr>
<td>IR</td>
<td>81</td>
<td>301</td>
</tr>
<tr>
<td>IV</td>
<td>19</td>
<td>183</td>
</tr>
</tbody>
</table>

The range of omission rates is quite broad (see section 2.2.1 for discussion of variability). The range of omission rates for F-categories is 4.1% to 58.4%. The range of omission rates for L-categories is 1.5% to 20.4%. These are schematized in figure 5 below.
As is reflected in the bar graph, F-categories have a higher rate of omission than L-categories. What also becomes apparent is that F-categories have a much broader range of omission rates than L-categories. Any model of syntactic categories must be consistent with these facts. In order to account for the agrammatic treatment of F-categories, a syntactic distinction between L-categories and F-categories is required. I argue below that the agreement, Case and tense features that a category encodes affects the rates of omissions (and substitution; see chapter 4). Since functional categories encode more of these features, it comes as no surprise that their omission rates vary more than those of lexical categories.

3.4.2.3 Nominal versus Verbal Categories

Several studies have shown that agrammatics have more difficulties with Verbal categories than with Nominal categories (for English, Jakobson, 1964; for Dutch, Kolk et al., 1982; for Italian, Miceli et al., 1983; Zingeser & Berndt, 1990). In this section I investigate the division between Nominal categories (N-categories) and Verbal categories (V-categories). Let us consider the agrammatic production of these categories. The table in (166) shows the omission rates of all the agrammatic speakers. For each individual, N-categories are better retained than V-categories, (i.e. omission rates are higher with verbs than with nouns) the exception being GB,
where V-category omission is 8.8% and N-category omission is 10.8% (also notice that GB is the only agrammatic whose omission rates do not follow the retention hierarchy).

Table 13: Agrammatic Omission Rates of Verbal and Nominal Categories

<table>
<thead>
<tr>
<th></th>
<th>Verbal categories</th>
<th>Nominal categories</th>
</tr>
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<tr>
<td></td>
<td>Tokens</td>
<td>Context</td>
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<tr>
<td>EF</td>
<td>13</td>
<td>151</td>
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<tr>
<td>EE</td>
<td>35</td>
<td>117</td>
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<tr>
<td>DB</td>
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<td>216</td>
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<tr>
<td>DH</td>
<td>11</td>
<td>204</td>
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<td>GB</td>
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<td>GM</td>
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<td>211</td>
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<td>FC</td>
<td>29</td>
<td>206</td>
</tr>
<tr>
<td>FA</td>
<td>7</td>
<td>200</td>
</tr>
<tr>
<td>IR</td>
<td>62</td>
<td>233</td>
</tr>
<tr>
<td>IV</td>
<td>14</td>
<td>199</td>
</tr>
</tbody>
</table>

The range of omission rates is quite broad (see section 2.2.1 for discussion of variability). The range of omission rates for verbal categories is 3.5% to 54.4%. The range of omission rates for nominal categories is 3.1% to 29.5%. These are schematized in figure 6 below.
As is reflected in the bar graph, verbal categories (tend to) have a higher rate of omission than nominal categories. Verbal categories also have a much broader range of omission rates than nominal categories. This parallels the F-category/L-category distinction. Since verbs are more like functional categories than nouns, they are expected to behave more like F-categories than nouns. Any model of syntactic categories must be consistent with these facts. In order to account for the agrammatic treatment of verbal categories, a syntactic distinction between verbal categories and nominal categories is required. Once again, agreement, Case and tense features affect the rates of omission. Verbal categories can encode more of these features. They are therefore expected to display a wider range of omission rates than nominal categories.

3.5 CONCLUSION

In this chapter I addressed the issue of omission errors in agrammatic production, focusing on the nature and distribution of omissions. In order to determine what mechanisms are impaired I established what structures are intact. I argued against the Lexical Projection Hypothesis, the Truncation Hypothesis and the Optional Tense Hypothesis, and argued for the presence of (at least) CP, TP and AgrOP. Moreover, I proposed that agrammatic clauses require the complete array of syntactic projections. This array includes not only verbal functional
projections (such as CP and TP), but also nominal functional projections (like DP) and lexical projections (NP and VP in particular).

I then discussed the rate and distribution of omissions. Although any syntactic category may be omitted, not all categories are omitted with the same frequency. I showed that the more severe the deficit (as indicated by MLU and MRP), the higher the overall omission rates. Furthermore, I demonstrated that while absolute rates of omissions do vary from agrammatic to agrammatic, the relative rates of omissions are constant across agrammatics and across languages. The hierarchy is as follows: N > V > D > Aux/Modal, where “>” means “better retained or more often produced than”.

A more detailed survey of the various categories then followed. I concluded that two distinctions are relevant to agrammatism: the lexical-functional and nominal-verbal distinctions. Lexical categories are produced more frequently than functional categories, and nominal categories are produced more frequently than verbal categories.
Chapter 4

AGRAMMATISM: SUBSTITUTION ERRORS

Agrammatic speech is characterized by omissions and substitutions. I addressed omission errors in the preceding chapter. I now turn to substitution errors. The utterances in (1) illustrate substitution errors in agrammatic speech. Italics indicate the item that is produced; the content of the following rounded brackets ‘()’ represents the speaker’s target.

(1) a. My, your ears is (are) larger
   “My, your ears are larger”

   b. de man and een vrouw pakt (pakken) nee de hond pakt the kip
   “the man and a woman take:3Sg (take:3Pl) no the dog take:3Sg the chicken
   “the man and a woman take, no the dog takes the chicken”

   c. weil er nicht noch nicht aus schlafen (geschlafen) bin ist
   “because he has not had enough sleep”

   d. le couple y sont (est) arrivé pour manger
   “the couple they be:Prs-Pl (be:Sg) arrive:Part to eat:Inf
   “the couple arrive to eat”

   e. i genitori stava (stavano) in pensiero
   “the parents were thinking”

Agrammatic utterances with substitutions are different from those with omissions in one obvious way: there are no missing words, as shown in (1). There are utterances that include both omissions and substitutions. However, what is relevant here is that the two need not co-occur. The only deviation from non-pathological speech is the production of an inappropriate lexical item. Otherwise, the utterance is normal: it displays appropriate word order, and the full array of structures is projected. What then is the nature of substitution? In what way is the lexical item ‘inappropriate’? First, I argue that substitutions are not completely random. Substitutions are of the same syntactic category. A noun substitutes for a noun, a verb for a verb, and so on. Second, I argue that substitutions are further constrained. There are three types of substitutions: phonological, semantic and syntactic. Phonological substitutions involve
mis-selecting a word with the same initial segment: pick for picnic, for example. Semantic substitutions involve mis-selecting a word along semantic lines: wife for man, trip for fall, and the like. And syntactic substitutions involve mis-selecting a word with different agreement (person, number and gender), Case or tense features: say, dogs for dog. I then argue that syntactic substitutions are even more restricted. A given substitution error may only involve a single feature (the Single Feature Constraint).

Having established the nature of substitution errors, I investigate their distribution. What are the most frequent feature shifts? What direction do shifts follow? In some cases, feature substitutions are bi-directional. When we compare the feature systems encoded in the different syntactic categories, we notice that agrammatics of differing languages do not treat a given category in the same way. For instance, determiners are frequently omitted in English and Dutch, whereas determiners suffer from substitution rather than omission in German. Further, the number of agreement and Case features encoded in a given category influences the substitution rate.

4.1 THE NATURE OF SUBSTITUTION

In this section, I establish that substitutions are restricted to the same syntactic category. I then show that the features involved in substitution are agreement, Case and tense features. Next, I argue that these features are not randomly manipulated. Rather, for any given substitution a single feature is changed.

4.1.1 Substitution Is Not Chaotic

What is substitution? The first possible explanation is that substitution errors are completely random, with no constraints governing them. If substitutions are random, then any word can substitute for any other word. For example, the singular noun cat could substitute for
the 3Sg verb *eats* in the target utterance *the dog eats the chicken*. The resulting utterance would then be: *the dog cat the chicken*. However, this cross-category substitution is unattested. In agrammatism we do not find substitution errors that replace one syntactic category with another (Garrett, 1988). This parallels the categorial restriction for substitution errors in normals (Nooteboom, 1969; Fromkin, 1971; Stemberger, 1985). This is illustrated below. First, verbs substitute for verbs.

(2) Agrammatic Substitution: Verb for Verb

a. the boy *give* (gives) to the girl a cookie
   "the boy gives to a/the girl a cookie"

b. maar verder [DP] *kom* (komt) vanself
   but further [DP] *come:1Sg* (come:3Sg) by-itself
   "but further such a thing comes by itself"

c. im Büro hat [DP] nicht gearbeit[et]
   in+the office has [DP] not work:Part

   *und* (sondern) *schlafen* (geschlafen)
   *and* (rather) *sleep:*Inf (sleep:Part)

   "in the office he didn’t work, rather he sleeps"

d. no examples in database

e. [Det] due sposini *prepara* (preparano) da mangiare in terra
   [Det] two newlyweds *prepare:*3Sg (prepare:3Pl) to eat:Inf in ground
   "the two newlyweds get ready to eat on the ground"

In the English example, the bare verb *give* substitutes for the verb *gives*. In Dutch *kom* "come:Prs-1Sg" substitutes for *komt* "come:Prs-3Sg". The German example involves the verb *sleep*: the infinitive *schlafen* substitutes for the participial *geschlafen*. The Italian substitution involves *prepara* for *preparano*, both being instances of the verb "prepare".

Modals and auxiliaries substitute for modals and auxiliaries, respectfully. This is illustrated in (3).

(3) Agrammatic Substitution: Modal/Auxiliary for Modal/Auxiliary

a. I *can’t* (couldn’t) speak
   "I couldn’t speak"
In the English example, the modal can substitutes for the modal could. In Dutch moet “must:Prs” substitutes for moest “must:Pst”. The German example involves the auxiliary have: the plural form haben substitutes for the singular form hat. In French the plural vont replaces the singular va. The Italian substitution involves sono for è, both being instances of the auxiliary “be”.

Next, nouns substitute for nouns, as shown below.

(4) Agrammatic Substitution: Noun for Noun

a. the men (man) was eating
   “the man was eating”

b. [V] [DP] twee kamer (kamers)
   [V] [DP] two room:Sg (room:Pl)
   “we have two rooms”

c. [DP] ist in, ist in Gedanke (Gedanken) wo gewesen
   [DP] is in, is in thought:Sg (thought:Pl) somewhere be:Part
   “she is somewhere else in her thoughts”

d. no examples in database

e. il contadino prepara [Det] seme (semi)
   the farmer prepares [Det] seed:Sg (seed:Pl)
   “the farmer prepares the seeds”

In the English example, the noun men substitutes for the noun man. In Dutch kamer “room” substitutes for kamers “rooms”. The German example involves the noun “thought”: the
singular form *Gedanke* substitutes for the plural form *Gedanken*. The Italian substitution involves *seme* for *semi*, both being instances of the noun “seed”.

Next, determiners substitute for determiners, as shown in (5).

(5) Agrammatic Substitution: Determiner for Determiner

- a. I [Cop] flat on the (my) back
  “I was flat on my back”
  
  - English

- b. de dief kwam binnen door de (het) raam
  the thief come:Past in through the:Sg-M/F (the:N) window
  “the thief came in through the window”
  
  - Dutch

- c. [DP] hatte einen (einen) Korb gepackt
  [DP] have:Pst-3Sg a:Dat-M-Sg (a:Acc) basket pack:Part
  “she had packed a basket”
  
  - German

- d. je marchais avec le (la) grande canne anglaise
  I walked with the:M (the:F) long stick English
  “I was walking with the long English walking stick”
  
  - French

- e. il contadino mangia i (il) granone
  the farmer eats the:M-Pl (the:M-Sg) grain:Sg
  “the farmer eats the grain”
  
  - Italian

In the English example, the determiner *the* substitutes for the determiner *my*. In Dutch *de* “the:Sg-M/F” substitutes for *het* “the:Sg-N”. The German example involves the indefinite article “a”: the dative form *einem* substitutes for the accusative form *einen*. In French the masculine definite article *le* replaces the feminine *la*. The Italian substitution involves the plural *i* for the singular *li*, both being instances of the determiner “the”.

The descriptive generalization is the following: mis-selected words are of the same syntactic category. Is it possible that this restriction is semantic rather than syntactic? This category constraint cannot be a semantic constraint, since mapping between semantic function and syntactic category is not consistent (Maratsos & Chalkley, 1980). For example, verbs (6a), adjectives (6b) and nouns (6c) can behave like semantic predicates, as shown below.
(6) Possible Predicates

a. Carmina danced.
b. Carmina is pretty.
c. Carmina is a woman.

If substitutions were simply semantically constrained, we would expect to find verbs, adjectives and nouns substituting for each other as predicates. It is difficult to tell if cross-categorial substitution has taken place in an utterance with omissions. Consider the following.

(6')
a. Carmina dancer
b. Carmina [is] [a] dancer
c. Carmina dancer (danced)

(6'a) is a possible agrammatic utterance. It can be interpreted in one of two ways. Either the copula is and the determiner a are omitted, or the noun dancer is substituting for the verb danced. The first interpretation involves no cross-categorial shift whereas the second does. How can we determine which is correct? I have favored the non-cross-categorial interpretation for the following reason. If agrammatic substitutions can be cross-categorial, we expect to find examples of the following.

(6'') Carmina is a danced (dancer)

In (6''), the verb danced substitutes for the noun dancer. This is a clear case of cross-categorial substitution. This type of substitution is not attested in agrammatic production. Substitution errors are syntactically constrained: they must be of the same syntactic category. I reiterate the generalization in the following constraint.

(7) Categorial Constraint on Substitution

X substitutes for Y, iff category X = category Y

Since substitutions are syntactically constrained, substitutions are not random.
4.1.2 Substitution Involves Agreement, Case and Tense Features

I have established that substitution errors are constrained by syntactic category. Are they governed by any other constraints? If not, we would expect that any word from a given category could substitute for a target of that same category. For example, any noun, say bohemians, could substitute for the noun dog in the utterance a dog eats the chicken, resulting in the following: a bohemians eats the chicken. However, this is not the case. Substitutions are further constrained in one of three ways: they are phonologically constrained, semantically constrained or syntactically constrained. I discuss each in turn below, beginning with phonological substitutions.

4.1.2.1 Phonologically Constrained Substitutions

The first set of substitution errors are phonologically constrained substitutions. Phonological substitutions involve words with the same initial segment, porridge for poorhouse, for example. I found only three examples of phonological substitutions in the corpus under study, all three from German. These are presented below.

(8) Agrammatic Substitutions: Phonologically Related

a. und das Mädchen dankte der Wolf ist nicht gut German
   and the girl thought the wolf is not good
   “and the girl thought the wolf isn’t good”

b. das Paar geht picknicken ... picknick (picknicken) German
   the couple goes pick:Inf pss:Inf ... picnic (picnic:Inf)
   “the couple goes on a picnic”

c. ... geht der Bauer eine (einen) Kukuruz proben probieren German
   ... goes the farmer a:F (a:M) corn test:Inf taste:Inf
   “(still later) the farmer goes to taste the corn”

Although there are few such errors in the agrammatic corpus, they match the phonological substitutions in normal speakers, which have been studied extensively (Fromkin,
1968; MacKay, 1969, 1970a; Nooteboom, 1969; Fay, 1980ab; Cutler & Fay, 1982; Garrett, 1988). Each of the three examples involves repetition sequences, where the first item produced is incorrect, but is followed by the correct word. In each case, the mis-selection shares the same initial segment or syllable as the correct item. In (8a) dankt “thanks” is produced for dachte “thought”, both beginning with [da]. In (8b) first picken “pick”, and then pickeln “piss” are selected instead of picknick “picnic”. Each item begins with the three segments [pik]. And last, in (8c) proben “test” is produced for probieren “taste”. Both start with the segments [prob].

Thus, phonological substitutions are evidence that substitutions can be constrained by phonological shape in addition to syntactic category.

4.1.2.2 Semantically Constrained Substitutions

The second set of substitution errors are semantically constrained substitutions. Semantic substitutions involve words with similar semantic features, say boy for girl, where both noun have the features [+human] and [+young]. Semantic substitutions are in evidence in agrammatic production. They involve any syntactic category. I present examples of semantic substitutions of verbs in (9). The only examples in the corpus of semantic substitutions for verbs are from English,

(9) Agrammatic Semantic Substitutions: Verb

a. [DP] trips (is falling) on the floor  
   "he is falling on the floor"  
   English

b. RH looks [at] (listens to) [Poss] voice,  
   "RH listens to his voice"  
   English

In (9a) trip substitutes for fall, where both verbs involve some descending action. In (9b) look substitutes for listen. These two verbs involve the senses; look involves vision, listen
involves audition. The next example involves a German modal. Here *sollt* "should" substitutes for *kann* "can", both involving mood.

(10) Agrammatic Semantic Substitutions: Modal

\[
\text{damit ich sie, dich ah höre (hören) \ldots sollt (kann) German}\]
\[
\text{in-order-that I her, you uh hear:Prs-1Sg (hear:Inf) \ldots should (can) “so that I can hear you”}\]

Next we find semantic substitutions of nouns. These are illustrated below.

(11) Agrammatic Semantic Substitutions: Noun

a. [Det] *wife* (man) eats breakfast
   "the man eats breakfast"

b. no examples in database

c. und es rinnt der *Hahn* (das *Wasser*) über
   and it flows the *faucet* (the *water*) over
   "and the water is overflowing"

d. no examples in database

e. e va sul *motore* (camion)
   and go:3Sg on+the *engine* (truck)
   "and he goes on the truck"

In the English example, the noun *wife* substitutes for the noun *man*. These nouns share the semantic features [+human] and [+adult]. The German example involves the noun *Hahn* "faucet" substitutes for the noun *Wasser* "water". "Faucet" and "water" are semantically related in that water comes out of the faucet. The Italian substitution involves *motore* "engine" for *camion* "truck". Again, the semantic link is one of inclusion: an engine is contained within a truck. This last example has its literary parallel in synecdoche, where a part (of an object, say) is used to indicate the whole.

Next we find semantic substitutions of prepositions, illustrated in (12).
(12) Agrammatic Semantic Substitution: Preposition

a. the woman is washing the dishes and didn't pay (doesn’t pay) attention for (to) the sink
   “the woman is washing the dishes and isn’t paying attention to the sink”

b. no examples in database

c. dann die worte hinten (nach) und vor then the:Acc-Pl words behind (after) and before
   “then the words after and before”

d. [DP] [V] visite en (à) [Poss] grandmere [DP] [V] visite by (to) [Poss] grandmother
   “she’s paying a visit to her grandmother”

e. va con (a) vendere il granturco goes with (to) sell:Inf the corn
   “he goes to sell the corn”

For preposition substitutions, the semantic link is difficult to tease apart from the grammatical function. In the English example, the preposition for substitutes for the preposition to. Here, some element of directionality is shared. In German hinten “behind” substitutes for nach “after”. Both prepositions have an element of “distance from the speaker, where in space for “behind” or time for “after”. In the French example, the preposition en “by” substitutes for the preposition à “to”, again involving direction. The Italian substitution involves con “with” for a “to”, a plausible link being “with intent”.

The last set of semantic substitutions are adverbs. There are only two such examples, one from Dutch and one from French.

(13) Agrammatic Semantic Substitution: Adverb

a. [Pleo] [Cop] acht uur pas (al) [V] [Det] mevrouw [Pleo] [Cop] eight o’clock only (already) [V] [Det] woman
   “It’s already eight o’clock” says the woman

b. je [me] [V] peu (pas) du tout le voyage I [myself] [V] little (not) at all the trip
   “I don’t remember the trip”

In Dutch the adverb pas “only” substitutes for the adverb al “already”. Both adverbs indicate a form of brevity, here with respect to time. The French substitution involves peu
“little” for *pas* “not”, both involving some negative semantic feature (these are not adverbs but do involve a modifying category).

These examples are evidence that substitutions can be constrained by semantic features, as well as by syntactic category.

4.1.2.3 Syntactically Constrained Substitutions

The third set of substitutions errors are syntactically constrained substitutions. Syntactic substitutions involve words with similar syntactic features, specifically agreement, Case and tense features. Syntactic substitutions show a shift in these syntactic features. This form of substitution is the most common of the three types in this corpus. Examples of agreement shift, Case shift and tense shift are presented below. I begin with agreement substitutions, as in (14-15).

(14) Agrammatic Nominal Substitution: Agreement

   a. the *men* (man) was eating
      “the man was eating”
   
   b. [V] [DP] *twee kamer* (kamers)
      [V] [DP] two room:Sg (room:Pl)
      “we have two rooms”
   
   c. [DP] ist in, ist in *Gedanke* (Gedanken) wo gewesen
      [DP] is in, is in thought:Sg (thought:Pl) somewhere be:Part
      “she is somewhere else in her thoughts”
   
   d. *les* (le) tabouret bascule
      the:Pl (the:Sg) stool tips
      “the stool tips over”
   
   e. [Det] acqua [V] sotto (sul) [Det] pavimenti (pavimento)
      [Det] water [V] under (on) [Det] floor:Pl (floor:Sg)
      “the water goes on the floor”

Each of the examples in (14) involves a nominal agreement shift, specifically a shift in number. In (14a) *men* is produced for *man*, the plural noun for the singular. In Dutch (14b), the singular *kamer* “room” substitutes for the plural *kamers* “rooms”. A similar shift occurs in
German (14c), with Gedanke "thought" substituting for Gedanken "thoughts". In French (14d), the number shift involves a determiner: les "the:Pl" substitutes for le "the:Sg". And last, the Italian plural pavimenti "floors" is produced instead of the singular pavimento "floor".

(15) Agrammatic Verbal Substitution: Agreement

a. your ears is (are) larger
   "your ears are larger"

b. van [Det] hond ruiken (ruikt) [DP]
   well [Det] dog smell:3Pl (smell:3Sg) [DP]
   "the dog smells something"

c. ... [Det] Paar [DP] nicht gemerkt haben (hat)
   ... [Det] couple [DP] not notice:Part have:Pl (have:Sg)
   "(so that) the couple doesn’t notice it"

d. [Pleo] [Cop] un couple qui vont (va) manger sur l’herbe
   [Pleo] [Cop] a couple that go:3Pl (go:3Sg) eat:Inf on the grass
   "it’s a couple who are eating on the grass"

e. i genitori stava (stavano) in pensiero
   the parents be:Pst-3Sg (be:Pst-3Pl) in thought
   "the parents were worried"

As with the nominal shifts, each of the verbal agreement shifts in (15) involves number. In (15a) is is produced for are, the singular copula for the plural. In Dutch (15b), the plural ruiken "smell" substitutes for the singular ruikt "smells". A similar shift occurs in German (15c), with plural haben "have" substituting for singular hat "has". The French example (15d) follows the same pattern, with plural vont "go" substituting for singular va "goes". And last, the Italian singular stava "was" is produced instead of the plural stavano "were".

The second type of feature shift involves Case, as in (16)

(16) Agrammatic Nominal Substitution: Case

a. I [Cop] flat on the (my) back
   "I was flat on my back"

b. no examples in database

b. no examples in database

c. [DP] hatte einem (einen) Korb gepackt
   [DP] have:Pst-3Sg a:Dat-M-Sg (a:Acc) basket pack:Part
   "she had packed a basket"
I have included under Case substitutions two different types of shifts. The first is illustrated by the English and French examples, in (16a) and (16d), respectively. In both the non-possessive determiner substitutes for the possessive determiner: English the for my and French l’ “the” for mon “my”. The second type involves the Case of the determiner. In German, determiners have four Case forms: nominative, accusative, dative and genitive. Substitution errors with German determiners involve shifting between these four Cases (among other shifts). In (16c) the dative indefinite article einem is produced instead of the accusative einen.

I now turn to the last type of substitution, tense shift.

(17) Agrammatic Verbal Substitution: Tense

a. I can’t (couldn’t) speak
   “I couldn’t speak”

b. [DP] moet (moest) [DP] uitsprechen
   [DP] must:Prs (must:Pst) [DP] pronounce:Inf
   “I had to pronounce everything”

c. im Büro hat [DP] nicht gearbeit[et]
   in+the office has [DP] not work:Part
   und (sondern) schlafen (geschlafen)
   and (rather) sleep:Inf (sleep:Part)
   “in the office he didn’t work, rather he sleeps”

d. no examples in database

Again, I have included under tense substitutions two different types of shifts. The first is illustrated by the English (17a), Dutch (17b) and Italian (17e) examples. In both English and
Dutch, present substitutes for past: can for could and moet “must:Prs” for moest “must:Pst”. The Italian displays the reverse, past for present: disse “said” for dice “says”. The second type involves verbs bearing no tense features, in other words, infinitival and participial forms. The shift remains within the untensed paradigm (no tensed verbs substitute for untensed, or vice versa). In German, the infinitival form of “sleep” schlafen substitutes for the participial form geschlafen.

Syntactic substitutions are evidence that substitutions can be constrained by syntactic features as well as syntactic category.

4.1.3 Substitution Involves a Single Feature Shift

I have established that substitution errors are constrained by more than just syntactic category. They are governed by either phonological shape, semantic features or syntactic features. I will focus on syntactic substitutions. Are there any constraints governing the substitution of syntactic features? First, I argue against syntactic features randomly shifting with each other i.e. Case for number, number for gender, and so on. Rather, substitutions occur within a very restricted domain. The same features substitute for each other, Case for Case, number for number, etc. I then take a closer look at verbal and nominal substitutions and show that substitutions are even further constrained: any given substitution involves a single syntactic feature.

4.1.3.1 Substitution Is Not Random Feature Swapping

Can any syntactic feature substitute for any other syntactic feature? If so, we would expect to find gender substituting for Case, number for person, Case for number, and so on. I call this Random Feature Swapping. Random Feature Swapping predicts that two Case markings can appear on a word, where Case and number would be required, for example. This
cross-feature substitution is unattested in agrammatic production. Why should this be the case? I propose that cross-feature substitution is not possible. To begin, what would such a substitution entail? For concreteness, let us consider the nominative pronoun him. Him is specified for person (3rd), number (singular), gender (masculine) and Case (nominative i.e. ‘subject’). Him can undergo substitution involving these syntactic features. Let us attempt the feature swap suggested above: replace number with (another) Case. This requires replacing singular with accusative, say. The resulting feature bundle is the following: 3rd, feminine, nominative and accusative. There is no word that corresponds to this collection of features. Moreover such a combination of features is not licit: there is a conflict of Case features (an element cannot be both Nominative and Accusative).

Perhaps, Random Feature Swapping can be saved. A possible scenario is the following. Features do swap indiscriminately. However, when no word matches the set of features, the substitution crashes and therefore is not produced. Thus, the Case-for-number swap attempted above can occur: it simply crashes. This account is unappealing for three reasons. First, it allows for a large array of vacuous substitutions. Any time the substitution crosses features, it crashes. This may seem sensible when all the features appear in a single morpheme, like the him example. But what of a syntactic feature that is instantiated by an independent morpheme? We could expect to find the possessive marker ‘s being added to the pronoun him. The result would be him’s. These errors are unattested in agrammatism.

Notice that the him’s error violates the morphological restrictions of English. This brings us to the second argument against Random Feature Swapping: it runs contrary to other types of production errors. Production errors are constrained by the grammar. Fromkin (1968, 1971) argues that phonological errors obey the phonological rules of the language. Language-specific constraints also govern agrammatic errors\(^1\). Specifically, production errors respect the

\(^1\) See any of the following for such language-specific constraints on agrammatic behavior: Peuser & Fittschen, 1977; Grodzinsky, 1984; Caplan, 1987; Slobin & Talay, 1988; Tzeng & Chen, 1988; Chen, 1989, 1993; Wulfeck et al., 1989; Hagiwara & Caplan, 1990; Kehayia et al.,
morphological constraints of the language (Kehayia & Jarema, 1991; MacWhinney & Osmán-Sági, 1991; Kehayia, 1992). Random Feature Swapping states that the mechanisms underlying substitutions may violate the constraints of the language, even though the phonetic output does not. This is an unattractive situation. More appealing is the proposal that substitutions occur within a very restricted domain. Like the categorial constraint, where nouns substitute for nouns (verbs for verbs, etc.), features of one kind substitute for features of the same kind: Case for Case, number for number, person for person, and so on.

Third, Random Feature Swapping makes the wrong predictions: it predicts that any feature can substitute for any other feature, and that any number of features can be substituted. If we restrict ourselves to licit combinations of syntactic features, we could logically expect to find Case substituting for Case and number substituting for number at the same time. For example, in French the possessive plural determiner *mes* "my" could substitute for the singular feminine definite determiner *la* "the". This particular substitution would involve a shift in both number and Case (I exclude gender here since *mes* is unspecified for gender). However, these types of substitution errors are unattested. Rather, there is a pattern within the set of syntactic features: any given substitution involves a single syntactic feature. I propose the following constraint.

(18) Single Feature Constraint on Substitution

\[ \text{X substitutes for } Y, \text{ iff category } X \text{ and category } Y \text{ differ by feature } \alpha \]

where \( \alpha = \) one of \{person, number, gender, Case, tense\}

I show below that substitution errors follow the Single Feature Constraint.

4.1.3.2 Verbal Substitution

In verbal substitutions we find substitutions of agreement and tense. Agreement substitutions involve person (1st, 2nd, and 3rd), number (plural and singular) and gender (feminine, masculine and neuter). Tense substitutions are split between tensed (past and present) and untensed (participials and infinitives) verbs.

4.1.3.2.1 Agreement

Verbal agreement substitution divides into person (1st, 2nd, and 3rd), number (plural and singular), and gender (feminine, masculine and neuter). These three sets are illustrated below. I begin with Person substitution, as in (19). More examples of person substitutions on verbs are presented in Appendix (38).

(19) Agrammatic Substitution: Person on Verbs

a. he open (opens) the doors
   "he open the doors"

b. maar verder [DP] kom (komt) vanself
   but further [DP] come:Prs-1Sg (come:3Sg) by-itself
   "but further such a thing comes by itself"

c. no examples in database

Dutch

d. no examples in database

German

e. il lupo scruto (scruta) la bambina
   the wolf watch:Prs-1Sg (watch:3Sg) the girl
   "the wolf watches the girl"

English

In (19a) open is produced for opens, a non-3Sg form of the verb for the 3Sg form². In Dutch (19b), the 1Sg kom “come” substitutes for the 3Sg ruikt “comes”. A similar shift occurs in Italian (19e), with scrutu “watch:1Sg” substituting for scrutu “watch:3Sg”.

² I am aware that the English verb in question is a bare form. However, I am assuming an agreement shift by analogy with the unambiguous Italian examples. Notice that these English examples can also be interpreted as number shifts from 3Sg to 3Pl.

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I now turn to number substitution, as in (20). For more examples of verbal number substitutions, see Appendix (39).

(20) Agrammatic Substitution: Number on Verbs

a. your ears *is* (are) larger
   “your ears are larger”

b. van [Det] hond *ruiken* (ruikt) [DP]
   well [Det] dog *smell:*Prs-3Pl (smell:3Sg) [DP]
   “the dog smells something”

c. ... [Det] Paar [DP] nicht gemerkt *haben* (hat)
   ... [Det] couple [DP] not notice:Part *have:*Prs-3Pl (have:3Sg)
   “(so that) the couple doesn’t notice it”

d. [Pleo] [Cop] un couple qui *vont* (va) manger sur l’herbe
   [Pleo] [Cop] a couple that *go:*Prs-3Pl (go:3Sg) eat:Inf on the grass
   “it’s a couple who are eating on the grass”

e. i genitori *stava* (stavano) in pensiero
   the parents *be:*Pst-3Sg (be:3Pl) in thought
   “the parents were worried”

The examples in (20) match those presented above: each of the verbal agreement shifts involves number. In (20a) *is* is produced for *are*, the singular copula for the plural. In Dutch (20b), the plural *ruiken* “smell” substitutes for the singular *ruikt* “smells”. A similar shift occurs in German (20c), with *haben* “have” substituting for *hat* “has”. The French example (20d) follows the same pattern, with *vont* “go” substituting for *va* “goes”. And last in (20e), the Italian singular *stava* “was” is produced instead of the plural *stavano* “were”.

The last type of agreement shift involves gender, as in (21).

(21) Agrammatic Substitution: Gender on Verbs

è *andato* (andata) nel bosco
   is *gone:*M-Sg (gone:F) in+the wood
   “she went into the woods”

The only example of verbal gender shift is in Italian. That participial “gone” is produced in the masculine *andato* instead of the feminine *andata*. 
Crucially, what is not attested is a substitution that combines these three features. In other words, we do not find a ‘mixed’ shift in person, number and gender, or any combination of the three features. If person shifts, it shifts alone. If number shifts, no other feature shifts. This is true for gender as well. Only a single feature ever shifts. Agreement shifts follow the Single Feature Constraint.

4.1.3.2.2 Tense

Both tensed and untensed verbs undergo substitutions that are not shifts in agreement features. Substitutions with tensed verbs involve the various tense markings: present and past, specifically. These are illustrated below. More examples of tense substitutions are presented in Appendix (40).

(22) Agrammatic Verbal Substitution: Tense

a. I can’t (couldn’t) speak
   “I couldn’t speak”

b. [DP] moet (moest) [DP] uitsprechen
   [DP] must:Prs (must:Pst) [DP] pronounce:Inf
   “I had to pronounce everything”

c. no examples in database

Dutch

d. no examples in database

German

e. “E’ tardi” disse (dice)
   “It’s late” say:Past-3Sg (say:Prs)
   “”It’s late” she says”

Italian

In the English (22a) and Dutch (22b), present substitutes for past: can for could and moet “must:Prs” for moest “must:Pst”. The Italian example (22e) displays the reverse, past for present: disse “said” for dice “says”.

I include a second type of substitution under tense shift: substitutions involving untensed verbs, in other words, verbs bearing no tense features. Substitutions with untensed verbs involve shifting between participials and infinitivals. These are illustrated below. For more examples of substitutions involving untensed verbs, see Appendix (41).
(23) Agrammatic Verbal Substitution: Non-finite Forms

a. the couple was *surprise* (surprised) to, English
   was *surprise* (surprised) that the basket was open
   "the couple was surprised that the basket was open"

b. no examples in database Dutch

c. im Büro hat [DP] nicht gearbeit[et]
   in+the office has [DP] not work:Part
   *und* (sondern) *schlafen* (geschlafen)
   *and* (rather) *sleep:Inf* (sleep:Part)
   "in the office he didn’t work, rather he sleeps"

d. no examples in database French

e. l’uomo sta posando no *prendere* (prendendo) la sveglia
   the man is putting no *take:Inf* (taking) the alarm-clock
   "the man is putting/taking the alarm clock"

In (23a), the bare verb *surprise* substitutes for the participial *surprised*. In German (23c), the infinitival form of “sleep” *schlafen* substitutes for the participial form *geschlafen*. In (23e) the Italian infinitival *prendere* “take” substitutes for the participial *prendendo* “taking”.

As with the agreement substitutions, one feature shifts at a time. Moreover, the shift remains within the untensed paradigm: untensed verbs do not substitute for tensed verbs, nor vice versa.

I summarize the verbal substitution patterns in the table below.

---

3 The general problem lies with the nature of bare verbs in English. Bare verbs function as both the infinitival form and the non-3Sg ‘present tense’ forms. The infinitival and non-3Sg present forms of main verbs are, therefore, morphologically indistinguishable. However I base the analysis on the languages where the forms are unambiguous. Since the English data is consistent with the proposed analysis, I assume number/person shifting and infinitival shifting wherever appropriate.
Table 14: Attested Agrammatic Verbal Substitutions

<table>
<thead>
<tr>
<th></th>
<th>Person</th>
<th>Number</th>
<th>Gender</th>
<th>Tense</th>
<th>Untensed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td></td>
<td>√</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tense</td>
<td></td>
<td></td>
<td></td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Untensed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>√</td>
</tr>
</tbody>
</table>

A given feature shift does not co-occur with any other feature shift. When the feature person shifts to any setting of that person feature, we do not find a simultaneous shift in either number, gender, tense or untensed settings. This restriction carries through the entire selection of verbal features. Substitution thus adheres to the Single Feature Constraint.

4.1.3.3 Nominal Substitutions

In nominal substitutions we find substitutions of agreement and Case.

4.1.3.3.1 Agreement

Nominal agreement substitution divides into person (1st, 2nd, and 3rd), number (plural and singular), and gender (feminine, masculine and neuter). Not every nominal category can or does undergo substitution for each agreement feature. In this database, the only examples of nominal person shift are found with object clitics. If this restriction turns out to be true for a larger database, it is significant because it gives us a diagnostic for clitic status.

Since of the five languages only French and Italian have clitics, these are the only two languages that display person shift.
(24) Agrammatic Substitution: Person on Clitics

a. et avant me (se) [Aux] déguiser avec (en) chaperon French
   and before self:1Sg (self:3Sg) disguise:Part/Inf with (as) RH
   "and before (he) disguised himself as LRRH"

b. e la donna si (lo) sveglia Italian
   and the woman self (him) wakes
   "and the woman wakes him"

In the French example, the 1Sg me "self:1Sg" substitutes for se "self:3Sg". In the Italian example, both clitics are 3Sg. The clitic shifts to a reflexive form si "self:3g" from the non-reflexive lo "him" target.

Unlike person, number substitution is attested in nouns (25), adjectives (26) and determiners (27). More examples of number substitutions with nouns are presented in Appendix (42).

(25) Agrammatic Substitution: Number on Nouns

a. the men (man) was eating English
   "the man was eating"

b. [V] [DP] twee kamer (kamers) Dutch
   [V] [DP] two room:Sg (room:Pl)
   "we have two rooms"

c. [DP] ist in, ist in Gedanke (Gedanken) wo gewesen German
   [DP] is in, is in thought:Sg (thought:Pl) somewhere be:Part
   "she is somewhere else in her thoughts"

d. no examples in database French

e. [Det] acqua [V] sotto (sul) [Det] pavimenti (pavimento) Italian
   [Det] water [V] under (on) [Det] floor:Pl (floor:Sg)
   "the water goes on the floor"

In (25a) men is produced for man, the plural noun for the singular. In Dutch (25b), the singular kamer "room" substitutes for the plural kamers "rooms". A similar shift occurs in German (25c), with Gedanke "thought" substituting for Gedanken "thoughts". And last, the Italian plural pavimenti "floors" is produced instead of the singular pavimento "floor".
Only one example of number substitution on adjectives is attested. In the French example below, the singular “normal” normal substitutes for the plural normaux.

(26) Agrammatic Substitution: Number on Adjectives

d. [DP] [Cop] normal (normaux)  
   [DP] [Cop] normal:Sg (normal:Pl)
   “they were normal”

Number substitution is also attested with determiners, as in (27). For more examples of number substitution with determiners, see Appendix (43).

(27) Agrammatic Substitution: Number on Determiners

a. no examples in database  
   Tube:English
b. no examples in database  
   Tube:Dutch
c. no examples in database  
   Tube:German
d. les (le) tabouret bascule  
   the:Pl (the:Sg) stool tips
   “the stool tips over”
e. il contadino mangia i (il) granone  
   the farmer eats the:M-Pl (the:Sg) grain:Sg
   “the farmer eats the grain”

In (27d) the French plural determiner les “the” substitutes for the singular le. In the Italian example, the plural i “the” is produced instead of the singular il.

Gender substitution also affects a wide range of nominal categories. We find gender substitution in pronouns (28), clitics (29), adjectives (30) and determiners (31). For more examples of gender substitutions involving pronouns, see Appendix (44).

(28) Agrammatic Substitution: Gender on Pronouns

a. no examples in database  
   Tube:English
b. no examples in database  
   Tube:Dutch
c. sie (es) wollte die kranke Oma besuchen  
   she:F (she:N) wanted the sick grandma visit
   “she wanted to visit her sick grandma”
d. le loup demande au [N] où il (elle) va
   the wolf asks to+the [N] where he (she) goes
   “the wolf asks LRRH where she is going”

e. no examples in database

In (28c) the feminine pronoun sie “she” is produced instead of the required neuter es. In the French example, the masculine il “he” substitutes for the feminine elle “she”.

The only gender substitution with clitics involves a shifts from the masculine le “him” to the feminine la “her”.

(29) Agrammatic Substitution: Gender on Clitics

elle la (le) réveille
she her (him) wake up

Gender shifts on adjectives are also attested, as in (30). More examples of gender substitutions with adjectives are presented in Appendix (45).

(30) Agrammatic Substitution: Gender on Adjectives

a. distinction not available
b. no examples in database
c. no examples in database
d. et Grand-mère comme vous les avez les grands (grandes) dents
   and Grandmother how you them have the big:M (big:F) teeth:F
   “and Grandmother, what big teeth you have”
e. sta zitto (zitta)
   be:Prs-3Sg quiet:M (quiet:F)
   “Be quiet!”

Both examples in (30) involve substituting the masculine form for the feminine: French grands “big:M” for grandes “big:F” and Italian zitto “quiet:M” for zitta “quiet:F”.

Gender shift shows up most frequently on determiners, when the distinction is available. Examples are presented in (31). More examples of gender substitution involving determiners are presented in Appendix (46).
In Dutch (31b) the feminine/masculine form for “the” de substitutes for the neuter form het. The German example in (31c) displays a similar shift: the feminine ihre “her:F” substitutes for the neuter seine “her:N”. In French (31c) the masculine “the” le is produced instead of the required feminine la. And last, in the Italian example, the first attempt at the definite article is the masculine il rather than the feminine la.

As with the verbal substitutions, a single agreement feature shifts at a time. Mixed substitutions are not attested. Once again, substitutions follow the Single Feature Constraint.

4.1.3.3.2 Case

Case substitution involves the various Case markings: nominative, accusative, dative, etc. I address two types of Case substitution. The first involves shifting from [+Case] to [-Case]. This is exemplified in English and French. The shift we observe is from a possessive determiner to a definite determiner. For our purposes we can describe this shift as possessive to non-possessive. These are illustrated below. For more examples of Case substitution with determiners, see Appendix (47).
(32) Agrammatic Substitution: Case on Determiners

a. I [Cop] flat on the (my) back
   "I was flat on my back"

b. pour mieux t’entendre l’ (mon) enfant
to better you hear the (my) child

The only feature that is shifting in both the examples in (32) is Case. Although the possessive determiners are each specified for person (here 1st), no person shift can be taking place since the definite articles are unspecified for person. For English, both the possessive my and the definite the are unspecified for number. But for French this is not the case. Both the possessive mon and the definite l’ are singular. No number shift has occurred. This mixed agreement and Case shift is unattested in the agrammatic corpus.

Let us now turn to the second type of Case shift. Unlike English and French, Dutch and German mark their nominal categories for a number of Cases. For example, determiners are marked for nominative, accusative, dative and genitive. Thus the Case shifts that occur in Dutch and German are not simply shifts between possessive and non-possessive categories. We are witness to shifts between accusative and nominative, dative and accusative, and so on. As with gender substitution, Case substitution is most often attested with determiners. In (33b), the dative indefinite article einem substitutes for the accusative einen. More examples of Case substitutions involving determiners are presented in Appendix (47).

(33) Agrammatic Substitution: Case on Determiners

a. no examples in database Dutch

b. [DP] hatte einem (einen) Korb gepackt
   [DP] have:Pst-3Sg a:Dati-M-Sg (a:Acc) basket pack:Part
   "she had packed a basket"

Case substitutions also affect adjectives (34), nouns (35) and pronouns (36). However, there is only one example in the corpus of each type of substitution, all three being from German.
Each of the examples above display a shift from a dative form to an accusative (or accusative/nominative) form.

In all the examples of Case shifts, only Case is substituted. No other feature changes.

Once again, substitutions only involve a single feature.

I summarize the substitution pattern in the table below.

Table 15: Attested Agrammatic Nominal Substitution 

<table>
<thead>
<tr>
<th>Person</th>
<th>Number</th>
<th>Gender</th>
<th>Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

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A given feature shift does not co-occur with any other feature shift. When the feature Case shifts to any setting of that Case feature, we do not find a simultaneous shift in either person, number or gender settings. This restriction carries through the entire selection of nominal features. Substitution thus adheres to the Single Feature Constraint.

4.2 THE DISTRIBUTION OF SUBSTITUTIONS

I have established that substitution errors involve a single feature shift among agreement, Case and tense features. But is every possible feature shift equally instantiated? Put differently, what are the most frequent feature shifts? Although some feature display a favored direction, the general conclusion is that markedness is not a governing principle for substitutions. Using the substitution rate of determiners as a case study, I argue that number of features influences substitution: the more features a category encodes, the higher the substitution rate (and the lower omission rate).

There are two putative exceptions to the Single Feature Constraint. Both involve German determiners. They are displayed below.

(i) da begegnet sie *ein* sie *eine* Wolf

there meet:Prs-3Sg she *a:Nom-M-Sg* she *a:Nom/Acc-F-Sg* wolf

"there she meets a wolf"

(ii) in *der* in das Büro

in the:*Nom-M-Sg* in the:*Acc-N-Sg* office

"in the office"

In (i), the required form of the determiner is indicated as *einem* "a:Dat-M-Sg". The first attempt *ein* is Nom-M-Sg; this involves a single feature shift, Case. The second attempt *eine* is Nom/Acc-F-Sg; this involves a double shift, Case and gender. However, the choice of *einem* as target is not uncontroversial. Another possible target is *einen* "a:Acc-M-Sg" (p.c. from native speakers). The difference is between a dative object for "meet" or an accusative object. If the target is *einen* "a:Acc-M-Sg", both attempts shift by a single feature: *ein* is nominative instead of the required accusative; *eine* is feminine instead of the required masculine.

In (ii) the target is *das* "the:Acc-N-Sg". The first attempt is *der* "Nom-M-Sg". This attempt displays an apparent double shift, Case and gender. However, the Acc-N form of *the* (das) is homophonous with the Nom-M form. It is possible that the shift only involves the following: *der* "Nom-M" to *das* "Nom-N", with the target being *das* "Acc-M". In other words, the actual target was never uttered (but is phonologically identical to the second attempt). We are then left with 2 single feature shifts: one of gender, *der* to *das*; and one of Case, *das* to *das*. 

4 There are two putative exceptions to the Single Feature Constraint. Both involve German determiners. They are displayed below.

(i) da begegnet sie *ein* sie *eine* Wolf

there meet:Prs-3Sg she *a:Nom-M-Sg* she *a:Nom/Acc-F-Sg* wolf

"there she meets a wolf"

(ii) in *der* in das Büro

in the:*Nom-M-Sg* in the:*Acc-N-Sg* office

"in the office"
4.2.1 Verbal Substitution

Verbal substitutions include agreement and tense shifts. I summarize the substitution rates for person, number, gender, tense and untensed shifts in the table below.

Table 16: Agrammatic Percentage of Verbal Feature Substitutions

<table>
<thead>
<tr>
<th></th>
<th>Person</th>
<th>Number</th>
<th>Gender</th>
<th>Tense</th>
<th>Untensed</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF</td>
<td>6/14 - 42.9%</td>
<td>1/14 - 7.1%</td>
<td>n/a</td>
<td>4/14 - 28.6%</td>
<td>3/14 - 21.4%</td>
</tr>
<tr>
<td>EE</td>
<td>2/8 - 25%</td>
<td>0%</td>
<td>n/a</td>
<td>4/8 - 50%</td>
<td>2/8 - 25%</td>
</tr>
<tr>
<td>DB</td>
<td>1/3 - 33.3%</td>
<td>1/3 - 33.3%</td>
<td>n/a</td>
<td>1/3 - 33.3%</td>
<td>0%</td>
</tr>
<tr>
<td>DH</td>
<td>0%</td>
<td>2/2 - 100%</td>
<td>n/a</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>GB</td>
<td>0%</td>
<td>1/2 - 50%</td>
<td>n/a</td>
<td>0%</td>
<td>1/2 - 50%</td>
</tr>
<tr>
<td>GM</td>
<td>1/3 - 33.3%</td>
<td>0%</td>
<td>n/a</td>
<td>0%</td>
<td>2/3 - 66.7%</td>
</tr>
<tr>
<td>FC</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
</tr>
<tr>
<td>FA</td>
<td>0%</td>
<td>2/2 - 100%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>IR</td>
<td>9/15 - 60%</td>
<td>5/15 - 33.3%</td>
<td>1/15 - 6.7%</td>
<td>0%</td>
<td>1/15 - 6.7%</td>
</tr>
<tr>
<td>IV</td>
<td>0%</td>
<td>4/6 - 66.7%</td>
<td>0%</td>
<td>2/6 - 33.3%</td>
<td>0%</td>
</tr>
</tbody>
</table>

There are two observations to make. First, there is no single feature that consistently undergoes substitution more often than the other features. Second, the substitutions are minuscule in number, with the one exception of Italian (where the numbers are simply small). Since there are so few tokens of any given error in a single speaker or language, it is impossible
to determine in what direction a feature shifts. I therefore group together all the shifts for each verbal feature.

4.2.1 Agreement

I consider the three agreement features: person, number and gender. Most of the person shifts involve 3rd to 1st. Number is almost evenly split between plural and singular, the shift being bi-directional i.e. plural shifts to singular and singular shifts to plural. Gender involves a single token, shifting from feminine to masculine.

4.2.1.1 Person

Of the 11 person shifts, the majority (10) involve 3rd to 1st person, specifically 3Sg to 1Sg.

Table 17: Agrammatic Person Substitution Pattern

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st</td>
</tr>
<tr>
<td>1st</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>9</td>
</tr>
</tbody>
</table>

Most of these are found in one Italian subject (IR). The confusion lies with describing the actions of an individual in the story or picture description (the wolf, for example) as done by the speaker himself.
4.2.1.1.2 Number

Number displays a bi-directional shift between singular and plural, with the shift to singular being very slightly higher, 9 of the 16 shifts being from plural to singular. This is displayed in the table below.

Table 18: Agrammatic Number Substitution Pattern

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plural</td>
<td>Plural</td>
</tr>
<tr>
<td>Singular</td>
<td>7</td>
</tr>
</tbody>
</table>

With such an even distribution between the two shifts, number substitution cannot be governed by markedness, which would presumably favor one direction over the other.

4.2.1.1.3 Gender

Only one verbal gender shift is displayed. The token is an Italian past participial. The shift is from feminine to masculine. It is presented below.

(37) Agrammatic Verbal Substitution Pattern: Gender Errors

\[ \text{è andato} \ (\text{andata}) \ \text{nel bosco} \]

is \[ \text{gone:}\text{M-Sg} \ (\text{gone:F}) \ \text{in+the wood} \]

“she went into the woods”
Table 19: Agrammatic Gender Substitution Pattern

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Masculine</td>
</tr>
<tr>
<td>Masculine</td>
<td></td>
</tr>
<tr>
<td>Feminine</td>
<td>1</td>
</tr>
</tbody>
</table>

4.2.1.2 Tense

The majority of tense shifts are from past to present.

Table 20: Agrammatic Tense Substitution Pattern

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Past</td>
</tr>
<tr>
<td>Past</td>
<td>9</td>
</tr>
<tr>
<td>Present</td>
<td>2</td>
</tr>
</tbody>
</table>

Substitutions involving untensed verbs shift between infinitival and participial forms. The majority of these errors shift to the infinitive form, where the infinitive is not a bare form of the verb but rather includes an infinitival suffix (for all but English).
Table 21: Agrammatic Substitution Pattern for Untensed Verbs

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infinitive</td>
<td>3</td>
</tr>
<tr>
<td>Participle</td>
<td>6</td>
</tr>
</tbody>
</table>

4.2.2 Nominal Substitution

Nominal substitutions include agreement and Case shifts. I summarize the substitution rates for person, number, gender and Case shifts in the table below.
Table 22: Percentage of Nominal Substitutions in the Agrammatic Data

<table>
<thead>
<tr>
<th>Person</th>
<th>Number</th>
<th>Gender</th>
<th>Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF</td>
<td>0%</td>
<td>1/1 - 100%</td>
<td>0%</td>
</tr>
<tr>
<td>EE</td>
<td>0%</td>
<td>3/5 - 60%</td>
<td>0%</td>
</tr>
<tr>
<td>DB</td>
<td>0%</td>
<td>0%</td>
<td>1/1 - 100%</td>
</tr>
<tr>
<td>DH</td>
<td>0%</td>
<td>1/3 - 33.3%</td>
<td>2/3 - 66.6%</td>
</tr>
<tr>
<td>GB</td>
<td>0%</td>
<td>5/24 - 20.8%</td>
<td>10/24 - 41.7%</td>
</tr>
<tr>
<td>GM</td>
<td>0%</td>
<td>0%</td>
<td>21/31 - 67.7%</td>
</tr>
<tr>
<td>FC</td>
<td>2/21 - 9.5%</td>
<td>2/21 - 9.5%</td>
<td>13/21 - 61.9%</td>
</tr>
<tr>
<td>FA</td>
<td>0%</td>
<td>0%</td>
<td>3/3 - 100%</td>
</tr>
<tr>
<td>IR</td>
<td>0%</td>
<td>4/12 - 33.3%</td>
<td>8/12 - 66.7%</td>
</tr>
<tr>
<td>IV</td>
<td>1/5 - 20%</td>
<td>2/5 - 40%</td>
<td>2/5 - 40%</td>
</tr>
<tr>
<td>Total # of tokens</td>
<td>3</td>
<td>18</td>
<td>50</td>
</tr>
</tbody>
</table>

The feature with the overall highest levels of substitution is gender, followed by Case. Since there are so few tokens of any given error in a single speaker or language, it is difficult to determine in what direction a feature shifts. I therefore group together all the shifts for each nominal feature.
4.2.2.1 Agreement

I consider the three agreement features: person, number and gender. All three person shifts involve clitics, two of which shift to a reflexive form. Number is evenly split between plural and singular, displaying a bi-directional shift. The largest number of feature shifts involve gender, most of which shift to the feminine.

4.2.2.1.1 Person

There are very few tokens of nominal person shift. We find two tokens in French and one in Italian. I present them below.

(38) Agrammatic Nominal Substitution: Person Errors

a. avant me (se) [Aux] déguisé/er avec (en) chaperon French 
   before self:1Sg (self:3Sg) [Aux] disguise:Part/Infl with (as) RH 
   “before disguised himself as LRRH”

b. à ce moment-là un policier s’ (l’) attend French 
   at that moment a policeman self (him) wait:Prs-3Sg 
   “at that moment a policeman waits for him”

c. e la donna si (lo) sveglia Italian 
   and the woman self (him) wake:Prs-3Sg 
   “and the woman wakes him”

All three person shifts involves object clitics. The French examples involve two types of shifts. First, person shifts from 3rd to 1st. Second, person remains within 3rd person, but shifts from 3rd person to a reflexive 3rd person. The Italian person also shifts from 3rd person to a reflexive 3rd person. The shifts are presented in the table below.
4.2.2.1.2 Number

There is a larger pool of number errors. No preferred direction is indicated, however. Instead we find bi-directional shifting between singular and plural.

Table 24: Agrammatic Number Substitution Pattern

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
</table>
|        | Plural | 9  
|        | Singular |  
| Plural |         |  
| Singular | 9  |
4.2.2.1.3 Gender

When it comes to gender errors, all or most of them are syntactic and not semantic. In other words, a shift in gender is not in the direction of the biological sex of the argument in question. The only language which exhibits a (relatively) substantial number of semantic gender errors is German. All the gender shifts are displayed in the table below.

Table 25: Agrammatic Gender Substitution Pattern

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
<th>Masculine</th>
<th>Feminine</th>
<th>Neuter</th>
<th>M/F</th>
<th>M/N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>16</td>
<td>37</td>
<td>5</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Masculine</td>
<td>24</td>
<td>21</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feminine</td>
<td>12</td>
<td>11</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neuter</td>
<td>22</td>
<td>5</td>
<td>15</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M/F</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M/N</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Although gender shifts seem to display almost all patterns, over half of the shifts are to the feminine form (37/60), followed by a shift to the masculine form (16/60).

4.2.2.2 Case

Case substitutions favor shifts to nominative and accusative forms. The Case shifts are displayed in the table below.
Once again the shifts display a variety of patterns. However, two tendencies are observed. First, about half of the Case shifts involve shifting from dative to some other Case (12/23). Second, with two exceptions, shifts are to nominative or accusative. Since one of the Cases is a combined nominative/accusative, it is difficult to determine which of the two is favored. Keeping to the tokens that can distinguish between the two, eight shift to accusative while five shift to nominative. Thus there is a slight tendency to favor the accusative. *This needs to be tied in to verb class - do the accusative shifts have accusative semantics?*

### 4.2.3 Robustness and Substitution

I showed above that substitutions do not pattern in a specific direction, although a few features seem to favor somewhat one direction over another. Are there any other factors that influence substitution? A given syntactic category does not display the same substitution (or
omission) rate across languages. What syntactic properties could be contributing to the variability (setting aside the factors discussed in chapter 2)? I take as a case study the category of determiner. Consider the following Table, which indicates the percentage of determiners that are omitted and that are substituted for each agrammatic.

Table 27: Agrammatic Determiner Error Rate

<table>
<thead>
<tr>
<th></th>
<th>Omission</th>
<th>Substitution</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF</td>
<td>7.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>EE</td>
<td>55.2%</td>
<td>1.9%</td>
</tr>
<tr>
<td>DB</td>
<td>81.5%</td>
<td>0.6%</td>
</tr>
<tr>
<td>DH</td>
<td>55.2%</td>
<td>1.3%</td>
</tr>
<tr>
<td>GB</td>
<td>18.5%</td>
<td>8.1%</td>
</tr>
<tr>
<td>GM</td>
<td>15.5%</td>
<td>16.0%</td>
</tr>
<tr>
<td>FC</td>
<td>18.3%</td>
<td>6.3%</td>
</tr>
<tr>
<td>FA</td>
<td>4.2%</td>
<td>1.4%</td>
</tr>
<tr>
<td>IR</td>
<td>21.5%</td>
<td>1.7%</td>
</tr>
<tr>
<td>IV</td>
<td>14.3%</td>
<td>7.6%</td>
</tr>
</tbody>
</table>

I focus on Dutch and German since they display the sharpest contrast with respect to omission and substitution rates. German determiners encode more agreement and Case features than any of the other languages. German determiners encode 2 number features (singular and
plural), 3 gender features (feminine, masculine and neuter) and 4 Case features (nominative, accusative, dative and genitive). In contrast, Dutch determiners encode 2 number features (singular and plural), two gender features (M/F and N), and no Case features.

The substitution rates for Dutch determiners are 0.6% and 1.3%. The substitution rates for German determiners are 8.1% and 16.0%. Thus, German determiners, which encode more features than Dutch determiners, display a higher substitution rate than Dutch determiners. Moreover, German determiners have lower omission rates than Dutch determiners: 18.5% and 15.5% for German; 81.5% and 55.2% for English. Thus, German determiners encode more agreement and Case features than Dutch determiners and show a lower omission rate. I propose that the difference in omission and substitution results from Robustness. The more agreement and Case features a category encodes, the more Robust it is. The more Robust a syntactic category, the better retained it is. However, it is then more likely to suffer from substitution errors. German determiners, which encode more features than Dutch determiners, are more Robust. Consequently, they show a lower rate of omission but a higher rate of substitution. I develop a more explicit Principle of Robustness in chapter 5.

4.3 CONCLUSION

I discussed three types of substitutions: phonologically constrained, semantically constrained and syntactically constrained. I concentrated on syntactic substitutions. These substitution errors display four characteristics. First, substitutions are of the same syntactic category. A noun substitutes for a noun, a verb for a verb, and so on. Substitutions are therefore subject to the Categorial Constraint, repeated below.

(39) Categorial Constraint on Substitution

\[ X \text{ substitutes for } Y, \text{ iff category } X = \text{ category } Y \]
Second, substitutions involve the mis-selection of agreement, Case and tense features. These mis-selections are governed by the Single Feature Constraint, whereby only a single agreement, Case or tense feature can be mis-selected. The constraint is presented in (40).

(40) Single Feature Constraint on Substitution

\[ X \text{ substitutes for } Y, \text{ iff category } X \text{ and category } Y \text{ differ by feature } \alpha \]
\[ \text{where } \alpha = \text{ one of } \{ \text{person, number, gender, Case, tense} \} \]

Third, substitution involves markedness only minimally. In other words, substitution does not involve a shifting to a less marked feature specification. In fact, substitutions are frequently bi-directional.

Last, substitutions are influenced by the number of features encoded in a given category. The more features that are encoded in a category (i.e. the more Robust a category), the higher the substitution rate (and the lower the omission rate). This Principle of Robustness is articulated more explicitly in the following chapter.
In the two previous chapters I discussed the nature of omissions and substitutions. I proposed that agrammatic clauses include the full array of syntactic projections and that omissions are not the result of syntactic structures that are 'missing'. With respect to substitutions, I showed that agreement, Case and tense features are manipulated and that only one feature shifts at a time. In this chapter I address the following question: Where in the Grammar does the agrammatic deficit take place? In other words, what mechanisms are impaired such that they result in omission and/or substitution errors? I investigate the phonological, morphological and semantic levels, and conclude that none of these linguistic levels accounts for agrammatic omission and substitution errors. The deficit must lie outside the linguistic levels of representation per se. I propose that the agrammatic deficit lies with the interface between the Lexicon and the linguistic levels of representation, specifically the process of Lexical Insertion.

Lexical Insertion is the process by which Lexical Items are introduced into the structures that are manipulated by the grammar, be it the semantic, syntactic, morphological or phonological component. Lexical Items are the elements contained within the Lexicon. In order to fully understand the process of Lexical Insertion, I address the nature of Lexical Items. Any given Lexical Item is made up of a bundle of features. This bundle is composed of 4 subarrays: a phonological matrix, optional formal features, intrinsic formal features and semantic features. The phonological matrix consists of all the relevant phonological features making up the Lexical Item: the feature geometry, syllabic structure, prosodic structure, etc. The optional formal features consist of agreement, Case and tense features. The intrinsic formal features consist of categorial features and Case-assigning features (the latter are only relevant to V, P and any other category that assigns Case). The semantic features consist of idiosyncratic semantic information ([canine] for wolf, [feline] for cat, and so on) and for V theta-grids (or their equivalent).
Subsequent to establishing what a Lexical Item is, I turn to the general process of Lexical Insertion. I discuss two proposals for Lexical Insertion: Full Lexical Insertion (Chomsky, 1965, 1975, 1981, 1986, 1993, 1995; and many others), Split Lexical Insertion (Otero, 1976, 1983; den Besten, 1977; Fiengo, 1980; Koster, 1987; Anderson, 1992; Büring, 1993; Halle & Marantz, 1993). I argue for a version of Split Lexical Insertion, the detailed mechanisms of which I make explicit. Split Lexical Insertion has the following three mechanisms: Feature Insertion, Feature Matching and Lexical Retrieval. Feature Insertion involves the following: it takes from the Lexicon a feature bundle consisting of the semantic features and the intrinsic formal features of a Lexical Item and inserts them into the syntactic component in the course of the derivation. Once the derivation is complete, Feature Matching scans the relevant paradigm and pairs the feature bundle with the appropriate phonological matrix. Lexical Retrieval, the final mechanism, inserts the fully specified feature bundle into the structure. I argue that Lexical Insertion is impaired for both omission and substitution. However, the specific mechanisms that are impaired are different. For omission, Lexical Retrieval is damaged: the complete feature bundle is not retrieved, leaving the utterance without the phonological matrix. For substitution, Feature Matching is damaged: the Base semantico-syntactic feature bundle is paired with the wrong phonological matrix, resulting in a word with the wrong optional formal features. Further, I argue that a Principle of Robustness governs omissions and that the paradigmatic organization of the Lexicon accounts for the characteristics of substitutions. Thus omission and substitution result from different impairments.

Lastly, I consider the interaction between the principles of UG and processing mechanisms. I define competence and performance, equating competence with UG and performance with processing mechanisms. I then discuss the constraints that are placed on a model of language production.
5.1 WHAT AN AGRAMMATIC DEFICIT ISN'T

I have argued that the structure of agrammatic clauses include the full array of syntactic projections. Moreover, I claimed that the deficit lies outside the syntax proper. In this section, I argue against a purely phonological, morphological, or semantic account of omission and substitution errors. In other words, neither omissions nor syntactic substitutions can be reduced to phonological, morphological or semantic errors. The evidence I present is of two types. First, both omission and substitution display certain characteristics. I show that none of these accounts can explain all these characteristics. Second, each account predicts certain behavior. I show that these predictions are not borne out. I conclude that the agrammatic deficit lies in the interface between the Lexicon and the linguistic levels of representation. The precise nature of the deficit is addressed in 5.2.

5.1.1 Not a Purely Phonological Deficit

The phonological component (henceforth PF) manipulates the phonological matrices of morphemes. A phonological matrix includes featural, segmental, syllabic, and prosodic information. When combined with syntactic information, PF also contributes the stress patterns of sentences. If PF is the locus of the agrammatic deficit, we expect production characteristics that involve only features, segments, syllables, prosody and sentential stress. However, agrammatic production is typically characterized by omission and substitution errors that display syntactic characteristics. Agrammatics may display deviant segmental articulation (Blumstein et al., 1978). However, this results from articulatory and phonatory difficulties that are independent of the agrammatic deficit per se (cf. dysarthria).

I begin with omission errors. The characteristics of omission errors are summarized below.
(1) Characteristics of omission errors

a. Omissions involve all syntactic categories
b. Lexical categories are better retained than functional categories
c. The various functional categories display different retention patterns
d. Nominal categories are better retained than verbal categories
e. 'Parts of words' are not omitted (where bare forms are not licit in the language)

Kean (1977, 1980) argues that the phonological word is "the domain over which the assignment of stress takes place". She claims that agrammatic speech tends to reduce the structure of the sentence to the minimal string of phonological words. Since Kean defines 'phonological word' in terms of stress, her account only addresses omissions in languages where words are either stressed or unstressed. English is such a language. However, French and Italian, while displaying reduced stress, do not display unstressed words. Kean's account must at the outset be modified to accommodate these types of languages.

I now turn to the five characteristics in (1). All syntactic categories (potentially) can be omitted. A phonological deficit splits omission along phonological and non-phonological word status. The prediction is that not all categories are omitted. A phonological deficit does not account for characteristic (1a).

F(unctional) categories, being unstressed, are not considered phonological words, and, therefore, tend to be omitted. L(exical) categories, being stressed, are phonological words, and,

---

1 Nespoulous & Dordain (1990) also argue that agrammatic speech results from a phonological deficit.
2 Blumstein & Goodglass (1972) and Goodglass et al. (1975) argue that English-speaking agrammatics retain stress perception. This sensitivity to stress is apparent in their production: agrammatics produce appropriate word stress. Notice that word stress being intact is yet another argument against a phonological deficit. However, I restrict myself to omissions and substitutions since these are the foci of the thesis.
3 Schwartz, Saffran and Marin (SS&M) (1980) argue that Kean's claim is too strong. If agrammatics are insensitive to F-categories and, consequently, to the purely syntactic aspects of grammatical morphemes, they ought to be able to recover underlying structures where grammatical morphemes are not essential. In other words, they ought to be able to map an N-V-N sequence onto the canonical (English) SVO relationship. SS&M argue that agrammatics do not exhibit an SVO overgeneralization with respect to comprehension. They conclude that agrammatics suffer from a word order defect. However, I must repeat the following two points: SS&M study comprehension, and I focus on production; with respect to production, I argued that word order is unimpaired.
therefore, tend not to be omitted\textsuperscript{4}. The prediction is that lexical categories are better retained than functional categories. This is indeed the case. A phonological deficit therefore potentially accounts for the lexical-functional distinction in (1b).

Although a phonological deficit explains the lexical-functional distinction, it predicts all F-categories to have the same rates of omission, all other (phonological) things being equal. In other words, a phonological account does not predict the differing omission rates between the various F-categories. In section 3.4.2.2 I showed that F-categories do not have the same rate of omission. Specifically, D is better retained than T. A phonological deficit cannot account for characteristic (1c).

L-categories all bear stress. According to Kean's definition, L-categories are phonological words and should be unaffected. Although omission rates of L-categories are lower than those of F-categories, L-categories still are omitted. Consequently, it is not the case that only non-phonological words are omitted, as predicted by a phonological account. Even were we to allow for L-category omissions, a phonological account predicts all L-categories to have the same rate of omission. Specifically, nouns and verbs ought to have the same rate of omission. This prediction is not borne out: nouns are better retained than verbs, as shown in section 3.4.2.3. A phonological deficit cannot account for characteristic (1d).

The last characteristic in (1) is that 'parts' of words are not omitted. For example, agreement markings on verbs are not omitted, leaving a bare verb, where bare forms are not licit in the language. A phonological deficit predicts only that non-phonological words, not parts of words, tend to be omitted. A phonological deficit therefore accounts for characteristic (1e).

I now turn to substitution errors. To begin, a phonological account does not predict substitution errors. The prediction is that phonological words are retained, and non-phonological words are omitted. Thus the existence of substitution errors themselves are evidence against a

\textsuperscript{4} Brown (1980) cites work done by Kellar (1978) which reveals that the abnormal sorting pattern, which makes agrammatic (who have a lesion in the anterior portion of the brain) sensitive to stressed elements and correspondingly insensitive to unstressed elements, is also present in aphasics who have a lesion in the posterior section of the brain. He, therefore, argues that it is "premature to link this [stress] deficit to agrammatism" (1980: 291).
phonological account. However, let us assume that substitutions are predicted. The characteristics of substitution errors are summarized below.

(2) Characteristics of Substitution Errors

a. All syntactic categories are substituted
b. Substitutions involve a single syntactic feature
c. Substitutions are governed by the Principle of Robustness

As with omissions, all syntactic categories are (potentially) substituted. Once again, a phonological deficit splits substitution along phonological and non-phonological word status. The prediction is that not all categories are substituted. A phonological deficit does not account for characteristic (2a).

A phonological account makes two further predictions with respect to substitutions. Substitutions are either phonologically less-marked or they are random, involving any number or type of features. This prediction is not borne out. First, markedness is not involved, neither syntactic nor phonological, since shifts are (for the most part) bi-directional (see section 4.2). Second, substitution errors are not random. They are governed by the Single Feature Constraint, where only a single agreement, Case or tense feature is altered (see section 4.1.3). A phonological deficit fails to account for characteristic (2b).

Lastly, a phonological deficit cannot predict which categories suffer substitution errors and which suffer omission errors. Under phonological rule, a given category should suffer the same omission/substitution rate regardless of the number of syntactic features it encodes. Once again, this is not the case. Categories that encode more syntactic F-features are more likely to be substituted and less likely to be omitted. This requires access to syntactic features. A phonological deficit fails to account for characteristic (2c).

---

5 This single feature shift parallels the single feature change in phonological slips of the tongue (see Fromkin, 1968, 1971).
Since a phonological deficit cannot account most of the production characteristics of agrammatism, the phonological component must be rejected as the unique locus of the deficit\(^6\).

5.1.2 Not a Purely Morphological Deficit

I argue that a purely morphological deficit, with no reference to syntactic features, is not a possible explanation for agrammatism\(^7\). Let us begin by considering a (purely) morphological component. First, this component is responsible for derivational, inflectional and compound morphology. A morphological deficit predicts agrammatics to have difficulties with all three types of morphology. However, agrammatics have problems with neither derivational (De Bleser & Bayer, 1985; Eling, 1986; Miceli & Caramazza, 1988; Ulatowska, 1988; Bebout, 1993) nor compound (Hittmair-Delazer et al., 1994) morphology. Of the three, only inflectional morphology is affected. Thus only the aspect of morphology that makes reference to syntactic features is affected.

Allowing for this focus on inflectional morphology, if the morphological component is the locus of the agrammatic deficit, we expect production characteristics that involve only morphological units. In other words, a morphological deficit predicts omissions and substitutions to display characteristics along purely morphological lines. The distinctions are between roots (bare forms), stems, affixes and (morphological) clitics, with a more general split between free and bound morphemes. We therefore expect to find omissions and substitutions dividing along these types of morphemes.

I begin with omission errors. The characteristics of omission errors are summarized below.

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\(^6\)In addition to not accounting for the agrammatic characteristics, a phonological deficit makes certain predictions. In a phonological deficit we expect to find a disruption of the phonological rules of the language. This prediction is unattested. Hungarian aphatics, for example, retain vowel harmony (MacWhinney & Osmán-Sági, 1991).

\(^7\)This runs contrary to some who argue for a morphological deficit (Bradley et al., 1980; Lapointe, 1983; Kehayia et al., 1990; Kehayia, 1992). However, they too run into opposition
(3) Characteristics of omission errors

a. Omissions involve all syntactic categories
b. Lexical categories are better retained than functional categories
c. The various functional categories display different retention patterns
d. Nominal categories are better retained than verbal categories
e. 'Parts of words' are not omitted (where bare forms are not licit in the language)

Although all syntactic categories can be omitted, the tendency is for free morphemes to be omitted and bound morphemes to be substituted. A morphological deficit can account for this splits by adopting a free-bound distinction. A morphological deficit is compatible with characteristic (3a).

L-categories are, for the most part, stems. F-categories are, for the most part (morphological) clitics (cf. determiners, pronouns, reduced auxiliaries and modals). A morphological deficit can account for the lexical-functional distinction by adopting an omission contrast between stems and clitic categories. Stems are retained, and clitics are omitted. A morphological account can therefore account for characteristic (3b).

However, variation within these stem and clitic divisions is more difficult to account for. Not all F-categories share the same omission rate. The distinction within F-categories cannot be one of clitic versus affix, since affixes on the whole are substituted rather than omitted (see discussion below). A morphological deficit does not account for characteristic (3c).

Although a morphological deficit predicts the stem-clitic distinction, it does not account for the omission contrast between nouns and verbs (Zingeser & Berndt, 1990). Both nouns and verbs are stems. Both ought to suffer the same omission rate. However, they do not: verbs are omitted more frequently than nouns. A morphological deficit does not account for characteristic (3d).

The last characteristic in (3) is that 'parts' of words are not omitted. This brings us to the realm of substitution. A morphological deficit predicts that bare forms may be substituted for

inflected forms. However, this prediction is not borne out\textsuperscript{8}. Bare forms are not produced when they are not licit in the language. Moreover, where these so-called bare forms are produced, it is only when they are options with the relevant paradigms. In other words, if a given paradigm does not include the bare form, it will not be produced. A morphological deficit therefore does not account for characteristic (3e).

I now turn to substitution errors. The characteristics of substitution errors are summarized below.

(4) Characteristics of Substitution Errors
   a. All syntactic categories are substituted
   b. Substitutions involve a single syntactic feature
   c. Substitutions are governed by the Principle of Robustness

As mentioned above, free morphemes tend to be omitted and bound morphemes tend to be substituted. A morphological deficit accounts for characteristic (4a).

Since inflectional morphology has access to agreement, Case and tense features, a morphological deficit can account for characteristics that are determined by these specific features. A morphological deficit then accounts for characteristic (4b-c).

A morphological deficit makes one last prediction: any given morphological category displays omission or substitution. For example, free morphemes are omitted, and bound morphemes are substituted. However, some morphological classes display split behavior: the omission of a free morpheme and the substitution of a bound morpheme. This is true of determiners, pronominal clitics (for French and Italian) (see chapters 3 and 4) and Chinese nominal classifiers (Tzeng et al., 1991). Morphology is left to explain why free morphemes display the behavior of both free and bound morphemes.

Since a morphological deficit does not account for all the production characteristics of agrammatism, I reject it as the unique locus of the deficit.

\textsuperscript{8} Lapointe (1985) argues that English speaking agrammatics show a preference for the least marked verbal form, and claims that this tendency is universal. Bastiane et al. (1991) show that
5.1.3 Not a Purely Semantic Deficit

The semantic component specifies the semantic features of a morpheme and the relations between the morphological items. The semantic component is also the locus of discourse and pragmatic constraints. If agrammatic production results from a semantic deficit, we expect agrammatics to have disturbed discourse and pragmatic structures. Although research in this area is only at the preliminary stages, these predictions are not borne out. Pragmatic factors governing reference (such as the use of novel/familiar information) are found to be intact in agrammatics (Wulfeck et al., 1989). As well, agrammatics have no difficulty with contextual appropriateness of adverbs (Hupet et al., 1986; Frederix, 1985).

I now turn to omission errors. The characteristics of omission errors are summarized below.

(5) Characteristics of omission errors

a. Omissions involve all syntactic categories
b. Lexical categories are better retained than functional categories
c. The various functional categories display different retention patterns
d. Nominal categories are better retained than verbal categories
e. ‘Parts of words’ are not omitted (where bare forms are not licit in the language)

Conceivably, a semantic deficit affects anything with semantic content, thus all syntactic categories. A semantic deficit therefore accounts for characteristic (5a).

A semantic deficit separates categories along semantic lines. If syntactic categories display distinctions along these semantic lines, then they are predicted to behave differently with respect to omission. Semantic features distinguish F-categories from L-categories and nouns from verbs. A semantic deficit therefore accounts for characteristics (5b) and (5d). However, variation within F-categories is syntactically defined rather than semantically defined. A semantic deficit does not account for characteristic (5c).

for Dutch agrammatics, this is not the case. In chapter 4 I argue that morphological markedness is not the governing principle for substitution errors.
I now turn to substitution errors. The characteristics of substitution errors are summarized below.

(6) Characteristics of Substitution Errors

a. All syntactic categories are substituted
b. Substitutions involve a single syntactic feature
c. Substitutions are governed by the Principle of Robustness

Once again, a semantic deficit affects anything with semantic content, thus all syntactic categories. A semantic deficit therefore accounts for characteristic (6a).

However, if the semantic component is the locus of the agrammatic deficit, we expect production characteristics to involve features that influence semantic interpretation. Since agreement, Case and tense features are not crucial for semantic interpretation, a semantic deficit would not predict these features to 'go wrong'. A semantic deficit does not account for any characteristics that involve these features, namely (6b-c).

Since a semantic deficit does not predict all of the production characteristics of agrammatism, the semantic component must be rejected as the unique locus of the deficit.

I summarize the evidence from omissions and substitutions against phonological, morphological and semantic accounts of agrammatic production in the following table.
5.2 AGRAMMATIC PRODUCTION: A DEFICIT IN LEXICAL INSERTION

The omission and substitution errors under study cannot be accounted for by a purely phonological, morphological or semantic deficit. Moreover, I argued that agrammatic clauses include the full array of syntactic projections, leaving syntactic movement unimpaired. In other words, omissions and substitutions are syntactic errors that do not result from a deficit within the syntactic component. Then what exactly is affected when omissions and substitutions are in
evidence? I propose that the deficit is one that involves the process of Lexical Insertion. Lexical Insertion is the process by which Lexical Items are introduced into the structures that are manipulated by the grammar, be it the semantic, syntactic, morphological or phonological component. Lexical Items are the elements contained within the Lexicon. In order to fully understand the process of Lexical Insertion, I address the nature of Lexical Items.

5.2.1 The Lexical Item

The Lexicon contains a list of all the words in the speaker's language. Each word is a Lexical Item (henceforth LI). Following Chomsky (1993), an LI is made up of a feature array, which includes a phonological matrix, formal features (F-features) and semantic features. There are two types of F-features, intrinsic and optional. The feature array consists of 4 sub-arrays: a phonological matrix, a bundle of optional F-features, a bundle of intrinsic F-features (which consists of categorial features, for the most part), and a semantic feature array. The phonological matrix consists of all the relevant phonological features making up the Lexical Item: segmental, syllabic and prosodic structures, etc. The optional F-features consist of agreement, Case and tense features. The intrinsic F-features consist of categorial features and Case-assigning features (the latter are only relevant to V, P and any other category that assigns Case). The semantic features consist of idiosyncratic semantic information ([canine] for wolf, [feline] for cat, and so on) and for V theta-grids. The LI for wolf is presented in (7).

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9 This split between intrinsic and optional F-features seems to match very closely Gazdar et al.'s (1985) split between Major (intrinsic, more or less) and Minor (optional, more or less) features.

10 There is variation in what constitutes optional and intrinsic F-features. The 3rd person feature is an intrinsic F-feature for all nouns. However, pronouns, determiners and agreement on verbs may vary in person specifications. For example, we have the pronouns I, you, she for 1st, 2nd and 3rd person, respectively. In these cases, the person feature is an optional F-feature rather than an intrinsic one. Note also that Case features are specific to nominal categories and tense features are specific to verbal categories.
(7) LI for *wolf*

WOLF: [wolf] [Singular] [Lexical] [Canine]
[Ø Gender] [Nominal] [Wild]
[Ø Case] [Referential] [3rd Person]

I use upper case to indicate the abstract form of the item under scrutiny. In other words, the term 'WOLF' refers to the abstract entity which denotes the English noun *wolf*. The LI in (7) shows 4 columns. Each column represents one of the 4 feature sub-arrays. I describe each column from left to right. The first column within the LI is the phonological matrix. I represent the matrix by the phonemic entry of the morpheme, side-stepping the phonological details. The second column consists of the optional F-features (in this case *wolf* is unspecified for gender and Case features, which I indicate with ‘Ø’). The third column are the intrinsic F-features, here the categorial and person features. The last column are the semantic features. I have displayed the feature sub-arrays from most to least language-specific.

Each syntactic category is a bundle of categorial features. The use of N(oun) or V(erb) is thus an abbreviation for these bundles. This is illustrated in (8).

(8)     
<table>
<thead>
<tr>
<th>N</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Lexical Referential Nominal]</td>
<td>[Lexical Referential]</td>
</tr>
</tbody>
</table>

The term N refers to the bundle of privatives features [Lexical Referential Nominal], and the term V refers to the bundle of features [Lexical Referential]. I adopt the use of this abbreviation for the specifications of LI, when the precise categorial features are not relevant. The abbreviated LI for *wolf* is presented in (9).

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11 Although I include in the array the optional F-features that are unspecified, it is also possible that these features are absent from the array altogether. Either approach is consistent with my analysis.
LI for *wolf* (English)

WOLF: [wolf] [Singular] N [Canine]
[Ø Gender] [3rd Person] [Wild]
[Ø Case]

Let us now consider the LI for the German noun *Wolf*.

LI for *Wolf* (German)

WOLF: [volf] [Singular] N [Canine]
[Masculine] [3rd Person] [Wild]
[Ø Case]

The intrinsic F-features and the semantic features are identical to that of English WOLF. Where the differences lie are with respect to the phonological matrix and the optional F-features. This is exactly the locus of omission and substitution.

In summary, an LI is a feature bundle consisting of four sub-arrays of features: phonological features, optional F-features, intrinsic F-features and semantic features.

5.2.2 *Lexical Insertion*

The Lexicon is the basis from which syntactic structures are projected. As mentioned in the preceding section, the elements contained within the Lexicon are Lexical Items (LIs). Lexical Insertion is then the process by which LIs are introduced into the syntax\(^\text{12}\). The LIs project the syntactic structures. More specifically, the categorial features (the intrinsic F-features) that make up the LI project the syntactic structure. These syntactic structures are then subject to the various

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\(^{12}\) There is a further debate about Lexical Insertion, independent of where it takes place: is Lexical Insertion rule-based or representation-based? Jackendoff (1995) proposes that the Lexicon is an interface level that matches three independent sets of representations: phonological, syntactic and semantic. Lexical Insertion then is not insertion at all. Rather it consists of a matching condition on representations. A similar debate runs through the processing literature, with production models being rule-based (Schlesinger, 1977) or representation-based (McClelland & Rumelhart, 1981; Stemberger, 1985; Pritchett, 1992). What is at issue for my purposes is the location of Lexical Insertion, not the nature of the process. I therefore remain neutral with respect to which variant I prefer.

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syntactic operations and constraints within the syntactic component.

There are two general approaches to Lexical Insertion. First, Chomsky's (1965, 1975, 1981, 1986, 1993) Lexical Insertion is a process which introduces the fully specified LI at the start of the derivation. I label this Full Lexical Insertion. In an alternative version of Lexical Insertion the phonological matrix is not introduced when syntactic structures are projected. Instead, the phonological matrix is inserted after all syntactic operations have been performed, but before the string enters the phonological component (Otero, 1976, 1983; den Besten, 1977; Fiengo, 1980; Koster, 1987; Anderson, 1992; Büring, 1993; Halle & Marantz, 1993). I call this Split Lexical Insertion. In this section I describe the two approaches to Lexical Insertion. I begin with Full Lexical Insertion and show that problems arise when attempting to account for omissions and substitutions. I then turn to Split Lexical Insertion.

5.2.2.1 Full Lexical Insertion

Full Lexical Insertion (FLI) introduces all four feature subarrays into the syntactic component at the start of the derivation (Chomsky, 1965, 1975, 1981, 1986, 1993). I refer to this mechanism as Lexical Insertion. A general diagram illustrating this mechanism is provided below.

---

13 I use the term “derivation” to denote the process of constructing a grammatical sentence, whether the process consists of the application of a collection of rules or the use of constraints on representations.
The process of Lexical Insertion takes from the Lexicon the complete feature bundle (with all four subarrays) and introduces it into the syntactic component at the start of the derivation. I argued that agrammatic clauses have the full set of projections. If the intrinsic F-features project the syntactic structures, these features must be available to the agrammatic speakers. Moreover, the mechanism that introduces these features must be fully functional in agrammatics. Thus, the process of Lexical Insertion (which introduces intrinsic F-features into the syntactic component) cannot be impaired. But how is this feature bundle created? What are the processes involved in combining the various feature subarrays?

Following Chomsky (1993, 1995) I assume that the semantic features and the intrinsic F-features are inherent to a Lexical Item. This bundle of two subarrays makes up the Base (feature bundle) of an LI in the Lexicon. The Base (feature bundle) is schematized as follows.

(11) Base Feature Bundle for a Lexical Item in the Lexicon

The optional F-features are added to this Base via a mechanism I call Optional Feature Insertion. The resulting tripartite feature bundle is presented below.
The Lexical Item must now receive its phonological matrix. The phonological matrix is dependent on the optional F-features that are present in the tripartite feature bundle (which is why the phonological matrix is not inserted into the matrix before the optional features are). To illustrate, the pronouns *he* and *she* have identical semantic and intrinsic features. They differ in their optional features: *he* is [Masculine] and *she* is [Feminine]. I argue below that the Lexicon is organized in paradigms. To retrieve the appropriate phonological matrix, a mechanism first scans the relevant paradigm and pairs the tripartite feature bundle with the appropriate phonological matrix. I label this mechanism Feature Matching. A second mechanism retrieves and inserts this matched phonological matrix into the tripartite feature bundle, producing a complete feature bundle. I label this mechanism Phonological Matrix Insertion. The resulting complete feature bundle is schematized below.

The process of Lexical Insertion inserts this complete feature bundle into the syntactic component. Within the syntactic component the process of Feature Checking, among other functions, ensures that words agree in their feature specifications (subjects agreeing with verbs, for example) (Chomsky, 1993, 1995)\(^{14}\).

\(^{14}\) Chomsky (1995) mentions that optional F-features may be assigned during the derivation rather than being inserted in the Lexicon and then checked in the derivation. If the phonological
Having described the various mechanisms contributing to Lexical Insertion, I now consider the following question: how are substitutions and omissions produced? I begin with substitutions. Substitutions are in effect mismatches between sets of optional features and phonological matrices. I propose that substitutions result from an impaired Feature Matching mechanism and/or an impaired Phonological Matrix Insertion mechanism. When no substitution occurs, the following processes take place: optional features are assigned to the Base feature bundle (via Optional Feature Insertion); the correct phonological matrix is paired with the tripartite feature bundle (via Feature Matching); that same phonological matrix is retrieved and inserted into the tripartite feature bundle (via Phonological Matrix Insertion); the complete feature bundle is inserted into the syntactic component (via Lexical Insertion); and the optional features are checked in the syntax (via Feature Checking). When a substitution occurs, Optional Feature Insertion still assigns optional F-features to the Base feature bundle, as such Feature Checking does not force the derivation to crash since the optional features are correct (it is the phonological matrix that is incorrectly matched). Beyond that, processes go awry. There are three possibilities. First, the wrong phonological matrix is paired with the tripartite bundle, this particular wrong matrix is (correctly) retrieved and inserted into the tripartite bundle, and the complete feature bundle (with the wrong phonological features) is inserted into the syntactic component. This sequence results from an impaired Feature Matching mechanism (FM). Second, the correct phonological matrix is paired with the tripartite bundle, the wrong matrix is retrieved and inserted into the tripartite bundle, and the complete feature bundle (with the wrong phonological features) is inserted into the syntactic component. This sequence results from an impaired Phonological Matrix Insertion mechanism. Third, the wrong phonological matrix is paired with the tripartite bundle, a different phonological wrong matrix is retrieved and inserted into the tripartite bundle, and the complete matrix is specified at the start of the derivation, having optional F-features assigned during the derivation requires the following. The phonological matrix itself must be specified for the optional features, which must be checked with the optional features that are assigned during the derivation, otherwise there is no way of ensuring that the phonological matrix is matched to the correct optional features. If the two sets of optional features match, the derivation is licit. If they do not match, the derivation crashes. This is unduly complicated since it requires the feature
feature bundle (with the wrong phonological features) is inserted into the syntactic component. This sequence results from impairment to both Feature Matching and Phonological Matrix Insertion.

All three possible sequences result in substitutions. How to decide between them? To begin, substitutions are subject to the Single Feature Constraint. If both Feature Matching and Phonological Matrix Insertion are impaired, more than a single feature is likely to shift. Moreover, if impairment to a single mechanism can account for substitution, why posit a deficit to two mechanisms? Thus either Feature Matching or Phonological Matrix Insertion is impaired. Which one is impaired? Once again I return to the Single Feature Constraint on substitutions. Assume Feature Matching is impaired. To derive a single feature shift, the impaired Feature Matching must (i) choose the correct paradigm and (ii) pick a phonological matrix close to the target rather than anywhere in that paradigm. This requires unimpaired selection of the paradigm as well as some awareness of the actual target. If Feature Matching is indeed impaired, neither bit of information should be accessible. Now assume Phonological Matrix Insertion is impaired. A fully functional Feature Matching has lead us to the correct paradigm and ultimately the correct target. Since Phonological Matrix Insertion is already located at the target, when it is impaired, it copies a neighboring matrix rather than one in another paradigm or far off from the target. In other words, an impaired Phonological Matrix Insertion readily lends itself to the Single Feature Constraint. I therefore propose that substitutions result from an impaired Phonological Matrix Insertion.

I now turn to omissions. What mechanism is impaired such that omissions result? There are two possibilities: Optional Feature Insertion and Phonological Matrix Insertion. I begin with the former. As mentioned above, optional F-features and phonological features are closely linked. The specific identity of the phonological matrix is determined by what optional features are present. Conceivably, if no optional features are present then no phonological matrix can be retrieved. It is possible then that omissions result from an impaired Optional Feature Insertion.

checking mechanism that feature assignment is to replace. I therefore assume that optional
When Optional Feature Insertion is functional, the following takes place: optional F-features are assigned; a phonological matrix is paired with the tripartite feature bundle (via Feature Matching); the phonological matrix is inserted into the feature bundle (via Phonological Matrix Insertion); and the complete feature bundle is inserted into the syntactic component (via Lexical Insertion). When Optional Feature Insertion is non-functional, optional features are not assigned, no phonological matrix is paired or retrieved, and an incomplete feature bundle (with only semantic and intrinsic features) is inserted into the syntactic component.

There are two problems with such a proposal. First, one of the functions of Feature Checking is to motivate movement. In other words, syntactic categories move in order to check their optional features. If no optional features are present, then movement should not take place. However, as I argued in chapter 3, movement takes place even when omissions are in evidence. Second, Optional Feature Insertion manipulates optional features but not intrinsic features. I argue below that (the number of) intrinsic features influence omission rates. It is unclear how a process that does not handle intrinsic features can account for a phenomenon that is influenced by intrinsic features.

These problems disappear if the impairment lies with Phonological Matrix Insertion. When Phonological Matrix Insertion is functional, the following takes place: optional F-features are assigned (via Optional Feature Insertion); a phonological matrix is paired with the tripartite feature bundle (via Feature Matching); the phonological matrix is inserted into the feature bundle; and the complete feature bundle is inserted into the syntactic component (via Lexical Insertion). When Phonological Matrix Insertion is non-functional, the following sequence occurs: optional features are assigned (via Optional Feature Insertion); a phonological matrix is paired to the tripartite feature bundle (via Feature Matching); no phonological matrix is retrieved and/or inserted into the tripartite bundle; and an incomplete feature bundle (with only semantic, intrinsic and optional features) is inserted into the syntactic component.

features are assigned in the Lexicon for Full Lexical Insertion.
I now return to the problems with the Optional Feature Insertion account mentioned above. Optional F-features are required if movement is to take place in the syntax. The Optional Feature Insertion account eliminates optional features from the feature bundle that enters the syntactic component. With the Phonological Matrix Insertion account, the feature bundle that is inserted into the syntactic component includes optional F-features. This eliminates the first of the two problems. The second problem revolves around the Retention Hierarchy. I argue below that syntactic categories that are specified for more categorial features (intrinsic F-features) are more likely to be retained than those specified for fewer categorial features. In other words, items with fewer intrinsic features are more likely to be omitted. This means that the (impaired) mechanism that results in omission should have access to the intrinsic features of that item. Optional Feature Insertion simply manipulates optional F-features, with no access to intrinsic features. Phonological Matrix Insertion, on the other hand, handles the entire tripartite feature bundle, which includes intrinsic F-features. A Phonological Matrix Insertion account eliminates the second problem as well. I therefore propose that omissions result from an impaired Phonological Matrix Insertion.

For Full Lexical Insertion, both substitutions and omissions result from an impaired Phonological Matrix Insertion mechanism. With substitutions, the wrong matrix is retrieved and inserted into the feature bundle. With omissions, no phonological matrix is retrieved. The locus for both types of errors is the same; however, the process is different.

5.2.2.2 Split Lexical Insertion

Split Lexical Insertion introduces the semantic features, intrinsic F-features and optional F-features into the syntactic component at the start of the derivation and inserts the phonological matrix after all syntactic operations have been performed, but before the string enters the

\[\text{Recall that intrinsic F-features must be inserted into the syntactic component since they project the syntactic structures that are present in agrammatic clauses, even when omissions are in evidence.}\]
phonological component (Otero, 1976, 1983; den Besten, 1977; Fiengo, 1980; Koster, 1987; Anderson, 1992; Büring, 1993; Halle & Marantz, 1993). A general diagram illustrating these mechanisms is provided below.

Figure 8: General Schema of Split Lexical Insertion

Split Lexical Insertion has two mechanisms that connect the Lexicon to the syntactic component: Initial Insertion and Lexical Retrieval. Initial Insertion involves the following: it takes from the Lexicon a feature bundle of an LI consisting of the semantic features, the intrinsic F-features and the optional F-Features and inserts the bundle into the syntactic component at the beginning of the derivation. Lexical Retrieval is the process that retrieves the appropriate phonological matrix once the syntactic derivation is complete and before the string enters PF\(^{16}\) (the precise nature of this mechanism is described below).

I argued that agrammatic clauses have the full set of projections. If the intrinsic F-features project the syntactic structures, these features must be available to the agrammatic speakers. Moreover, the mechanism that introduces these features must be fully functional in agrammatics.

\(^{16}\) The process must precede the phonological component since strings that include omissions are subject to post-Lexical phonological rules. Consider the following utterance from French.

(i) \[je [Aux]\] arrivé
I [Aux] arrive:Part
“I arrived”

The pronoun would normally be je if the auxiliary were present: je suis arrivé. However, what is actually produced is the following: j' arrivé. The (phonologically determined) j’ variant is required since the following word begins with a vowel. See Sanchez (1992a) for other such examples.
Thus, the process of Initial Insertion (which introduces intrinsic F-features into the syntactic component) cannot be impaired. The agrammatic deficit must lie with other mechanisms.

Once again, following Chomsky (1993, 1995) I assume that the semantic features and the intrinsic F-features are inherent to a Lexical Item. This bundle of two subarrays makes up the Base (feature bundle) of an LI in the Lexicon. It is schematized below.

(14) Base Feature Bundle for a Lexical Item in the Lexicon

\[
\begin{array}{c}
\text{semantic features} \\
\text{intrinsic F-features}
\end{array}
\]

As with Full Lexical Insertion, the optional F-features are added to this Base via Optional Feature Insertion. The resulting tripartite feature bundle for an LI in the Lexicon is presented below.

(15) Tripartite Feature Bundle for a Lexical Item in the Lexicon

\[
\begin{array}{c}
\text{semantic features} \\
\text{intrinsic F-features} \\
\text{optional F-features}
\end{array}
\]

It is at this point that Split Lexical Insertion differs from Full Lexical Insertion. The process of Initial Insertion inserts this tripartite feature bundle into the syntactic component. Within the syntactic component the process of Feature Checking, among other functions, ensures that words agree in their feature specifications (subjects agreeing with verbs, for example) (Chomsky, 1993, 1995)\(^{17}\).

Before entering the phonological component, the Lexical Item must receive its phonological matrix. I argue below that the Lexicon is organized in paradigms. To retrieve the

\[17\] Chomsky (1995) mentions that optional F-features may be assigned during the derivation rather than being inserted in the Lexicon and then checked in the derivation. Either approach is
appropriate phonological matrix, the Feature Matching mechanism scans the relevant paradigm and pairs the tripartite feature bundle with the appropriate phonological matrix. As stated above, Phonological Matrix Insertion retrieves and inserts the phonological matrix into the tripartite feature bundle. This results in a complete feature bundle, schematized below.

(16) Complete Feature Bundle for a Lexical Item in the Lexicon

```
<table>
<thead>
<tr>
<th>semantic features</th>
</tr>
</thead>
<tbody>
<tr>
<td>intrinsic F-features</td>
</tr>
<tr>
<td>optional F-features</td>
</tr>
<tr>
<td>phonological features</td>
</tr>
</tbody>
</table>
```

The syntactic component interfaces with PF and LF. The complete feature bundle is introduced into this interface level. I label this process Lexical Retrieval, as schematized below.

Figure 9: Model of (a Split Lexical Insertion) Grammar

Having described the mechanisms contributing to the Split Lexical Insertion, I now consider the following question: how are substitutions and omissions produced? I begin with substitutions. To repeat, a substitution is a mismatch between a set of optional features and a phonological matrix. As with Full Lexical Insertion, I propose that substitutions result from an consistent with the account of agrammatic omission and substitution presented for Split Lexical Insertion.
impaired Phonological Matrix Insertion mechanism. The process is identical to that described for Full Lexical Insertion.

I now turn to omissions. There are two possible mechanisms that may be impaired: Phonological Matrix Insertion or Lexical Retrieval. The Phonological Matrix Insertion alternative is as described for Full Lexical Insertion. I now consider the Lexical Retrieval alternative. When Lexical Retrieval is functional, the following occurs: the tripartite feature bundle is introduced into the Lexicon; the bundle is paired to a phonological matrix; the phonological matrix is retrieved and inserted into the tripartite bundle; and the complete bundle is then inserted into the syntactic interface. When Lexical Retrieval is non-functional, the sequence is as follows: the tripartite feature bundle is introduced into the Lexicon; the bundle is paired to a phonological matrix; the matrix is retrieved and inserted into the tripartite bundle; but the complete feature bundle is not introduced into the syntax interface.

There are two possible loci for omission errors: Phonological Matrix Insertion and Lexical Retrieval. There are no empirical differences between the two. Choosing the Phonological Matrix Insertion account has in two implications. First, the same processes are impaired whether we have Full Lexical Insertion or Split Lexical Insertion. Second, omissions and substitutions result from impairment to the same mechanism, namely Phonological Matrix Insertion. Choosing an Lexical Retrieval account implies that (i) there is a distinction between Full Lexical Insertion and Split Lexical Insertion, and (ii) omissions and substitutions result from impairments to different mechanisms, substitutions from an impairment to Phonological Matrix Insertion and omissions from an impairment to Lexical Retrieval.

There are two reasons to prefer a Lexical Retrieval account. First, if an impaired Lexical Retrieval results in omissions, omissions are automatically distinct from substitutions, which result from an impaired Phonological Matrix Insertion. I argue below that substitutions and omissions are in fact distinct error types. Second, choosing the Lexical Retrieval account means

18 It is also possible that Lexical Retrieval separates the complete feature bundle into two components. The phonological matrix is introduced into the Syntax-PF interface, and the semantic, intrinsic and optional features are introduced into the Syntax-LF interface.
that Lexical Insertion is split. While my focus is syntactic substitutions, there are a variety of possible substitutions errors (semantic, for instance). Although Full Lexical Insertion can account for these different types of substitutions, we would not necessarily expect different types. With Split Lexical Insertion, we expect a variety of substitutions. I therefore maintain that omissions result from an impaired Lexical Retrieval mechanism and that substitution results from an impaired Phonological Matrix Insertion mechanism.

5.2.3 Accounting for Omissions

I argued that omissions result from impairment to Lexical Retrieval. Now I turn to the factors that influence the mechanism of Lexical Retrieval. I propose a Principle of Robustness whereby the quantity of features determines the likelihood of omission or retrieval; specifically, the quantity of syntactic features.

5.2.3.1 The Principle of Robustness

Recall that agrammatics (more often) omit F-categories and V-categories. In other words, they (more often) retrieve L-categories and N-categories. For a unified featural account of agrammatic behavior we must have the features [Functional] and [Verbal] OR [Lexical] and [Nominal]. I adopt Déchaine’s (1993) model of categorial features, which I repeat below (see section 1.1.3 for a discussion of syntactic features).

(18) Déchaine’s (1993) model of categorial features

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>T</th>
<th>V</th>
<th>K</th>
<th>D</th>
<th>N</th>
<th>P</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referential</td>
<td></td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
This model has the features [Functional] and [Nominal]. These features do not allow a unified account for the agrammatic deficit. A revised set of features is required: one feature must be changed. Agrammatism can be characterized in one of two ways: either agrammatics have difficulty accessing specified categories, or agrammatics can better retrieve specified categories. Let us consider the first option whereby agrammatics have difficulties accessing specified categories. Then, the more features a category has, the more specified it is. The more specified it is, the more difficulties it creates. Since F-categories and V-categories are more problematic for the agrammatic speaker, the required features for this approach to the deficit are [Functional] and [Verbal]. F-categories are [Functional], and L-categories are unspecified for the feature [Functional]. V-categories are [Verbal], and N-categories are unspecified for the feature [Verbal]. The resulting categorial table is shown in (19).

(19)  C  T  V  K  D  N  P  A

<table>
<thead>
<tr>
<th>Feature</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referential</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This model predicts that the fewer features a category has, the better retained it will be (by an agrammatic). If we compare nouns and verbs, we see that nouns have fewer features than verbs, and are, therefore, predicted to be better retained than verbs. As argued above, this is indeed the case. This model, in fact, predicts the following hierarchy of retention, where ">" means "better retained than".

(20) Incorrectly Predicted Retrieval Hierarchy

A > N, P, K > V, D, C > T

This hierarchy predicts that adjectives will show the best retention. This prediction is not borne out (Kolk, 1978; Rizzi, 1985; and many other references asserting that nouns are the category best retained).

Let us now consider the second alternative, whereby agrammatics can better access
specified categories. Once again, the more features a category has, the more specified it is. But now, the more specified a category is, the better retained it is. In other words, specified categories are more robust and ‘easier’ to retrieve than unspecified categories. Since L-categories and N-categories are better retained in agrammatic speech, the required features for this approach to the deficit are [Lexical] and [Nominal]. L-categories are [Lexical], and F-categories are unspecified for the feature [Lexical]. N-categories are [Nominal], and V-categories are unspecified for the feature [Nominal]. The resulting categorial table is shown in (21).

(21)  

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>T</th>
<th>V</th>
<th>K</th>
<th>D</th>
<th>N</th>
<th>P</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lexical</td>
<td></td>
<td></td>
<td>√</td>
<td></td>
<td></td>
<td>√</td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Nominal</td>
<td>√</td>
<td>√</td>
<td></td>
<td>√</td>
<td></td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referential</td>
<td>√</td>
<td>√</td>
<td></td>
<td>√</td>
<td></td>
<td>√</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This model predicts that the more features a category has, the better retained it will be (by an agrammatic)\(^{19}\). If we compare nouns and verbs, we see that nouns have more features than verbs, and are, therefore, predicted to be better retained than verbs. As argued above, this is indeed the case. The hierarchy of retention that this particular model predicts is presented in (22).

(22) Predicted Retrieval Hierarchy

\[ N \succ V, A, D \succ P, T, K \succ C \]

This hierarchy predicts that nouns are the most specified category and, therefore, will show the best retrieval. Nouns are indeed the category best retrieved in agrammatism. The fact that this most basic prediction is supported, whereas that of the hierarchy in (13) is not, argues in favor of the feature model in (21), where [Lexical] and [Nominal] (and [Referential]) are the necessary features. Moreover, consider the Hierarchy of Retention evidenced by the agrammatic

\(^{19}\) If the features are reversed such that N is the least specified syntactic category, the hierarchy still holds. In other words, adopting the features [Functional], [Verbal] and [-Referential] results in the same hierarchy but with the opposite specification: the less specified, the better retained. However, there is no evidence indicating that N must be the least specified. Moreover, when considering substitution errors, the more optional F-feature a category encodes, the more substitutions (and fewer omission) it undergoes. In other words, Robustness is at work in substitution. To match this, I favor Robustness rather than lack of specification for omission.
speakers in the previous section.

(23) Retention Hierarchy

\[ N > V > D > \text{Aux/Modal} \]

The hierarchy in (23) closely resembles that presented in (22). The only distinction lies in the division between V and D for (23) and the lack thereof for (22).

How does this hierarchy connect to Lexical Insertion? Specifically, how do categorial features fit into Lexical Retrieval? I propose a Principle of Robustness.

(24) Principle of Robustness

Category A is more ROBUST than category B if it is specified for more F-features than category B.

The process of Lexical Retrieval is then subject to the Principle of Robustness in that it can better manipulate syntactic categories that are more ROBUST. I argue below that this Principle extends to all syntactic features, including agreement, Case and tense features. The net result of the interaction between Lexical Retrieval and the Principle of Robustness is that categories that are more robust are more often retrieved and consequently show up more frequently in agrammatic production.

5.2.3.2 Deriving Omissions

I now trace the process of omission from beginning to end. I argued that omissions result from impairment to the process of Lexical Retrieval present in a Split Lexical Insertion model. The derivation I present below thus assumes such a model (as described in the section 5.2.2.2). Consider the sentences in (25). The sentence in (25a) contains an omission, the determiner\(^{20}\). The sentence in (25b) does not.

\(^{20}\)The original sentence from the database is the following.
(25) Sentences for omission derivation

a. [Det] wolf eats grandmother
b. the wolf eats grandmother

Both sentences require the following LIs.

(26) LIs for the Items that Project the Sentences in (25)

<table>
<thead>
<tr>
<th>THE:</th>
<th>[ðə]</th>
<th>[Ø Person]</th>
<th>[Nominal]</th>
<th>[Definite referent]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>[Ø Number]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Gender]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Case]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WOLF:</td>
<td>[wʊlf]</td>
<td>[Singular]</td>
<td>[Lexical]</td>
<td>[Canine]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Gender]</td>
<td>[Nominal]</td>
<td>[Wild]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Case]</td>
<td>[Referential]</td>
<td>3rd Person</td>
</tr>
<tr>
<td>EATS:</td>
<td>[ɪts]</td>
<td>[3rd Person]</td>
<td>[Lexical]</td>
<td>[Consumption of food]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Singular]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Gender]</td>
<td>[Referential]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Present]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TENSE:</td>
<td>[Ø]</td>
<td>[Ø Person]</td>
<td>[Referential]</td>
<td>[+Finite]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Number]</td>
<td></td>
<td>[Assign Nom] [Present]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Gender]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRANDMOTHER:</td>
<td>[ɡraʊndmʌðər]</td>
<td>[Singular]</td>
<td>[Lexical]</td>
<td>[Female]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[Nominal]</td>
<td>[Elder]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[Referential]</td>
<td>[Relation]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3rd Person</td>
<td></td>
</tr>
</tbody>
</table>

The derivation of the sentences in (25) begins with the mechanisms within the Lexicon. In the Lexicon, the inherent specifications of the LIs include the semantic features and the intrinsic F-features. The Base feature bundle for each of the LIs in (27) are displayed below. The left-hand set of features are the intrinsic F-features, and the right-hand set are (an approximation of) the semantic features.

(i) [Det] wolf eat (eats) grandmother
   "the wolf eats grandmother"

The sentence contains a substitution as well as an omission. For our present purposes, I ignore the substitution error and assume the correct verbal form.
Still within the Lexicon, the process of Optional Feature Insertion adds to this Base the optional F-features. The resulting tripartite feature bundles for all the LIs are presented below.

---

21 An alternative is that *grandmother* is unspecified for gender, [Ø Gender]. The use of *she* in reference to *grandmother* would derive from the semantic feature [Female].
(28) Tripartite Feature Bundle for Lexical Items in (26)

The process of Initial Insertion inserts this tripartite feature bundle into the syntactic component. The categorial features project their X-bar structure. The resulting structure is the
following. The only verbal functional categories I include is TP. The structure may be expanded to include AgrSP, AgrOP, CP, etc.

(29) Projected Syntactic Structure for Sentences in (25)

Within the syntactic component movement takes place to check (optional) features and for Case assignment. The subject DP [THE WOLF] raises to [Spec TP] to receive nominative Case (from T). This derivation is schematized in the tree below. Note that in English the main verb does not raise to check its features. However, verbs in other languages (such as French, Dutch and German) do raise to T.

(30) Derived Structure for the Sentences in (25)

The words in upper case indicate the tripartite feature bundles schematized in (28). What is missing are the phonological matrices. To retrieve the appropriate phonological matrix for each LI, the Feature Matching mechanism picks and scans the relevant paradigm and pairs the tripartite
feature bundle with the appropriate phonological matrix. The process of Phonological Matrix Insertion then retrieves and inserts the appropriate phonological matrix into the tripartite feature bundle. If the derivation is free of omission, as in (25b), Lexical Retrieval takes the complete feature bundles and introduces them into the Syntax interface with PF/LF (inserting them into their appropriate slots). This is schematized by the following tree.

(31) Structure with Phonological Matrices for Sentence (25b)

If however omission is in evidence, as in (25a), the process of Lexical Retrieval is non-functional for that LI. Lexical Retrieval handles the complete feature bundle and therefore has access to the (number of) F-features within each LI. The complete feature bundles are presented below.

(32) Complete Feature Bundle for Lexical Items in (25a)
In section 5.2.3.1 I argued that omissions are governed by the Principle of Robustness, which is repeated below.

(33) **Principle of Robustness**

Category A is more ROBUST than category B if it is specified for more F-features than category B.
Robustness governs Lexical Retrieval. Thus LIs that are specified for more F-features are more likely to be retrieved than those with fewer specified F-features. Of all the LIs in (32), the determiner has the fewest F-features. It is therefore most likely not to be retrieved and inserted into the Syntax interface with PF/LF. The resulting structure for the utterance with the omission is schematized by the following tree.

(34) Structure with Phonological Matrices for Sentence (25a)

```
TP
  /\         /\         /\         /\
DP /  T'    D' /  VP
   /\     /\   /\     /\   /\     /\
 D /  T    D' /  V'  N
  /\       /\   /\       /\   /\   /\
Ø / [wol]  (wolf) [its]  [grandma\d\jdr]  (grandmother)
```

The determiner is omitted while the other more Robust categories are retrieved.

5.2.4 *Accounting for Substitutions*

The Principle of Robustness determines the likelihood of retrieval. But what determines substitutions? In the preceding chapter I established that substitutions involved manipulating agreement (person, number, gender), Case and tense features. Moreover, I argued that these features are not randomly manipulated. Rather, for any given substitution a single feature is changed. This restricted pattern can only be accounted for by a model that incorporates paradigm structures for agreement, Case and tense. To account for these facts, I propose that Lexical Items within the Lexicon are organized in inflectional paradigms. The process of Feature Matching scans these paradigms in order to pair the tripartite (semantic, intrinsic and optional) feature
bundle with a phonological matrix. Then Phonological Matrix Insertion copies the selected matrix and inserts it into the feature bundle, which Lexical Retrieval introduces into the Syntax interface with PF/LF. Agrammatic substitutions then result from an impaired Phonological Matrix Insertion mechanism.

5.2.4.1 Paradigms in the Lexicon

What is a paradigm? A paradigm is multi-dimensional list of linguistically related forms. Within Generative Grammar paradigms have, for the most part, been reduced to a display method, with no theoretical status. Contrary to this trend, several linguists have proposed that linguistic structures are organized in paradigms (Halle, 1973; Williams, 1981; Bybee, 1985, 1988, 1991; Carstairs, 1987, 1991; 1994; Wurzel, 1987, 1990; Matthews, 1991; Postma, 1992; Rohrbacher, 1994; Thompson, 1995). Specifically, paradigmatic structures govern the architecture of the Lexicon. As stated in the earlier definition, a paradigm consists of several dimensions. Each dimension corresponds to a syntactic feature: Person, Number, Gender, Case, Finite and Non-Finite. Each dimension has a range of corresponding values. A given language can chose from the range. The dimension of Person has the values 1, 2 and 3 (for the languages under study). The dimension of Number has the values Singular (Sg) and Plural (Pl). Gender has the values M(asculine), F(emine), N(euter), or a combination of these three. The range of values available to the dimension of Case is Nom(inative), Acc(usative), Dat(ive) and Gen(itive). The dimension Finite has the values Present (Prs) and Past (Pst). And Non-Finite has the values Part(icle) and Inf(initive). A paradigm for a given syntactic category combines these dimensions. For example, pronouns display a Person-Number paradigm. I illustrate this for English in the table below.
Table 29: English Pronoun Paradigm

<table>
<thead>
<tr>
<th></th>
<th>Sg</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I</td>
<td>we</td>
</tr>
<tr>
<td>2</td>
<td>you</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>s/he</td>
<td>they</td>
</tr>
</tbody>
</table>

For English pronouns, 1Sg, 1Pl, 3Sg and 3Pl each has its own cell. Second Person has but a single cell containing *you* for both plural and singular.

Which dimensions combine for which categories is determined on a language-by-language basis. For example, for the 5 languages under study, the dimension Person and Finite interact, but Person and Non-Finite do not. We find verbal agreement in tensed verbs, but not in untensed verbs. In contrast, Portuguese displays agreement in infinitival verbs, revealing that the dimensions Person and Non-Finite can interact.

There are two important characteristics of substitution to consider. First, substitutions are not cross-categorial. Second, substitutions are subject to the Single Feature Constraint. If the Lexicon is organized in paradigms, these characteristics of substitution are accounted for.

5.2.4.2 Deriving Substitutions

I now trace the process of substitution from beginning to end. I argued that substitutions result from impairment to the process of Phonological Matrix Insertion within a Split Lexical Insertion model. The derivation I present below thus assumes such a model (as described in the section 5.2.2.2). Consider the sentences in (35). The sentence in (35a) contains a substitution, the copula. The sentence in (35b) does not.
(35) Sentences for substitution derivation

a. your ears *is* larger
b. your ears are larger

Both sentences require the following LIs.

(36) LIs for the Items that Project the Sentences in (35)

<table>
<thead>
<tr>
<th>YOUR:</th>
<th>[jor]</th>
<th>[2nd Person] D</th>
<th>Possession</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>[Ø Number]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Gender]</td>
<td></td>
</tr>
<tr>
<td>EARS:</td>
<td>[ir]</td>
<td>[Plural] N</td>
<td>Auditory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Case]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[3rd Person]</td>
<td></td>
</tr>
<tr>
<td>IS:</td>
<td>[iz]</td>
<td>[3rd Person] V</td>
<td>Existence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Singular]</td>
<td>+Finite</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Gender]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Present]</td>
<td></td>
</tr>
<tr>
<td>ARE:</td>
<td>[ar]</td>
<td>[3rd Person] V</td>
<td>Existence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Plural]</td>
<td>+Finite</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Gender]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Present]</td>
<td></td>
</tr>
<tr>
<td>TENSE:</td>
<td>[Ø]</td>
<td>[Ø Person] T</td>
<td>+Finite</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Assign Nom]</td>
<td>[Present]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Number]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Gender]</td>
<td></td>
</tr>
<tr>
<td>LARGER:</td>
<td>[larjør]</td>
<td>[Ø Person] A</td>
<td>Size</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Number]</td>
<td>Big</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Gender]</td>
<td>Comparative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Ø Case]</td>
<td></td>
</tr>
</tbody>
</table>

The derivation of the sentences in (35) begins with the mechanisms within the Lexicon. In the Lexicon, the inherent specifications of the LIs include the semantic features and the intrinsic F-features. The Base feature bundle for each of the LIs in (36) are displayed below. The left-hand set of features are the intrinsic F-features, and the right-hand set are (an approximation of) the semantic features.
(37) Base Feature Bundle for Lexical Items in (36)

Still within the Lexicon, the process of Optional Feature Insertion adds to this Base the optional F-features. The resulting tripartite feature bundles for all the relevant LIs are presented below.
(38) Tripartite Feature Bundle for Lexical Items in (36)

YOUR

- 2nd Person
- D
- Possession
- Definite referent

EARS

- Plural
- 3rd Person
- N
- Auditory
- Body part

IS

- 3rd Person
- Singular
- Present
- V
- Existence
- +Finite

ARE

- 3rd Person
- Plural
- Present
- V
- Existence
- +Finite

TENSE

- Referential
- Assign Nom

LARGER

- A
- Size
- Big
- Comparative
As with the omission derivation in the previous section, the process of Initial Insertion inserts this tripartite feature bundle into the syntactic component. The categorial features project their X-bar structure. The resulting structure is the following. The only verbal functional categories I include is TP. The structure may be expanded to include AgrSP, AgrOP, CP, etc.

(39) Projected Syntactic Structure for Sentences in (35)

```
TP
   └── T'
       └── T [Present]
           └── VP
               └── V'
                   └── V 'BE'
                       └── AP
                           └── A'
                               └── A
                                   └── LARGER
                           └── DP
                               └── D'
                                   └── D
                                       └── YOUR
                                           └── N'
                                               └── N
                                                   └── EARS
```

Within the syntactic component movement takes place to check (optional) features and for Case assignment. The subject DP YOUR EARS raises to [Spec TP] in order to be assigned nominative Case (from T). The copula raises to pick up the T affix and to check its (strong) features. This derivation is schematized in the tree below.

(40) Derived Structure for the Sentences in (35)

```
TP
   └── T'
       └── VP
           └── V'
               └── V 'BE'
                   └── AP
                           └── A'
                               └── A
                                   └── LARGER
                           └── DP
                               └── t_v
                                   └── [V+T]
                                       └── YOUR EARS
                                           └── t_dp
```

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The words in upper case indicate the tripartite feature bundles schematized in (38). What is missing are the phonological matrices. To retrieve the appropriate phonological matrix for each LI, the Feature Matching mechanism picks and scans the relevant paradigm and pairs the tripartite feature bundle with the appropriate phonological matrix. If the derivation is free of omission, as in (35b), Phonological Matrix Insertion copies and inserts the appropriate phonological matrix into the tripartite feature bundle. Lexical Retrieval then inserts the complete feature bundles into the Syntax interface with PF/LF. The resulting structure is schematized below.

(41) Structure with Phonological Matrices for Sentence (35b)

If however substitution is in evidence, as in (35a), the process of Phonological Matrix Insertion copies and inserts the wrong phonological matrix into the tripartite feature bundle. Consider the paradigm in question.

Table 30: English Present Tense Copula Paradigm

<table>
<thead>
<tr>
<th></th>
<th>Sg</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>am</td>
<td>are</td>
</tr>
<tr>
<td>2</td>
<td>are</td>
<td>are</td>
</tr>
<tr>
<td>3</td>
<td>is</td>
<td>are</td>
</tr>
</tbody>
</table>

237
The target is *are*. Phonological Matrix Insertion copies the phonological matrix from the wrong cell. PMI can copy either *am* or *is*. In this example, *is* is copied and inserted into the tripartite feature bundle. Lexical Retrieval then inserts the complete feature bundles into the Syntax interface with the phonological component. The result is a substitution error, as schematized below.

(42) Structure with Phonological Matrices for Sentence (35a)

Substitutions display the following two characteristics. Substitutions shift by a single feature, and they do not cross categories. The process of Feature Matching is not impaired for substitution. This process picks the appropriate paradigm, which ensures that the category that is produced is the same as that of the target, in fact within the same paradigm as the target. Feature Matching also scans the paradigms for the target. This means that the copying and insertion mechanism that is impaired (Phonological Matrix Insertion) is located at the target. PMI is impaired so copies and inserts the wrong phonological matrix. However, since it is located at the target, the cell it copies is a neighbor to the target. Since the phonological matrices are organized in paradigms, the neighboring cells differ by a single feature. The result is a single feature shift.
5.3 THE RELATIONSHIP BETWEEN OMISSION AND SUBSTITUTION

Agrammatic production includes both omission and substitution errors. Are these two types of errors distinct? Or do they result from the same deficit? There are three reasons to conclude that omission and substitution are distinct. First, there are the obvious production characteristics: omission involves the lack of a word, whereas substitution involves the presence of the wrong form of a word. Second, omission rates (tend to) reflect the level of severity of the agrammatic deficit. Substitution rates do not. Third, omission rates follow a set hierarchy: nouns are best retained, then verbs, then determiners, with auxiliaries and modals trailing last. No such hierarchy is present in substitution rates.

5.3.1 Substitution Rates Do Not Reflect Severity of Deficit

The first observation is that substitution rates, unlike omission rates, do not remotely reflect the level of agrammatic severity. The following table compares average substitution rate and average omission rate.
Recall that higher omission rates (tend to) match a more severe level of impairment. The substitution rates do not match this trend. First, substitution rates are for the most part considerably lower than omission rates. Second, there is not as much of a difference between the two agrammatic speakers for each language. Third, any difference between speaker does not necessarily match the direction of the severity.

### 5.3.2 There Is No Hierarchy of Substitution

Omission rates pattern into a general retention hierarchy. I repeat the hierarchy below.

<table>
<thead>
<tr>
<th></th>
<th>Substitution</th>
<th>Omission</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF</td>
<td>6.3%</td>
<td>6.8%</td>
</tr>
<tr>
<td>EE</td>
<td>6.1%</td>
<td>40.1%</td>
</tr>
<tr>
<td>DB</td>
<td>0.9%</td>
<td>47.0%</td>
</tr>
<tr>
<td>DH</td>
<td>1.1%</td>
<td>38.8%</td>
</tr>
<tr>
<td>GB</td>
<td>6.1%</td>
<td>9.3%</td>
</tr>
<tr>
<td>GM</td>
<td>6.4%</td>
<td>17.0%</td>
</tr>
<tr>
<td>FC</td>
<td>5.1%</td>
<td>19.1%</td>
</tr>
<tr>
<td>FA</td>
<td>2.4%</td>
<td>4.1%</td>
</tr>
<tr>
<td>IR</td>
<td>3.6%</td>
<td>23.7%</td>
</tr>
<tr>
<td>IV</td>
<td>6.4%</td>
<td>9.4%</td>
</tr>
</tbody>
</table>
(43) Retention Hierarchy

\[ N > V > D > \text{Aux/Modal} \]

Substitution rates do not display this pattern. In fact, they do not readily display any pattern.

Table 32: English Agrammatic Substitution Rates

<table>
<thead>
<tr>
<th></th>
<th>EF</th>
<th></th>
<th></th>
<th></th>
<th>EE</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1</td>
<td>92</td>
<td>1.1%</td>
<td>4</td>
<td>139</td>
<td>2.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>11</td>
<td>69</td>
<td>15.9%</td>
<td>10</td>
<td>51</td>
<td>19.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>99</td>
<td>1.0%</td>
<td>2</td>
<td>105</td>
<td>1.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aux/Modal</td>
<td>4</td>
<td>55</td>
<td>7.3%</td>
<td>0</td>
<td>23</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average substitution rate</td>
<td>6.3%</td>
<td></td>
<td></td>
<td></td>
<td>6.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Severity of deficit</td>
<td>deficit EF &lt; deficit EE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The substitution hierarchy for EF, from fewest to most substitutions is as follows: \( D > N \) > Aux/Modal > V. The hierarchy for EE follows a different pattern: Aux/Modal > D > N > V.

The substitution rates for DB and DH are presented in Table 33. The substitution rates for GB and GM are presented in Table 34. The hierarchy for DB is the following: \( N > \text{Aux/Modal} > D > V \). The hierarchy for DH follows a different pattern: Aux/Modal > N > D > V. The hierarchy for GB is the following: N, Aux/Modal > V > D. This contrasts with the hierarchy for GM: N > V > Aux/Modal > D.
Table 33: Dutch Agrammatic Substitution Rates

<table>
<thead>
<tr>
<th></th>
<th>DB</th>
<th></th>
<th></th>
<th>DH</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
</tr>
<tr>
<td>N</td>
<td>0</td>
<td>104</td>
<td>0%</td>
<td>1</td>
<td>148</td>
<td>0.7%</td>
</tr>
<tr>
<td>V</td>
<td>2</td>
<td>91</td>
<td>2.2%</td>
<td>2</td>
<td>81</td>
<td>2.5%</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>162</td>
<td>0.6%</td>
<td>2</td>
<td>154</td>
<td>1.3%</td>
</tr>
<tr>
<td>Aux/Modal</td>
<td>1</td>
<td>76</td>
<td>0.6%</td>
<td>0</td>
<td>66</td>
<td>0%</td>
</tr>
<tr>
<td>Average substitution rate</td>
<td></td>
<td></td>
<td>0.9%</td>
<td></td>
<td></td>
<td>1.1%</td>
</tr>
<tr>
<td>Severity of deficit</td>
<td></td>
<td></td>
<td>deficit DB &lt; deficit DH</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 34: German Agrammatic Substitution Rates

<table>
<thead>
<tr>
<th></th>
<th>GB</th>
<th></th>
<th></th>
<th>GM</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
</tr>
<tr>
<td>N</td>
<td>8</td>
<td>170</td>
<td>4.7%</td>
<td>1</td>
<td>138</td>
<td>0%</td>
</tr>
<tr>
<td>V</td>
<td>7</td>
<td>103</td>
<td>6.8%</td>
<td>4</td>
<td>97</td>
<td>4.1%</td>
</tr>
<tr>
<td>D</td>
<td>17</td>
<td>211</td>
<td>8.1%</td>
<td>31</td>
<td>194</td>
<td>16.0%</td>
</tr>
<tr>
<td>Aux/Modal</td>
<td>2</td>
<td>43</td>
<td>4.7%</td>
<td>2</td>
<td>38</td>
<td>5.3%</td>
</tr>
<tr>
<td>Average substitution rate</td>
<td></td>
<td></td>
<td>6.1%</td>
<td></td>
<td></td>
<td>6.4%</td>
</tr>
<tr>
<td>Severity of deficit</td>
<td></td>
<td></td>
<td>deficit GB &gt; deficit GM</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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The substitution rates for FC and FA are in Table 35, for IR and IV in Table 36.

### Table 35: French Agrammatic Substitution Rates

<table>
<thead>
<tr>
<th></th>
<th>FC</th>
<th></th>
<th>FA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
<td>Tokens</td>
</tr>
<tr>
<td>N</td>
<td>0</td>
<td>196</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>V</td>
<td>2</td>
<td>131</td>
<td>1.5%</td>
<td>0</td>
</tr>
<tr>
<td>D</td>
<td>18</td>
<td>284</td>
<td>6.3%</td>
<td>3</td>
</tr>
<tr>
<td>Aux/Modal</td>
<td>4</td>
<td>32</td>
<td>12.5%</td>
<td>5</td>
</tr>
<tr>
<td>Average substitution rate</td>
<td>5.1%</td>
<td>2.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity of deficit</td>
<td>deficit FC &gt; deficit FA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 36: Italian Agrammatic Substitution Rates

<table>
<thead>
<tr>
<th></th>
<th>IR</th>
<th></th>
<th>IV</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tokens</td>
<td>Context</td>
<td>%</td>
<td>Tokens</td>
</tr>
<tr>
<td>N</td>
<td>2</td>
<td>93</td>
<td>2.2%</td>
<td>2</td>
</tr>
<tr>
<td>V</td>
<td>7</td>
<td>101</td>
<td>6.9%</td>
<td>13</td>
</tr>
<tr>
<td>D</td>
<td>3</td>
<td>175</td>
<td>1.7%</td>
<td>8</td>
</tr>
<tr>
<td>Aux/Modal</td>
<td>2</td>
<td>59</td>
<td>3.4%</td>
<td>1</td>
</tr>
<tr>
<td>Average substitution rate</td>
<td>3.6%</td>
<td>6.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity of deficit</td>
<td>deficit IR &gt; deficit IV</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The hierarchy of substitution for FC is $N > V > D > Aux/Modal$. The hierarchy for FA is different. Here we find the following: $N, V > D > Aux/Modal$. The hierarchy for IR is $D > N > Aux/Modal > V$. The hierarchy for IV is $N > Aux/Modal > D > V$.

The various substitution hierarchies are grouped together, below.

(44) The Array of Substitution Hierarchies

- a. $D > N > Aux/Modal > V$
- b. $Aux/Modal > D > N > V$
- c. $N > Aux/Modal > D > V$
- d. $Aux/Modal > N > D > V$
- e. $N = Aux/Modal > V > D$
- f. $N > V > Aux/Modal > D$
- g. $N > V > D > Aux/Modal$
- h. $N = V > D > Aux/Modal$
- i. $D > N > Aux/Modal > V$
- j. $N > Aux/Modal > D > V$

Two trends do emerge when we compare the various substitution hierarchies. Nouns tend to be the least affected by substitution errors. Moreover, nouns always show fewer substitutions than verbs (with FA showing the same rate for the two). This parallels the omission pattern. Substitutions and omissions share two patterns. First, they both display the noun-verb distinction: nouns show fewer substitution errors than verbs. Second, of all the categories, nouns (tend to) display the fewest substitution errors. This is true of omissions as well. However, this is where similarities end. Whereas omissions (tend to) reflect severity of deficit, this is not the case with respect to substitutions. Substitution rates tend to be the same across speakers of a single language. Moreover, if there is a difference between the speakers, the higher substitution rate is not necessarily associated with the higher deficit.

5.4 CONSTRAINTS ON A MODEL OF LANGUAGE PRODUCTION

I discussed the linguistic level of the agrammatic deficit. I argued that the locus of agrammatic omission is Lexical Retrieval, the mechanism which inserts the complete feature...
bundle (including the phonological matrix) into the syntactic interface with PF/LF (i.e. before the entire string enters the phonological component). Further, I argued that the locus of substitution is Phonological Matrix Insertion, the process that copies the targeted phonological matrix and inserts it into the feature bundle. I now address the interaction between the principles of UG and processing mechanisms. First, I define competence and performance, equating competence with UG and performance with processing mechanisms. I then discuss the constraints that are placed on a model of language production.

5.4.1 Competence and Performance

The language faculty enables the use and understanding of language. It is made up of two parts: competence and performance. Competence consists of a generative system that creates a sequence of linguistic representations. Performance consists of a performance system that enables the linguistic representations “to be used for articulating, interpreting, referring, inquiring, reflecting, and other actions” (Chomsky, 1995:168). The performance system in effect translates the “instructions” encoded in the linguistic representations into a form that can be communicated to an independent motor coding system. Briefly, the motor coding system includes the sequence of neural, muscular and articulatory commands which ultimately produce the utterance. The interaction of the three systems is schematized in the following diagram.

Figure 10: Interaction of Competence-Performance-Motor Systems

| KNOWLEDGE SYSTEM | → | PERFORMANCE SYSTEM | → | MOTOR CODING SYSTEM |

I address each of these three systems in turn, beginning with the last in the sequence. Although the motor coding system is of primary importance to the production of speech, it concerns us here only in as much as it interfaces with the performance system. That having been
said, I will very briefly outline the structure of the motor coding system and then set the issue side. The motor coding system is made up of three different components: neuromotor, myomotor, and articulatory (Borden, Harris & Raphael, 1994). The neuromotor component controls the neurological stimulation of the relevant muscles (i.e. the rules that govern neural impulses). The myomotor component controls the contraction of the muscles that have been stimulated (i.e. the rules that govern muscle-cell behavior). The articulatory component controls articulatory positions within the vocal tract (i.e. the rules that govern which physiological arrangements within the vocal tract produce which sounds). The final output of this system is the physiological production of sound. The system is schematized below.

Figure 11: Internal Structure of the Motor Coding System

I have distinguished Motor coding from competence and performance. I now address the distinction between these two. From Broca to Chomsky (and many others between and since),

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22 This sequence of neuromotor, myomotor, and articulatory is well accepted. The modules within the motor coding system are interconnected by feedback loops. Further details can be
the linguistic system has been divided into two components. Broca’s division consists of the language faculty and the faculty of spoken language. This division is illustrated in the following excerpt from a translation of his 1861 paper in *Bulletin de la Société Anatomique*.

In some cases the general language faculty remains unaltered; the auditory apparatus is intact; all muscles, including those of the voice and articulation, function properly, and nevertheless a cerebral lesion destroys spoken language. [...] Those who first studied these strange facts may have believed, for lack of sufficient analysis, that in such a case the language faculty is damaged; but it evidently is completely intact, because the patients understand spoken and written language perfectly well; [...] because those who are educated, and who can use their hands freely, write their ideas down clearly. So they know the meaning and value of words, in aural as well as graphic form. The language that they spoke before is still familiar to them, but they no longer are able to execute the series of systematic and coordinated movements that correspond to the syllable that they are looking for. What has vanished is not the language faculty, nor word memory, neither is it the action of the nerves or muscles of phonation and articulation; it is something else, a particular faculty, [...] the faculty of spoken language, because without it, speech is not possible.

Eling, 1994: 43-44, translation of Broca 1861

Weigl & Bierwisch define a split between “the tacit knowledge of a given language” (1970:4) and access to that knowledge. Chomsky (1993, 1995) offers a separation between a generative system and a performance system. In all three cases, the distinction lies between a system that involves knowledge of the language and a system that enables the use of that underlying knowledge. The underlying knowledge of language, I label competence. The system that enables the use of the underlying knowledge, I label performance. Competence is a generative system that creates a sequence of phonological, morphological, syntactic, and semantic representations. In other words, grammatical competence is organized by principles of UG. The model as argued for above is schematized below.
And what of performance? Performance is the system that translates these linguistic representations into a form that can be interpreted by the motor production system. What then is the relationship between performance and processing? Is the performance system a link between competence and language processing, or is it itself the language processing system? If we assume that the performance system simply translates between competence and processing then we must posit an additional level, namely the processing system. Assuming that the performance system is itself the processing system requires no such addition. Since the burden of proof lies on the more complex hypothesis, I favor the latter: the performance system is the processing system. Thus competence interfaces with the processing mechanism. The nature of the processing system is addressed below.

5.4.2 A Processing Account of Agrammatic Production

The term "processing" refers to the performance mechanisms that enable the production and comprehension of language. I focus on the mechanisms involved in language production. I begin with a brief overview of processing accounts of agrammatism and then discuss the set of characteristics required for a model of language production.

Language production, whether normal or disturbed, involves processing mechanisms. Many aphasiologists have chosen to explain the agrammatic deficit as a disruption to the processing system. They follow one of two approaches: holistic or specialized. The holistic
approach states that the agrammatic processing system as a whole is disturbed, functioning at a slower pace (Schvaneveldt et al., 1976; Hagoort et al., 1989; Swinney, Zurif & Nicol, 1989; Friederici & Saddy, 1991; Haarman & Kolk, 1994). The specialized approach proposes that agrammatic processing of a particular item, F-categories for instance, is disrupted (Bradley et al., 1980; Lapointe, 1985; Friederici & Saddy, 1991; Friederici et al., 1992; Pulvermüller, 1995a, 1995b).

I consider the specialized approach first. This approach states that agrammatics have difficulties processing F-categories. While this is true, this approach says nothing as to why this should be the case. As well, this approach does not account for the differing omission rates within F-categories23, namely that some F-categories have higher omission rates than others. Nor does it account for difficulties with verbal as opposed to nominal categories. Since this specialized approach addresses but a single characteristic of agrammatism, it cannot account for anything other than that one item. I therefore reject this approach as too narrow.

I now turn to the holistic approach. If the processing system operates at a slower pace, it is argued, agrammatics are predicted to favor utterances that involve less processing time. More complex utterances are assumed to require more processing time. Thus, more complex utterances are less likely to be produced. This explains the lack of embedded clauses and the labored speech. If we assume that verbs have a more complex internal structure than nouns, and thus require more processing time, a slower processing system explains why agrammatics have more difficulties with verbs than with nouns. If we assume that F-categories are more complex than L-categories, and thus require more processing time, a slower processing system explains why agrammatics have more difficulties with functional categories than with lexical categories. If categories that encode more agreement, Case and tense features are assumed to be more complex.

23 A notable exception to this is Levelt (1990), who states that some F-categories are partially determined by their relationship with lexical category whereas others are ‘conceptually’ determined. For example, gender on a determiner is determined by gender of the noun with which the determiner is associated, whereas negation is accessed differently. Levelt’s approach makes different delineations between the functional categories, predicting that the difficulty of a given category could vary from language to language depending on how its specification is determined.
than categories that encode fewer of these optional F-features, and thus require more processing
time, a slower processing system explains why categories with more agreement and Case features
create more difficulties than categories with fewer agreement and Case features\textsuperscript{24}. While these
predictions are certainly borne out, the holistic approach requires exactly the set of assumptions
that match the observed behavior\textsuperscript{25}. In other words, this approach assumes the facts it is
supposed to explain. The argument behind the holistic approach is circular. Moreover, the
holistic approach cannot account for the contrast between omission and substitution. That is to
say, the holistic approach cannot predict when substitution as opposed to omission takes place. I
therefore reject the holistic approach.

While processing is undoubtedly involved in language production and hence in
agrammatic production, neither the holistic nor the specialized approach satisfactorily accounts for
the agrammatic deficit. Agrammatic production displays a number of characteristics (these have
been discussed in the various preceding sections/chapters). These production characteristics must
be captured by any processing account.

There is a long-standing tradition of using production errors to understand the
mechanisms governing speech processing (Lashley, 1951; Hockett, 1967; Fromkin, 1968, 1971;
MacKay, 1969, 1970a; Nooteboom, 1969; Garrett, 1975, 1984; Shattuck-Hufnagel, 1979,
1985)\textsuperscript{26}. The analysis of these errors enables the construction of language production models,
which in turn can be tested by new disorder data.

\textsuperscript{24} Friederici & Saddy (1991) do state that the type of information encoded influences how a
specific category is accessed (direct versus indirect). In reference to English and German
auxiliaries, they observe that “[c]losed class elements encoding mood may be accessed more
directly than those encoding tense” (p.19). However, they do not propose how this information
is encoded, nor where in the processing system this may take place.

\textsuperscript{25} There is much debate about the role of processing in agrammatism. See the following authors
for arguments against a (holistic) processing account of the agrammatic deficit: Ahlsen, 1994; De
Bleser & Luzzatti, 1994; Ostrin & Tyler, 1993; Friederici & Saddy, 1991; Shapiro & Levine,

\textsuperscript{26} I have lumped together errors from both pathological and non-pathological speakers.
Stemberger (1984a, 1985) argues that agrammatic production is an aggravated version of the
errors that normals produce and that agrammatic errors and errors in non-disturbed speakers are
qualitatively similar, occurring in the same system and being governed by the same constraints.
Needless to say, all the characteristics of agrammatism are rarely found in normal slips of the
tongue. The implication, however, is that normals ought to display these characteristics at some
All production models agree that a semantic component, connected to the cognitive structures, drives the derivation of an utterance, and that syntax, phonology and the lexicon must be integrated into the processing system. However, production models differ on various issues. First they differ in whether they include linguistic levels (Garrett, 1975, 1976, 1980a) or linguistic principles (Fay, 1980ab; Pritchett, 1992). Garrett (1975, 1980a) maintains that only linguistic levels should be matched in production models. Pritchett, on the other hand, argues that “rather deep and abstract grammatical principles strongly influence surface processing performance, revealing an intimate grammar-parser relationship. Specifically, the core of parsing is in essence simply the local application of global grammatical principles” (1992:4).

Second, production models differ in what units are represented and manipulated. It has been argued that language production manipulates the same units that are part of UG. Language production requires “a hierarchy of different-sized units” (Fromkin, 1971:38). Among these we find semantic features, words, syllables (Fromkin, 1968; MacKay, 1969, 1970a; Nooteboom, 1969), segments as well as distinctive features (Hockett, 1967; Green, 1969; Fromkin, 1971). Moreover, production errors are constrained by the grammar. For example, phonological errors obey the phonological rules of the language (Fromkin, 1968, 1971). Language-specific constraints also govern agrammatic errors. Further, I have argued in the preceding chapters that the UG principles governing syntactic representations are not violated in agrammatic production. As such, we expect to find a fairly strong parallel between the principles of UG and the mechanisms governing language production. Such a parallel argues for a production model that reflects these principles.

Regardless, any model of language production must incorporate the characteristics listed below.

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27 For detailed discussion of language-specific errors see the following: Peuser & Fittschen, 1977; Grodzinsky, 1984ab; Caplan, 1987; Slobin & Talay, 1988; Tzeng & Chen, 1988; Chen, 1989, 1993; Wulfeck et al., 1989; Hagiwara & Caplan, 1990; Kehayia et al., 1990; Lorch, 1990;
(45) Characteristics Required of a Language Production Model

   a. Distinction between lexical and functional categories
   b. Distinction between items within functional categories
   c. Distinction between nouns and verbs
   d. Sensitivity to intrinsic and optional Formal features
   e. Sensitivity to paradigm structure
   f. Sensitivity to the Principle of Robustness

   A production model must distinguish between L-categories and F-categories, between the various F-categories, and between the various L-categories. In other words, a production models must be able to identify each syntactic category. It must therefore be sensitive to intrinsic F-features, namely the categorial features (which determine syntactic category). A production model must also be sensitive to optional F-features, like agreement, Case and tense. Further, it must match the workings of a paradigm structure. Lastly, the featural specifications within a production model must be the reverse of the conventional approach to the markedness distinction (cf. the more features are specified, the better retained the item is).

5.5 CONCLUSION

   Where in the grammar is the locus of the deficit? What mechanisms are affected in agrammatic production? In this chapter I argued that omission and substitution result from different impaired mechanisms. Omissions result from impairment to Lexical Retrieval, the process that introduces the completed feature bundle into the Syntax-Phonology interface. Substitutions, on the other hand, result from impairment to the process of Phonological Matrix Insertion, the mechanism that copies the targeted phonological matrix and inserts it into the feature bundle that is subsequently inserted into the Syntax-Phonology interface.

   In chapter 3 I concluded that two distinctions are relevant to agrammatism: the lexical-functional and nominal-verbal distinctions, where lexical categories are produced more frequently than F-categories, and N-categories are produced more frequently than verbal categories. In this

Kehayia & Jarema, 1991; MacWhinney & Osmán-Sági, 1991; MacWhinney et al., 1991; Safi-
chapter I provided a unified account of the two distinctions. I adopted the independently motivated theoretical construct of categorial features, whereby syntactic categories are projections of features (Chomsky, 1970). Specifically, I adopted Déchaïne's (1993) feature system, which captures the relevant distinctions using the privative features [Nominal], [Functional], and [Referential]. I argued that [Lexical] had to replace [Functional] if the feature system were to account for the agrammatic data. With this final model, I provided an account of agrammatism in which agrammatics better retain categories that have more feature specifications. This account predicted the following Hierarchy of Retrieval: N > V, A, D > P, T, K > C, where “>” means “better retained or more often produced than”. This hierarchy matched the previously observed Hierarchy of Retention (N > V > D > Aux/Modal).

Although any syntactic category can be omitted, I showed that a Retention Hierarchy existed. I proposed that this omission hierarchy is determined by syntactic features, in particular the intrinsic F-features (categorial features, for the most part). The process of Lexical Retrieval is then subject to the Principle of Robustness in that it can better manipulate syntactic categories that are more robust, where robust means specified for more syntactic features. The net result of the interaction between Lexical Retrieval and the Principle of Robustness is that, contrary to the conventional approach to markedness, the more features a syntactic category is specified for, the more likely it is retrieved.

In chapter 4 I showed that substitutions are not cross-categorial. Moreover, I argued that substitutions are subject to the Single Feature Constraint. I proposed that Lexical Items within the Lexicon are arranged in paradigms. When substitution takes place, the Feature Matching mechanism is unimpaired. Feature Matching picks the relevant paradigm, scans it and matches the phonological matrix to the feature bundle. Thus, the correct category is picked and the target is located. Thus the impaired process of Phonological Matrix Insertion copies the phonological matrix of a cell neighboring that of the target. The result is a single feature shift.

I concluded the chapter by addressing the characteristics required of a (processing) model of language production. While processing is undoubtedly involved in any language deficit, a thorough and appropriate account of agrammatism requires reference to linguistic representations.
Chapter 6
CONCLUDING REMARKS

This thesis investigates the omission and substitution errors that are characteristic of agrammatic production. It serves as a bridge between theoretical linguistics and the clinical disciplines. On the one hand, I use grammatical theory to account for agrammatic omissions and substitutions. On the other, I use agrammatic production as a data base with which to test and constrain grammatical theory. Moreover, this thesis functions as a spring board for a discussion about grammar in the brain. These concluding remarks begin the discussion by addressing the issue of competence and performance. I then summarize the work presented in the preceding chapters. I end this chapter with suggestions for further research.

6.1 THE COMPETENCE-PERFORMANCE DEBATE

Human linguistic abilities have been characterized as involving an idealized distinction between competence and performance. This idealization places linguistics knowledge within competence and use of that knowledge within performance. One of the debates surrounding agrammatism lies in whether the lesion to the brain has destroyed underlying linguistic knowledge or whether it has disrupted the use of that knowledge (Wulfeck et al., 1991; Nespoulous et al., 1988). In other words is it competence or performance that is affected? As discussed in the previous chapter, the relationship between competence and performance, or between the principles of Universal Grammar and the processing mechanisms is quite intimate, and can be easily confused. This makes such a debate rather difficult.

Competence underlies all linguistic modalities (oral and written production, oral and written comprehension). If a specific component within competence is disturbed, and assuming that competence is uniquely encoded (i.e. not redundantly encoded), then this component is disrupted for all modalities. The prediction is that, for any given agrammatic, all linguist
modalities suffer the same (type of) impairment. Zurif et al. (1972) and Zurif et al. (1976) argue that agrammatism indeed involves all language modalities. The argument extends to the actual locus of the deficit being linguistic competence rather than performance.

If we take competence to be the generative system, then permanent loss of a specific component within competence requires that this component be disrupted at all times. The prediction is that any individual agrammatic always suffers from the same level of disturbance. In other words, for any given task, an agrammatic performs equally well/poorly at all times. This is not the case. In section 2.2.1 I showed that there is much variability in the comprehension and production of a single agrammatic. Given intra-agrammatic variability, the arguments goes, it cannot be competence that is disrupted. Performance must be affected.

There are two issues that confuse this debate. The first is what we define competence and performance to be. If competence consists of the Lexicon, Syntax, Phonology and Semantics, but excludes the mechanisms underlying Lexical Insertion, then the agrammatic deficit does indeed lie outside competence. However, if competence includes the mechanisms underlying Lexical Insertion, the agrammatic deficit remains a competence-based deficit.

The second issue consists of the nature of a deficit. The fundamental assumption that has been made is that if there is damage to competence, whatever ‘knowledge’ is affected is in fact gone, no longer accessible in any way or by any modality. This is in contrast to performance, which allows for ‘noisy’ access to its processing modules. This distinction is certainly a possibility, but is not a necessity. Is it not possible that damage to competence match damage to performance? If some process within competence is damaged, the nature of the disturbance may be that of a bottle neck, rather than a cave-in. In other words, the process within competence may also be ‘noisy’ rather than obliterated. This being the case, there is no reason to assume that the agrammatic deficit lies within performance. I conclude that the competence-performance distinction adds nothing to the account of agrammatism.
SUMMARY OF THE THESIS

Agrammatism is one of many language disorders resulting from damage to the brain. Despite some debate, the consensus is that agrammatism is a cohesive syndrome. In this thesis I investigate the production deficit of agrammatics, specifically the omission and substitution errors that characterize agrammatic speech. I argue that omissions and substitutions result from impairments to different mechanisms within the grammar. Moreover, I conclude that the agrammatic deficit lies outside the phonological, syntactic and semantic components. Instead, omissions and substitutions result from an impairment to the mechanisms that interface between the Lexicon, the Syntax and the Phonology.

My analysis centers on the structures that underlie the agrammatic utterance, concluding that the structures themselves are the same as those produced by normal speakers. Agrammatic speakers produce utterances that are free of omission and substitution errors and that are otherwise identical to those produced by normal speakers. Further, agrammatic utterances that have omissions display, for the words that are produced, the appropriate word order. This includes structures like adverbs, negation, and for German and Dutch, verb-second matrix clauses. These structures are derived by movement to functional projections. I argue that the most concise account of agrammatic production is one in which UG governs agrammatic speech.

I discuss three sets of projections: verbal functional projections, nominal functional projections and lexical projections, focusing on the first. Drawing from the acquisition literature, I argue that agrammatic (untensed) clauses include minimally two verbal functional projections (other than NegP). Moreover, I propose that the full array of functional projections is present in agrammatic speech. I thus argue against Rizzi’s (1994a,b) Truncation Hypothesis and Poeppel & Wexler’s (1993) Optional Tense Hypothesis, both of which maintain that functional projections are missing (in root infinitives). I extend this argument to nominal functional projections, like DP. Since utterances with missing determiners display possession as well as the novel/familiar...
distinction, some phonologically null determiner must be present. Thus nominal functional projections must be present in agrammatic speech.

Lastly, I argue that 'missing' nouns and verbs project phrasal structure in agrammatic speech. Lexical categories that are omitted still receive appropriate interpretations. Consequently missing verbs must assign theta-roles and Case, and missing arguments must receive theta-roles and Case. Lexical projections must therefore be present and active in the syntax of agrammatic speech.

Although any syntactic category may be omitted, not all categories are omitted with the same frequency. First, the more severe the deficit (as indicated by Mean Length of Utterance and Mean Rate of Production), the higher the omission rates. Second, lexical categories are better retained than functional categories. Third, nominal categories are better retained than verbal categories. Lastly, the relative rates of omission are constant across agrammatics and across languages. The Retention Hierarchy is as follows: N > V > D > Aux/Modal, where “>“ means “better retained than”.

Thus syntactic projections are unimpaired, and syntactic categories are subject to a Retention Hierarchy. Where do omissions come from? I argue that omissions result from an impaired Lexical Retrieval mechanism. The process of Lexical Retrieval inserts the complete feature bundle from the Lexicon into the Syntax-PF/LF interface. This is schematized below.

Figure 13: Model of (a Split Lexical Insertion) Grammar

Since Lexical Retrieval handles the entire feature bundle, it is sensitive to the intrinsic Formal features (categorial features) that make up syntactic categories. I propose the Principle of
Robustness whereby the more Formal features a category is specified for, the more Robust it is. The process of Lexical Retrieval is then subject to the Principle of Robustness in that it can better manipulate syntactic categories that are more Robust. The net result of the interaction between Lexical Retrieval and the Principle of Robustness is that, contrary to the conventional approach to markedness, the more features a syntactic category is specified for, the more likely it is retrieved. This, along with a modified version of Déchaine's (1993) system of categorial features, results in the following Retrieval Hierarchy: N > V, A, D > P, T, K > C. This matches the previously observed Retention Hierarchy, namely N > V > D > Aux/Modal (where Aux/Modal = Tense).

In addition to omissions, agrammatic speech includes substitutions. Although substitutions may be phonological, semantic or syntactic, in this thesis I concentrate on syntactic substitutions. Substitutions display two striking characteristics. First, substitutions are not cross-categorial. In other words, nouns substitute for nouns, verbs for verbs, and so on. Second, I observe that substitutions are subject to the Single Feature Constraint. Only one feature from agreement (person, number and gender), Case and tense is altered. I argue that substitutions result from an impaired Phonological Matrix Insertion mechanism. The process of Phonological Matrix Insertion copies the targeted phonological matrix and inserts it into the feature bundle that is subsequently inserted into the Syntax-PF/LF interface (by Lexical Retrieval).

Lexical Items within the Lexicon are arranged in paradigms. When substitution takes place, the Feature Matching mechanism is unimpaired. Feature Matching matches the tripartite feature bundle (with semantic, intrinsic and optional features) to the correct phonological matrix. Feature Matching picks the relevant paradigm, scans it and matches the phonological matrix to the feature bundle. Thus, the correct category is picked and the target is located. The impaired process of Phonological Matrix Insertion then copies the phonological matrix of a cell neighboring that of the target. The result is a single feature shift.

Language production is intimately related to processing mechanisms. While processing is undoubtedly involved in any language deficit, a thorough and appropriate account of agrammatism requires reference to linguistic representations. A production model must be able to
distinguish between each syntactic category. It must therefore be sensitive to intrinsic Formal features, namely the features which determine syntactic category. A production model must also be sensitive to optional Formal features, like agreement, Case and tense. Further, it must match the workings of a paradigm structure in order to derive the Single Feature Constraint on substitutions. Lastly, the featural specifications within a production model must be the reverse of the conventional approach to the markedness distinction: the more features a category is specified for, the better retrieved it is (though the more likely it is to undergo substitution).

6.3 FURTHER RESEARCH

In this thesis I concentrate on the nature and distribution of omissions and substitutions, and account for these two characteristics of agrammatic speech. My proposals and conclusions may now serve as springboards for further research. First, my analysis makes various predictions which require testing. Does the Retrieval Hierarchy work for all the syntactic categories? Does the Retrieval Hierarchy work for other language disorders? Is the Retrieval Hierarchy reflected in normal language acquisition? Is the Retrieval Hierarchy reflected in pathological language acquisition? Do normal language processes reflect aspects of the Retrieval Hierarchy?

Second, my analysis may lead to clinical applications. What are the clinical implications for a deficit that is located within the mechanisms that underlie Lexical Insertion? How can we mend an impaired Lexical Retrieval process? How can we heal an impaired Phonological Matrix Insertion mechanism? I have argued that the syntactic structures that underlie agrammatic clauses are complete. The implication is that agrammatics can perform all operations that involve movement. Is this true for more complex sentences? In other words, what do agrammatics do with questions, relative clauses, topicalization, and so on?

I look forward to the answers and hope that others will share in their pursuit.
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APPENDIX

(1) Agrammatic Clauses without Errors: Negation

a. I can’t speak

b. the woman is washing the dishes
   and didn’t pay attention for (to) the sink

c. ik weet niet meer
   I know:Prs-1Sg not more
   “I don’t know anymore”

d. nou ik weet niet hoor maar het is niet goed
   well I know:Prs-1Sg not you-know but is not right
   “well, I don’t know but it’s not right”

e. das weiss ich nicht
   that know:Prs I not
   “that I do not know”

f. je m’en rappelle plus
   I myself of-it remember:Prs no-more
   “I don’t remember anymore”

g. je pouvais plus me lever
   I could no-more myself get-up:Inf
   “I could no longer get up”

h. c’est pas difficile a faire ça
   it is not difficult to do that
   “that’s not difficult to do”

i. elle a pas oublie
   she has not forget:Part
   “she hasn’t forgotten”

j. non s’è accorta
   not self is aware
   “she doesn’t notice”

k. io non lo so
   I not it know:Prs-1Sg
   “I don’t understand”
(2) Agrammatic Clauses without Errors: Adverb

a. it’s just foolish  
   English

b. it’s really depressing  
   English

c. aber die Oma liegt noch immer im Bett  
   but the grandma lies still in+the bed  
   "but the grandma is still lying in bed"  
   Dutch

d. maar de man en een vrouw wandelen verder  
   but the man and a woman walk:Prs-3Pl further  
   "but the man and a woman walk further"  
   Dutch

e. es ist schon spät-  
   it is already late  
   "it is already late"  
   German

f. damit ich besser hören kann  
   so that I better hear:Inf can:Prs  
   "so I can hear better"  
   German

g. j’ai encore étouffé et tout  
   I have still suffocate:Part and all  
   "I suffocated still and all"  
   French

h. io parlo assai  
   I talk:Prs-1Sg much  
   "I talk a lot"  
   Italian

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(3) Agrammatic Clause Order: Subject Precedes Untensed Verb

a. the man [Aux] running on the street
   “the man is running on the street”

b. the wolf [Aux] hurrying [Conj] running
   “the wolf is hurrying and running”

c. the corn [Aux] growing
   “the corn is growing”

d. the farmer [Aux] watching
   “the farmer is watching”

e. [Adv] [Modal] [Poss] vrouw toevallig eventjes thuis-komen
   Dutch
   “then my wife accidentally came home for a while”

f. ik [Aux] nou 21 jaar gewerkt
   Dutch
   “I have worked for 21 years”

g. [Det] moeder [Modal] [Det] afwas doen
   Dutch
   “the mother is doing the dishes”

h. [Det] meisje [Modal] lachen
   Dutch
   “the girl had to laugh”

i. [Det] boer [Modal] zien of proeven
   Dutch
   “the farmer wants to see or taste it”

j. die Frau [Modal] in die Frau Doktor geverstündigt (verständigt)
   German
   “my wife notified the doctor”

k. je [Aux] perdu la parole
   French
   “I lost my ability to speak”

l. ma femme [Aux] appelé/er un ami et les pompiers
   French
   “my wife called a friend and the firemen”

m. après, j’ [Aux] attendu [Poss] sortie
   French
   “afterwards, I waited to be discharged”

n. il signore e la signora [Aux] meravigliati
   Italian
   “the gentleman and the lady are astonished”
o. la signora [Aux] scocciata
the lady [Aux] annoy:PastPart
“the lady is annoyed”
(4) Agrammatic Clause Order: Subject Precedes Tensed Verb/Auxiliary/Modal

a. it’s a [N]
   “it’s a stroke”

b. I can’t (couldn’t) [V]
   “I can’t/couldn’t speak”

c. [Det] wolf says: “[Det] better [to] smell [DP] [P]”
   “the wolf says: “The better to smell you with””

d. de kraan is over-gestroomd want [DP] [Cop] in [Det] plas
   “the tap has overflowed because she is in a puddle”

e. en [Det] krukje is bijna om-gevallen
   “and the stool has nearly fallen down”

f. [Det] horloge en andere spullen pakt hij ja
   “he takes a clock and other things”

g. bevor ich geheiratet habe
   “before I was married”

h. die Frau weckt [DP] wieder
   “the woman wakes him again”

i. und das Mädchen dankt[e] dachte der Wolf ist nicht gut
   “and the girl thought the wolf isn’t good”

j. etle loup bondit sur elle et il [Cl] mange
   “and the wolf jumped on her and ate her”

k. j’étais à (au) CHU
   “I was at the hospital”

l. c’a je [Cl-Refl] souviens [P] une chose, pas deux
   “I can only remember one thing”

m. je [Cl-Refl] rapelle les déplacements en ville au CHU
   “I remember the trips to town to the hospital”

n. un poliziotto [CL] aspetta
   “a policeman waits for him”
o. la mamma lava [Det] piatti, asciuga [Det] piatti
   the mother washes [Det] dishes, dries [Det] dishes
   "the mother washes the dishes, dries the dishes"

p. il ragazzo prende [Det] biscotti
   the boy gets [Det] cookies
   "the boy is getting some/the cookies"
(5) Agrammatic Clauses: Subject Precedes Adjective

a. I [Cop] flat on the (my) back
   "I was flat on my back"

b. [Det] chicken [Cop] gone
   "the chicken is gone"

   "her grandmother was sick at home in the forest"

d. [Det] kippebout [Cop] weg
   [Det] drumstick [Cop] gone
   "the drumstick is gone"

e. die Abgase [Cop] nicht desund
   the exhaust-fumes [Cop] not healthy
   "the exhaust fumes were not healthy"

f. weil die Grossmutter krank gewesen ist
   because the grandmother sick be:Part is:3Sg
   "because the grandmother was sick"

g. und das Mädchen dankte [Cop]
daachte der Wolf ist nicht gut
   and the girl thanks thought the wolf is not good
   "and the girl thought the wolf isn’t good"

h. le premier jour les (mes) souvenirs [Cop] flous
   the first day the (my) memories [Cop] vague
   "on the first day my memories were vague"

i. e la nonna e Cappuccetto Rosso [Cop] salve
   and the grandmother and LRRH [Cop] safe:F-Pl
   "and the grandmother and LRRH were safe"

j. la porta [Cop] chiusa
   the door [Cop] closed
   "the door was closed"
(6) Agrammatic Dutch and German: Non-subject in Initial Position

a. [Det] horloge en andere spullen pakt hij ja
   [Det] clock and other things take:3Sg he yes
   “he takes a clock and other things”

b. zaterdag[Modal] [DP] slecht praten
   Saturday badly talk:Inf
   “Saturday I could only talk badly”

c. [Det] kippebout [Aux] [Det] hond gepakt
   [Det] drumstick [Aux] [Det] dog take:Part
   “the dog takes the drumstick”

d. verdwenen [Cop] de kip
   disappeared [Cop] the chicken
   “the chicken has disappeared”

e. nou ja moeilijk [Modal] [Pleo] altijd blijven
   well yes difficult always remain:Inf
   “well yes, it will always remain difficult”

f. maar verder [DP] kom (komt) venself
   but further [DP] come:1Sg (come:3Sg) by-itself
   “but further such a thing comes by itself”

g. zondagochtend [Aux] [DP] gewerkt
   Sunday-morning [Aux] [DP] work:Part
   “Sunday morning I had worked”

h. [Det] man [Modal] [Det] wekker roepen
   [Det] man [Modal] [Det] alarm call:Inf
   “the alarm clock is calling/waking the man”

i. langzamerhand ja [V] [DP] de oude niet
   gradually yes [V] [DP] the old not
   maar [DP] [Modal] door-zetten en proberen
   but [DP] [Modal] persevere:Inf and try:Inf
   “I didn’t become my old self but I must persevere and try”

j. vergeleken [P] [Det] [N] geleden [Cop] [Pleo] vooruitgang
   compared [P] [Det] [N] ago [Cop] [Pleo] progress
   “compared with a year ago, there’s progress”

k. en iedere keer [Cop] [Pleo] verbeteringen
   and every time [Cop] [Pleo] improvements
   “and every time there are improvements”

l. im büro hat [DP] nicht gearbeit[et]
   in+the office have:Prs-3Sg [DP] not work:Part
   “in the office he didn’t work”
m. [P+Det] Abend bin ich schlafen gangen
   [P+Det] evening be:Pst-1Sg I sleep:Inf go:Inf
   "I went to sleep in the evening"

n. bei den Kindern (Kindern) bin ich zu Hause geblieben
   by the:Dat-Pl children:Nom/Acc (children:Dat) be:Pst1Sg I at home
   stay:Part
   "I stayed at home with the children"
(7) Agrammatic German: Embedded Clauses with Final Tensed Verb/Auxiliary

a. die Grossmutter sagt: “Damit ich besser fressen kann”
   German
   the grandmother say:Prs-3Sg: “So that I better eat:Inf can:Prs-3Sg”
   “the grandmother says: “So that I can eat better””

b. weil die Grossmutter krank gewesen ist
   German
   because the grandmother sick be:Part is:3Sg
   “because the grandmother was sick”

c. weil sie (es) wa’ [zu] essen haben (hat)
   German
   because they (it) something [to] eat:Inf have:3Pl/Inf (have:3Sg)
   “because they have something to eat”

d. damit (so dass) die zweiss,
   German
   in-order (so that) the two,

   [Det] Paar [DP] nicht gemerkt haben (hat)
   [Det] couple [DP] not notice:Part have:Pl (have:Sg)

   “so that the couple doesn’t notice it”
(8) Agrammatic French and Italian: Clitics

a. je me rappelle plus
   I myself remember: Pres no-more
   “I don’t remember any more”

b. elle s’en va pour porter les confitures [P] sa grandmère
   she self prt go:Prs to take:Inf the jam [P] her grandmother
   “she’s on her way to take the jam to her grandmother”

c. cela fait y s’endort au grand dam [P] sa femme
   that done he falls+asleep to+the great displeasure [P] his wife
   “at once he falls asleep, to the great displeasure of his wife”

d. elle la (le) réveille
   she her (him) wakes
   “she wakes him up”

e. non s’è accorta
   not self is aware
   “she doesn’t notice”

f. [Det] ragazzo li prende e la ragazza li mangia
   [Det] boy them gets and the girl them eats
   “the boy gets them and the girl eats them”

g. [DP] trova un poliziotto e [DP] l’arresta
   [DP] finds a policeman and [DP] him arrests
   “the thief finds a policeman and the policeman arrests him”

h. e la donna si (lo) sveglia
   and the woman self (him) wakes
   “and the woman wakes him”

i. io non lo so che stanno [V]
   I not it know what are [V]
   “I don’t now what they are talking about”
(9) Agrammatic Italian: SVO Order

a. la mamma `sciuga i piatti
   the mother dry:Prs-3Sg the dishes
   “the mother is drying the dishes”

b. il ragazzo sta prendendo i dolci
   the boy be:Prs-3Sg take:Part the cookies
   “the boy is taking the cookies”

c. la mamma lava [Det] piatti, asciuga [Det] piatti
   the mother washes [Det] dishes, dries [Det] dishes
   “the mother washes the dishes, dries the dishes”

d. il contadino prepara [P] seme (semi)
   the farmer prepares [P] seed:Sg (seed:Pl)
   “the farmer prepares the seeds”

e. il contadino mangia i (il) granone
   the farmer eats the:M-Pl (the:M-Sg) grain:Sg
   “the farmer eats the grain”

f. l’uomo sta posando no prendere (prendendo) la sveglia
   the man is putting no take:Inf (taking) the alarm-clock
   “the man is putting/taking the alarm clock”

g. l’uomo no insomma eh uccido (uccide) la il lupo
   the man no right hmm kill:1Sg (kill:3Sg) the:F-Sg the:M-Sg wolf
   “the man kills the wolf”
(10) Agrammatic Clauses: Adjective and Noun

a. [Poss] blood pressure [Aux] low pressure
   "my blood pressure was low pressure"

b. [Poss] legs and arms [P] [Poss] left side [Cop] weak
   and [DP] [Aux] [P] Moss Hospital [P] two months
   "my legs and arms on my left side were weak, and I was in Moss Hospital for
   two months"

c. RRH [Cop] [Det] pretty girl
   "LRRH is a pretty girl"

d. ik denk [Det] half jaar geleden
   I think:1Sg [Det] half year ago
   "I think a half year ago"

e. de boze fee, de boze wolf [V] in het bed
   the wicked fairy, the wicked wolf [V] in the bed
   "the wicked fairy, the wicked wolf lies in the bed"

f. [DP] [V] in het bos de oude vrouw, de heks misschien
   [DP] [V] in the forest the old woman, the witch perhaps
   "she sees the old woman in the forest, the witch perhaps"

g. das Paar steht voll vor [Det] leeren Korb
   the couple stands full in-front-of [Det] empty basket
   "the couple stands in front of the/ an empty basket"

h. und lass dich [P+Det] Wol’
   and let yourself [P+Det] wolf
   von bösen Wolf [Neg] angesprechen werden
   from+the bad wolf [Neg] speak:Part be:Inf
   "and don’t let yourself be spoken to by the wolf"

i. Grossmutter warum hast [DP] [Det] [Adv] grossen Mund
   grandmother why have:Psr-2Sg [DP] [Det] [Adv] big mouth
   "grandmother, why do you have such a big mouth?"

j. eine alte Tante wohnt in [Det] Wald
   an old aunt lives in [Det] forest
   "an old aunt lives in the forest"

k. [Det] grands yeux, les yeux percants
   [Det] big eyes, the eyes piercing
   "big eyes, piercing eyes"

l. [DP] [Aux] les jambes et les bras [V] [P] un quart d’heure
   [DP] [Aux] the legs and the arms [V] [P] one quarter hour
   "my legs and arms were paralyzed within a quarter hour"
m. puis les meubles modernes garnissent les [N] and the furniture modern decorate the [N] “and the modern furniture decorates the rooms”

n. cela fait y s’endort au grand dam [P] sa femme that done he falls asleep to+the great displeasure [P] his wife “at once he falls asleep, to the great displeasure of his wife”

o. je marchais avec le (la) grande canne anglaise I walked with the: M (the: F) long stick English “I was walking with the long English walking stick”

p. j’étais à (au) CHU I was at (at+the) hospital pour pratiquer les examens diverses (divers) sans résultat to practice the tests various: F-Pl (various: M-Pl) without result “I was at the CHU to have various tests done, without results”

q. solanto l’occhio sinistro [CI] [Aux] aperto only the eye left [CI] [Aux] open: PastPart “only my left eye was torn open”

r. [CI] [Aux] [V] tre punti [CI] [Aux] [V] three stitches “they gave me three stitches”

s. e pure il dottore [Det] assessore sanitario dice and also the doctor [Det] assessor sanitary says “Subito, subito, subito, [V] [Det] ambulanza” “quick, quick, quick, [V] [Det] ambulance” “and also the doctor, the sanitary assessor says: “Quick, get an ambulance!””
(11) Agrammatic Clause: Verb and Adverb

a. it’s really depressing  
   English

b. zaterdag [Mod] [DP] slecht praten  
   Saturday [Mod] [DP] badly talk:Inf  
   “Saturday I spoke badly”  
   Dutch

c. en [DP] [Modal] gauw eten  
   and [DP] [Modal] quickly eat:Inf  
   “and he ate quickly”  
   Dutch

d. en [DP] [Aux] gelijk gekomen  
   and [DP] [Aux] immediately come:Part  
   “and he came immediately”  
   Dutch

e. en [DP] [Modal] hard lopen en [P] kantoor verder slapen  
   and [DP] [Modal] fast run:Inf and [P] office further sleep:Inf  
   “and he has to run fast, and then he sleeps at the office”  
   Dutch

f. aber die Oma liegt noch immer im Bett  
   but the grandma lies still more in+the bed  
   “but the grandma is still lying in bed”  
   German

g. nou ja moeilijk [Modal] [Pleo] altijd blijven  
   well yes difficult [Modal] [Pleo] always remain:Inf  
   “well yes, it will always remain difficult”  
   Dutch

h. und [DP] vergisst ganz  
   and [DP] forget:Pres completely  
   “and she completely forgets”  
   German

i. die Frau weckt [DP] wieder  
   the woman wakes again  
   “the woman wakes him again”  
   German

j. [c’est] pour mieux t’entendre l’ (mon) enfant  
   [it’s] to better you hear the:Sg (my:Sg) child  
   “Better to hear you with, my child”  
   French

k. j’ai encore étouffé et tout  
   I have still suffocate:Part and all  
   “I suffocated still and all”  
   French

l. io parlo assai  
   I talk:Prs-1Sg much  
   “I talk a lot”  
   Italian
(12) Agrammatic Clause: Verb and Negation

a. I can’t speak

b. the woman is washing the dishes
   and didn’t pay attention for (to) the sink

c. ik niet bij
   I not with
   “I wasn’t conscious”

d. en nou twee maanden niet lopen
   and well two months not walk-Inf
   “and after two months I still couldn’t walk”

e. ik weet niet meer
   I know:Prs-1Sg not more
   “I don’t know anymore”

f. ja maar terug-vertellen niet
   yes but retell:Inf not
   “but I can’t retell (the story)”

g. ja op-staan niet
   yes up-get not
   “he doesn’t get up”

h. im büro hat nicht gearbeitet
   in+the office has not work:Part
   “in the office he didn’t work”

i. und die Mutter konnte nicht zu begleiten
   and the mother can:3Sg not to accompany:Part
   “and the mother can’t take it to grandmother”

j. war nicht mehr da
   be:Pst not more there
   “I wasn’t there anymore”

k. je m’en rappelle plus
   I myself of-it remember:Prs no-more
   “I don’t remember anymore”

l. je pouvais plus me lever
   I could no-more myself get-up:Inf
   “I could no longer get up”

m. c’est pas difficile à faire ça
   it is not difficult to do that
   “that’s not difficult to do”

n. io non lo so
   I not it know:Prs-1Sg
   “I don’t understand”
(13) Agrammatic Clauses: Replacement Sequences for Determiners

a. the thief lifts his [N]
   "the thief lifts his body"

a'. the thief lifts [Det] body
   "the thief lifts his body"

b. the dog sniffs [Det] chicken
   "the dog sniffs the chicken"

b'. the dog steals the chicken

c. [Det] wife (man) eats breakfast
   "the man eats breakfast"

c'. the man hurries up

d. [Det] boer [V] [P] [Det] vogelverschrikker
   [Det] farmer [V] [P] [Det] scarecrow
   "the farmer is looking at a scarecrow"

d'. de boer [V] mai-
   the farmer [V] cor-
   "the farmer wants corn"

e. ein Bauer in [+dem=im] Frühling sät
   a farmer in [the] spring sow:Prs-3Sg
   "a farmer sows in spring"

e'. na im
   well in+the
   "well, in the"

f. damit die zwei [Det] Paar [DP] nicht gemerkt haben (hat)
   in-order-that the two [Det] couple [DP] not notice:Part have:Prs-3Sg (have:3Pl)
   "so that the couple do not notice if"

f'. der das Paar hat der (das) werden nicht gemerkt [Aux]
   the:Nom-M (the:N) couple the:Nom (the:Acc) will:Prs-3Pl not notice:Prt [Aux]
   "the couple will not have notced this/that"

g. [Det] Mutter [Cop] verliebt
   [Det] mother [Cop] in+love:Prt
   "the mother is in love"

g'. die Mutter ist verliebt
   the mother is in+love:Prt
   "the mother is in love"

h. und [DP] [V] [Det] Backhuhn ja
   and [DP] [V] [Det] backing+chicken yes
   "and they bought a chicken"
h'. ein Hund schuppert das Backhuhn
   a dog sniff:Prs-3Sg the baking+chicken
   "a dog sniffs at the chicken"

i. un chien suit un couple pendant [Det] trajet
   a dog follow:Prs a couple during [Det] trip
   "a dog follows a couple during a trip"

i'. un trajet pour pique-niquer
   a trip to picnic:Inf
   "a picnic trip"

j. [Det] marito sta [V] [Det] sveglia
   [Det] husband be:Prs-3Sg [V] [Det] alarm+clock
   "the husband putting the alarm clock"

j'. l'uomo sta posando no prendere (prendendo) la sveglia
   the man be:Prs-3Sg putting no take:Inf (taking) the alarm clock
   "the man is putting the alarm clock"
(14) Agrammatic Clauses: Null Determiner with Possessive Interpretation

a. then strength mood up
   "then my strength and my mood were up"

b. [Poss] legs and arms left side weak
   "my legs and arms on my left side were weak"

c. the thief lifts body
   "the thief lifts his body"

d. grandmother sick home forest
   "her grandmother was sick at home in the forest"

e. RH looks voice, looks in dress, looks bed
   "RH listens to his voice, looks at his dress, looks at the bed"

f. ihr Schpuck nein Schmuck und Geld versteckt
   "(the family has hidden) their jewelry and their money in the oven"

g. in Körper gut nicht reden
   "my body was healthy, but I couldn’t speak"

h. après, j’ attendu sortie
   "afterwards, I waited for my discharge"
(15) English Agrammatic Clauses: Null Possessive Morpheme

a. LRRH go to see grandma[‘s] house
   "LRRH goes to grandma’s house"
   
   b. LRRH says: “I’m going to see granma[‘s] house”
      "LRRH says: “I’m going to see granma’s house”"

   c. the wolf is running to LRRH[‘s] granma
      “the wolf is running to LRRH’s granma”

   d. he took granma[‘s] bonnet and hopped into bed
      “he took granma’s bonnet and hopped into bed”

   e. wolf voice[‘s] and dress and wolf[‘s] actions
      “the wolf’s voice and dress and the wolf’s actions”
(16) Agrammatic Untensed Clauses: Subject-Neg and Subject-Adv

a. ik [Cop] niet bij
   I [Cop] not with
   "I was not conscious"

b. en ikke [V] niet
   and I [V] not
   "and I don't do it"

c. langzamerhand ja [Cop] de oude niet
   gradually yes [Cop] the old not
   "I didn’t become my old self"

d. [Modal] [Det] vrouw toevallig eventjes thuis-komen
   [Modal] [Det] wife accidentally for-a-while home-come:Inf
   "my wife accidentally came home for a while"

e. maar ik [V] auto graag
   but I [V] car happily
   "but I like to drive the car"

f. ik [Aux] nou 21 jaar gewerkt
   I [Aux] now 21 year work:Part
   "I have worked for 21 years"

 g. ja alle dagen [Cop] weer anders
    yes all days [Cop] again different
    "every day is different again"

h. das [Cop] nicht gut
   that [Cop] not good
   "that's not good"

i. und die Abgase [Cop] nicht desund
   and the exhaust-fumes [Cop] not healthy
   "and the exhaust fumes were not healthy"

j. drei Monate ich [Modal] überhaupt nicht reden
   three months I [Modal] at-all not speak:Inf
   "for three months I couldn’t speak at all"

k. und der Wolf [V] inzwischen die Grossmutter ah im Bauch
   and the wolf [V] meanwhile the grandmother uh in+the belly
   "and in the meantime the wolf has the grandmother in its belly"

l. das Kind und ihre (seine) Grossmutter [Cop] wieder normal
   the child and her:F (her:N) grandmother [Cop] again normal
   "the child and her grandmother were normal again"

m. der Hund [Cop] noch hm [V]
   the dog [Cop] still hm [V]
   "the dog is still eating the chicken"
n. je [Cl] [V] peu (pas) du tout le voyage
I [Cl] [V] little (not) at all the trip
"I don’t remember the trip"
(17) Agrammatic Italian Subject-Initial Clauses: S-V, S-Adj, S-N and S-PP

a. solanto l'occhio sinistro [Cl] [Aux] aperto
   only the eye left [Cl] [Aux] open:PastPart
   "only my left eye was torn open"

b. il signore e la signora [Aux] meravigliati
   the gentleman and the lady [Aux] astonish:PastPart-Pl
   "the gentleman and the lady are astonished"

c. la signora [Aux] scocciata
   the lady [Aux] annoy:Part
   "the lady is annoyed"

d. la porta [Cop] chiusa
   the door [Cop] closed
   "the door was closed"

e. e la nonna e Cappuccetto Rosso [Cop] salve
   and the grandmother and LRRH [Cop] safe:F-Pl
   "and the grandmother and LRRH were safe"

f. e io [Cop] assessore pure
   and I [Cop] member too
   "and I am a member too"

g. [Det] acqua [V] sotto (sul) [Det] pavimenti (pavimento)
   [Det] water [V] under (on) [Det] floor:Pl (floor:Sg)
   "the water goes on the floor"

h. il ladro [V] sopra la finestra
   the thief [V] above the window
   "the thief goes on top of the window"

i. io [Aux] [V] tre giorni [P+Det] rianimazione
   I [Aux] [V] three days [P+Det] ICU
   "I stayed three days in the ICU"
(18) Agrammatic Clauses: Missing Verb

a. I can’t (couldn’t) [V]  
   “I can’t/couldn’t speak”  

b. the couple is [V]  
   “the couple is walking/going”  

c. the wife is [V]: “Hurry up!”  
   “the wife is saying: “Hurry up!””  

d. [Pleo] [V] half an hour  
   “it took half an hour”  

e. [DP] [V] grandmother’s clothes, [Det] wolf  
   “he wears grandmother’s clothes, the wolf”  

   “LRRH runs/is outside the home”  

g. [Det] wolf [V/Cop] outside [Det] house  
   “the wolf runs/is outside the house”  

h. de man en een vrouw [V] in de mand  
   “the man and a woman [V] in the basket”  

i. en [Det] boer [V] [P] [Det] vogelverschikker  
   “and [Det] farmer [V] [P] [Det] scarecrow”  
   “and the farmer is looking at the scarecrow”  

j. [Det] derde keer [V] [DP] plat hoor [P] de gang  
   “[Det] third time [V] [DP] flat you-know [P] the hall”  
   “the third time I fell flat, you know, in the hall”  

k. maar anders [V] ik zelf deze kamer en de douche  
   “but otherwise [V] I myself this:M/F room and the shower-bath”  
   “otherwise I, myself had this room and the shower”  

l. want [DP] [V] nog in bed de man  
   “since the man is still lying in bed”  

m. maar ik [V] auto graag  
   “but I [V] car happily”  

n. en ikke [V] [DP] niet  
   “and I [V] [DP] not”  

o. langzamerhand ja [V] [DP] de oude niet  
   “I didn’t gradually become the old me”
p. [P] kantoor [V] [DP] eindelijk rust
[P] office [V] [DP] finally peace
"at the office he finally has some peace"

q. und die (das) Geld und [Det] Schmuck [V] [DP]
and the:Acc-F-Sg (the:Acc-N-Sg) money:N and [Det] jewelry [V] [DP]
"and he steals the money and the jewelry"

r. die Mutter wollte nicht
the:Nom-F-Sg mother wanted:3Sg not
das Mädchen in den Wald gehen [V]
the:Nom/Acc-N-Sg girl in the wood go:inf [V]
"The mother did not want to let the girl go into the forest"

s. der Hund [V] noch hni [DP]
the dog [V] still hni [DP]
"the dog is still eating the chicken"

t. und der Wolf [V] inzwischen die Grossmutter ah im Bauch
and the wolf [V] meanwhile the grandmother uh in+the belly
"and in the meantime the wolf has the grandmother in its belly"

u. la grand-mère [V] "Ouvre, la chevillette cherra"
the grandmother [V] "Open, the latch will lift"
"the grandmother says: "Open, the latcch will lift""

v. je [me] [V] peu (pas) du tout le voyage
I [myself] [V] little (not) at all the trip
"I don’t remember the trip"

w. [Det] marito sta [V] [Det] sveglia
[Det] husband is [V] [Det] alarm-clock
"the husband is turning off the alarm clock"

x. io non lo so che stanno [V]
I not it know what are [V]
"I don’t know what it is they are saying"

y. allora alle dieci [P] ufficio [V] [Det] riposino
then at+the ten [P] office [V] [Det] nap
"then at ten, he takes a nap in the office"

z. e allora [V] [Det] libertà [P] la nonna e [P] la bambina
and then [V] [Det] freedom [P] the grandmother and [P] the girl
"and then he frees the grandmother and the girl"

A. [V] la camicia da notte
[pro V] the dress for night
"it wore the nightgown"
B. io [V] tre giorni [P] rianimazione
I [V] three days [P] ICU
"I stayed three days in the ICU"
(19) Agrammatic Clauses: Replacement Sequences for Verbs

a. en dan [Mod] de [N] opstaan
   and then [Mod] the [N] up+get
   “and then the man must get up”

a’. de man begint met opstaan
    the man begin:Prs-3Sg with up+get
    “the man starts to get up”

b. einmal [V] die Mutter ...
   once [V] the mother ...
   “once the mother wanted ...”

b’. einmal wollte [DP] ...
    once want:Pst [DP] ...
    “once the motehr wanted ...”

c. [Det] Mutter [Cop] verliebt
   [Det] mother [Cop] in+love:Prt
   “the mother is in love”

c’. die Mutter ist verliebt
    the mother is in+love:Prt
    “the mother is in love”

d. und [DP] [V] [Det] Backhuhn ja
   and [DP] [V] [Det] backing+chicken yes
   “and they bought a chicken”

d’. ein Hund schuppert das Backhuhn
    a dog sniff:Prs-3Sg the baking+chicken
    “a dog sniffs at the chicken”

e. dans son jardi pour faire [N]
   in his garden to give [N]
   “in his garden to frighten”

e’. pour [V] peur aux moineaux
   to [V] fright to+the birds
   “to frighten the birds”

f. [Det] marito sta [V] [Det] sveglia
   [Det] husband be:Prs-3Sg [V] [Det] alarm+clock
   “the husband putting the alarm clock”

f’. l’uomo sta posando no prendere (prendendo) la sveglia
    the man be:Prs-3Sg putting no take:Inf (taking) the alarm clock
    “the man is putting the alarm clock”
(20) Agrammatic Omissions: Missing Subject Noun

a. the [N] [V]: “[Det] better [to] eat you all up”
   “the wolf says: “The better to eat you all up””

b. en dan [Modal] de [N] opstaan
   and then [Modal] the [N] up-get:Inf
   “and then the man must get up”

(c. so [Cop] die [N] so gut
   so [Cop] the [N] so good
   “thus the (parts of the) body is/are good”

   English

   Dutch

   German
(21) Agrammatic Omissions: Missing Object Noun

a. various [N] of work
   “various kinds of work”

b. the thief lifts his [N]
   “the thief lifts his body”

c. it’s a [N]
   “it’s a stroke”

d. [DP] [Aux] de ‘t [N] vergeten
   [DP] [Aux] the:M/F the:N [N] forgotten:Part
   “she had forgotten the gas (?)”

e. [DP] [V] braille-[N] en ja [P] alles
   [DP] [V] braille-[N] and yes [P] everything
   “they make braille-books and all sorts of things”

f. vergelenken [P] [Det] [N] geleden [Cop] [Pleo] vooruitgang
   compared [P] [Det] [N] ago [Cop] [Pleo] progress
   “compared with a year ago, there is progress”

g. ... stellt er auf den (das) Feld eine [N] [Ptl]
   “he puts up a scarecrow in the field”

h. ein Einbrecher nutzt die [N]
   “a thief uses the [N]”

i. und er folgt die (den) zwei [N]
   “and he follows the two people”

j. le loup demande au [N] où il (elle) va
   “the wolf asks LRRH where she is going”

k. puis les meubles modernes garnissent les [N]
   “and the modern furniture decorates the rooms”

l. l’autre [N] avec le (la) fenêtre donnant sur la campagne
   “the other [N] with the:M (the:F) window open:Part on the countryside”

m. y fait la sieste [P] ratrapper [Det] [N] perdu
   “he takes a nap to make up for lost time”

n. dans son jardin pour faire [N]
   “in his garden to frighten (give fright)”
o. le paysan attend [Comp] le [N] pousse
   the farmer waits [Comp] the [N] grows
   “the farmer is waiting for the corn to grow”

   “I went with the orderly to the third floor downstairs”
(22) Agrammatic Clauses: Replacement Sequences for Nouns

a. the thief lifts his [N]
   "the thief lifts his body"

a'. the thief lifts [Det] body
   "the thief lifts his body"

b. en dan [Mod] de [N] opstaan
   and then [Mod] the [N] up+get
   "and then the man must get up"

b'. de man begint met opstaan
   the man begin:Prs-3Sg with up+get
   "the man starts to get up"

c. dans son jardi pour faire [N]
   in his garden to give [N]
   "in his garden to frighten"

c'. pour [V] peur aux moineaux
   to [V] fright to+the birds
   "to frighten the birds"
(23) Agrammatic Omissions: Missing Subject - 1Sg

a. [DP] pass (passed) out
   “I passed out”

b. [DP] [Aux] drink[ing] [Conj] talk[ing]
   “I was drinking and talking”

c. [DP] [Cop] [P] [Det] wheelchair [P] Hahneman Hospital [P] a week
   “I was in a wheelchair at Hahneman Hospital for a week”

d. and [DP] [Aux] [P] Moss Hospital [P] two months
   “and I was in Moss Hospital for two months”

e. ja [DP] dacht van
   yes [DP] think:Past-lSg well
   “I thought so”

f. van [Cop] [DP] moe, heel moe, dag en nacht
   well [Cop] [DP] tired, very tired, day and night
   “well I was tired, very tired, day and night”

g. zaterdag [Modal] [DP] slecht praten
   Saturday [Modal] [DP] badly talk:Inf
   “Saturday I could only talk badly”

h. van drie jaar [geleden] [Modal] [DP] weinig praten
   well three year [ago] [Modal] [DP] hardly speak:Inf
   “three years ago I could hardly speak”

i. [DP] moet (moest) [DP] uitsprechen
   [DP] must:Prs (must:Pst) [DP] pronounce:Inf
   maar [DP] [Modal] [DP] eigenlijk niet
   but [DP] [Modal] [DP] really not
   “I must pronounce everything, but I couldn’t really (do) that”

j. zondagochtend [Aux] [DP] gewerkt
   Sunday-morning [Aux] [DP] work:Part
   “Sunday morning I had worked”

k. en [P] twaalf uur [Modal] [DP] thuis-komen
   and [P] twelve o’clock [Modal] [DP] home-come:Inf
   “at twelve o’clock I came home”

l. van ja [Adv] [Modal] [DP] plat-vallen
   well yes [Adv] [Modal] [DP] down-fall:Inf
   “well then I fell down”

m. [DP] [Aux] net boven gehaald
   [DP] [Aux] just upstairs reach:Part
   “I had just reached upstairs”
n. en [DP] [Aux] zelf in bed gekropen
   and [DP] [Aux] self in bed go:Part
   “and I went to bed”

o. en [DP] kom later
   and [DP] come:Prs-1Sg later
   “and I will come later”

p. [DP] [Modal] [DP] [Adv] om-kleden
   [DP] [Modal] [DP] [Adv] change:Inf
   “I must still change myself”

q. en nou [DP] [Modal] [P] twee maanden [Adv] niet lopen
   and well [Modal] [DP] [P] two months [still] not walk-Inf
   “after two months I still couldn’t walk”

r. [S-Adv] [Modal] [DP] gehoord
   [S-Adv] [Modal] [DP] hear:Part
   “then I heard”

s. [DP] [Aux] [DP] samen gesproken
   [DP] [Aux] [DP] together talk:Part
   “I saw them talk together”

t. maar [DP] [Aux] begonnen van [met] boodschappen doen
   but [DP] [Aux] start:PrsPart well [to] errands do:Inf
   “but I have started to do errands”

u. ja [DP] dacht van
   yes [DP] think:Pst-1Sg well
   “I thought, well”

v. [DP] moet lopen
   [DP] must:Prs-1Sg walk:Inf
   “I must walk”

w. en [DP] [Modal] proberen [te] lopen
   and [DP] [Modal] try:Inf [to] walk:Inf
   “and I must try to walk”

x. [Det] derde keer [V] [DP] plat hoor [P] de gang
   [Det] third time [V] [DP] flat you-know [P] the hall
   “the third time I fell flat, you know, in the hall”

y. negen en een half jar geleden [Cop] [DP] gezond
   nine and a half year ago [Cop] [DP] healthy
   “nine and a half years ago I was healthy”

z. en ja [DP] [Aux] anders geworden
   and yes [DP] [Aux] different become:Part
   “and I have become different”
A. eerst [Cop] [DP] gezond
   first [Cop] [DP] healthy
   “first I was healthy”

B. en ja langzamer [V] [DP] weer de oude
   and yes gradually [V] [DP] again the old
   “and I gradually became my old self”

C. vijf jaar geleden [Modal] [DP] nog moeilijk praten en lezen
   five year ago [Modal] [DP] yet hardly talk:Inf and read:Inf
   “five years ago I could hardly talk and read”

D. maar ja [DP] [Modal] moed houden
   but yes DP] [Modal] courage keep:Inf
   “I must keep my courage up”

E. langzamerhand ja [V] [DP] de oude niet
   gradually yes [V] [DP] the old not
   maar [DP] [Modal] door-zetten en proberen
   but [DP] [Modal] persevere:Inf and try:Inf
   “I didn’t become my old self but I must persevere and try”

F. ja maar terug-vertellen [Modal] [DP] niet
   yes but retell:Inf [Modal] [DP] not
   “but tell (the story), I can’t do that”

G. [DP] war nicht mehr da
   [DP] be:Pst-1Sg not more there
   “I wasn’t there anymore”

H. [DP] [V] nicht mehr
   [DP] [V] not anymore
   “I don’t know anymore”

I. also [DP] [Modal] Buchstaben aus-lassen
   thus [DP] [Modal] letter:Pl out-leave:Inf
   “so I leave out letters”

J. [DP] weiss nicht ob ich [DP] noch kann
   [DP] know:1Sg not whether I [DP] still can:1Sg
   “I don’t know whether I still can (remember) it”

K. [DP] weiss [DP] nimmer
   [DP] know [DP] not+anymore
   “I don’t know it anymore”
L. [DP] habe (bin) in Pension [V]  
[DP] have:1Sg (am) in pension [V]  

und dann [Aux] [DP] [P] [Det] Garage gearbeitet  
and then [Aux] [DP] [P] [Det] garage work:Part  

“I went on my pension and then I worked in a garage”  

M. und ein Jahr später [Aux] [DP] [Det] Schlag [V]  
and a year later [Aux] [DP] [Det] stroke [V]  

“and a year later, I had a stroke”  

N. in [Poss] Körper [Cop] gut [Conj] [DP] [Modal] nicht reden  
in [Poss] body [Cop] good [Conj] [DP] [Modal] not speak:Inf  

“my body was healthy, but I couldn’t speak”  

O. [DP] [Aux] les jambes et les bras [V] [P] un quart d’heure  
[DP] [Aux] the legs and the arms [V] [P] one quarter hour  

“my legs and arms were paralyzed within a quarter hour”
(24) Agrammatic Omissions: Missing Subject - 2Sg

a. [DP] [Modal] boodschappen doen
   [DP] [Modal] errands do:Inf
   “you can do errands”

b. [DP] [DP] zelf bepaalt
   [DP] [DP] self determine:2/3Sg
   “you determine everything yourself”

c. en ja [DP] moet praten [P] [Det] maatschappij of niks zeggen
   and yes [DP] must:Prs talk:Inf [P] [Det] society or nothing say:Inf
   “you must talk in company, or say nothing”

d. Grossmutter warum hast [DP] [Det] [Adv] grossen Mund
   grandmother why have:Psr-2Sg [DP] [Det] [Adv] big mouth
   “grandmother, why do you have such a big mouth?”
(25) Agrammatic Omissions: Missing Subject DP - 3Sg Referential

a. [DP] leans [over]
   “the stool leans over”

b. [DP] trips (is falling) on the floor
   “he is falling on the floor”

c. [DP] forgot the wash, the dishes
   “she forgot the wash, the dishes”

d. [DP] likes grandmother’s voice
   “she likes grandmother’s voice”

e. [DP] shaved me, [Det] nurse
   “she shaved me, the nurse”

f. [DP] [V] grandmother’s clothes, [Det] wolf
   “he wears grandmother’s clothes, the wolf”

g. [DP] [Cop] niet verklaarbaar
   [DP] [Cop] not explainable
   “it’s not explainable”

h. maar verder [DP] kom (komt) vanzelf
   “but further such a thing comes by itself”

i. [DP] [Modal] [P] [Det] boot aan-komen
   [DP] [Modal] [P] [Det] boat arrive:Inf
   “he would arrive by boat”

j. of [DP] [Aux] [Det] gas uit-gedaan
   “or she turned off the gas”

k. [DP] [Modal] [DP] gelijk op-bellen
   [DP] [Modal] [him] immediately call:Inf
   “she had called him immediately”

l. en [DP] [Aux] gelijk gekomen
   “and he came immediately”

m. van [DP] [V] [Det] koekje
   “he takes a cookie”

n. nou ja [DP] betekent [DP] denk ik
   “that’s what it means, I think”

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o. en [DP] [Modal] [P] [Det] kamer zoeken
   and [DP] [Modal] [P] [Det] room look:Inf
   "he looked in the room"

p. en [DP] [Modal] buiten-komen
   and [DP] [Modal] outside-come:Inf
   "and he came out"

q. en [DP] [Modal] af-zetten
   and [DP] [Modal] off-turn:Inf
   "and he turns it off"

r. en [DP] [Aux] door-geslapen
   and [DP] [Aux] on-sleep:Part
   "and he goes on sleeping"

s. en [DP] [Modal] gauw eten
   and [DP] [Modal] quickly eat:Inf
   "and he must eat quickly"

t. de kraan is over-gestroomd want [DP] [Cop] in [Det] plas
   the tap be:Prs-3Sg over-flow:Part because [DP] [Cop] in [Det] puddle
   "the tap has overflowed because she is in a puddle"

u. en [DP] [Cop] in het (de) kamer
   and [DP] [Cop] in the: N (the: M/F) room
   "and he was in the room"

v. en dan [V] [DP] naar het raam [Conj] [V] weer naar buiten
   and then [V] [DP] to the window [Conj] [V] again to outside
   "and then he goes to the window and climbs outside"

w. en dan [Modal] [DP] vlug op-staan
   an then [Modal] [DP] quickly up-get
   "and he must quickly get up"

x. en dan [P] half negen [V] [DP] vlug naar kantoor
   and then [P] half nine [V] [DP] quickly to office
   "and then at half past nine he quickly goes to the office"

y. [DP] [V] in het bos de oude vrouw, de heks misschien
   [DP] [V] in the forest the old woman, the witch perhaps
   "she (LRRH) sees the old woman in the forest, the witch perhaps"

z. [DP] [Modal] [Det] koek [P] [Det] meisje geven
   [DP] [Modal] [Det] cookie [P] [Det] girl give-Inf
   "he tried to give the cookie to the girl"

A. en [DP] [Modal] hard lopen en [P] kantoor verder slapen
   and [DP] [Modal] fast run:Inf and [P] office further sleep:Inf
   "and he must run fast and can sleep some more at the office"
B. ja op-staan [Modal] [DP] niet
yes up-get [Modal] [DP] not
want [DP] [V] nog in bed de man
for [DP] [V] still in bed the man

"he doesn't get up, since the man is still lying in bed"

C. [P] kantoor [V] [DP] eindelijk rust
[P] office [V] [DP] finally peace
"at the office he finally has some peace"

D. [DP] hatte einen (einen) Korb gepackt
[DP] have:Pst-3Sg a:Dat-M-Sg (a:Acc-M-Sg) basket pack:Part
"she had packed a basket"

E. und [DP] vergisst ganz
and [DP] forget:Prs-3Sg completely
"and she completely forgets"

F. einmal wollte [DP]
once wanted [DP]
"Once the mother wanted"

G. und hat sich [DP] ins Bett von ihr, Grossmutter, gelegt
and has himself [DP] in+the bed of her, grandmother, lie:Part
"and the wolf lay down in her grandmother’s bed"

H. [DP] ist in, ist in Gedanke (Gedanken) wo gewesen
[DP] is in, is in thought (thoughts) somewhere be:Part
"she is somewhere else in her thoughts"

I. später begutachtet [DP] seinen Kukuruz
later examines [DP] his corn
"later he examines his corn"

J. und ins Büro oder wo' [Modal] [DP]
and in+the office or (some)where [Modal] [DP]
"and he has to go to the office or somewhere else"

K. [DP] sagt
[DP] say:Prs-3Sg
"she says"

L. ich weiss nicht was [DP] [V]
I know not what [DP] [V]
"I don’t know what she asks"

M. und die (das) Geld und [Det] Schmuck [V] [DP]
and the:Acc-F-Sg (the:N) money:N and [Det] jewelry [V] [DP]
"and he steals the money and the jewelry"
N. und [DP] eilt auf die Strasse
and [DP] hurries on the street
“and he hurries onto the street”

O. im Büro hat [DP] nicht gearbeit[et]
in+the office has [DP] not work:Part
“in the office he didn’t work”

P. [DP] [Aux] mir auch passiert
[DP] [Aux] me:Data:so happen:Part
“that has also happened to me”

Q. [DP] [V] visite en (à) [Poss] grandmère
[DP] [V] visite by (to) [Poss] grandmother
“she is paying a visit to her grandmother”

R. [DP] [Aux] mis un épouvantail pour chasser les oiseaux
[DP] [Aux] put:PastPart a scarecrow to chase the birds
“he put in a scarecrow to chase the birds away”

S. peu après [DP] contemple [Det] récolte
little after [DP] consider:Prs-3Sg [Det] harvest
“a little later he considers the harvest”

T. une fois [DP] fini
one time [DP] finish:Part
“once the film was over”

U. [DP] sta per scivolare sulla (dallo) sgabello
[DP] is about slip:Inf on+the:F-Sg (from+the:M-Sg) stool:M-Sg
“the boy is about to slip off the stool”

V. [DP] cresce
[DP] grows
“the corn grows”

W. [DP] trova un poliziotto e [DP] l’arresta
[DP] finds a policeman and [DP] him arrests
“the thief finds a policeman and the policeman arrests him”
(26) Agrammatic Omissions: Missing Subject DP - 3Sg Expletive Quasi-Argument

a. [Pleo] [Cop] [Det] nice day
   "it is a nice day"

b. [Pleo] [Cop] eight thirty
   "it is eight thirty"

c. [Pleo] [Cop] [Det] beetje laat
   [Pleo] [Cop] [Det] little late
   "it is a little late"

d. [Pleo] [Cop] zeven uur
   [Pleo] [Cop] seven o'clock
   "it is seven o'clock"

e. [Pleo] [Cop] acht uur pas (al) [V] [Det] mevrouw
   [Pleo] [Cop] eight o'clock only (already) [V] [Det] woman
   "It is eight o'clock already" says the woman"
(27) Agrammatic Omissions: Missing Subject DP - 3Sg Expletive Non-Argument

a. [Pleo] [Cop] a view [P] shrubs, trees [Conj] grass  
   "there is a view of shrubs, trees and grass"  

b. [Pleo] [Cop] [Det] scarecrow  
   "there is a scarecrow"  

c. [Pleo] gaat wel  
   [Pleo] go:3Sg well  
   "it is going well"  

d. eigenlijk [Cop] [Pleo] niks  
   actually [Cop] [Pleo] nothing  
   "there was nothing really"  

e. en iedere keer [Cop] [Pleo] verbeteringen  
   and every time [Cop] [Pleo] improvements  
   "and every time there are improvements"  

f. ja [Pleo] [Cop] alle dagen weer anders  
   yes [Pleo] [Cop] all days again different  
   "every day it is different again"  

g. vergeleken [P] [Det] [N] geleden [Cop] [Pleo] vooruitgandaan  
   compared [P] [Det] [N] ago [Cop] [Pleo] progress  
   "compared with a year ago, there is progress"  

h. [Pleo] [Cop] duidelijk te zien  
   [Pleo] [Cop] clear to see:Inf  
   "it is clear to see"  

i. [Cop] [Pleo] seinen Namen Rotkäppchen  
   [Cop] [Pleo] her:Acc-M-Sg name LRRH  
   "it is her name LRRH"  

j. [Pleo] fehlt was  
   [Pleo] miss:Prs-3Sg something  
   "there is something missing"  

k. und [Pleo] sagt mir ein Universitäts-professor  
   and [Pleo] say:Prs-3Sg me a university-professor  
   "and there says to me a university professor says"  

l. [Pleo] [Cop] deux phases  
   [Pleo] [Cop] two stages  
   "there were two stages"  

m. [Pleo] [Cop] pour mieux t'entendre l' (mon) enfant  
   [Pleo] [Cop] to better you hear the:Sg (my:Sg) child  
   "it is to better hear you with, my child"
n. [Pleo] [Cop] [P] mieux [CL] voir le (mon) enfant
[Pleo] [Cop] [P] better [CL] see:Inf the (my) child
“it is to better see you with, my child”

o. [Pleo] [Cop] un couple qui vont (va) manger sur l’herbe
[Pleo] [Cop] a couple that go:3Pl (go:3Sg) eat:Inf on the grass
“it is a couple who are eating on the grass”
(28) Agrammatic Omissions: Missing Subject DP - 1Pl

   [DP] [V] this room and [Det] shower-bath and [Adv] nothing more
   “we have this room and a shower and then nothing more.

b. [V] [DP] twee kamer (kamers) Dutch
   [V] [DP] two room:Sg (room:Pl)
   “we have two rooms”
(29) Agrammatic Omissions: Missing Subject DP - 3Pl

a. [DP] spread [Det] cloth, napkin[s], dish[es], forks, spoons. [P] two
   “they spread a cloth, napkins, dishes, forks, spoons, for two

b. [DP] [Modal] thuis-komen
   [DP] [Modal] home-come:Inf
   “they had come home”

c. [DP] [Cop] normal (normaux)
   [DP] [Cop] normal:Sg (normal:Pl)
   “they were normal”
(30) Agrammatic Omissions: Missing Object DP - 1Sg

a. [my] wife, Rosa, take[s] (took) [DP] [P] Loveladies and transfer[s] (transferred) [DP] [P] Hahnemann Hospital [P] [Det] ambulance
   “my wife Rosa took me to Loveladies and transferred me to Hahnemann Hospital in an ambulance”

b. [DP] shaved [DP]
   “she shaved me”

c. [DP] [Modal] [DP] [Adv] om-kleden
   [DP] [Modal] [DP] [Adv] change:Inf
   “I must still change myself”

d. ma femme [Aux] appelé/er un ami et les pompiers
   my wife [Aux] call:Part/Inf a friend and the firemen
   pour [CL] conduire à la clinique
   to [CL] drive:Inf to the clinic
   “my wife called a friend and the firemen to drive me to the clinic”

e. [CL] [Aux] [V] tre punti
   [CL] [Aux] [V] three stitches
   “they gave me three stitches”
(31) Agrammatic Omissions: Missing Object DP - 2Sg

   “the wolf says: “The better to smell you with””

b. [DP] [DP] zelf bepaalt
   [DP] [DP] self determine:2/3Sg
   “you determine everything yourself”
Agrammatic Omissions: Missing Object DP - 3Sg

a. the wife was showing [DP] the clock
   "the wife was showing him the clock"

b. [DP] moet (moest) [DP] uitsprechen
   [DP] must:Prs (must:Pst) [DP] pronounce:Inf
   "I must pronounce everything"

c. [DP] [Modal] [DP] gelijk op-bellen
   [DP] [Modal] [DP] immediately call:Inf
   "she had called him immediately"

d. nou ja [DP] betekent [DP] denk ik
   well yes [Dp] mean:3Sg [DP] think:1Sg I
   "that's what it means, I think"

e. en [Det] hond [Modal] [DP] op-eten
   and [Det] dog [Modal] [DP] up-eat:Inf
   "and the dog has eaten the chicken up"

f. en ikke [V] [DP] niet
   and I [V] [DP] not
   "and I don't do it"

g. midden in het bos pakte de heks nee [Det] wolf [DP]
   middle in the forest caught the witch no [Det] wolf [DP]
   "in the middle of the forest the witch, no the wolf caught her"

h. und die Mutter konnte [DP] nicht zu [DP] begleiten
   and the mother could:3Sg [DP] not to [DP] accompany:PastPart
   "and the mother could not accompany LRRH to grandmother"

i. das Kind und der Wolf na [V] [DP]
   the child and the wolf na [V] [DP]
   "the child and the wolf met each other"

j. aber wie Kinder sind überredete [DP] der Wolf
   but as children are persuaded [DP] the wolf
   ein paar Blumen für die Grossmutter zu pflücken
   a few flowers for the grandmother to pick:Inf
   "but as children are, the wolf persuaded her to pick a few flowers for the grandmother"

k. [DP] weiss [DP] nimmer
   [DP] know [DP] not+anymore
   "I don't know it anymore"

l. [Det] Paar [DP] nicht gemerkt haben (hat)
   [Det] couple [DP] not notice:Part have:P (have:Sg)
   "the couple doesn't notice it"
m. der Hund [V] noch hm [DP]
the dog [V] still hm [DP]
“the dog is still eating the chicken”

n. die Frau weckt [DP] wieder
the woman wakes [DP] again
“the woman wakes him again”

o. wie er dann durch das Fenster auf ein (eine) Strasse steigt,
as he then through the window onto a:Acc-N-Sg (a:F) street climbs,

sieh (sieht) [DP] da ein Polizist
see:Prs-3Sg [DP] there a policeman

“as he climbs through the window onto a street, a poliman sees him there”

p. après trois, non deux mois après [DP] [Cl] [V] à pied
“after three, no two months after [DP] [Cl] [V] on foot

two months later I went there on foot”

q. [DP] [V] visite en (à) [Poss] grandmère pour [CL] apporter le beurre
she’s paying a visit to her grandmother to bring her the butter

r. et le loup bondit sur elle et il [Cl] mange
and the wolf jumps on her and he [Cl] eats
“and the wolf jumped on her and ate her”

s. le chaperon rouge [Cl] donne le panier avec les friandises
“LRRH gives him the basket with the goodies”

“she was coming to see her grandmother to bring her some cake, or maybe some bread”

v. elle (il) [Cl] a mangé
she (he) [Cl] has eat:PastPart
“he ate her”

w. il [Cl] emporte
he [Cl] transports
“he transports it”
x. il [Cl] mange
   he [Cl] eats
   "he eats it"

y. un poliziotto [Cl] aspetta
   a policeman [Cl] waits
   "a policeman waits for him"

z. [Cl] [Aux] mangiato il cane
   [Cl] [Aux] eat:PastPart-M-Sg the dog
   "the dog has/had eaten it"

A. il poliziotto guarda e [Cl] arresta
   the policeman watches and [Cl] arrests
   "the policeman watches and arrests him"
(33) Agrammatic Omissions: Missing Object DP - 3Pl

a. [DP] [Aux] [DP] samen gesproken
   [DP] [Aux] [DP] together talk:Part
   “I saw them talk together”

b. i (gli) uccelli non mangiano [DP]
   the:3Pl (the:3Pl) birds not eat:3Pl [DP]
   “the birds don’t eat the seeds”
(34) Agrammatic Clauses: Replacement Sequences for Arguments

a. [DP] shaved [DP]
   “the nurse shaved me”

a’. [Det] nurse shaved me
   “the nurse shaved me”

b. einmal [V] die Mutter...
   “once the mother...”

b’. einmal wollte [DP]...
   “once the mother wanted...”

c. und [DP] [V] [Det] Backhuhn ja
   “and they bought a chicken”

c’. ein Hund schuppert das Backhuhn
   “a dog sniffs at the chicken”

d. y fait la sieste [P] rattraper [DP] perdu
   “he takes a nap the make up for wasted time”

d’. le temps perdu de sommeil
   “the lost sleeping time”

e. et après [DP] fini
   “and once the movie was over”

e’. le film fini
   “the movie was over”

f. en (sur) [Det] chemin y a un petit chien qui [Cl] suit
   “on the road there is a little dog that follows them”

f’. les suit
   “follows them”
Agrammatic Clauses: Agreement Errors on Verb with Overt Subject

a. RRH says: “My, your ears is (are) larger”
   “RRH says: “My, you ears are larger”

b. LRRH go (goes) to see grandma house
   “LRRH goes to grandma’s house”

c. the boy give (gives) to the girl a cookie
   “the boy gives to a/the girl a cookie”

d. the man is woken up by the alarm and then go (goes) to sleep
   “the man is woken up by the alarm and then goes to sleep”

e. the men (man) was eating
   “the man was eating”

f. the thief case (cases) job
   “the thief cases a/the job”

g. wolf eat (eats) grandmother
   “the wolf eats grandmother”

h. van hond ruiken (ruikt)
   well dog smell:3Pl (smell:3Sg)
   “a/the dog smells something”

i. de man and een vrouw pak (pakken) nee de hond pakt the kip
   the man and a woman take:3Sg (take:3Pl) no the dog take:3Sg the chicken
   “the man and a woman take, no the dog takes the chicken”

j. Paar nicht gemerkt haben (hat)
   couple not notice:Part have:Pl (have:Sg)
   “so that the couple doesn’t notice it”

k. und weil er nicht noch nicht aus schlafen (geschlafen) bin ist
   and because he not yet not PRT sleep:Inf (sleep:Part) be:Prs-1Sg be:Prs-3Sg,
   “because he has not had enough sleep”

l. un couple qui vont (va) manger sur l’herbe
   a couple that go:3Pl (go:3Sg) eat:Inf on the grass
   “it’s a couple who are eating on the grass”

m. le couple y sont (est) arrivé pour manger
   the couple they are (is) arrive:PastPart to eat:Inf
   “the couple arrive to eat”

n. I genitori stava (stavano) in pensiero
   the:M-Pl parents was:3Sg (was:3Pl) in thought
   “my parents were worried”

o. era (erano) svegli
   was:3Sg (was:3Pl) awake:M-Pl
   “they were awake”
p. due sposini prepara (preparano) da mangiare in terra
"the two newlyweds get ready to eat on the ground"

q. io il provveditore: "Scusa, scusiamo, scuso (scusi)"
"I said to the chief of the committee: "Excuse me""

r. due minuti io mal di testa e allora sviene (svengo)
"two minutes later I get a headache and then I faint"

s. dottori assai assai, dice (dicono)
"there were many doctors, they said"

r. rubano, rubo (rubate, rubano) i soldi e oro
"(the thief) steals the money and the jewelry"

u. "vai vai vai (andate, andate, andate) a scuola" i due, tre figli
"go go to school" the two, three kids

v. il la bambina sono andata a ...
"the girl went to..."

w. il lupo, vicino, scruto (scruta)
"the wolf, nearby, is watching"

x. ka il lupo scruto (scruta) la bambina
"the wolf is watching the girl"

y. e uccido (uccide) la nonna
"and the wolf kills the grandmother"

z. l'uomo no insomma eh uccido (uccide) ka il lupo
"the man kills the wolf"
(36) Agrammatic Omissions: Null Subject with Agreement on Verb

<table>
<thead>
<tr>
<th>a. [DP] likes grandmother’s voice</th>
<th>English</th>
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<tbody>
<tr>
<td>“she likes grandmother’s voice”</td>
<td></td>
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<thead>
<tr>
<th>b. [DP] trips (is falling) on the floor</th>
<th>English</th>
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<td>“he is falling on the floor”</td>
<td></td>
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<tr>
<th>c. [DP] leans [Ptr]</th>
<th>English</th>
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<tr>
<th>d. nou ja [Pleo] betekent [DP] denk ik</th>
<th>Dutch</th>
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<tbody>
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<tr>
<th>e. ja [DP] dacht van</th>
<th>Dutch</th>
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<tbody>
<tr>
<td>yes [DP] think:Pst-1Sg well</td>
<td></td>
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<tr>
<td>“I thought so”</td>
<td></td>
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<tr>
<th>f. [DP] gaat wel</th>
<th>Dutch</th>
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<tr>
<td>[DP] go:Prs-3Sg well</td>
<td></td>
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<tr>
<td>“it’s going well”</td>
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<tr>
<th>g. [DP] moet lopen</th>
<th>Dutch</th>
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<tbody>
<tr>
<td>[DP] must:Prs-1Sg walk:Inf</td>
<td></td>
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<tr>
<td>“I must walk”</td>
<td></td>
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<tr>
<th>h. [DP] moet uitsprechen maar eigenlijk niet</th>
<th>Dutch</th>
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<tbody>
<tr>
<td>must:Prs-1Sg pronounce:Inf but really not</td>
<td></td>
</tr>
<tr>
<td>“I have to pronounce everything, but I can’t”</td>
<td></td>
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<tr>
<th>i. maar verder kom (komt) [DP] vanzelf</th>
<th>Dutch</th>
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<tr>
<td>but further come:1Sg (come:3Sg) by-itself</td>
<td></td>
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<tr>
<td>“but further such a thing comes by itself”</td>
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<tr>
<th>j. en [DP] kom later</th>
<th>Dutch</th>
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<tbody>
<tr>
<td>and come:Prs-1Sg later</td>
<td></td>
</tr>
<tr>
<td>“and I will come later”</td>
<td></td>
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<tr>
<th>k. [DP] hatte einen (einen) Korb gepackt</th>
<th>German</th>
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<tbody>
<tr>
<td>[DP] have:Past-3Sg a:Dat-M-Sg (a:Acc-M-Sg) basket pack:Part</td>
<td></td>
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<tr>
<td>“she had packed a basket”</td>
<td></td>
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<tr>
<th>l. und [DP] vergisst ganz</th>
<th>German</th>
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<tbody>
<tr>
<td>and [she] forget:Prs-3Sg completely</td>
<td></td>
</tr>
<tr>
<td>“and she completely forgets”</td>
<td></td>
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<tr>
<th>m. [DP] war nicht mehr da</th>
<th>German</th>
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<tr>
<td>[DP] be:Pst-1Sg not more there</td>
<td></td>
</tr>
<tr>
<td>“I wasn’t there anymore”</td>
<td></td>
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<tr>
<th>n. [DP] weiss nicht ob ich [DP] noch kann</th>
<th>German</th>
</tr>
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<tbody>
<tr>
<td>[DP] know:1Sg not whether I [DP] still can:Prs-1Sg</td>
<td></td>
</tr>
<tr>
<td>“I don’t know whether I still can (remember it)”</td>
<td></td>
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</table>
o. [DP] sta per scivolare sulla (dal) sgabello
   [DP] be:Prs-3Sg about slip:Inf on+the:F-Sg (from+the:M-Sg) stool:M-Sg
   "the boy is about to slip off the stool"

p. [DP] cresce
   [DP] grow:Prs-3Sg
   "the corn grows"

q. [DP] trova un poliziotto e [DP] l’arresta
   [DP] find:Prs-3Sg a policeman and [DP] him arrest:Prs-3Sg
   "the thief finds a policeman and the policeman arrests him"
Agrammatic Clauses: Null Arguments with no Antecedents in the Discourse and/or That Introduce New Discourse Topic

a. [DP] shaved [DP]
   "the nurse shaved me"
   Context: The preceding discourse topic revolves around patients in general and the speaker's position (flat on his back).

b. [DP] leans [Prt]
   "the stool leans over"
   Context: The preceding discourse topic revolves around a girl asking a boy for a cookie.

c. [DP] spread [Det] cloth, napkin, dish, forks, spoons
   "they spread a cloth, napkins, dishes, forks, spoons"
   Context: The preceding discourse topic revolves around a dog sniffing and then stealing chicken.

d. [DP] [V]: “Ga maar maar ik kom later”
   [DP] [V]: “go:Imp just but I come:Prs-1Sg later”
   "I said: "You can go but I will come later on""
   Context: The preceding discourse topic revolves around the activity of the speaker's wife and children (and St. Nicholas).

e. “ja dat is goed” [V] [DP]
   "yes that be:Prs-3Sg good” [V] [DP]
   ""yes that is good" she said”
   Context: The preceding discourse topic revolves around the speaker and his actions.

f. [DP] [V] gelijk [V] [Det] dokter
   [DP] [V] immediately [V] [Det] doctor
   "she went right away to call the doctor"
   Context: The preceding discourse topic revolves around the speaker's illness and fear.

g. en [DP] [Mod] thuis-komen
   and [DP] [Mod] home-come:Inf
   "and they come home"
   Context: The preceding discourse topic revolves around a dog taking (chicken) drumstick.

h. negen en een half jaar geleden [Cop] [DP] gezond
   nine and a half year ago [V] [DP] healthy
   "nine and a half years ago I was healthy”
   Context: This is the speaker's first utterance.
i. [DP] [V] deze kamer en [Det] douche en [Adv] niks meer Dutch
   [DP] [V] this room and [Det] shower+bath and [Adv] nothing more
   "we have this room and a shower-bath and nothing else"

   **Context:** The preceding discourse topic was the size and number of the rooms, but no mention of who lived there.

j. einmal wollte [DP] [Comp] [DP] der Grossmutter [DP] [V] German
   weil die Grossmutter krank gewesen ist
   because the grandmother sick be:Part be:Prs-3Sg

   "once the mother wanted LRRH to take a basket to grandmother because grandmother was sick"

   **Context:** The preceding discourse topic was LRRH and why her name was L Red RH. The was no previous mention of a basket.

k. et après [DP] fini French
   and after [DP] ended
   "and once the movie was over"

   **Context:** The preceding discourse sets up the activity (watching television) but does not mention movie explicitly.

l. [DP] sta per scivolare Italian
   [DP] be:Prs-3Sg about slip:Inf
   "the boy is about to slip"

   **Context:** The preceding discourse topic was the girl eating cookies.

m. [DP] cresce Italian
   [DP] grow:Prs-3Sg
   "the corn grows"

   **Context:** The preceding discourse topic was the farmer waiting.

n. [DP] guarda che guarda il punto di maturazione Italian
   [DP] watch:Prs-3Sg that watch:Prs-3Sg the point of maturation
   "the faarmer watches for the stage of ripeness"

   **Context:** The preceding discourse topic was the corn.

o. [DP] trova un poliziotto e [DP] l’arresta Italian
   [DP] find:Prs-3Sg a policeman and [DP] him arrest:Prs-3Sg
   "the thief finds a policeman and the policeman arrests him"

   **Context:** The discourse topic shifts so the subjects must be expressed.
Context: The preceding discourse topic involves the wife's activities. This is a focus shift and requires an overt subject.
(38) Agrammatic Person Substitution: Verb, Auxiliary, Copula

a. maar verder [DP] kom (komt) vanself
   but further [DP] come:Prs-lSg (come:3Sg) by-itself
   “but further such a thing comes by itself”

b. [DP] hab[e] (bin) in Pension [V]
   [DP] have:1Sg (be:1Sg) in pension [V]
   “I went on my pension”

c. weil er nicht noch nicht aus schlafen (geschlafen) bin ist
   because he not yet not Particle sleep:Inf (sleep:Part) be:Prs-lSg be:3Sg
   “because he has not had enough sleep”

d. alle 11 io [P] il proveditore [V]: “Scusa (scusi),
   at+the 11 I [P] the chief-of-the-committee [V]: “Excuse:2Sg (excuse:3Sg),
   scusiamo (scusi), scuso (scusi),
   excuse:3Pl (excuse:3Sg), excuse:1Sg (excuse:3Sg),

e. e allora sviene (svengo)
   and then faint:3Sg (faint:1Sg)
   “and then I faint”

f. il ladro [V] sopra la finestra e poi,
   the thief [V] above the window and then,
   in casa rubano (ruba), rubo (ruba) i soldi e [Det] oro
   in house steal:3Pl (steal:3Sg), steal:1Sg (steal:3Sg) the moneys and [Det] gold
   “the thief goes on top of the window and then in the house and steals the money
   and the jewelry”

g. il lupo, vicino, scruto (scruta)
   the wolf, nearby, watch:1Sg (watch:3Sg)
   “the wolf, nearby, is watching”

h. il il lupo scruto (scruta) la bambina
   the:F-Sg the:M-Sg wolf watch:1Sg (watch:3Sg) the girl
   “the wolf is watching the girl”

i. l’ il lupo corre corre corre corre e corre al (a) casa sua della nonna
   the the wolf runs runs runs runs to+the (to) house her of+the grandmother
   e uccido (uccide) la nonna
   and kill:1Sg (kill:3Sg) the grandmother
   “the wolf runs to the grandmother’s house and kills the grandmother”

j. busso busso busso (bussa bussa bussa)
   knock:1Sg (knock:3Sg)
   “Knock knock knock”
k. l'uomo no insomma eh uccido (uccide) ka il lupo
    the man no right hmm kill:1Sg (kill:3Sg) the:F-Sg the:M-Sg wolf
    "the man kills the wolf"

l. il la bambina sono è andata a ...
    the:M-Sg the:F-Sg girl be:3Pl/lSg be:3Sg go:Part to ...
    "the girl went to..."
(39) Agrammatic Number Substitution: Verb, Auxiliary, Modal

a. Red Riding Hood says: “My, your ears is (are) larger” English
   “LRRH says: “My, your ears are larger””

b. the thief case (cases) [Det] job English
   “the thief cases a/the job”

c. [Det] wolf eat (eats) grandmother English
   “the wolf eats grandmother”

d. the boy give (gives) to [DP] a cookie English
   “the boy gives to a/the girl a cookie”

e. the boy give (gives) to the girl a cookie English
   “the boy gives to a/the girl a cookie”

f. LRRH go (goes) to see grandma[’s] house English
   “LRRH goes to grandma’s house”

g. he open (opens) the doors English
   and [Aux] taking the money and [Det] watch
    “he opens the doors and is taking the money and watch”

h. the man is woken up by the alarm and then go (goes) to sleep English
   “the man is woken up by the alarm and then goes to sleep”

i. the man was tired and go (goes/went) to sleep at the office English
   “the man was tired and goes/went to sleep at the office”

j. van [Det] hond ruiken (ruikt) [DP] Dutch
   well [Det] dog smell:3Pl (smell:3Sg) [DP]
   “the dog smells something”

k. de man and een vrouw pakt (pakken) nee de hond pakt the kip Dutch
   the man and a woman take:3Sg (take:3Pl) no the dog take:3Sg the chicken
   “the man and a woman take, no the dog takes the chicken”

l. de man and een vrouw [V] in de mand Dutch
   the man and a woman [V] in the basket

   [Conj] pakt (pakken) [DP]
   [Conj] take:3Sg (take:3Pl) [DP]
   “the man and a woman look in the basket and take the chicken”

m. weil sie (es) wa’ [zu] essen haben (hat) German
   because they (it) something [to] eat:Inf have:3Pl (have:3Sg)
   “(a roaming dog follows a couple) because they have something to eat”

1 Note that these English examples of verbal number substitution may also be interpreted as instances of verbal person substitution.

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n. [Det] Paar [DP] nicht gemerkt haben (hat)  
[Det] couple [DP] not notice:Part have:Pl (have:Sg)  
"(so that) the couple doesn’t notice it"

o. [Pleo] [Cop] un couple qui vont (va) manger sur l’herbe  
[Pleo] [Cop] a couple that go:3Pl (go:3Sg) eat:Inf on the grass  
"it’s a couple who are eating on the grass"

p. le couple y sont (est) arrivé pour manger  
the couple they be:Prs-Pl (be:Sg) arrive:PastPart to eat:Inf  
"the couple arrive to eat"

q. i genitori stava (stavano) in pensiero  
the:M-Pl parents be:Pst-3Sg (be:3Pl) in thought  
"my parents were worried"

r. era (erano) svegli  
be:Pst-3Sg (be:3Pl) awake:M-Pl  
"they were awake"

s. [Det] due sposini prepara (preparano) da mangiare in terra  
[Det] two newlyweds prepare:3Sg (prepare:3Pl) to eat:Inf in ground  
"the two newlyweds get ready to eat on the ground"

t. trova (trovano) [Comp] non c’è il pollo  
find:3Sg (find:3Pl) [Comp] not there is not the chicken  
"they find that the chicken isn’t there"

u. [Pleo] [Cop] dottori assai assai, dice (dicono)  
[Pleo] [Cop] doctors much much, say:3Sg (say:3Pl)  
"there were many doctors, they said"

v. “Subito vai vai vai (andate andate andate) a scuola”  
"Quick, go go go:2Sg (go go go:2Pl) to school"

[P] i due, tre figli  
[P] the two, three kids  
"”Quick, go to school” to the three kids"
(40) Agrammatic Tense Substitution: Tensed Verb, Auxiliary, and Modal

a. I can’t (couldn’t) [V]
   “I couldn’t speak”
   English

b. I can’t (couldn’t) speak
   “I couldn’t speak”
   English

c. the man was tired and go (goes/went) to sleep at the office
   “the man was tired and goes/went to sleep at the office”
   English

d. the woman is washing the dishes
   and didn’t pay (isn’t paying) attention
   “the woman is washing the dishes and isn’t paying attention”
   English

e. [DP] pass (passed) out
   “I passed out”
   English

f. [Poss] wife, Rosa, take (took) [DP] [P] Loveladies
   and transfer (transferred) [DP] [P] Hahnemann Hospital
   “my wife Rosa took me to Loveladies and transferred me to HH”
   English

g. [DP] open (opened) the window
   “she opened the window”
   English

h. [DP] moet (moest) [DP] uitsprechen
   [DP] must:Prs (must:Pst) [DP] pronounce:Inf
   “I had to pronounce everything”
   Dutch

i. un personaggio dire (dice) disse (dice): “Sta zitto (zitta)”
   “a character says: “Be quiet!””
   Italian

j. “E’ tardi” disse (dice)
   “It’s late” say:Past-3Sg (say:Pres)
   “It’s late” she says
   Italian

k. che vorrebbe (avrebbe voluto) andare a trovare la nonna
   that would-want:Prs (would-want:Past) go:Inf to see:Inf the grandma
   “(LRRH said) that she would have wanted to see grandmother”
   Italian
(41) Agrammatic Verbal Substitution: Untensed Forms

a. the farmer is driving the truck
   and *carry* (carrying) [Det] corn to the market
   “the farmer is driving the truck and carrying the corn to the market”

b. the burglar is *open* (opening) the window
   “the burglar is opening the window”

c. the couple was *surprise* (surprised) to,
   was *surprise* (surprised) that the basket was open

*d. [DP] [Aux] *drink* (drinking) [Conj] *talk* (talking)
   “I was drinking and talking”

e. ... *pflücken, pflicken* (gepflückt) hat
   ... *pick:Inf, pick:Inf* (pick:Part) has
   “(while the child) was still picking flowers”

f. und gleich [Modal] ein Polizist *fangen* gefangen (gefangen)
   “and the policeman instantly catches”

g. *gefressen* (gefressen) [Aux]
   *eat:Part-Weak (eat:Part-Strong)* [Aux]
   “(that the wolf) has eaten LRRH”

h. im Büro hat [DP] nicht gearbeit[et]
   in+the office has [DP] not work:Part
   und (sondern) schlafen (geschlafen)
   and (rather) sleep:Inf (sleep:Part)
   “in the office he didn’t work, rather he sleeps”

i. weil er nicht noch nicht aus schlafen (geschlafen) *bin* ist
   because he not yet not Particle sleep:Inf (sleep:Part) be:Prs-1Sg be:3Sg
   “because he has not had enough sleep”

j. l’uomo sta posando no *prendere* (prendendo) la sveglia
   the man is putting no *take:Inf* (taking) the alarm-clock
   “the man is putting/taking the alarm clock”
Agrammatic Substitution: Number on Nouns

a. the men (man) was eating
   “the man was eating” English

b. a women (woman)
   “a woman” English

c. [DP] spread [Det] cloth, napkin (napkins), dish (dishes), forks, spoons, [P] two
   “they spread a cloth, napkins, dishes, forks, spoons, for two” English

d. [V] [DP] twee kamer (kamers)
   [V] [DP] two room:Sg (room:Pl)
   “we have two rooms” Dutch

e. waren das Kind immer Blume (Blumen)
   while the child always flower:Sg (flower:Pl)
   “while the child (was still picking) flowers” German

f. [DP] ist in, ist in Gedanke (Gedanken) wo gewesen
   [DP] is in, is in thought:Sg (thought:Pl) somewhere be:Part
   “she is somewhere else in her thoughts” German

g. im Herbst werden die Kukuruz (Kukuruze)
   in+the fall are the:Pl corn:Sg (corn:Pl)
   “in the fall the corn is (put on a truck)” German

h. und stillt (stiehlt) eine (ein) Hühner (Huhn) Hühne (Huhn)
   and steals (umlaut) aF (a:N) chicken:Pl (chicken:Sg) chicken:Pl (chicken:Sg)
  “(the dog stands on both paws) and steals the chicken” German

i. entra nelle case (nella casa), guarda
   enters in+the:F-Pl house:F-Pl (in+the:F-Sg house:F-Sg), looks
   “he enters the house, looks” Italian

j. [Det] acqua [V] sotto (sul) [Det] pavimenti (pavimento)
   [Det] water [V] under (on) [Det] floor:Pl (floor:Sg)
   “the water goes on the floor” Italian

k. il contadino prepara [Det] seme (semi)
   the farmer prepares [Det] seed:Sg (seed:Pl)
   “the farmer prepares the seeds” Italian
Agrammatic Substitution: Number on Determiners

a. *les* (le) tabouret bascule
   *the:Pl* (the:Sg) stool tips
   “the stool tips over”

b. *la il i* il ragazzo sta prendendo i dolci
   *the:F-Sg* *the:M-Sg* *the:M-Pl* the:M-Sg boy is take:PrsPart the cookies
   “the boy is getting the cookies”

c. *il contadino mangia i* (il) granone
   the farmer eats *the:M-Pl* (the:Sg) grain:Sg
   “the farmer eats the grain”

d. *perché i* (gli) uccelli non mangiano [DP]
   because *the:M-Pl* (the:M-Pl) birds not eat:3Pl [DP]
   “because the birds don’t eat the seeds”
(44) Agrammatic Substitution: Gender on Pronouns

a. *sie (es) wollte die kranke Oma besuchen*  
   *she:F (she:N)* wanted the sick grandma visit  
   "she wanted to visit her sick grandma"

b. *es (er) sieht den Wecker*  
   *it:Nom-N-Sg (he:M)* sees the alarm-clock  
   "he sees the alarm clock"

c. *was fragt sie (es)*  
   *what asks Pron:F-3Sg (Pron:N)*  
   "what does she ask?"

d. *le loup demande au [N] où il (elle) va*  
   *the wolf asks to+[N] where he (she) goes*  
   "the wolf asks LRRH where she is going"

e. *elle (il) [CL] a mangé*  
   *she (he) [CL] has eat:PastPart*  
   "he ate her"

f. *elle (il) a sorti la grandmere et la petite fille*  
   *she (he) has take:Part the grandmother and the little girl*  
   "he took out the grandmother and the little girl"
(45) Agrammatic Substitution: Gender on Adjectives

a. à la clinique j'ai subi les examens *divers* (divers) French
   at the clinic I had undergone:PastPart the tests *various:*F-Pl (various:M-Pl)
   "at the clinic I underwent various tests"

b. et Grand-mère comme vous les avez les *grands* (grandes) dents French
   and Grandmother how you them have the *big:*M (big:F) teeth:F
   "and Grandmother, what big teeth you have"

c. sta *zitto* (zitta) Italian
   be:Prs-3Sg *quiet:*M (quiet:F)
   "Be quiet!"

d. gioisce [V] *tutta* (tutto) po' di 'sta roba, gioielli, soldi Italian
   rejoices [V] all:F-Sg (all:M-Sg) lot:M-Sg of this stuff, jewels, moneys
   "(he enters the house, looks,) rejoices seeing a lot of stuff"
(46) Agrammatic Substitution: Gender on Determiners

a. van [P] het de (het) bedrijf
   well [P] the:Sg-N the:Sg-M/F (the:N) company
   “for the company”

b. de dief kwam binnen door de (het) raam
   the thief come:Past in through the:Sg-M/F (the:N) window
   “the thief came in through the window”

c. en [DP] [Cop] in het (de) kamer
   and [DP] [Cop] in the:Sg-N (the:M/F) room
   “and he was in the room”

d. das Kind und ihre (seine) Grossmutter [Cop] wieder normal
   the child and her:F (her:N) grandmother [Cop] again normal
   “so the child and her grandmother were normal”

e. das kleine Mädchen streckt ihre (seine) Hand emport
   the little girl stretches her:F (her:N) hand up
   “the little girl stretches her hand out”

f. ... der Bauer eine (einen) Kukuruz proben probieren
   ... the farmer a:F (a:M) corn test:Inf taste:Inf
   “(still later) the farmer (goes) to taste the corn”

g. auf ein (einen) Lastwagen gegeben
   on a: Acc-N (a: Acc-M) truck put:Part
   “(in the fall the corn is put) on a truck”

h. im Ofen hat die Familie
   in+the oven has the family
   ihr (ihren) Schpuck nein Schmuck und [Poss] Geld versteckt
   their:N (theinM) ‘dewelry’ no jewelry and [Poss] money hide:Part
   “the family has hidden their jewelry and their money in the oven”

i. die (das) Paar,
   the:F-Sg (the:N) couple,
   “the couple (goes on a picnic)”

j. und stilt (stiehlt) eine (ein) Hühner (Huhn) Hühne (Huhn)
   and steals (umlaut) aF (a:N) chicken:Pl (chicken:Sg) chicken:Pl (chicken:Sg)
   “(the dog stands on both paws) and steals the chicken”

k. der das Paar hat der (das) werden night gemerkt
   the:M the:N couple:N has this:Nom (this:Acc) will:Pl/Inf not notice:Part
   “the couple has, will not have noticed this”

l. und der (das) erste Wort [Cop] Scheisse
   and the:Nom-M-Sg (the:N) first word:N [Cop] shit
   “and the first word was shit”
m. *die* (das) Rotkäppchen
   *the*:Nom-F-Sg (the:N) LRRH
   "LRRH"

n. und *die* (das) R sagt: "Zur Oma"
   and *the*:Nom-F-Sg (the:N) LRRH:N says: "To+the grandma"
   "and LRRH says: "To grandma’s"

o. *die* (der) Wolf sagt: "R"
   *the*:Nom-F-Sg (the:M) wolf says: "LRRH"
   "the wolf says: "LRRH"

p. und wie *die* (das) R kommt
   and as *the*:Nom-F-Sg (the:N) LRRH comes
   "and as LRRH comes"

q. *die* (der) Wolf sagt: "Damit ich besser hören kann"
   *the*:Nom-F-Sg (the:M) wolf says: "So that I better hear:Inf can"
   "the wolf says: "So that I can hear better"

r. und *die* (das) R fragt die Grossmutter
   and *the*:Nom-F-Sg (the:N) LRRH asks the grandmother
   "and LRRH asks the grandmother"

s. dass der Wolf *die* (das) R die [N]
   that the wolf *the*:Acc-F-Sg (the:N) LRRH the:Acc-F-Sg [N]
   "that the wolf (has eaten) LRRH"

t. und der Wolf frisst *die* (das) R
   and the wolf eats *the*:Nom-F-Sg (the:N) LRRH
   "and the wolf eats LRRH"

u. und der Bruder hat *eine* (einen) Hocker
   and the brother has *a*:Acc-F-Sg (a:M) stool
   "and the brother has a stool"

v. und wie *ihn* (er) *eine* (einen/ein) Keks [V]
   and as *him*:Acc-M-Sg (him:Nom) *a*:Acc-F-Sg (a:M/N) cookie [V]
   "and he takes a cookie"

w. ... stellt er auf *den* (das) eine [N] [Particle]
   ... puts he on *the*:Acc-M-Sg (the:N) a [N] [Particle]
   "(so that ...) he puts up a scarecrow in the field"

x. der Bauer erntet *die* (den) Kukuruz
   the farmer harvests *the*:Acc-F-Sg (the:M) corn
   "the farmer harvests the corn"

y. und *die* (das) Geld und [Det] Schmuck [V] [DP]
   and *the*:Acc-F-Sg (the:N) money:N and [Det] jewelry [V] [DP]
   "and he steals the money and the jewelry"
z. wie er dann durch das Fenster auf ein (eine) Strasse steigt
   "as he then through the window onto a:Acc-N-Sg (a:F) street climbs"

A. die (der) Mann muss in das Büro
   "the wife says:"Goodheavens!!" and the man must go to the office"

B. und die (der) Wolf frisst die Oma auf
   "and the wolf eats the grandma"

C. je marchais avec le (la) grande canne anglaise
   "I was walking with the:F (the:F) long stick English"

D. et la (le) CR arrive ces entrefaites et frappe aussi
   "and LRRH arrives at that moment and knocks as well"

E. à ces mots le loup bondit sur la (le) CR et mangea
   "with those words the wolf jumped on RRH and ate her"

F. l'image représente un (une) cuisine
   "the picture represents a kitchen"

G. l'autre avec le (la) fenêtre donnant sur la campagne
   "the other (room) with the window opening onto the countryside"

H. la scène montre le (la) maman essuye la vaisselle
   "the scene shows the mother drying the dishes"

I. la (le) pain ou pas (bien) mais
   "bread or else corn"

J. un loubard gratte, décroche le (la) fenêtre
   "a hoodlum scratches, lifts the:F (the:F) window"

K. y fouille les meubles et prend un (une) montre
   "he searches the furniture and takes a:M-Sg (a:F) watch"

L. sta per scivolare sulla (dallo) sgabello
   "the boy is about to slip off the stool"
M. Il ragazzo sta prendendo i dolci
    "the boy is getting the cookies"

N. Allora il contadino è contento per il (lo) spaventapassi
    "so the farmer is happy with the scarecrow"

O. La finestra
    "the window"

P. La marito sta mangiando il latte, il compagnato
    "the husband is eating the milk, the food"

Q. La bambina sono andata a...
    "the girl went to...

R. La lupo scruto (scruta) la bambina
    "the wolf is watching the girl"
(47) Agrammatic Substitution: Case on Determiners

a. I [Cop] flat on the (my) back
   "I was flat on my back"
   English

b. [Pleo] absently slipped the (her) mind
   "it absently slipped her mind"
   English

c. bei den Kinder (Kindern) bin ich zu Hause geblieben
   by the:Dat-Pl children:Nom/Acc (children:Dat) was:1Sg I at home stay:Part
   "I stayed at home with the children"
   German

d. und vor der (den) Satzübungen [wie] [Det] Ausländer
   and before the:Gen-Pl (the:Dat) sentence-exercises [like] [Det] foreigner
   "and before the exercises, like a foreigner"
   German

e. [P] lauter guten gute (guten) Dinge (Dingen)
   [P] nothing-but good good:Acc-Pl (good:Dat) thing:Acc-Pl (thing:Dat)
   "(she had packed a basket for grandmother) with nothing but good things to eat"
   German

f. Hund geht einen (einem) Paar nach
   dog goes a:Acc (a:Dat) couple after
   "(a roaming) dog follows a couple"
   German

g. der Hund stellt sich auf den (die) beiden Pfoten
   the dog puts himself on the:Dat-Pl (the:Acc) both paws
   "the dog stands on both paws"
   German

h. der das Paar hat der (das) werden nicht gemerkt
   the:M the:N couple:N has this:Nom (this:Acc) will:Pl/Inf not notice:Part
   "the couple has, will not have noticed this"
   German

i. dann [Det] Mann von der (dem) Wecker rast
   then [Det] man from the:Nom (the:Dat) alarm-clock rages
   "the/a man is furious at the alarm clock"
   German

j. und R geht in den Wald mit einem (einem) Korb voll Essen
   and LRRH goes in the forest with a:Acc-M-Sg (a:Dat) basket full food
   "and LRRH does in the forest with a basket full of food"
   German

k. da begegnet sie ein (einem) sie eine (einem) Wolf
   there meets she a:Nom-M-Sg (a:Dat) she a:Nom/Acc-M-Sg (a:Dat) wolf
   "there she meets a wolf"
   German

l. [Was] [hat] die Grossmutter für ein (einen) Mund
   [What] [has] the grandmother for a:Nom-M-Sg (a:Acc) mouth
   "What kind of mouth does grandmother have?"
   German

m. und führt ihn mit dem einen (einem) Lastwagon in die Stadt
   and drives him with a:Acc-M-Sg (a:Dat) truck in the city
   "(the farmer harvests the corn) and drives it by truck to the city"
   German
n. ein Hund schnuppert das Backhuhn und er folgt die (den) zwei
a dog sniffs the chicken and he follows the:Acc/Nom-Pl (the:Dat) two
"a dog sniffs at the chicken and he follows the two"

o. einen (ein) Mann grüsst
a:Acc-M-Sg (a:Nom) man greets
"a man is greeting"

p. le premier jour les (mes) souvenirs [Cop] flous
the first day the (my) memories [Cop] vague
"on the first day my memories were vague"

q. [Pleo] [Cop] pour mieux t'entendre l' (mon) enfant
[Pleo] [Cop] to better you hear the:Sg (my:Sg) child
"Better to hear you with, my child"

r. [Pleo] [Cop] [P] mieux [Cl] voir le (mon) ... enfant
[Pleo] [Cop] [P] better [Cl] see:Inf the (my) ... child
"the better to see you with, my child"