APHASIC COMPREHENSION OF FRENCH CAUSATIVE CONSTRUCTIONS

by

Jo-Ann Gendron

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Department of Linguistics
McGill University
Montreal, Quebec

ABSTRACT

Independently proposed linguistic analyses permit us to characterize function words and inflectional morphology as one class. These elements are hypothesized to constitute heads of functional projections. In this thesis, the Head Accessibility Hypothesis is proposed to account for the representations aphasics have of lexical and functional projections. It maintains that, as a consequence of the interactional nature of the modular grammar embodied in the principles and parameters version of Government-Binding theory (Chomsky 1982,1986), syntactic deficits may be due to problems at the level of access to the Mental Lexicon. The implications of this hypothesis for syntactic comprehension in general and for the comprehension of causatives by aphasic patients are tested in a series of batteries administered to nine French aphasics and ten controls. The results support the proposal that the Head Accessibility Hypothesis correctly accounts for the patterns of present and absent linguistic elements in the representations computed by all types of aphasics.

RÉSUMÉ

Les analyses linguistiques nous permettent de caractériser les mots fonctionnels et la morphologie flexionnelle comme faisant partie d'une seule classe. Ces éléments constituent les têtes de projections fonctionnelles. Dans cette thèse, nous proposons l' Hypothèse d' Accessibilité des Têtes pour expliquer les représentations de projections lexicales et fonctionnelles qu'ont les aphasiques. Cette hypothèse soutient que la nature interactionnelle de la grammaire modulaire que constitue la version paramétrique de la théorie du gouvernement et du liage de Chomsky (1982,1986) fait que les troubles syntaxiques pourraient être dûs à des problèmes au niveau du Lexique. Les implications de cette hypothèse pour la compréhension syntaxique des aphasiques en général et plus spécifiquement pour leur compréhension des causatives sont vérifiées dans une série de tests de compréhension de phrases administrés à neuf aphasiques et à dix sujets normaux francophones. Les résultats confirment l' Hypothèse d' Accessibilité des Têtes et supportent les prédictions qui en découlent quant à la disponibilité des items lexicaux et fonctionnels.

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Preface

This thesis examines aphasic comprehension and the nature of the sentential variables that can facilitate or hinder this process. It is divided into the following sections:

Chapter 1 provides an overview of syntactic deficits in aphasia (both productive and receptive). We postulate that previous linguistic accounts, which capture some insights, should in some sense be combined with psycholinguistic approaches that have reached the consensus that some version of a closed-class hypothesis, in which function words and inflectional morphology are considered the loci of processing difficulty, is to be adopted.

Chapter 2 provides the theoretical justification for this approach. Working within a principles and parameters approach, we show that the functional categories, because they entail the creation of additional hierarchical structure, are indeed more at risk in the aphasic condition. We propose a new account of morphosyntactic deficits--the Head Accessibility Hypothesis--which allows us to account for the deficits of both anterior and posterior aphasics. This hypothesis is tested by examining French causatives. In the second section of Chapter 2, we present Rosen's (1989) theoretical analysis of these constructions. Both the faire-inf and the faire-par constructions are described, as is the behaviour of clitics, which exhibit the phenomenon of clitic climbing in these structures.

Chapter 3 is a detailed presentation of the experimental design we adopted to test the Head Accessibility Hypothesis. We discuss the materials we used in an object manipulation paradigm and we describe the subjects tested. In addition, the scoring and statistical procedures we utilized to analyze our data are fully reported.

In Chapter 4, sentence types are divided into relevant sets in order to highlight important contrasts and make the presentation of the large number of results clearer. 'Sentence Contrasts 1' examines various causative constructions which are contrasted with similar structures that contain either the same number of clauses or more; the latter group would be predicted to be more difficult to understand. 'Sentence Contrasts 2' tests the comprehension of pronominal clitics in dative and causative constructions, comparing these results with those obtained with full NP (DP) versions of the same structures. The 'Sentence Contrasts 3' test was undertaken to examine the comprehension of reflexive clitics in causatives, contrasting them with passive full NP sentences, thus testing the theory of Grimshaw (1990) and Rosen (1989) that reflexive cliticization in Romance resembles passivization in its effects on phrasal structure. 'Sentence Contrasts 4' tests possible differences between structures in which hierarchical complexity is a consequence of the argument structure of the phrasal heads (complementation) and structures in which adjunction or coordination is responsible for the additional branching. 'Sentence Contrasts 5' examines only constructions that contain a wh-trace--relatives and cleft objects. These minimally contain two CPs. Some unexpected information was also provided by the control data, in that we found a significant effect for level of education, permitting us to state with some confidence which sentence types are difficult to process and to explain the reasons for this difficulty on theoretical grounds.

Chapter 5 examines each aphasic tested on a case by case basis in order to confirm that the statistically significant results obtained in the group studies did not obscure individual performance.

Finally, Chapter 6 further extends the analyses of the results presented in the two previous chapters, showing that our initial hypothesis was confirmed. In addition, we were able to extend Rosen's analysis of the faire -à construction. We discuss the processing of French causatives in relation to the Head Accessibility Hypothesis. We also make some suggestions as to the generalizability of the Head Accessibility Hypothesis to both the morphological and to the phonological domains. Thus, it is to be preferred to other proposed hypotheses because it cuts across linguistic levels in a principled way, can account for a larger body of data, and is not modality-specific.

Chapter 1- The Explanatory Function of Functional Categories in Aphasia

1.1. Morphosyntactic Deficits

Linguistic aphasiology is an interdisciplinary approach to the language deficits experienced as sequelae to brain damage. From the linguistic point of view, aphasic data as external evidence offers a testing ground for various theoretical analyses. From the point of view of aphasiology, linguistic analyses inform the aphasic condition. There is an increase in explanatory adequacy and theories with real predictive power can be formulated.

Both in aphasiology and in theoretical linguistics, research has too often been anglocentric; however, major new insights have been attained as superficially very different languages have been studied. Analyses of English and English aphasic data have also been vastly enriched as a result. We propose a rigorous study of causative constructions in French, and we will show how aphasic comprehension of these structures allows us to characterize morphosyntactic deficits in a maximally general way.

The two principal syntactic deficits in aphasia are agrammatism and paragrammatism. Agrammatism is a complex language deficit generally found In Broca's aphasics, i.e. patients who have suffered a cerebral accident in the anterior portion of the left, language dominant, hemisphere. A general clinical description of the syndrome is that the patients are non-fluent and tend to produce only major lexical category items--nouns, adjectives and verbs--while omitting function words and inflectional morphology. The syndrome was classically held to be an output disturbance, a deficit in language production only.

Paragrammatism, on the other hand, is generally found in the posterior aphasias--e.g. Wernicke's. The patients tend to be fluent but their speech may lack semantic content due to their production of neologisms and phrasal constructions which do not fit into the overall sentence structure, i.e. selectional and subcategorization requirements are not respected. They are seen as having problems with the major lexical categories. Functional categories do seem to be available to them since they will often correctly inflect their neologistic productions. Posterior aphasics generally have comprehension deficits as well; in some cases these are so severe that they cannot understand single words or participate in the testing of sentence comprehension.

The patterns of retention/loss (misselection) exhibited by aphasics, both agrammatics and paragrammatics (to the extent that there are principled differences between them), will be examined using Government-Binding theory (Chomsky 1982,1986,1989) and attributed to lexical access problems. Psycholinguists Bates and Wulfeck (1989), working from an entirely different perspective, have in fact proposed a version of the 'closed class hypothesis' which attributes morphosyntactic deficits to differential access to open and closed class items in the Lexicon. We feel that this parsimoniously explains the observed phenomena in a wide range of languages.

Due to the importance expressive deficits in aphasia have played in theory formulation and in the generation of linguistic analyses accounting for the patterns of retention/loss (misselection) exhibited by aphasics, we will, in addition to discussing receptive deficits (in the next section), briefly present some of these linguistically based hypotheses. These linguistic hypotheses, at first formulated to account for the production data, were extended to account for (asyntactic) comprehension. In Chapter 2, we will show how the existing theories are inadequate to account for the cross-linguistic data which are now available (Menn and Obler 1990) and we will propose a new hypothesis, the Head Accessibility Hypothesis, which accounts for both production and comprehension in a rather economical fashion. We propose to test this hypothesis by examining French causative constructions. The experimental results will also contribute to linguistic theory by supplying some external evidence confirming Rosen's (1989) analysis of these structures.

1.2. Comprehension Deficits

Bradley, Garrett and Zurif (1980) proposed the functor theory (a version of the closed class theory) to explain agrammatic processing. They posited that the closed class elements normally have a special access route; the loss of this route in agrammatics prevents these aphasics from building syntactic representations. Their work provided a psycholinguistic explanation for locating the deficit in the structure building operations of the syntactic level.

When the syndrome first began attracting the attention of researchers, an untested assumption was that Broca's aphasics were agrammatic in production only. Their ability to arrive at seemingly acceptable interpretations of contextualized verbal material did not challenge the widely held assumption that they have normal comprehension. Berndt and Caramazza (1981), in a review of the syndrome, chronicle the work of Zurif, Caramazza and others in establishing that agrammatics' (and conduction aphasics') ability to correctly interpret center embedded semantically reversible relative clauses of the type:

(1) The girl that the boy is hitting is tall.

was impaired, and that improbable sentences like:

(2) The bird that the worm is eating is blue.

were systematically misinterpreted. The authors postulated that the algorithmic processes of sentence comprehension had been disrupted in these patients and that they relied overly on heuristic strategies to process incoming messages. When semantic constraints and pragmatic real world expectations could not be used to disambiguate utterances, Broca's and conduction aphasics responded randomly.

Heilman and Scholes (1976) also showed that both agrammatics and conduction aphasics could not reliably interpret the following sentences, where word order and grammatical morphemes must be properly decoded for correct interpretation:

(3) i He showed her baby the pictures.

ii He showed her the baby pictures.

vs. iii He showed her baby pictures.

Only (3 iii) is truly ambiguous. The insertion of the in (3 i) and (3 ii) disambiguates the sentences and should provide a structure to which only one interpretation can apply. Berndt and Caramazza (1981) posited on such evidence that the language processing parsing system is at fault, preventing agrammatics from building a normal syntactic representation of the verbal input they receive.

Schwartz, Saffran and Marin (1980) had noted that the syntactic structures with which, for example, Caramazza and Zurif (1976) had chosen to test comprehension were particularly difficult ones. Therefore, in order to establish a lower bound on which syntactic structures could be understood by agrammatics, they chose to test simple transitive reversible sentences such as:

(4) The clown applauds the dancer.

These were contrasted with passives:

(5) The dancer is applauded by the clown.

Their hypothesis was that in English, since grammatical relations are determined in large part by word order, sentences of both types (4) and (5) would be interpreted as having subject-verb-object order (Bever1970), as neither the passive morphology nor the preposition by in (5) would be attended to by the agrammatic.

The authors concluded from their findings that their patients were no longer able to understand semantic notions nor could they map these relations (e.g. Agent, Theme, Goal, etc.) onto constituent structure. Caplan (1983a) rightly pointed out that animacy had confounded their results. Other authors who tested with this paradigm in other languages such as Dutch (Kolk and van Grunsven 1985) showed the same pattern of results, though to a much milder degree[1]. All these results led to agrammatism being considered as a central deficit in which all modalities were seemingly affected by the inability of the syntactic processor to deal with functional elements.

This central deficit analysis was compromised by the fact that case reports surfaced in the literature to the effect that expressive agrammatism could occur without asyntactic comprehension (Miceli, Mazzuchi, Menn and Goodglass 1983). In addition, these kinds of comprehension patterns could be seen in other patient populations without the corresponding expressive deficits (Goodglass and Menn 1985). In a large survey of unselected English and French aphasics, Caplan, Baker and Dehaut (1985) also found that different patterns of comprehension deficits did not correlate with etiology or clinical type (see also Butler, Caplan and Waters 1988). Rather, certain variables related to the sentence types tested did have a determining effect on comprehension, e.g. number of NPs, number of verbs, argument structure of the verb, number of clauses and whether or not a linear order strategy could be successfully employed to obtain a correct response.

Investigations of aphasia in languages with richer inflectional systems demonstrate 1) that aphasics try to compute a VP (see Gendron's (1983) re-examination of Smith and Mimica (1984) on Serbo-Croatian and Hagiwara and Caplan (1990) on Japanese), and 2) that language-specific thematic role orders are preferentially processed. Bates and her colleagues have also found, despite the occasional use of semi-grammatical sentences, that there are no syndrome-specific comprehension patterns. Rather, it is syntactic complexity which best predicts error rates, even in non-brain damaged hospitalized subjects. The main difference is that Broca's aphasics tend to use all available cues to boost their performance while Wernicke's do not seem able to use redundant cues. Grammatical morphemes seem less robust than word order but they are understood significantly better than would be predicted if aphasics had no access to them at all. In fact, their

[1] Whether this effect was due to differences between the subject groups or differences between the languages cannot be fully determined.

comprehension is more problematic than their production; this is no doubt due to perceptual salience.

1.3. The Relation of Comprehension and Production and the Issue of Competence vs. Performance

We will deal with both the above-mentioned issues in the present section because both involve the Mental Lexicon, how it is organized and how information is retrieved from it. In the absence of any evidence to the contrary, it is generally accepted that both comprehension and production make use of the same knowledge base (see Garnham 1985; Frazier 1988; Garrett 1990) Both comprehension and production involve lexical access and the construction of phrase structure The way the Lexicon is organized may be more efficient for one modality than the other, but the same organizational principles nevertheless apply for both. For example, it would aid access during comprehension if words with the same first segments were closely associated in the Lexicon This permits us to process words very quickly, when going from sound to meaning For production purposes, it is not necessary for them to be stored in close proximity, since in production we must go from meaning to sound. However, two phenomena lead us to believe that retrieval is similar for production: 1) Fay and Cutler (1977) have discussed malapropisms, words that share phonological characteristics with intended targets (similar length, sound and stress patterns), and 2) the tip-of-the-tongue phenomenon, i.e. we can describe many formal properties of a word we were not able to retrieve. Garrett (1990) describes the the two modalities as follows:

> In the relations thus suggested between comprehension and production, each system provides an error-checking mechanism for the other. Viewed in this way, the two are closely linked in their functions, and the fact of their similar design seems more inevitable than surprising. (p.166)

This is the case for the normal system. For this reason, we will occasionally discuss aphasic production data where relevant, especially since all the linguistic analyses which have been proposed to account for agrammatism were first formulated to account for production. In addition, what principally concerns us is the structure of the linguistic representations that may increase the processing load.

As long as the central deficit theory of agrammatism could be maintained, one could speak of a loss of the knowledge base or competence. However, not only were aphasiologists confronted by the modality-specific manifestations of syntactic deficits described above but, in tasks of grammaticality judgment, agrammatic patients were found to be sensitive to the closed class vocabulary (Linebarger, Schwartz and Saffran 1983). Zurif (1990) cites work by Rosenberg et al. (1985), who utilized a dual task paradigm to examine the phenomenon known as the 'invisibility' effect. In a text of connected prose, normals were asked to cross out certain letters. They tended to do so correctly for open class items only. The letters in closed class items were not attended to, that is, they did not intrude on conscious awareness. In scrambled texts, the experimental subjects would notice the letters regardless of vocabulary type. Broca's aphasics, on the other hand, always attended to the letters regardless of vocabulary and textual type--normal vs. scrambled. Wernicke's always disregarded the letters in function words regardless of the type of text. Broca's are able to deal with closed class items but we can see that they are not performing as normals do. Obviously, they are accessing these items differently, i.e. less automatically, than they would have done pre-morbidly, but they have not suffered a loss of competence; it is just that their performance has been altered. It is now the general consensus of psycholinguists that we are dealing not with loss but with problems of access. In section 1.5. below, we will see that the linguistic analyses of the syndrome talk of loss of competence--the proposal that we shall develop in Chapter 2 does not--it is a claim about performance. In order to understand the linguistic analyses of agrammatism reviewed in section 1 5., we will first present a brief introduction to some notions assumed within the theoretical framework adopted in this thesis.

1.4. Lexical and Functional Categories in Government-Binding Theory

Recent extensions of X'-theory permit us to incorporate functional categories into the rule schemata first proposed to account for the phrasal structure of the major lexical categories,[2]

i.e. N : [+N, -V] A : [+N, +V]

V : [-N, +V] P : [-N, -V]

(6) X'---> ... X...

X''--->...X'...

(6) maximally generalizes across categories; it captures the fact that the "lexical" category or X^0 projects to the X' or X^{n+1} category which contains the head and the complements of the head. This intermediate level category then in combination with the appropriate Specifier, projects to the X'' or maximal projection level (XP). Ordering information need not be encoded in the rule schemata themselves since the head parameter associated with a particular language, e.g. head-initial for English, head-final for Japanese, will account for the ordering of all complements in relation to each head cross-categorially. Specifiers, however, often seem to be generated in the opposite direction to the complements. The direction in which the complements are attached in the tree is the unmarked theta-role assignment order for a language.

X'-theory and θ-theory are two interactive modules of the principles and parameters version of Government-Binding theory (Chomsky 1982, 1986). The theory has dispensed with the less explanatory and often redundant phrase structure rules of earlier formulations.[3] The interaction of X'-theory and θ-theory (which is concerned with the semantic roles that a lexical item has to assign to its complements) generates a D-

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[2] Further discussion of these categories will be reserved for the first section of Chapter 2.

[3] For those unfamiliar with this framework, we would recommend that they consult an introduction to the theory such as Cook (1988).

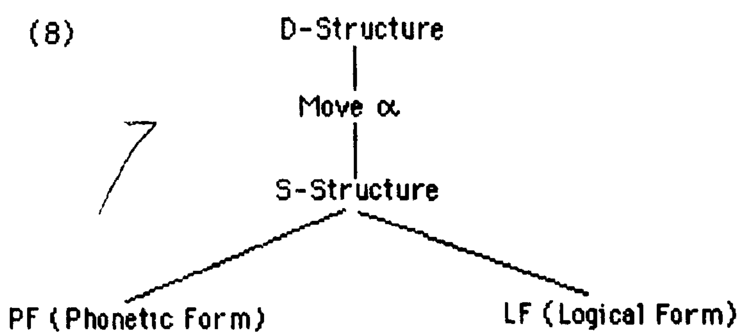
Structure representation of a syntactic string. The old Transformational component has been reduced to one rule, Move α which allows constituents to be moved, subject to certain generalized constraints. For instance, if a NP is moved it must be moved to an empty position which has not independently been assigned another θ-role (this would result in a violation of the θ-Criterion which stipulates that 'each argument bears one and only one θ-role, and each θ-role is assigned to one and only one argument' (Chomsky,1982: 36)). In addition, other elements which can move must be constrained from moving too far; this is handled by Bounding Theory. The need for all overt NPs to be assigned (abstract) Case will often force movement to an empty argument position, since if a base-generated NP is not in a position to receive Case the structure will be ruled out by the Case Filter, which states that structures containing lexical NPs that do not have Case are ill-formed. The fact that empty positions are generated follows from the Projection Principle, which states that:

(7) Representations at each syntactic level (i.e. LF and D-Structure and S-structure) are projected from the lexicon, in that they observe the subcategorization properties of lexical items.

(Chomsky, 1982 : 29)

The model of the syntactic component can be seen as:

(8)



(Chomsky and Lasnik 1977)

Traces of movement remain and may be read off the S-structure representation because they are bound to or form a chain with the moved element. This binding falls within the scope of Binding Theory which deals with the referential relationships between elements and stipulates which combinations of elements, overt and empty, can constitute proper chains; whether through some intrinsic property of their own (e.g. the contrast between anaphoric and pronominal elements) or because of the interaction of this sub-theory with θ-theory or Case Theory (only one θ-role and Case per chain). Finally, another sub-theory of the grammar deals with the subject of infinitivals, which is an empty category called PRO; the postulation of such an element follows directly from the extended Projection Principle, which states that all sentences must have a subject. (In root sentences this may also be accomplished by the insertion of an expletive item such as it or there in sentences like: It rained last night, where it clearly cannot be referential.

Now that we have briefly discussed the relevance of X' theory to lexical categories, we shall present the extensions of the theory to the non-lexical or functional categories (for discussion see Abney 1986, Chomsky 1986, Fukui and Speas 1986, Guilfoyle 1990).[4] In order to capture the parallelisms between the structure of noun phrases and sentences, it has been proposed that these categories should be headed by the functional elements D(eterminer) and INFL(ection) respectively. These 'heads' would then c(onstituent)-select their unique complements NP and VP respectively. In addition, their intermediate bar level may licence a Specifier position. In the case of the Determiner Phrase, this will be necessary to provide an empty position to act as a landing site for the possessor in John's hat, for example. The genitive 's is the head of the DP; John is generated in the NP complement and has to move to get Case. This will account for the word order facts, as in (9).

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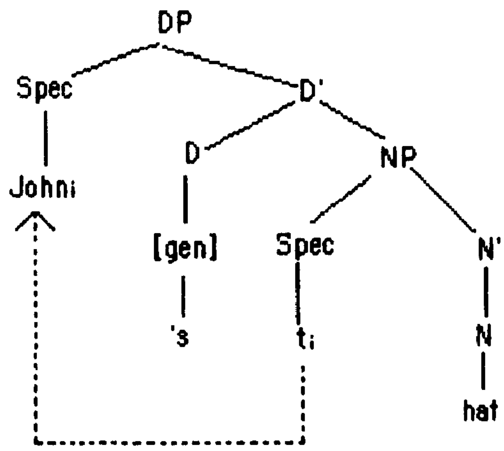
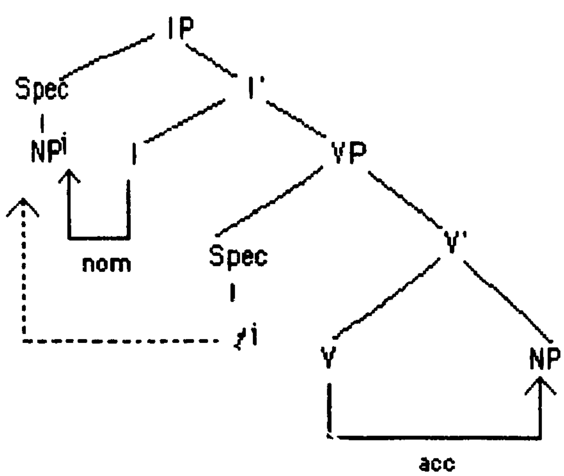
[4] There are some differences among these proposals. However, for the purposes of the present study a compromise position is taken since these differences do not affect the analysis of the aphasic phenomena in this first formulation. Further experimentation will no doubt require taking these differences into account in order to predict specific, and perhaps more subtle, deficits.

(9)



For the same reason, the IP (Inflection Phrase) must also have a Spec(ifier) position so that the NP subject can move to this position from its base-generated position in the VP (assuming the subject-in-VP analysis proposed recently by Koopman and Sportiche (1988)) in order to get nominative Case from INFL through the mechanism of Spec-head agreement (see (10)):

(10)



Note the resemblance between the mechanism for assigning nominative Case in the above tree and that for assigning genitive Case in (9).

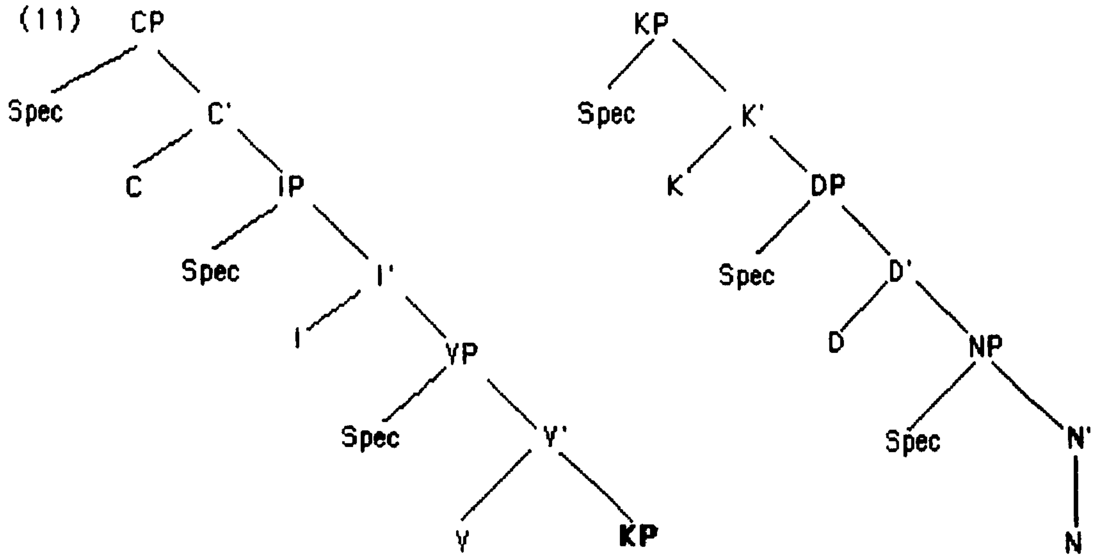
The functional category which selects for IP (the old S) is COMP and the projection of COMP (the old S') will form a CP (Complement Phrase) which is present in all root and most embedded sentences. The Spec of CP furnishes the landing site for wh-words in questions and relatives.

The last category we will discuss is called KP or Kase phrase; this was first proposed by Hale (class lectures) and later discussed by Lamontagne and Travis (1986). It attempts to reduce the Case Filter to an instance of the Empty Category Principle, which states that all empty categories must be properly governed (this is to constrain the proliferation of indiscriminately generated empty elements). K is an empty category and will take a DP complement (which itself takes a NP complement). Being governed by a Case assigner, K will be properly governed and Case features will be transferred to the NP which needs Case.

Note the parallels between CP and KP and also between IP and DP; both of the former take another functional category as complement, whereas the latter both take a phrasal complement that is the projection of a lexical category--VP and NP respectively. (In fact, a transitive VP will also take a functional category as its complement--DP; only NP having an inherently intransitive nature which need not take a complement of any kind (cf. Grimshaw 1990).)

The functional and lexical categories are further distinguished by the lack of semantic content of functional categories; this is captured by the proposal that, although the functional head is the <u>syntactic</u> head of its category, it cannot be the <u>semantic</u> head, which in fact must be the head of its lexical complement. Lexical items are both the syntactic and semantic heads of their maximal projections (cf. Abney 1986). It follows that the generation of a functional head entails the generation of its complement in order to generate its semantic head; this is not the case with lexical categories, where the head is redundantly identified by syntactic and semantic criteria.

(11)



After this brief overview of the model of grammar, we will present the principal theoretical analyses of agrammatism.

1.5. Linguistic Analyses of Agrammatism

As agrammatism has seemed more amenable to linguistic analysis than paragrammatism, attempts have been made to characterize in linguistic terms the pattern of omitted versus retained elements. The reader should keep in mind the anglocentric bias of some of the earlier analyses. Kean (1977,1978,1980) was the first to propose a principled linguistic account--the Phonological Hypothesis. She attempted to show that the pattern of agrammatic retention could only be characterized at the phonological level. She claimed:

(12) A Broca's aphasic tends to reduce the structure to the minimal string of elements which can be lexically construed as phonological words in his language.

(Kean 1978: ex. (19))

The relatively[5] retained linguistic elements would thus consist of phonological words (hereafter P-words), i.e. Ns, As, polysyllabic Preps, and complex words containing just +-boundaries. The relatively omitted elements would be the phonological clitics (hereafter P-clitics), i.e. determiners, auxiliaries, monosyllabic prepositions, and inflectional and derivational affixes, the latter even including the +-boundary ones attached to word-level stems, e.g. the -ive in definitive. Compound words would be considered to contain two phonological words since they contain #-boundaries. Lapointe (1983) took issue with Kean's characterization, arguing that new developments in linguistic theory, especially the increasing importance of the morphological sub-component in generative grammars, no longer supported Kean's analysis. Lapointe hypothesized that the deficit was at the morphosyntactic level:

(13) A morphosyntactic description of agrammatism

> The relatively retained elements in agrammatism are those stem-level items (of major categories) that are inserted into morphosyntactic structures during lexical insertion.
>
> (Lapointe 1983 : 24)

This concentrated attention on the loss of the inflectional elements. Recall that these hypotheses are neutral between production and comprehension since Kean and Lapointe subscribe to the central deficit theory. Those elements relatively omitted in production would not be available in the input string of a comprehension task; therefore deficits would be due to their being uninterpreted.

Various other hypotheses were advanced to account for why the syntactic level is the appropriate one at which to characterize the deficit. Caplan (1983b) puts forward the

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[5] This use of the imprecise term ' relatively' is characteristic of the field and is intended to account for the variability seen in aphasic performance. In some ways, we can see that, though these analyses are presented as theories of agrammatic competence, this 'variability' means that they are really theories about performance.

Lexical Node Hypothesis, which states that only linear sequences of major lexical category nodes are created and interpreted with respect to thematic roles. The Lexical Node Hypothesis states that:

> a. The syntactic representation available to agrammatics is the lexical category information of open-class items, i.e. the syntactic labels N, V, A are retrieved during the process of lexical identification when these words are accessed from the Mental Lexicon.
>
> b. The only supralexical category information available is retrieved at the same time and is constituted of the subcategorization frames which form part of the lexical entries.
>
> c. These supralexical nodes may be more or less available according to a "depth" analysis by which the first nonlexical nodes to be recovered are those immediately dominating lexical category nodes; more deeply embedded structures would only reemerge or be reacquired later, in proportion to their nodal distances from lexical category nodes.
>
> (Caplan 1983b: 186)

This is clearly a bottom-up approach. Grodzinsky (1984,1990) offers a different structural account, positing that non-lexical nodes are in fact created but that their phonological content is misselected from a list of category-appropriate items. He proposed this hypothesis for Hebrew data which could not be accounted for by Kean's analysis. Hebrew patients do not omit elements rather, they misselect the vowel tier which comprises the inflectional infixes to the consonantal root. Though the Hebrew data do not constitute counterexamples to Kean's hypothesis, since without the inflectional head there would be no 'phonological word', Kean cannot explain the misselection of elements, as in (14):

(14) salos milim... lo...slosa milim ve-'erba 'a ne'elam

(Three(F) words...no...three(M)(sic) words(F)(sic) and four(M) disappears(Msing.))

(Grodzinsky 1984 : 104)

Grodzinsky hypothesized that, in languages where lexical items depend both morphologically and phonologically on the inflection, a non-word or illegal phonological string can never be produced, so misselection often occurs (which is also typical of paragrammatism). He claimed that in Russian and Italian, where major lexical category items are morphologically but not phonologically dependent on inflection, i.e. an uninflected stem is often a non-word but is pronounceable, misselection rather than omission by agrammatics is also predicted:

(15) Russian:

Osjen pered zimji

(Fall before winter (wrong case))

(Tsvjetkova and Glosman (1978) as quoted by Grodzinsky 1984: 105)

In Grodzinsky (1990), the agrammatic is predicted to produce a string which is underlyingly a complete articulated tree, with all lexical and non-lexical nodes. Then a pruning operation occurs which will delete all non-lexical terminals and all governed prepositions (p.106). This seems extremely counterintuitive and he must arbitrarily stipulate the behaviour of specific prepositions. (We shall propose a principled account for this pattern of retention in Chapter 2.) Grodzinsky cannot account for the main verb omissions reported in the literature. Miceli, Silveri, Villa and Caramazza (1984) have hypothesized that the production of a verb entails the production of its arguments and necessitates a mapping of these elements onto syntactic structure, especially in configurational languages. Goodglass (1976), reporting on the results of testing eight agrammatic patients with a Story Completion paradigm, stated that the combination verb+object was much more stable than subject + verb, i.e. subjects were omitted more often than objects. He contended that patients had difficulty crossing the constituent boundary between the verb phrase and the subject noun phrase.

In dealing with the comprehension data, Grodzinsky has proposed the following:

(16) The Trace-Deletion Hypothesis:

The S-structure representation underlying agrammatic comprehension lacks traces. In interpretation, a Default principle is invoked that is defined as follows: If a lexical NP has no theta-role (that is, it is in a non-thematic position), assign it the theta-role that is canonically associated with the position it occupies, *unless* this assignment is blocked. In this case assign it a role from the next lower level in the Thematic Hierarchy.

(1990: 97)

Crucially, a fully elaborated tree is constructed and interpretive problems arise from difficulties in chain formations since the end or tail of the chain has been deleted. In a passive, for example, the Default Principle assigns the displaced Theme the Agent theta-role and Grodzinsky assumes that Agent is structurally assigned to the object of the preposition. He predicts that all sentences containing two Agent theta-roles will be responded to at chance levels. In a reply to Grodzinsky, Travis (1983) advances a more parsimonious account of aphasic disruptions in general, locating the impairment in the Lexicon. Her proposal differs from Lapointe's in that Lapointe allows stems to be stored in the Lexicon, retrieved and inserted into syntactic structures, while Travis claims that whole words are stored in the Lexicon, with misselection accounting for incorrect insertions into syntactic structures.[6]

---

[6] Both Grodzinsky and Travis are in agreement that only morphologically legal words of a language will be produced. However, the case of the Ndebele agrammatic (Traill 1970) may be said to provide counter-evidence to this claim. Ndebele is a Bantu language which has an elaborate system of prefixation. The patient produced both forms with incorrect prefixes affixed to stems to which they are never attached in normal language and also zero-morph prefixes which left a bare uninflected stem. All these forms are non-words in the language. For example, for the correct form u+nogwatsha

The postulated non-lexical nodes hypothesized by Grodzinsky are retained although they are left unspecified and lexically unrealized. In addition, Travis incorporates Rizzi's (1985, originally proposed in 1980) suggestions to incorporate θ-theory into Kean's analysis.

Agrammatics have been considered to have intact semantic capacities. Rizzi discussed a tripartite division of θ-assigners, θ-assignees and elements not within the scope of the module. His claim is that θ-assigners (heads of phrases, etc.) and θ-assignees will be retained in agrammatism. Most θ-assignees are NPs and as such are not distinct from Kean's P-words. It is in her P-clitics that a different subdivision of the data will be found. For example, to in I gave the book to Mary assigns or participates in assigning the Goal theta-role to Mary but to the infinitive marker is not a θ-role assigner; according to Rizzi, the former is expected to be retained while the latter would not. (In fact, neither is retained, which is what Travis correctly predicted). In the light of this criterion, predicates, i.e. predicate nominals, adjectives and verb phrases, would also be expected to be retained as they assign a theta-role through predication. Modification relationships such as are entered into by attributive adjectives would not be expected to be available to agrammatics (this has indeed been demonstrated in Kolk (1978)).[7]

This analysis (which was extended to include bound P-clitics in Gendron (1986)) cannot explain the phenomenon of verb omission. Travis convincingly showed that the Lexical Node Hypothesis was too strong, as the subject could not receive a theta-role [8] since theta-roles are assigned under government, not by linear precedence relations. Some phrasal nodes

---

(rabbit), he produced such forms as i+gwatsha, um+gwatsha (both i+ and um+ are different class prefixes from the correct u+) and ø-gwatsha.

[7] If we accept Grimshaw's (1990) and Higginbotham's (1985) analysis of modification, i.e. that the external arguments of both the modifier and the noun are identified and jointly satisfied, this mutual operation may be twice as costly. In addition, the structure of the phrase would be more complex.

[8] This has been somewhat weakened by the subject-within-VP hypothesis, which does not require that that θ-role be assigned compositionally. However, the Agent θ -role still cannot be assigned within the first projection of the verb.

must be available (e.g. an intermediate projection). There is a convergence of opinion that the grammatical description at the sentential level is crucial in characterizing the syndrome from a linguistic point of view.

One last proposal we will discuss is that of Ouhalla (1990) who makes the claim in (17):

(17) In agrammatic speech functional categories fail to project in terms of X-bar structures.

Their occasional presence would be due to their being adjoined to the unordered projections of lexical categories. This characterization is not supported by the data. It is not descriptively adequate, and it does not take into account main verb deletions since it assumes that all structures are projections of the predicate. In addition, it cannot speak to the differential presence of inflectional morphology in non-English and English speaking aphasics since it predicts that any inflectional morphology that is present is aberrantly base-generated in the lexicon. Thus, the fact that English agrammatics appear more impaired cannot be accounted for. He would therefore be predicting that the more 'normal' an utterance appears, the more aberrant is its representation. (This is not seen in the production data of non-English aphasics; see Menn and Obler 1990.) He also claims that agrammatics exhibit word order problems, citing studies of languages which show V2 effects, i.e. languages in which the verb moves to INFL and COMP--both functional heads (e.g. German and Icelandic). However, he is misrepresenting these studies. Stark and Dressler (1990) explicitly maintain that there are very few word order problems in German agrammatics. The verbs in the aphasic data do not occur in second position because they are not tensed; they are either infinitives or participles and thus are correctly ordered sentence-finally. The authors presuppose that there may be missing auxiliaries, which, in the case of the sentences containing participles, would be the tensed elements in second position. In Icelandic, the data is much the same and the authors cited by Ouhalla, Magnúsdóttir and Thráinsson (1990) never even discuss word order. This hypothesis may appear to be a mirror image of Caplan's, but Caplan's Lexical Node Hypothesis can at least correctly account for the word order facts while Ouhalla's cannot. Since he assumes that all parametric variation is accounted for by languages' functional categories and that the VP encodes dominance but not precedence relations, he cannot explain the following data. in Serbo-Croatian (Gendron's (1983) reinterpretation of Smith and Mimica (1984) and in Japanese (Hagiwara 1988), it has been demonstrated that aphasics try to create a VP, i. e. the initial projection of the verb and its argument. A language's direction of θ-role assignment appears to be resistant to brain damage and seems to be encoded with the lexical categories. However, the interaction of the extended X-bar theory with θ-theory requires that some hierarchical structure be assigned since θ-roles are assigned under government, which is a structural relation which holds between a head and its complement. The evidence cited above also demonstrates that Caplan's hypothesis must be revised, since some phrasal categories must be available.

Cross-linguistic work by Bates and her colleagues (1987a, 1987b, 1988, 1989) in English, German and Italian has convincingly shown that aphasics (both anterior and posterior) can construct well-formed sentences in canonical word order (we might say, in thematic role order). Both German and Italian have considerably more closed class items to contend with, i.e. inflectional morphology, yet these are produced with greater frequency than we would expect on the basis of the English literature. Hypotheses such as the Lexical Node Hypothesis or Grodzinsky's hypothesis cannot account for the better retention of inflectional morphology by speakers of languages other than English. We will claim that these elements are produced not only to maintain morphological well-formedness but also because they redundantly encode information; they involve the interaction of several modules of the grammar, which may give the aphasic a better chance of reaching his target. In addition, Bates et al. found that misselection rather than omission was characteristic of both agrammatics and paragrammatics. It seems that the theoretical distinction between these two classes of aphasics is becoming blurred.

In the next chapter, we will present a hypothesis which we feel correctly predicts the retained versus missing linguistic elements. It accounts for both production and comprehension data and generalizes to all classes of aphasics. We will also discuss a particular syntactic construction, the French causative, which allows us to test our hypothesis.

Chapter 2- The Head Accessibility Hypothesis and the Testing of French Causatives

2.0. Introduction

Having described aphasics' syntactic deficits as well as some of the linguistic analyses which have been proposed to account for their observed behavior in the previous chapter, we will now propose an alternate hypothesis which we believe demonstrates both descriptive and explanatory adequacy. One of our main criticisms of other hypotheses was quite simply that they failed to account for the data and made wrong predictions. The first section of the present chapter will be devoted to a detailed elaboration of our account. We will discuss implications for aphasiological production and, more importantly for our present purposes, comprehension. Further, we will discuss a particular structure in French,the causative, which will permit us to test our claims. In Section 2, the linguistic analysis of French causatives which we will be assuming in this thesis is presented in some detail.

2.1. Section 1.

2.1.1. A New Account-The Head Accessibility Hypothesis.

The notion or construct head plays an important role at all levels of the grammar. As the head of a structure, an item acquires structural prominence and is consequently more likely to be considered salient. In order to account for the (relatively) retained and omitted items in data from aphasics, the following hypothesis is proposed :

(1) **The Head Accessibility Hypothesis (HAH)** :

The categorial properties of a head and its subcategorization requirements will determine whether or not the head (and its projections) is accessible to the aphasic.

Saliency is an ill-defined concept. The semantic saliency of the imageability of items from the lexical categories affects the ease with which we can access lexical items from the Mental Lexicon. Inevitably, the more features that an item possesses - and these may be grammatical features in the case of a functional item - the more salient it will become. This additional "meaningfulness" will render it more salient; if this is coupled with structurally defined saliency -- i. e. being a head of a phrasal category--the HAH will predict an increased success rate for accessing the functional item. The hypothesis in (1) is a claim about processing, i. e. lexical access and phrase building, or performance, and not a claim about loss of lexical knowledge, or competence. This must be so to account for the attested variability both between patients (severity level within a clinical type) and within a single patient across tasks--production, comprehension, and grammaticality judgements - or even within the same task across testing sessions (see the work by Bates and colleagues which also advocates this view). In other words, we are assuming relatively intact competence but impaired access to that competence. The HAH attempts to characterize those aspects of linguistic representations which are associated with impaired access procedures.

Since what the HAH claims is that access is a function of the categorial properties of items which may act as heads, and the complementation these heads require, we can see that this will help us to define what constitutes structural complexity. This issue will be discussed at length in Section 2.1.2. We will see that anterior aphasics are particularly sensitive to structural complexity at all levels. Therefore, the less structure accessing an item requires the better. Anterior aphasics also greatly benefit from items which are more salient; therefore, the more features an item has the better. The HAH does not, however, rule out the possibility that certain deficits may affect a particular category (regardless of complexity). We speak in particular of posterior aphasics. It is well known that some cases of anomia are restricted to access problems with nouns, and Wernicke's aphasics too are known to have difficulties with the referential uses of words, particularly nouns (see also Linebarger (1989: 203) for a similar argument). Thus, posterior aphasics have a double problem in that, as more structure needs to be built up for a representation, their problems with semantics and reference interact with structural complexity. (In a case study, Caramazza & Miceli (1991) demonstrate that, though a fluent patient could access nouns and verbs with the appropriate inflectional morphology when processing single words, in sentential stiuctures he could not properly assign thematic roles in morphologically ambiguous, semantically reversible sentences.)[1]

2.1.2. Predictions of the HAH for production as a consequence of structural complexity

Structural complexity will be defined rather simply as the creation of additional hierarchical structure. This hierarchical structure is a direct consequence of particular categories' requirements for integration into a well-formed string. We will examine the categories in turn, beginning with the lexical categories and then discussing the functional ones.

A. Lexical Categories:

Nouns, which you will recall from Chapter 1 are [+N, -V], are more accessible than all other categories because only Ns need not take a complement but may have the structure in (2):

```
(2)          NP
             |
             N'
             |
             N
```

The external argument of the N (R) is satisfied by reference. However, if a NP does take a

---

[1] Category-specific types of impairments are not unusual in aphasiology. There are, for example, category-specific semantic impairments within a circumsribed semantic field. The population mostly affected by these is again made up of posterior aphasics.

complement, it has a thematic role to be discharged and its structure will be more complex and more difficult to build than that in (2) above, witness (3):

```
(3)          NP
              |
              N'
             / \
            N   PP
```

According to Higginbotham and Speas (Speas 1990), only nouns do not normally have event positions in their theta-grids. This may make them conceptually simpler. Presumably, certain derived nouns would have an event position and these Ns may be more difficult to process for this reason (though it should not be forgotten that the item would also be morphologically more complex).

The fact that retrieval of nouns is easier than retrieval of all other categories is attested copiously in the aphasiological literature. (See Zingeser and Berndt (1990), for instance, for English data and Tzeng, Chen and Hung (1991) and Bates, Chen, Tzeng, Li and Opie (1991) for Chinese.)

Adjectives, as [+N +V], are the only other [+N] categories. In English. Both adjectives and nouns take PP complements rather than the complements headed by functional categories that verbs must take (this will be discussed below). As was discussed in Chapter 1, adjectives are more accessible than verbs. However, Rizzi (1985) predicted and it has been shown empirically that predicate adjectives are preferentially produced while modifiers are less so (for some empirical confirmation, see Myerson & Goodglass (1972) and Kolk (1978)). The HAH predicts this because the adjective is the head of the structure when used predicatively but not when used attributively:

Predicative Use of Adjective (the copula is not produced):

Small clause AP:

```
(4)            AP
              /  \
           Spec   A'
             |    |
            NP    A
```

Modification Use of Adjective:

```
(5)            NP
              /  \
           Spec    N'
             |     |
            AP     N
```

The A, as the head of the structure in (4), is readily available. The noun is accessible as well because of its referential properties, [2] even though it makes the structure of the AP more complex. In the structure in (5), the N is the head and the A is only the head of the AP in Spec position. Thus, the Adjective is structurally more prominent when it is used predicatively.

Of the three major lexical categories, the verb [-N, +V] creates the most structurally complex phrases. Verbs have at least one argument. We adopt the subject-within-VP hypothesis

[2] This is true for all but paragrammatics, as discussed above. They may not retrieve particular nouns though structurally they are capable of neologistic creations that act as NP placeholders.

(first proposed by Koopman and Sportiche (1988)). This is now generally accepted (Chomsky 1992). Prior to this analysis, the NP subject was considered to be base-generated in Spec of IP (more about IP below); now it must simply move to this position in order to be assigned nominative Case. Examples of the structures of the two different kinds of intransitive VPs (i.e. unergatives and unaccusatives) are provided in (6) and (7) :

Intransitives:

Unergatives: (6)

```
     VP
    /  \
 Spec   V'
   |    |
  NP    V
```

Unaccusatives: (7)

```
   VP
   |
   V'
  /  \
 V    NP
```

Only one projection of the V branches, either VP or V" in (6) or V' in (7). [3]

A more complex structure is required for transitives since both the VP and the V' must branch to accommodate the verb's two arguments, as in (8):

Transitives:

2-place arguments (8)

```
      VP
     /  \
  Spec    V'
   |     /  \
  NP    V    NP
```

[3] It may be the case that some aphasic utterances which seem to exhibit word order errors are in fact base-generated unaccusatives. This possibility will be explored in future work involving production tasks.

Note that for both intransitives and 2-place-argument transitives the structures are interpretable as VP small clauses. Aphasics may be said to be producing lexical small clauses when they are unable to produce fully elaborated sentential structure. (A similar analysis for children's utterances has been proposed by Radford (1990).)

A verb taking an additional Goal argument will involve more hierarchical structure than the simple transitive of (8), witness the structure in (9):

3-place arguments (9)

```
              VP
             /  \
         Spec    V'
          |     /  \
          NP   V    V'
               |   /  \
               e  NP   V'
                      /  \
                     V    PP
```

This structure (adapted from Larson (1988) by Speas (1990)) requires the V to move to the empty verbal head in order to assign accusative Case to the Theme. This verb displacement is assumed to increase processing cost.

That these types are in fact more difficult to process has been reported in the literature. For example, in Hungarian (MacWhinney and Osmán-Sági 1991), Broca's aphasics have a tendency to omit the Goal argument and Wernicke's the Theme. Presumably, the aphasics can only generate one verbal head and one of the two arguments. They may be unable to generate the empty verbal head and the other argument. Miceli and Mazzuchi (1990) also discuss the tendency of their Italian Broca's patients to generate structures with missing Goal arguments. These results suggest that the two aphasic groups differ systematically in one respect, i.e. in the nature of the available argument; Wernicke's always have a tendency to produce more oblique forms.

Verbs taking infinitival complements are more complex than the forms discussed above but less complex than those taking tensed clauses, for reasons which will be made clearer below. Infinitival complements are produced more often by aphasics than tensed clauses (Menn and Obler 1990).

Prepositions, like verbs, are [-N]; unlike verbs, they are also [-V]. This lack of a + feature seems to capture the fact that, although a P is a lexical category, it is considered a minor one. In addition, although the P takes a NP argument, the PP itself can be either the complement or the argument of another lexical category, e.g. of N, A or V, or it may be an adjunct phrase. It is predicted that, as true adjuncts may not be present at D-structure (for a given sentential structure) (Lebeaux 1988; Speas 1990), adjunct PPs are more likely to be retained because individually they are not overly complex see (10). Argument PPs, because they are governed by a lexical category and within its projection, are likely to be omitted. (See Grodzinsky (1990) and Canzanella (1990) for confirming evidence.)

```
(10)        PP
           /  \
          P    NP
```

B. Functional Categories:

In general, functional categories will be less accessible because of the extra structure they require. They have low semantic content; this is reflected in the fact that, although they head their own projections, they require the accessing of their semantic heads as well. Their semantic heads are those of the lexical categories which are their complements.

B.1.1. Determiners (DPs)

As Radford (1990) mentions, evidence for a D-system is found with the presence of the referential/quantificational determiners such as a, the , this, that, some, all, etc. As well, there are the possessive determiners 's, my, etc., as well as pronominals I, they etc. Unlike the lexical categories, functional categories are not theta-assigners; rather, they are theta-binders. For example the, in combining with a common noun, will merge or theta-identify its restricted property position with the referential argument position of the noun; these positions will thus be jointly discharged. This operation is a combination of merger and discharge and is therefore more complex than either of the simplex ones alone. (See Speas (1990) for further discussion.)

```
(11)        DP
            |
            D'
           / \
          D   NP
              |
              N'
              |
              N
```

Note that the DP takes the preferentially processed NP as its complement.

Recall that the HAH claims that a head's features can aid retrieval. This is somewhat similar to the notion proposed by Bates and her colleagues of cue validity --i.e. the information load of a given item-- which they use to predict successful retrieval. Within a given language, the number of features included in the determiners will increase their chances of retrieval.

Determiners in languages such as German, where they contain information about gender, number and case, are produced more reliably than determiners in Italian, which lack case, though the latter are produced more often than the corresponding forms in English, which also lack gender and number features. The definite article the may thus only have a [+def] feature. In addition to rewriting as an article, the D node in English may alternatively rewrite as the possessive 's, i.e. as [+gen]; in this case, the structure would be as in (12) and the word order facts would be explained by a movement operation.

Genitives:
(English) (12)

```
          DP
         /  \
     Spec    D'
       |     / \
    NP_i    D    NP
            |   /  \
           's Spec  N'
                |    |
               t_i   N
```

The additional structure needed to create a landing site for the movement of the possessive phrase from Spec of NP to Spec of DP may not be available due to the increased processing cost such additional branching structure entails at both NP and DP levels. Alternatively, we could see the difficulty as arising because of the creation of a chain. It is assumed that any chain with two (or more) members, i.e. a head and a tail, is structurally more complex than a one-member chain. Since, by definition, a chain consists of one θ-role and one Case, then a lexical category which is base-generated and receives a thematic role and Case constitutes a chain.

B.1.2. Evidence of DPs in Aphasic Data

Articles are generally omitted by English agrammatics (Marshall1977) However, work by Bates, Hamby and Zurif (1983) shows that they can still lexicalize, in pragmatically appropriate ways, given or new information contained in three-picture scenarios in which one subject (or action) remains constant and one object (or action) is variable. Broca's aphasics performed appropriately by producing the definite article when referring to the given information but not when referring to the new. They enumerated the new information and only mentioned the given information once. (The Wernicke's, on the other hand, were not as sensitive to the given-new distinction.) The D node in these cases would be marked [+ def] and it would be expected to increase its "semantic" content (as opposed to a, which is [- def]). There is much evidence from other languages that if a ø-morph is not a viable default choice, then the determiners are more likely to be produced if they encode additional grammatical features. In French, where the category encodes definiteness, gender and number, the definite article is very often produced (e.g. Tissot, Mounin and Lhermitte's (1973) syntactic agrammatism, see also Feyereisen 1985, Farrell 1985, and Jarema and Kehayia 1990). In Italian, Bates et al. (1987a) found the same easier access to the category of determiners even though their presence is more redundant than in French since, in Italian, Ns are overtly marked for number and gender. In German and Greek, where it also encodes case information, Bates et al. (1987a) and Kehayia (1990), respectively also found that the article was produced more frequently than it is in English.[4]

The structure described in (12) (and ex. (9) in Chapter 1) helps us to explain the omission or presence of this case. In English, the genitive marker is found under the [+gen] D node; for a noun like John in 'John's hat' to get Case, it must move from NP-internal position into the Spec of DP. This movement creates potential problems, e.g. is the landing site available? This is the reason for the differential rate of production of the plural and the genitive, with the plural being more reliably produced than the genitive; regardless of whether we assume that the plural marker is attached in the Lexicon or within the NP itself, it is clear that the genitive involves a movement operation in English.[5] Contrast this with the consistent production of this form by German agrammatics reported by De Bleser and Beyer (1988), as well as the production of this form by a German transcortical motor aphasic who produced no other evidence of hierarchical

[4] Though the incorrect article was sometimes produced, agrammatics in both these studies generally erred in the value for only one feature, i.e. case or gender or number.

[5] Still, the genitive is produced more consistently than the homophonic third person singular present tense marker.

structure than well- constructed DPs (De Bleser et al. 1990). According to Giorgi and Longobardi (1991), the comparable German prenominal genitive is lexically restricted and the form is attached in the Lexicon; thus there is no movement operation. For severely afflicted agrammatics, the noun phrase (NP/DP) may be the most complex structure possible. Agrammatics might be considered to exploit the referential uses of nouns.

On the other hand, paragrammatics with their word finding difficulties seem particularly impaired with nominal forms. This follows from the HAH because it is precisely the categorial status of [+N] or the nominal head that makes it difficult to access. In a longitudinal study of production data, Butterworth, Panzeri, Semenza and Ferreri (1990) showed that a patient's recovery was only demonstrated by a reduction in errors in article use, which also corresponded to a decrease in the production of neologisms.[6] Thus, as the functional category which may inherit the feature [+N] from the noun (see discussion of Abney's (1987) Inheritance Principle cited in Radford (1990: 269)), the Det and DP are also at risk in paragrammatics. They have specific problems with reference. For additional evidence that they have problems with DPs, we note that, in comprehension, Luria's (1975) famous test of logico-grammatical relations which necessitated understanding the difference between brother's father and father's brother was only successful with the anterior aphasics, the posterior or 'semantic' ones being unable to comprehend the construction.

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6 That neologisms are predominantly caused by attempts at noun production can also be seen in an English patient, Mr. V., studied by Edwards and Garman (1988), as reported in Garman (1990).

B.2. Kase Phrases (KPs):

As we saw in Chapter 1, KP or Kase-Phrase was first proposed by Hale and later discussed by Lamontagne and Travis (1986). As was shown earlier, it attempts to reduce the Case Filter to an instance of the Empty Category Principle. K takes a DP complement, which itself takes a NP complement. Being governed by a case assigner, K will be properly governed and Case features will be transferred to the NP, which needs Case, as all NPs do.

```
(13)          KP
             /  \
          Spec   K'
                /  \
               K    DP
                    |
                    D'
                   /  \
                  D    NP
                       |
                       N'
                       |
                       N
```

Note that the production of a KP, a functional category, requires that of another functional category, i.e. DP. This leads one to predict that KPs are more vulnerable than DPs. However, we would also predict that if a language realizes (overt) case, rather than just assigning abstract Case as in English, this would lessen the processing cost; in comprehension, for example, the overt marking would act as a local cue to grammatical functions, thereby putting less demand on short-term memory capacities. If in addition, Case is realized as a suffix, affixal requirements will lead to inproved retrieval. In fact, in languages like Hungarian (MacWhinney, Osmán-Sági 1991) and Turkish (Slobin 1991), case endings are more often either produced correctly or substituted than omitted. (Broca's aphasics substitute citation forms and Wernicke's more oblique forms). Further intrinsic properties of these heads account for differences in availability in Turkish and Hungarian; in Turkish, case endings are both syllabic and stressed and are more often produced than the equivalent forms in Hungarian, which do not share these properties.[7]

B.3.1. Inflectional Phrases (IPs)

Evidence cited to show the presence of an I-system in English, for example, includes the following: infinitival to, modal, aspectual, copula, and dummy auxiliaries (Radford 1990: 276). IPs take VPs as their complements. They also have a Kase feature-- nominative-- to assign to the sentential subject. Whether the NP (DP) is in Spec of VP or in the complement position of unaccusatives and passives, it must move to Spec of IP to get case. Can the structure with its empty I-position be computed to act as a landing site? Presumably, if the limited resources of the aphasics have not been depleted by an overly complex structure elsewhere, such a position may be available. In terms of production, the approach taken here is strictly bottom-up, [8] i.e. we assume that the predicate is lexically accessed and that a small clause VP may be formed. Then, if inflectional elements can be accessed, this supra-structure can be constructed. For an example of the structure of a

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[7] In order to simplify the presentation of the lexical categories, we abstracted away from Kase phrases, etc., but it should be noted that, for the Theme of the 2- and 3-place transitives, as well as for the complement of the preposition, the structure should be a KP and not simply a NP. The other NPs must be assigned case by Inflection.

[8] A similar structure building approach is taken in Guilfoyle and Noonan (1988).

simple sentence containing a transitive verb, i.e. where the I has selected a 2-place VP complement, see (14):

2-place VP complement:

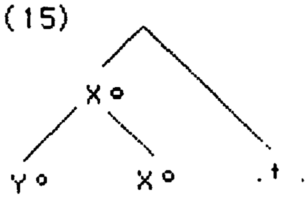
```
(14) IP
      / \
   Spec  I'
        / \
       I   VP
          / \
       Spec  V'
        |   / \
        DP V   KP
        |     / \
        D'  Spec  K'
       / \       / \
      D   NP    K   DP
          |         |
          N'        D'
          |        / \
          N       D   NP
                      |
                      N'
                      |
                      N
```

There are additional assumptions regarding phrase structure which involve INFL. This element is characterized by a feature complex which includes Tns (Tense) and Agr (Agreement). If we take the concept of binary branching seriously (i.e. a node X^n immediately dominates only two nodes, usually an X^{n-1} and Spec or YP, depending on the value of n), it was inevitable that a proposal such as Pollock's (1989) would be made. Pollock claimed that, to account for the word order facts of French, INFL instead of being treated as an amalgam, should be elaborated into at least two maximal projections --a TP

(Tense Phrase) and an AgrP (Agreement Phrase),[9] with AgrP being the complement of TP. In addition, to account for what in older versions of the theory was called Affix Hopping, auxiliary and main verbs in French (as well as in many other languages with a strong Agr) are claimed to move to [+finite] I (or T) to pick up inflection. This would be an instance of Head movement (X^0) (head to head movement). French infinitives and past participles would move to Agr or remain in their base-generated VP positions. In English, only auxiliary have and be would move to I, whereas main verbs could only receive Tns by having I lower onto the verb; this kind of movement is considered more marked. Infinitives and the present progressive may not move in English. The reason that main verbs cannot raise in English reduces to theta-theory in that, if the verb is a theta-marker, it must be able to transmit this ability via the trace. If Agr is strong, it will be transparent and allow the transmission, if it is weak, as in English, it will be opaque and prevent the transmission of the theta-role, resulting in a Theta-Criterion violation Finally, modals are generated in INFL in English (cf Chomsky 1989) but not in French, where movement of V to I is necessary.

For those languages in which verb movement is possible, the structure of the verb will be:

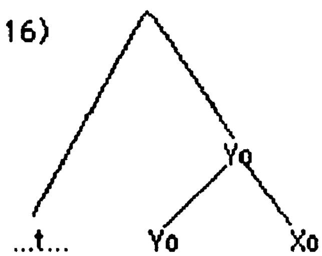
(15)



[9] We are abstracting away from further articulation of the INFL node. Whether there is both an AgrS and an AgrO (subject and object agreement respectively) (Chomsky 1992) need not concern us at this time.

In the case of affix lowering to the verb, as in English, the structure will be:

(16)



A complex element is created [Y^0-X^0] in both cases. The head is X^0 in (15), i.e. the inflectional affix but Y^0 or the verb in (16), the English case (Chomsky 1989).

Languages which have verb raising will have verbs surfacing with an inflectional head since they are adjoined to INFL. In English, the inflection can never be the head, which we feel accounts for the greater proportional loss of inflection in the English agrammatism literature. Being a head makes an item structurally more prominent. The additional requirement that an affix cannot be left stranded in a representation increases its chances of being processed. This is supported by the aphasiological data from various richly inflected languages.

B.3.2. Evidence of IPs in Aphasic Data

The need for the verb in most languages to raise to INFL (head movement of an X^0) to get Tns explains why infinitives, which need not do so, are preferentially produced by aphasics. This need for the verb to move permits us to see a certain parallelism with other structures which have displaced elements, i.e. a verbal trace must be in a properly formed chain with the head of the chain, the moved verb. In languages which have verbal forms that need an inflectional affix to project to the word level (no ø-form being available), either inflected forms will be produced even though an erroneous choice may be made (see Kehayia (1990) for just such cases in Greek)[10] or these forms will simply be omitted. That is, despite the additional structure that the generation of IP entails, there are strong constraints that will allow neither the stem to surface nor the affix to remain stranded. Therefore, we see that if, at a given moment, the aphasic can access the verb and its functional projection, he will produce an inflected form. If he cannot, he will omit the verb entirely. Thus, we can account for main verb deletion as a result of either failure to access the verb or failure to access the functional head--the inflection.

Fukui (1986) has claimed that Japanese lacks functional categories, though this may be too strong a claim since case particles do exist. However, Japanese does appear to have a defective INFL (no Agr). The verbal element must have a tense-like particle attached to it, in order to surface as a word. Agrammatics always produce these particles (Kamio 1984,1985). Case particles, on the other hand, which are often optional in certain contexts, are dropped. The fact that the verb and INFL are adjacent in the string due to the head-final parameter of Japanese may also help the agrammatic. Hindi has a rich agreement system and it is noteworthy that, as Bhatnagar and Whitaker (1984) have demonstrated, verbs are often omitted in agrammatism, presumably the articulated nature

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[10] It is also important to note that languages which permit null subjects have rich INFLs which allow the subject to be dentified. These additional person and number features increase the semantic weight or meaningfulness of the affix. As we saw with determiners, the more features a functional category contains the better.

of the IP would necessitate two movement operations to be properly inflected.

B.4. Complement Phrases (CPs)

All "normal" root sentences contain one CP (the old S'). Evidence for the presence of this category includes overt complementizers, preposed auxiliaries and wh-phrases. The category CP is predicted to be the most difficult structure to process since its creation implies that of all the other categories, as it takes an IP as its complement; see (17):

```
(17)        CP
           /  \
        Spec   C'
              /  \
             C    IP
                 /  \
              Spec   I'
                    / \
                   I   VP
                      /  \
                   Spec   V'
                     |   / \
                    DP  V   KP
                     |     /  \
                    D'  Spec   K'
                   / \         / \
                  D   NP      K   DP
                      |           |
                      N'          D'
                      |          / \
                      N         D   NP
                                    |
                                    N'
                                    |
                                    N
```

The structure above represents a simple sentence containing a transitive predicate with a

NP complement. At this point, we can return to the issue of which VPs would be the most difficult to construct, which could only partly be described earlier. It now becomes evident why infinitival complements are easier to process than tensed embedded clausal complements. An Event argument is realized canonically as an IP. A propositional argument will be realized as a tensed clause--a CP. A sentence containing such a structure would consequently contain two CPs which themselves contain two IPs, two VPs, etc. In addition, two tensed verbs within a structure would imply that two verbal movement operations are necessary. By contrast, an infinitive may remain within the VP This may account for the preferential use of the infinitive in all varieties of simplified registers since what is produced is a verbal Small Clause.

Both agrammatics and paragrammatics are known to avoid complex sentences (see the work of Bates and her colleagues) Although paragrammatics do produce some subordinate clauses, these were found to be semantically unrelated to the matrix clause (Cooper and Zurif 1983 citing Delis et al.1979).

2.1.3. How does the Head Accessibility Hypothesis compare with the other linguistic characterizations of syntactic deficits?

The Lexical Node Hypothesis proposes that only the X^o level of major lexical items (i.e. lexical heads) is available to the agrammatic. However, it does not predict the differential hierarchy exhibited within these classes: Noun > Adjective > Verb, with [+N] being the feature shared by the first two. We would contend that the ability to project the phrasal category XP is not impaired per se. Rather, it is the interaction of other modules of the grammar with X' theory that leads to difficulties in production or comprehension. [11]

Kean's Phonological Hypothesis fails to account for the phenomena of nominalization of verbs and verb omission. The better retention rates of inflectional morphology and free function words by speakers of languages other than English cannot be explained either. Lapointe hypothesized that only uninflected stems of major lexical categories tended to be retained; again, failure to produce main verbs is not predicted.

Rizzi's incorporation of θ-theory into Kean's account also privileges the lexical categories as they are the items involved within the scope of the module. θ-marking is accomplished by heads of phrases which assign thematic roles under government to XP complements, the projections of some lexical head. Verb omissions are not predicted by Rizzi's formulation nor can he account for inflectional morphology when it is present.

Grodzinsky's structural account cannot handle verb omission errors either nor can it predict the non-arbitrary choice of erroneous inflected items--agrammatics tend to produce citation forms, nominative case for nouns and infinitival forms for verbal targets. Even *paragrammatics'* propensity to misselect among oblique cases is not predicted.

Travis's account does share some features with the HAH by attributing syntactic deficits to problems of lexical access. We differ in not postulating the automatic creation of non-lexical nodes which are left lexically unrealized. If problems of access to lexical

[11] Lapointe (1985) has extended Garrett's sentence processing model to suggest that phrasal fragments are independently stored in the Lexicon and have to be accessed along with lexical items. We will simply state that the maximally general rule schemata of example (6) in Chapter 1 remain resistant to brain damage.

categories can be correctly predicted, similar access problems are predicted to occur for functional categories, with the added stipulation that, since the latter must also involve the creation of their lexical complements, they are more difficult to process.

Ouhalla's (1990,1991) account cannot handle differential processing within the major lexical categories. His account is very radical because he states that functional categories, when present, may only be adjoined to the rest of the structure. The more normal a patient's utterances may appear, the less his language would conform to principles of UG. Ouhalla cannot explain the word order facts either, since he does not assume that theta-role assignment is directional. Overwhelmingly, the evidence from various languages demonstrates that aphasics retain sensitivity to a language's particular direction for theta-role assignment.

We feel that our prososal correctly characterizes the relatively present or absent items in aphasic speech. We account for verb nominalizations by noting that the [+N] feature of the head of the derived word --the derivational affix-- will account for the presence of the affix and that the aphasic need no longer produce a VP Small Clause. Main verb deletion is predicted to occur for two possible reasons: 1) the verb's θ-grid would require the creation of more complex phrasal reflexes, [12] and /or 2) the production of a tensed verb may require a verb movement operation, again, more higher-level syntactic structure is necessary to provide the landing site for movement (in this case, the INFL

[12] They may in fact omit the whole of the predicate as well On other occasions, they may produce one argument of the verb in isolation. This would be like topicalizing this NP. They rely very much on the inferential capacities of their interlocutors to, in effect, build structure around their reduced utterances.

node, the head of which governs the head of the VP). We also account for the differential production of inflectional morphology in languages other than English by showing that, in these languages, the inflection acts as the head of the combined form, whereas the stem is the head in English. A requirement for an affix may thus mitigate the difficulty in creating additional structure. [13]

2.1.4. Predictions of the HAH for comprehension as a consequence of structural complexity

In comprehension, the input string, which must be parsed, contains the correct combinations of lexical and functional categories. The structural complexity issues are similar to those affecting production but the task of the experimental subject becomes one of applying both top-down and bottom-up interpretive strategies. These may also be affected by the accessibility of the heads of phrasal categories. The predictions with regard to comprehension will be essentially the same as those for production, with the proviso that perceptual issues can interact to complicate the picture.

For example, grammatical morphology seems particularly vulnerable in this modality. This is due to the fact that normally it is not very salient perceptually. Both Turkish and Hungarian aphasics, as well as hospitalized orthopedic controls performed less well in a comprehension task (Bates et al.1991). Any type of global stress will reduce comprehension accuracy if it is dependent in large part on grammatical morphology for the

[13] In fact, many of these languages permit null subjects because the subject can be identified by the inflectional morphology of the verb. The Spec of IP may not have to be constructed in these cases.

disambiguation of semantic roles. In a recent experiment, Kilborn (1991) demonstrated that the use of a low-level noise mask in conjunction with stimulus sentences decreased the accuracy of German normals though it had little effect on the English normals, who continued to rely on word order strategies.

Investigations of aphasia in languages with richer inflectional systems demonstrate 1) that aphasics try to compute a VP (see Gendron's (1983)re-examination of Smith and Mimica (1984) for Serbo-Croatian and Hagiwara and Caplan (1990), for Japanese), and 2) that language-specific thematic role orders are preferentially processed Bates and her colleagues have also found, despite the occasional use of semi-grammatical sentences, that there are no syndrome-specific comprehension patterns Rather, it is syntactic complexity which best predicts error rates. The main difference is that Broca's aphasics tend to use all available cues to boost their performance while Wernicke's do not seem sensitive to convergent cues. Grammatical morphemes seem less robust than word order but they are understood significantly better than would be predicted if aphasics had no access to them at all.

Work by Caplan and Hildebrandt (1988) also characterized processing complexity as the building of hierarchical structure (i.e. complex NPs). In addition, they showed that holding a NP without a thematic role in the syntactic structure increases processing load This directly affects the interpretation of passives, where the Theme role cannot be assigned to the subject NP before the processing of the verb down-line. This will also affect object relatives and clefts for similar reasons. There is little or no direct marking of non-canonical assignment of thematic roles in English and French. This is always more of a problem in non-case-marked languages since, in languages that encode grammatical functions morphologically, the functions are locally signalled The overt presence of grammatical morphemes in KPs, for example, will reduce the memory load of an aphasic when sentences contain non-canonical word orders. The head of a chain will be more easily identified and the tail will therefore be expected. In English and French, the identification of chains is not as easy as in some other languages, for Case is not overt but abstract.

Hypotheses such as the Lexical Node Hypothesis or Grodzinsky's Trace Deletion Hypothesis (which claims that traces of movement are deleted, leading to chance performances on such structures as passives) cannot account for the better performances by speakers of languages other than English. The Head Accessibility Hypothesis, on the other hand, would predict that the richer the morphological system of a language, the more likely it is that aphasics can access the "features" it contains to help build a representation of the sentence. Complex structures containing additional functional categories continue to prove problematic. Movement entails more hierarchical structure. Therefore, we expect impairments in performance due to the patients' attempt to build the head of the chain and all necessary links until the trace or empty category can be located at the tail (see Caplan and Hildebrandt (1988) for confirmation).

2.1.5. Testing the Head Accessibility Hypothesis

In order to test the Head Accessibility Hypothesis in comprehension, we must use a structure with the following characteristics

1- the head of the construction must seem to have idiosyncratic properties This follows from the fact (stated in (1) that the subcategorization properties of a head will determine whether the complement will be lexically accessible to the aphasic.

2- the construction must not allow a linear order strategy to be applied, since this obscures the structural differences between sentence types for which such a strategy yields the correct response (this stipulation constrains the choice of structure very much) This holds for comprehension tasks only

3- the structure must contain only one tensed verb, i e it must have only one instance of X^0-movement This characteristic of the structure will control the number of verbal chains. In addition, this restriction is imposed to control the number of CPs, IPs and VPs, i e. if the structure has two tensed verbs it will most likely also have two CPs (with the possible exception of conjoined IPs) Thus, a monoclausal structure may be compared to a biclausal one containing two IPs

4- the structure must contain an infinitival complement This is in part a consequence of 3 above. If we want to compare the structure with a biclausal one which contains an object control verb, the embedded verb cannot be tensed.

5-the structure must be base generated as transparently close to its surface form as possible. The reason for this is that movement of DPs must always be to the Spec position of a functional XP. Again, to compare the chosen structure with monoclausal ones, we want only one DP movement, to Spec of IP. Biclausal structures chosen will either involve a PRO as the infinitival subject of the embedded verbal complement or an operator-variable binding relation arising from the predication of the relative clause to its head noun, where the head noun itself continues to occupy its proper position in the matrix clause.

We therefore chose to test the Causative contructions in French because:

1- the causative verb faire has the property of taking a VP rather than an IP complement.[14] (As we will see in the next section, it undergoes a process of partial argument structure merger which accounts for this property.) In addition, this construction shows the phenomenon of clitic climbing. Clitics, which are heads (Kayne 1989) moved to a functional category, can be tested. All other analyses would predict that they would not be attended to; however, the HAH predicts that they can be successfully processed, first of all because of their structurally salient status as heads and, more importantly, because their cliticization to INFL, a functional head, will add to this category's semantic weight since clitics form a Case and θ-chain.

2-the causative does not permit a linear order strategy to be applied since the two verbs are normally adjacent. The causee or agent of the embedded verb follows the verb.

3- only the causative verb is tensed in this construction, making comparisons with

[14] This is a very unusual property as verbs normally take an IP or CP complement. This therefore makes the causative more complex than a dative, which takes an additional NP argument, and less complex than control verbs or perception verbs, which take infinitival complements which are IPs.

monoclausal structures more direct.

4- the embedded verb is in the infinitive.

5- there is no NP- or wh-movement of elements in the embedded complement.

We predict that the lexical entry of faire will signal a non-canonical semantic role assignment and that the number of IP nodes contained in the sentence (i.e. one) will have a facilitating effect on aphasics' response patterns. The reason for testing the aphasics with a comprehension task is to control the number of lexical and functional categories that they must process. As well, it would be very difficult to elicit causatives in a production task due to the possibility that the subjects might produce paraphrases, especially if they were using strategies to avoid structurally complex constructions. Other matters concern the difficulty of visually representing sentences containing two propositions, as well as the particular difficulty of picturing the rather abstract notion of CAUSATION. In the next section, we provide a detailed characterization of the structural properties of the French causative.

2.2. Section 2.-- Linguistic Analyses of French Causatives

2.2.1. Some Properties of Causatives Cross-Linguistically

Causative constructions encode two propositions, one expressing the notion of causation and the other, which is conceptually dependent on the first, the notion of the effect of the causing event. Comrie (1976,1981) claims that there exists a continuum of causative types across languages-- from analytic causatives, in which the causative verb is separate from the verb describing the effect of the causation, through morphological causatives, in which the causative morpheme and the event predicate are related by a productive morphological process such as affixation, and to lexical causatives, in which the relation between the causative verbal form and the non-causative one is unsystematic and is best represented by suppletion (e.g. kill/die). (Lexical causatives will not be discussed further in this thesis)

An example of a morphological causative can be found in Japanese, [15]

(18) a. Taroo ga hatarak-u

Taroo nom work-pres

'Taroo works.'

b. Hanako ga Taroo o hatarak-ase-ru.

Hanako nom Taroo acc work-cause-pres

'Hanako makes Taroo work.'

(Shibatani, 1976: 241 as quoted in Rosen,1989:242)

The Causee Taroo in (18b) is in the accusative case but may also take a dative case particle -ni since the verbal root is intransitive. Were the root transitive, then the causee could only be marked dative because the direct object of the root would be case-marked

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[15] As some evidence that Japanese agrammatics can at least comprehend causative morphology, Hayata, Nojima & Fujita (1985) (as reported in Hagiwara 1985) discovered that two Broca's aphasics who had a memory span of only two items could properly assign the thematic roles to the NP arguments in causative sentences in non-canonical word order, the most difficult sentence stimuli tested in their comprehension task. In a grammaticality judgment task, Hagiwara (1987) also found that aphasics were not impaired in judging sentences containing causatives.

accusative. This phenomenon is attested cross-linguistically

There are two ways to analyze this structure In one, the affixation of the causative morpheme occurs in the lexicon. Thus, an X^n-place predicate becomes a X^{n+1}-place predicate and morphological principles, i.e percolation of features and argument structure through the head of the word, dictate the derived argument structure of the causative verb form as a consequence of the affixation process (see Williams 1981a, 1981b) Such derived verbs are then predicted to act like underived verbs when they are inserted into the terminal nodes of syntactic structures This type of analysis preserves the clear separation of derivational morphology and syntax proposed in the Lexicalist Hypothesis (Chomsky 1970).

The other type of analysis allows the causative morpheme to be inserted into a terminal node in D-structure and then permits the root verb to incorporate with it in the matrix sentence. This does not preserve the distinction between morphological and syntactic processes. Baker (1985, 1988) and Rosen (1989) use this approach. [16] In fact, Rosen's analysis of this type of Japanese causative closely parallels her analysis of Romance causatives, which we will discuss below.

English, on the other hand, exemplifies the analytic or periphrastic causative:

(19) John made Bill sing.

Notice that there is no auxiliary element to before sing. To is the infinitival marker and

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[16] Which approach is to be preferred on theoretical grounds cannot be fully explored within the scope of this thesis. The reader is therefore referred to the works cited in the text as well as Di Sciullo and Williams (1987).

normally it is generated in a [-finite] INFL, which would then be able to project to IP. Since the inflectional head to is not present in (19), we might legitimately presume that the category IP is not present However, to does surface in the passive, as in (20):

(20) John was made to sing.

Since the inflectional head is present, it will project to the IP level. It is not a property of passivization to add clausal structure, in this case IP. Therefore, we will take the more conservative approach and assume that IP is also present in the active sentence. Therefore, make must minimally take an IP complement Make is an Exceptional Case Marking verb (ECM); it can assign accusative Case into the embedded clause to the subject of the infinitive In English, strict adjacency is required for Case assignment. In a structure with a transitive verb in the embedded VP, the lower verb will assign case to its NP complement. English causative verbs such as make and perception verbs such as see are considered not to subcategorize for full clausal complements (in the sense of CP) but rather for what have been termed Naked Infinitives (NI). Zubizarreta (1982: 231-232) quoting Gee (1976. 477) explains:

> "Semantically, I believe NI-constructions have a particularly close relationship between the VP in the complement and the higher perception verb (an almost "direct object"-like relationship).... If [this construction] has complementizerless or bare Ss [IPs], then there may be something of a lack of correspondence between syntax and semantics here...."

This may appear somewhat vague but it does capture the intuition of native speakers that the NI constructions are somewhat idiosyncratic Additional properties of NIs, according to Williams (1983: 302) are that they do not seem to take subjects with either narrow scope or arbitrary reference, nor do they ever show thematic independence in argument positions, i.e. have PRO as subjects.

English causative constructions conform to the Projection Principle, i e the subcategorization frame of the lower verb is maintained at all syntactic levels Thus, any idiosyncracy of the NI construction is attributable to the lexical entry of the causative verb make.

2.2.2. Analysis of the French Causative

2.2.2.1.1. Faire-Inf

The facts are clearly more complex in the French causative than in the English. Witness the following.

(21) i. Jean a fait manger Pierre.

'John made eat Peter'

'John made Peter eat.'

ii. Jean a fait manger une pomme à Pierre.

'John made eat an apple to Peter.'

'John made Peter eat an apple.'

We see that the verb manger and its logical subject Pierre are inverted, the logical subject appearing to be realized as a direct object in (21i) and as an indirect object in (21ii).

The Theme argument of manger is pomme and it is in its usual position of direct object in (21ii)[17] The surface order of the embedded clause is VOS which is non-canonical for French.[18] However, according to various authors (e g. Rouveret and Vergnaud (1980)), the two verbs a fait and manger being adjacent, can be viewed as a verbal complex. The two individual verbs are cosuperscripted, indicating that they are "thematically indexed" and act as one verb; the canonical SVO pattern is thus reestablished for the sentence as a whole.

Various proposals have been put forward claiming that the Faire-Inf construction is best analyzed by parallel structures or by co-analysis. (See Williams (1980), Zubizarreta (1982,1985), Goodall (1987), and Di Sciullo and Williams (1987) for different approaches to parallel structures.) These co-analyses permit one structure to have two representations throughout the derivation, one that does not violate the Lexicalist Hypothesis and one which does, in which the causative verb and the adjacent "root" verb form a verbal unit, allowing the argument structure to be changed in the syntax, as is shown in (22).

(22) Jean a fait rire Pierre.

'John made laugh Peter.'

'John made Peter laugh.'

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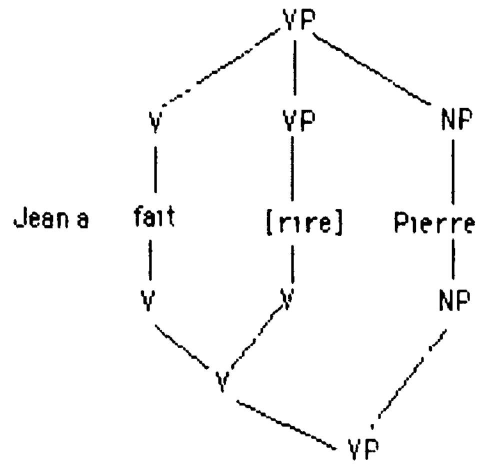
[17] This is reminiscent of the Japanese case discussed above.

[18] Although there have been recent proposals that the Subject is base-generated to the right of the verb in Romance languages, see e.g. Pierce (1989).



Earlier analyses also maintained that there were two structures in this construction. Aissen (1974,1979), for example (see also Kayne 1975), postulated a biclausal deep structure and a monoclausal surface structure derived by a Verb Raising transformation (i.e. movement of V', which is disallowed within the current framework) for French and Turkish causatives. This option is no longer viable within the current GB framework as it violates the Projection Principle since the verb's subcategorization properties have not remained constant throughout the derivation. To avert such a violation, parallel structures were proposed for Romance causatives.

Recently, there has been a move in the literature to analyze this structure as being monoclausal, i.e. with no additional IP node. [19] The analysis adopted in this thesis is of this type, as is that of Rosen (1989).

Our analysis falls within the Government-Binding framework of Chomsky (1982,

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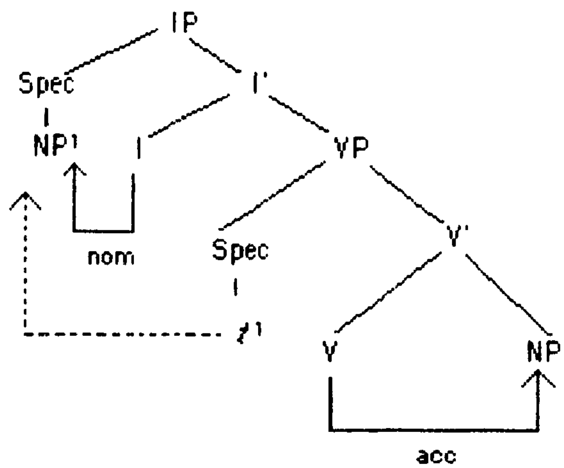
[19] In the Relational Grammar framework, Davies and Rosen (1988) as reported by Blake (1990), have proposed a monoclausal analysis which posits that the whole inner predicate is forced into "chômage". Within Government-Binding theory, other analyses also claim that faire takes a VP complement, e.g. Rochette (1988). Rochette claims that the semantics of the causative determines the fact that it takes a VP complement Her analysis parallels that of Larson (1988) for double-object constructions, i.e. the embedded verb moves to an empty verbal head within the embedded VP to permit adjacency with faire.

1986) In addition, the proposal that subjects are base-generated within the Spec of VP and move to the Spec of IP position to get case (e g. Koopman and Sportiche 1988) is assumed An example of this can be seen in (23) (repeated from (9), Chapter 1)

(23)



Finally, the more elaborated structure of IP proposed by Pollock (1989), i.e. with a T(ns)P c-selecting a N(eg)P and the latter c-selecting AgrP is also assumed, as is shown in (24). [20]

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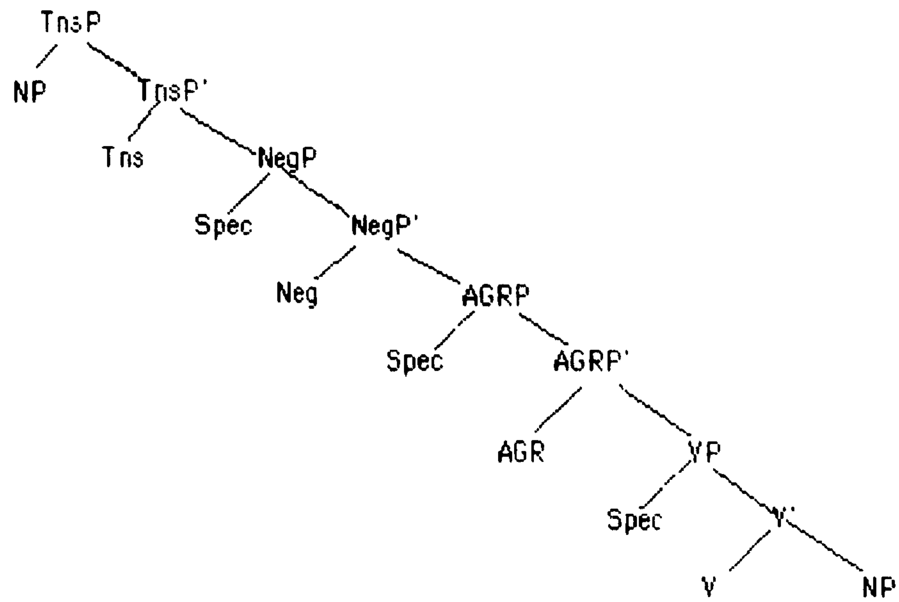
[20] In order to simplify the exposition in the experimental sections of the thesis, in most cases AgrP and TnsP will continue to be discussed jointly as IP. The tree in (24) assumes the subject NP movement of (23).

(24)



Rosen proposes an argument structure merger account for Romance causatives.[21] Like Grimshaw (1990), she accepts the need for an additional level of representation--the argument structure level--which mediates between a verb's Lexical Conceptual Structure (LCS) and its realization in phrasal syntax Separate operations can and do operate at this level with consequent reflexes in the phrase structure. Rosen proposes a mechanism to permit the partial merger of faire and the verb in its complement

(25) faire [w (x)] < e >

'make' Ag Ev

manger [y (z)] < e>

'eat' Ag Th

faire manger [w [y (z)]] < e > < e >

Ag Ag Th |___|

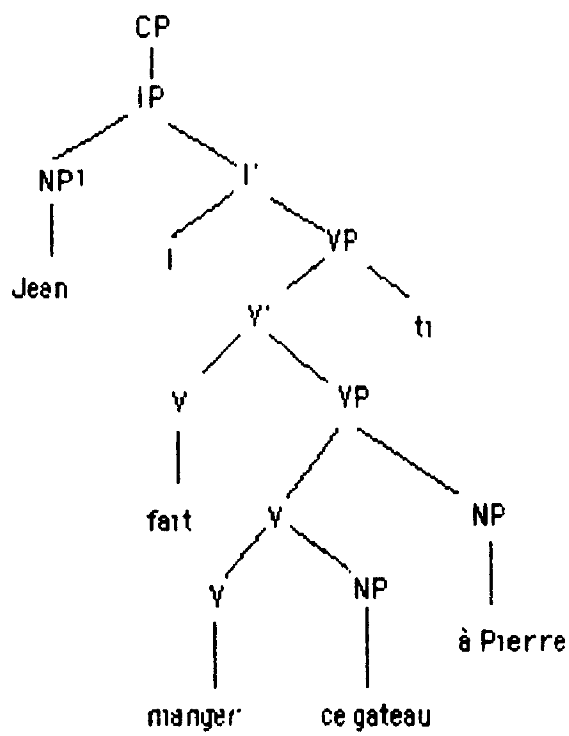
The semantic type of the complement of faire is an Event argument which, according to

---

21 Unlike Italian, the merger in French and Spanish is only partial.

Grimshaw's (1981) Canonical Structural Realization (CSR) principle, is canonically realized as an IP or a VP. The event structure of verbs < e > licences Inflection; the mechanism of binding the < e >s of the two verbs has as a consequence that only one IP will be licensed, which forces the embedded verb to map into a VP complement rather than an IP [22] e.g.:

(26)



As Sportiche (1988) has argued to explain the behavior of quantifiers, the subject may be generated in Spec of VP and that Spec of VP may appear either to the right or to the left of V'. Therefore the base generation of the embedded subject in that position in the causative construction need not be independently accounted for. The merger of the two verbs will simply combine their case arrays and the complex predicate will assign the number of cases available according to the Romance Case-assigning template, i.e. accusative and then

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[22] This structure abstracts away from the movement of faire itself.

dative. When the embedded verb is intransitive, it will assign accusative Case to the embedded subject; when it is transitive, the causee will receive dative Case since the accusative will already have been assigned to the Theme of the embedded verb

In the case of intransitive complements, both unergatives and unaccusatives can be straightforwardly accounted for by postulating that the unergatives will have a non-branching V' and the subject will be generated in Spec of VP as a sister to the intermediate projection; unaccusatives, on the other hand, will have a branching V' but a non-branching VP since these verbs have no external (or most prominent) argument The Theme of the unaccusative need not move to get Case as it normally would have to, because the accusative Case of faire will Case-mark the single argument of either type of verb regardless of the difference between the two positions, [23] for an unergative example see (27) and for an unaccusative see (28):[24]

(27) a. faire [w (x)] < e >

'make' Ag Ev

dormir [y] < e>

'sleep' Ag

faire dormir [w [y]] < e > < e >

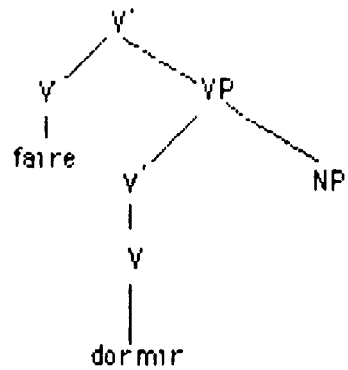
Ag Ag |___|

---

[23] For those who advocate the subject-within-VP analysis, the Agent, which normally must move from the Spec of VP position to Spec of IP in order to get nominative case, need not do so in this instance and will receive accusative case. It is for this reason that it looks like a direct object.

[24] In keeping with Burzio (1986), we are assuming that Italian and French have the same class of ergative verbs and that one diagnostic for inclusion in this class is auxiliary selection, i.e. ergatives select essere / être , unergatives select avere / avoir. However, we are aware that this diagnostic is more reliable for Italian.

b.



(28) a. faire [w (x)] < e >

'make' Ag Ev

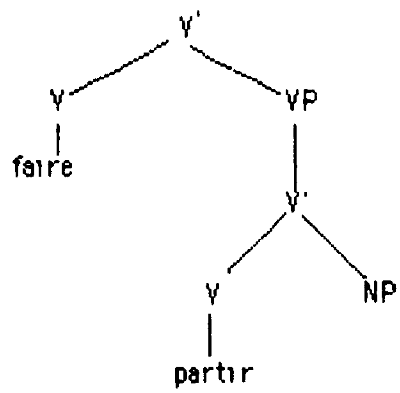
faire partir [w [(y)]] < e > < e >

Ag Th |___|

partir [(y)] < e>

'leave' Th

b.



Before proceeding to the Causative (Faire-par) construction in section 2.2.2.2, we will present an alternative account of the Faire-Inf construction which helps to further highlight the features of Rosen's analysis which will prove crucial to the issues raised in this thesis.

2.2.2.1.2. Biclausal Account

Reed (1990a, 1990b, 1990c, 1991) presents a straightforwardly biclausal analysis of causative structures. All the background theoretical assumptions found in Rosen's account are assumed here also. Because of the existence of tensed complements as in:

(29) Mon Dieu, faites que mes parents reviennent vite!

'My God, make that my parents come back quickly!'

Reed argues that faire always subcategorizes for a CP complement. This would appear to obey Baker's (1988) UTAH (The Uniformity of Theta Assignment Hypothesis):

(30) Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure (p 46)[25]

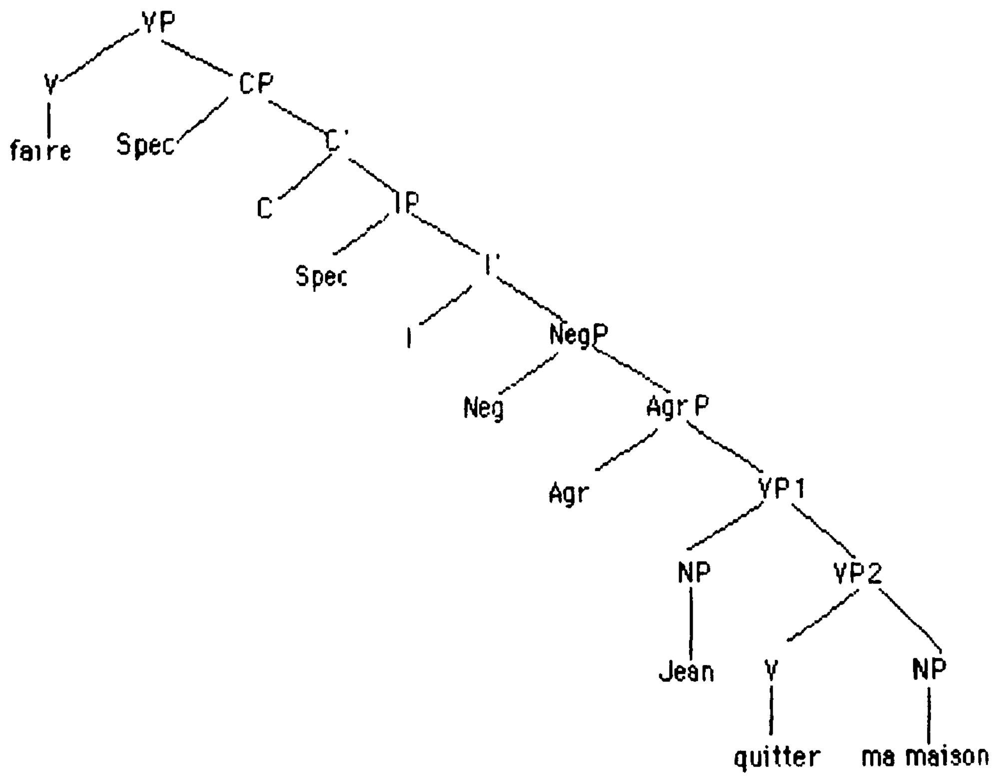
Furthermore, unlike Rosen, Reed does not allow for the optional generation of the Spec of VP on either side of V'; therefore, there is no way to get the word order facts without a movement analysis, so it is the requirements of Case Theory that motivate the movement. The mechanisms for the movement are VP adjunction, as permitted by Chomsky (1986), and/or short verb movement to Agr as in Pollock (1989) and movement of AgrP to Spec of CP. Reed further assumes that faire, laisser and the perception verbs are marked for government chain formation, i.e. faire will govern the raised verb. In addition, if faire and the embedded verb share compatible case arrays, i.e. if they both can assign accusative case, the complex verb formation takes place. However, Reed claims that this "complexity " does not extend to Θ-marking. An example to the comparable structure in (26) would be

---

[25] However, a possible caveat to this is that, as noted by Jackendoff (1985), tensed and infinitival complements do not tend to mean exactly the same thing. This is certainly the intuition of any French speaker with regard to these tensed versions and the Causative (Faire-à).

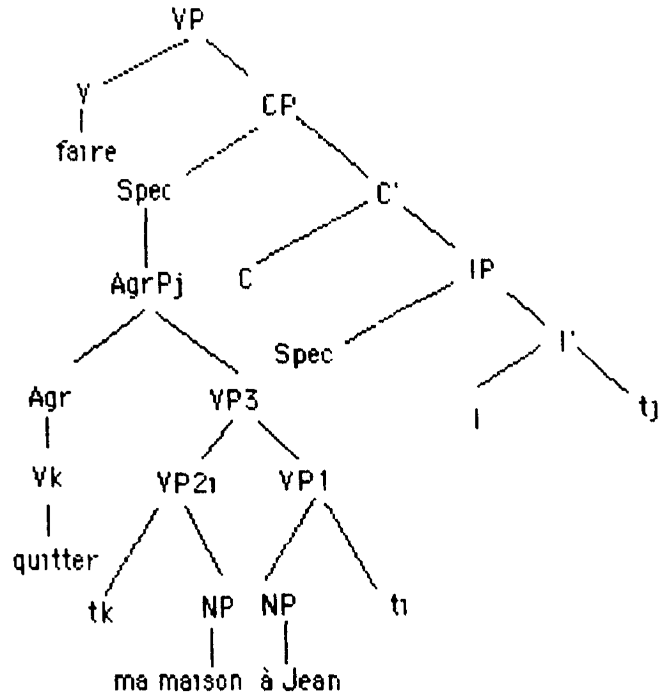
the following .

(31) D-structure: Simple Transitive verb



The S-structure after VP adjunction, movement of AgrP to Spec of CP and subsequent short verb movement to Agr would be as in (32):

(32)



In this account, an intransitive embedded verb would also have to move so that it would be "close enough" to enter into government chain formation with the matrix verb in order to case-mark the NP argument of the displaced predicate. [26] In fact, Reed states that intransitives optionally allow either direct V^0 movement or VP-adjunction followed by V^0 movement. This would lead sentences containing certain verbs to have slightly different S-structure representations with regard to traces (and their indices). Indirect transitives such as <u>téléphoner à</u> which take a PP complement would only allow V^0 movement; VP-adjunction would yield an illicit S-structure. Simple transitives as in (32) must have VP-adjunction before V^0 movement to account for the Case-marking facts; only this ordering yields a licit structure. This account would thus predict different S-structure

[26] Note that intransitives of all types and indirect transitives do not form a complex predicate with the causative though they do enter into government chain formations.

representations for faire-inf depending on the valency of the embedded verb selected. In and of itself, this should not lead us to reject this analysis and accept Rosen's. However, it can be argued that it lacks the simplicity of Rosen's, which posits a maximally general mechanism, allowing the generation of more uniform (and more intuitively plausible) phrasal reflexes of argument structure representations. In terms of processing, Reed's account would predict that all Faire-Inf causatives would be very difficult to process due to the need to form multiple chains, any one of which could fail to be properly established. [27]

2.2.2.2. Faire-Par

Faire-par constructions are uncontroversially held to take a base-generated VP complement. Burzio (1986: 248 and 251) discusses the equivalent Italian construction.

[27] Were we not testing the HAH itself by the use of French causatives, the HAH might allow us to choose between the two analyses. Results discussed in Chapter 4 will, in fact, appear to support Rosen's analysis over Reed's. In the above discussion, we wish to show that there are independent reasons to prefer Rosen's. However, since the bulk of the experimental contrasts involve faire-par and Reed's analysis does not deal with this construction, we will not pursue this issue further.

(33) Maria fa [α riparare la macchina (da Giovanni)]

'Maria has the car repaired (by Giovanni).'

i. A subject of α appears impossible to characterize as an *ec*, since its properties would not correspond to those of any of the established types of *ec*'s.

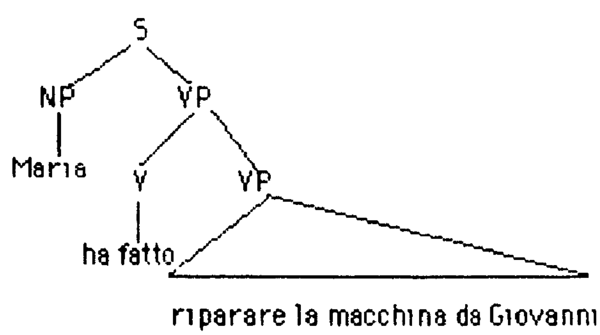
ii. Phrases anaphoric to the subject are impossible

iii There are neither S-structure, nor D-Structure SSC effects.

[SSC=Specified Subject Condition]

He gives the structure of (33) as:

(34)



Burzio (1986 228)

Rosen uses the mechanism of argument structure merger previously described to account for this construction. The relation of faire-par (FP) to faire-inf (FI) can be seen by comparing the following representation with that given in (25):

(35) faire [w (x)] < e >

'make' Ag Ev

manger [y-ø (z)] < e >

'to eat' Th

(passive)

faire manger [w [y-ø (z)]] < e > < e >

Ag Th I___I

It is assumed that the embedded verb in these cases acts like a passive. The external argument of the verb is suppressed and the accusative case of the embedded verb gets absorbed; the structure is still salvaged since faire has a case to assign to the z argument. An a(rgument)-adjunct par-phrase is added and the preposition will assign the Causee NP a Case As an adjunct expression, the Causee becomes optional. However, there will be no additional functional categories in the structure and no Spec of the embedded VP since the subject position is suppressed [28] This structure is less complex than FI because of the non-branching nature of the embedded VP, it is the V' that branches The adjoined agentive phrase does not add to sentential complexity because adjoined structures are not governed by the lexical head (Chomsky 1986).

2.2.2.3. Behaviour of Clitics in Causative Constructions

Rosen also discusses the behaviour of clitics in these constructions. As opposed to

---

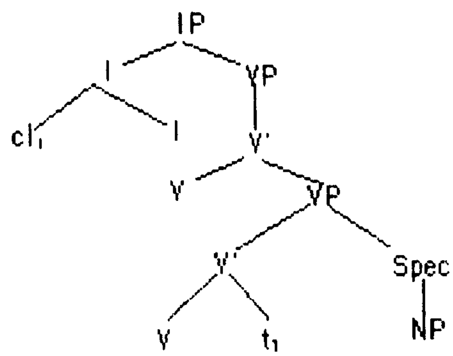
[28] Guasti (1990) presents a different analysis of the FP causative. She assumes that there is a functional category INFP which takes an infinitival verb as its complement. The verb will move from the VP to the functional head to pick up the infinitival ending. The causative verb will select nominal features for the functional head and the embedded verb will also receive these by adjoining to INF. Crucially, there is neither an AgrP nor a TnsP in the embedded structure.

their behaviour in other structures, in which they are normally attached to the verb of which they are the complement, in causatives they clitic climb and attach themselves to faire, or rather to the INFL that takes the VP which faire heads as its complement, as in (36):

(36) $[_{IP}$ [I]$[_{AgrP}[_{VP}$ $[_{V'}$ V cl] $[_{Spec}$NP]]]]

The clitic must move to INFL; the only INFL available is the one in the matrix clause and therefore it adjoins to that INFL

(37)



Rosen invokes Rizzi's (1990) Relativized Minimality Condition to show that there is no barrier to chain formation since only a closer governor of the same type can block antecedent government of a trace; since the clitic moves to an A' position and there is no intervening potential A' governor (since there is no intervening IP), the clitic will be able to be form a proper chain with its trace. [29]

The attachment of reflexive clitics is performed as an operation on argument structures. As Grimshaw (1990) suggests, the se performs a similar function to

---

[29] We will also assume Kayne's (1989) analysis of pronominal clitics as heads and not phrases. In this same paper, Kayne also analyzes faire as taking a VP complement in FI constructions and accepts as uncontroversial the notion of FP as monoclausal.

passivization, i.e. the external argument of the verb it attaches to is satisfied and, additionally, it lexically binds the internal argument:

(38) faire raser [x[y (z)]] ----> faire se raser [$x[y_i$-ø $(z_i)]]$

Ag Ag Th → Ag Ag Th

(39) faire raser [x[y (z)]] -----> se faire raser [x_i-ø [y -ø (z_i)]]

Ag Ag Th → Ag Ag Th

In (39), se can only be attached to the causative faire-par, otherwise the external y argument of the embedded verb will block the binding between the satisfied matrix external and embedded object arguments in the embedded VP of FI, which is a Complete Functional Complex (CFC).

2.2.3. Concluding Remarks

In conclusion, we have adopted Rosen's analysis which postulates that both types of French causatives have a VP complement. Her analysis is accepted for the following reasons:

1. Recall that the nature of the argument that a verb subcategorizes for--Event vs. Proposition--determines the categorial status of the syntactic realization of the argument. Event arguments are realized as either VP or IP, and Propositional arguments are realized as CP. The English causative verb make takes an IP complement; there is no argument structure merger process operating on this structure in English. Rosen's account predicts

that make takes an IP complement, Reed's stipulates it.[30] Reed's account proposes that there is more hierarchical structure in Romance causatives than in English ones This seems very counterintuitive since Romance causatives are often perceived as closely resembling compound verbs

2. Rosen uses the (partial) argument structure merger process to account for both faire-à and faire-par causatives in a uniform way This process also permits us to see the interaction of reflexivization and causativization Reed proposes very different analyses of faire-à and faire-par Faire-à involves several possible movement operations--short verb movement to Agr, VP-adjunction and movement of AgrP to Spec of CP The choice of which movement is appropriate in a given structure is dependent on the argument structure of the embedded verb. Although she does not deal directly with faire-par, she alludes to Burzio's analysis Thus the categorial status of the embedded complement of faire-par is uncontroversially VP There is no IP (or CP) between it and faire

3. In terms of processing, since Rosen's account claims that the embedded complement of the verb faire will be a base-generated structure regardless of its transitive or passive nature, these causative structures are predicted to show similar accuracy rates to other structures of comparable complexity. On the other hand, Reed's account predicts that faire-inf constructions would be as difficult or more difficult to

30 Although, she admits that it might only be a VP complement (Reed 1991).

process than other biclausal structures.[31] Causatives thus allow us to test our hypothesis that the properties of phrasal heads, of both the matrix and the embedded verb, will predict aphasics' ability to correctly interpret sentences which contain them. We will then contrast them with structures that take complements that entail the creation of either more or less complex hierarchical structures. The HAH predicts that, as causatives select a VP complement rather than an IP or CP complement, aphasics will respond to intransitive versions of the faire-inf construction much as they would to a simple active. It is also predicted that faire-par versions of the structure will be responded to more accurately than faire-inf transitive versions (recall that we are speaking of the valency of the embedded predicate). This is because the embedded VP does not contain a Spec position since the passivization of the VP has led to the suppression of this position. Despite the different results that we are predicting for the two causative types, we still expect faire-à structures to cause fewer errors in interpretation than equivalent structures containing IPs and CPs. In Chapter 3, we will present in some detail the various sentence types which were designed to fully test these predictions.

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[31] Evidence will be presented in Chapter 6 which further indicates that Rosen's analysis is the correct one.

Chapter 3- Experimental Design

3.1. Materials in the Object Manipulation Batteries

3.1.1. Description of the Object Manipulation Batteries (OMBs)

All OMBs consist of 168 sentences, 12 tokens each of 14 types In order for the sentences to be completely reversible, all NPs designate animate beings, i e animals, since animacy can bias subjects' interpretation of sentences In any sentence containing a contrast in the animacy of the NPs, the animate NP tends to be assigned the function of the Doer of the action encoded by the verb

· The following description is true of all the OMBs Six animal names are used, three are masculine nouns, three are feminine For one, la vache, the natural and the grammatical gender are the same

MASCULINE		FEMININE	
l' éléphant	'the elephant'	la vache	'the cow'
le lapin	'the rabbit'	la grenouille	'the frog'
le singe	'the monkey'	la chèvre	'the goat'

Each name is balanced across positions in the sentence (i.e they are assigned an equal number of times to the first, second, third (and fourth where applicable) NP slot in the linear string).

The verbs were all tested in the passé composé in French as this sounded most natural in this type of test situation. This is especially true in sentences containing two verbs (excluding the copula and auxiliaries), where the use of the present tense would indicate that the actions were occurring simultaneously. The verbs were carefully chosen to meet certain criteria. Six verbs which were unambiguously intransitive were chosen

trembler	'to shake'

bondir	'to jump'
danser	'to dance'
marcher	'to walk'
sauter	'to hop'
courir	'to run'

Twelve transitive verbs were used (the two verb sentences required that a greater number of these be available); a necessary criterion was that no gender cues be present in the past participle (most of the verbs chosen are of the regular -er type, the past participles of which are the homophonous é (masc) and ée (fem). The only three verbs not of this conjugation were tenir, saisir, and mordre, the past participles of which are tenu(e), saisi(e), and mordu(e)

frapper	'to hit'
chatouiller	'to tickle'
embrasser	'to kiss'
gratter	'to scratch'
bousculer	'to shake'
flatter	'to stroke'
caresser	'to pat'
tenir	'to hold'
attraper	'to catch'
saisir	'to grab'
mordre	'to bite''
serrer	'to squeeze'

In addition, six dative verbs were chosen:

confier	'to pass'

offrir	'to deliver'[1]
amener	'to take'
donner	'to give'
apporter	'to bring'
remettre	'to return'

To control for the gender cue in the feminine offerte and remise, these verbs were always tested with the three feminine nouns while the masculine versions of the past participles offert and remis were tested with the three male animals In this way, no additional gender cue was present in the stimuli [2]

3.1.1.1. Original OMB

A list of the sentence types used in this battery, which was not designed to test causatives, can be found in the following table

Table 3.1.1. Sentence Types in the OMBs

[01] [OMB1] Active (A2)
La grenouille a frappé le singe.
The frog hit the monkey.

[02] [OMB2] Passive (P2)
Le singe a été frappé par la grenouille
The monkey was hit by the frog

[03] [OMB3] Truncated Passive (Tr P)
Le singe a été frappé
The monkey was hit.

[04] [OMB4] Cleft Object (CO2)
C'est la vache que le lapin a embrassé.
It was the cow that the rabbit kissed.

---

[1] Exact translational equivalents were not always the most appropriate verbs to use in this context. For helpful discussions of datives which helped me revise the original OMB, carrying over the revisions into the two batteries which I devised specifically for the present research, I would like to thank Jody Davis.

[2] This is not a problem for the causative verb since fait is invariant.

[05] [OMB5] Dative (A3)
Le lapin a confie la vache a la chevre
The rabbit passed the cow to the goat

[06] [OMB6] Dative Passive (P3)
L'éléphant a éte donné au singe par la grenouille.
The elephant was given to the monkey by the frog

[07] [OMB7] Cleft-Object Dative (CO3)
C'est la chevre que le lapin a donné à la vache.
It was the goat that the rabbit gave to the cow.

[08] [OMB8] Conjoined (C)
Le singe a gratté le lapin et a caresse l'éléphant.
The monkey scratched the rabbit and patted the elephant.

[09] [OMB9] Subject-Object Relative (SO)
Le singe que le lapin a saisi a bousculé la chèvre
The monkey that the rabbit grabbed shook the goat

[10] [OMB10] Object-Subject Relative (OS)
La chèvre a frappé le lapin qui a saisi la vache.
The goat hit the rabbit that grabbed the cow

[11] [OMB11] Object-Object Relative (OO)
Le singe a chatouillé la grenouille que la chevre a bousculée
The monkey tickled the frog that the goat shook

[12] [OMB12] Subject-Subject Relative (SS)
La grenouille qui a tenu la vache a attrapé l'éléphant.
The frog that held the cow caught the elephant

[13] [OMB13] Active Conjoined Theme (Act)
Le lapin a frappé la vache et la chèvre
The rabbit hit the cow and the goat.

[14] [OMB14] Passive Conjoined Agent (Pca)
La grenouille a été caressée par la chèvre et la vache.
The frog was patted by the goat and the cow.

3.1.1.2. Justification for Testing the OMB

Although not originally conceived specifically to test the HAH, this battery rather economically permits us to verify certain of the predictions which were discussed in the previous chapter.[3, 4] [01 Active], [02 Passive] and [04 Cleft Object] are examples of

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[3] Given the large number of sentence types which need to be tested, it is fortuitous that we can dispense with sentences containing only intransitive (unergative) verbs. Since they do not permit an incorrect response in comprehension tasks, the prediction of the HAH that such verbs are easier to process may in future be tested with a production task. However, it was possible to

2-NP (actually 2-DP) sentences, they contrast in that the active sentence is clearly predicted to be easier to understand because it involves less structure The passive version of the sentence involves the construction of the Specifier position of the functional category IP to allow a landing site for the Theme of the verb This is expected to lead to more incorrect responses than we would see for the active Despite this increased processing difficulty, we would still predict that passives contained within a single IP will be easier to process than the clefted structures because of the two CPs (and consequently two IPs) contained in the latter sentence type We chose to include [03 Truncated Passive] in order to verify the precise contribution of the explicit by-phrase in [02], i e , whether it leads to greater or lesser accuracy

In order to test whether dative verbs are more difficult to process than simple transitives, the equivalent structures to [01], [02], and [04] were included, i e [05 Dative], [06 Dative Passive] and [07 Cleft-Object Dative] In each case it was assumed that the 3- NP versions would be more difficult because of the greater number of arguments and that, within the group of 3-NP versions, the same discrepancies in performance between passives, relatives and clefts would obtain, for the reasons given above.

In order to verify that it was indeed the argument structure of the verb which leads to processing difficulty and not merely the presence of an additional NP (or DP), sentence types [13 Active Conjoined Theme] and [14 Passive Conjoined Agent] were included. It is predicted that, because the verbs are active or passive versions of

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use intransitives in sentences where the intransitive is an embedded verb; see sentence types [15], [16], [18] in the Causative OMB as well as sentence type [39] in the Pronoun OMB. Additional testing in a different paradigm which I adapted from Caplan & Hildebrandt (1988)-- the Anaphora and Control Batteries-- also demonstrated that embedded intransitives are easier to process than the equivalent transitive versions for my French subjects Caplan (personal communication) has confirmed this to be a robust finding with his English subjects as well

4 Some additional justification for the use of some of the OMB sentence types will be reserved for more direct comparisons with the causatives.

ditransitives, subjects would treat them more like [01] and [02] than like [05] and [06].

It was also necessary to include various structures containing two clauses These sentence types are often tested in psycholinguistic experiments. They acted as baselines for the structures tested in the Causative OMB (or COMB). [08 **Conjoined**] involves of the conjunction of two IPs. It permits a Parallel Function strategy to be utilised, [5] i.e. attributing the function of subject to the same NP for both actions described in the sentence. [6] It is predicted that this sentence type will be more difficult to process than [05 **Dative**] due to the increase in hierarchical structure The conjoined structure is, however, predicted to be easier than [12 **Subject-Subject Relative**], for which the Parallel Function strategy will also facilitate response, because the latter type involves two CPS [10 **Object-Subject Relative**] should be more difficult than [05 **Dative**] for the same reason The two object relatives are expected to be more difficult because the wh-traces are in object position. Interpretation of the embedded clauses requires the subject to fully parse the structures to arrive at the correct responses. A slight advantage stemming from the recency effect, i e. the last thing heard may be more salient, and the Parallel Function strategy, would lead to better performances on [11 **Object-Object Relative**] than on [09 **Subject-Object Relative**]. We also expect that both [02 **Passive**] and [06 **Dative Passive**] will prove less difficult to process than the two former structures.

3.1.2.1. Description of the Causative OMB (COMB)

Turning to the test specifically involving the causative, a list of the 14 sentence types can be found in the Table 3.1.2.:

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[5] Caplan, however, also counts this as evidence of the linear order strategy. We believe it is necessary to preserve the distinction.

[6] Attributing the function of object of both verbs to the same NP is also an instance of this strategy.

Table 3.1.2. Sentence Types in the COMB

[15] [COMB1] Direct Object Control, Intransitive Verb (DOC + Iv)
La grenouille a forcé le singe à bondir.
The frog forced the monkey to jump.

[16] [COMB2] Passivized Direct Object Control, Intransitive Verb (Pass DOC + Iv)
La vache a été forcée par le singe à danser
The cow was forced by the rabbit to dance.

[17] [COMB3] Truncated Causative (Tr Caus)
Le lapin a fait frapper la vache
The rabbit had the cow hit

[18] [COMB4] Causative + Intransitive Verb (Caus + Iv)
La vache a fait danser le lapin
The cow made the rabbit dance.

[19] [COMB5] Direct Object Control + Transitive Verb (DOC + Tv)
Le lapin a forcé la chevre à frapper la vache
The rabbit forced the goat to hit the cow.

[20] [COMB6] Passivized Direct Object Control + Transitive Verb (Pass DOC + Tv)
La grenouille a été forcée par l'éléphant à caresser le singe.
The frog was forced by the elephant to pat the monkey

[21] [COMB7] Causative (Faire-à) (Caus F-à)
La grenouille a fait caresser le singe à l'éléphant
The frog made the elephant pat the monkey

[22] [COMB8] Causative (Faire-par) (Caus F-par)
Le lapin a fait frapper la vache par la chèvre
The rabbit had the goat hit the cow

[23] [COMB9] Cleft-Object Causative (Faire-par) (CO Caus)
C'est l'éléphant que le singe a fait saisir par la grenouille.
It was the elephant that the monkey made the frog grab.

[24] [COMB10] Conjoined Causative (Conj Caus)
La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.
The frog made the monkey hit the cow and tickle the elephant.

[25] [COMB11] Causative + Dative (Caus + Dat)
L'éléphant a fait apporter le singe à la grenouille par la vache.
The elephant made the cow bring the monkey to the frog

[26] [COMB12] Causative + SS Relative (Caus + SS)
La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.
The frog made the monkey that hit the cow tickle the elephant.

[27] [COMB13] SS Relative + Conjoined Theme (SS + Conj T)
L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille
The elephant that tickled the cow and the monkey hit the frog.

[28] [COMB14] Conjoined Clauses 4 NPs (No Deletion) (Baseline) (Conj Cls)
La grenouille a frappé le singe et la vache a chatouillé l'éléphant.
The frog hit the monkey and the cow tickled the elephant

3.1.2.2. Justification for Testing the COMB

Causatives allow us to examine sentences which are monoclausal (i.e. containing only one IP (and CP).[7] In order to test the hypothesis that such structures will be easier to process than biclausal ones, other structures analyzed as being monoclausal or biclausal must be used as bases for comparison. If causatives, barring other interacting sentence variables, pattern with other monoclausal structures (as measured by number of correct responses) and differ from accuracy rates for biclausal structures, it will be considered support for the hypothesis that the computation of additional functional categories, specifically IP and CP, leads to a degradation of performance.

French canonical word order for sentences containing full NPs is NVN (SVO). We tested the following:

(1) i. Le singe a fait courir le lapin.
'The monkey made run the rabbit.'
'The monkey made the rabbit run.'
ii. Le singe a fait frapper la grenouille au /par le lapin
'The monkey made hit the frog to/by the rabbit.'
'The monkey made /had the rabbit hit the frog.'

In (1i) we have $N_1V_1V_2N_2$ order. If the two verbs are viewed as a verbal unit, the sentence will be interpreted as SVO (though both the S and the O are agents). In order to mitigate the

[7] However, Rosen does not call the structure monoclausal because, since the embedded VP complement to the causative verb functions as a CFC (Complete Functional Complex), it can be considered a Small Clause. We will continue to refer to the structure as monoclausal though the reader should keep in mind our stipulation that the presence of IP is necessary for "clausehood".

possibility that such a causative + intransitive verb might be perceived as some kind of compound verb and only allow the correct interpretation, another contrasting type is included -- the [17 Truncated Causative], which must involve an actor not mentioned in the sentence in order to be interpreted correctly:

(2) Le singe a fait frapper la grenouille.

'The monkey made hit the frog.'

'The monkey had the frog hit.'

Some third animal must hit the frog. Should the agent of faire be chosen, we would have to assume that the patient is using a linear order strategy or the kind of parallel function hypothesis sometimes seen in the responses children make to relative clauses.

Example (1ii) does not mimic canonical word order, here $N_1V_1V_2N_2N_3$ must be interpreted as S-V-V-O- IO, where the NP in the PP is the agent of the second verb. However, within the lexical entry for the causative verb is information that presumably distinguishes it from others which do not exhibit noncanonical order. (Rosen (1989) would say that it is because it subcategorizes for a VP complement.)

The core of the Causative test is made up of sentences with three NPs. Given the following in French:

(3) Le lapin a fait frapper la vache par la chèvre.

'The rabbit made hit the cow by the goat.'

'The rabbit had the goat hit the cow.'

we must compare it with other structures with par-phrases such as [06 Dative Passive](a monoclausal structure) and [20 Passivized Direct Object Control + Transitive Verb] (a biclausal stucture). Additional biclausal contrasts also include the relative clause types discussed previously and especially [09 Subject-Object Relative] and [11 Object-Object Relative].

We find the following justifications for testing these structures.

1. The linear order of the lexical categories of the causative is $N_1V_1V_2N_2$[par]N_3 which could be interpreted as $N_1V_1N_2$[par]N_3 where V stands for a complex V. We therefore contrast this with the Dative Passive which has a very similar linear order, $N_1V_{aux}V_1N_2$[par]N_3. Neither structure allows for a linear order strategy.

In addition, an examination of simple Datives in the same patient allows us to obtain a baseline for the ability to interpret three place argument verbs. Does the complex predicate in the faire-à construction act like a simple three place verb? Such a contrast is not as direct in the faire-par construction as, according to the theory, the NP in the by-phrase is considered an adjunct and not an argument of the complex predicate (see Grimshaw (1990) for a discussion of the different status of a-adjuncts and arguments). However, it must be identified as coreferential with the implicit (suppressed) agent, and whether the θ-role can be assigned directly is open to debate. Only the very simplest type of <u>faire-à</u> constructions will be used because of its relative unacceptability and because of the ambiguity of à as a cue.

The Dative Passive also contains a nominal trace and is a sentence type in which movement has occurred, as opposed to the causative which, under one type of analysis, is base-generated as is (Manzini 1983, Rosen 1989) and contains no trace; according to other analyses (e.g. Baker 1988, Reed 1990a, 1990b, 1990c and 1991) it does contain a verbal trace left by VP-to-COMP movement. For this reason, therefore, we want to contrast the **Causative (Faire-par)** and **Dative Passive** with a **Cleft-Object Causative (Faire-par)** structure $N_1N_2V_1V_2$[par]N_3 or N_1N_2V[par]N_3, which contains a wh-trace like the relatives clauses discussed above. Cleft constructions are structures which indisputably have a mismatch between number of propositions and number of clauses, though there is considerably more structure in both 'clauses' of the causative construction.) We must then also examine the **Cleft-Object Dative** ($N_1N_2VN_3$) to examine the effects of having two preverbal NPs as opposed to two postverbal ones.

2. The **Passivized Direct Object Control + Transitive Verb** presents the patient with a string of the type $N_1VauxV_1[par]N_2V_2N_3$. Although the par-phrase is preverbal with respect to V_2 rather than postverbal,[8] it permits us to examine a case which does not permit a linear interpretive strategy. As a structure containing a trace where one of the Agents is signalled by a par-phrase, it can also be contrasted with Dative Passive. A biclausal structure in French which permits a linear order strategy and which does not contain a trace (though it does contain the empty category PRO) is also incuded - **Direct Object Control + Transitive Verb.** As in the causative, the same lexical items (i.e. the NPs) can hold the same thematic roles with respect to each other despite their not being in the same grammatical positions in the sentence or in the same slots in the linear string. The verbs used to test the control structures --forcer and inciter were chosen because they, like faire, are members of what Karttunen (1970, as cited in Rosen1989, pp. 32-33) has called 'positive implicatives', i.e. we know that the action in the complement 'clause' has been performed. In addition, both control verbs subcategorize for à rather than de as their complementizer; this in turn led to better contrasts with both the Causative (Faire-à) and the datives that were used.

3. **Subject-Object Relative** $[N_1N_2V_1V_2N_3]$ permits us to examine other

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[8] A sentence of the type Le singe a été forcé à frapper le lapin par la grenouille may for experimental reasons seem a better contrast. However, the structure is ungrammatical according to native speakers. Sentences of the type Le singe a forcé la grenouille à être frapper par le lapin are considerably worse. The semantics of the verb forcer (and other verbs that could be used here) require a (positive) action verb in the embedded clause. You cannot get a stative reading of the passivized verb (Rochette, p.c.). To encode a sentence with an equivalent meaning, one would use Le singe a forcé la grenouille à se faire frapper par le lapin, which is still somewhat odd but acceptable. However, note that there is the confounding effect not only of the causative but also of the reflexive clitic. Testing of such a structure must await our having examined the structures in isolation.

structures with two verbal categories adjacent to each other in the linear string, as in the French causative. In both **Subject-Object Relative** and causatives, part of the response pattern is alike -- the animal referred to by the first NP acts on the one designated by the third and final NP.

4. **Object-Object Relative** $[N_1V_1N_2N_3V_2]$ (recall the discussion of the possibility that the causative is perceived as $[N_1VN_2N_3]$). We thus have another category with two postverbal NPs; in addition, part of the pattern of response must be similar to the causative, i.e. the subject must have N_3 act on N_2.

5. **Subject-Subject Relative** $[N_1V_1N_2V_2N_3]$ does not permit a linear order strategy; it shares part of its response pattern with **Passivized Direct Object Control + Transitive Verb** -- N_1 acts on N_3.

6. **Object-Subject Relative** $[N_1V_1N_2V_2N_3]$ can also be compared with the biclausal structure, the [19 **Direct Object Control + Transitive Verb**], which has the same linear string and the same response pattern, i.e. N_1 acts on N_2 and N_2 acts on N_3. It is predicted that, in the absence of any confounding effect of the linear order strategy, the relativized structure containing two CPs should be more difficult to process than the control structures which have only one since the complement is an IP (if we remain consistent and consider the canonical realization of event arguments to be IP).

Patients are extremely sensitive to certain sentential variables; for some it is the number of NPs in the sentence, for others it can be the number of verbs. For this reason, sentences with only two NPs were included, e.g. [15 **Direct Object Control, Intransitive Verb**], [16 **Passivized Direct Object Control, Intransitive Verb**], [17 **Truncated Causative**] and [17 **Causative + Intransitive Verb**]. These were predicted to be easier to process because of the argument structure of the verbs involved.

In addition, for those patients who have little difficulty with three NPs, four- NP sentences were included in order to test their maximum capacity.[9] It was also hoped that patients who had some difficulty with three- NP sentences would still be able to understand a sufficient number of four- NP sentences because of the information contained in the lexical entry of the causative verb (which is in some sense the head of the complex predicate). As a baseline, two simple sentences are conjoined (2Vs, 2NPs, 2CPs). To this we contrast [24 **Conjoined Causative**], [25 **Causative + Dative**], [26 **Causative + SS Relative**] and [27 SS **Relative + Conjoined Theme**] in the embedded clause. Thus, an upper limit of interpretable NPs can be set. We predict that [25] should be easier than [24] since [25] has an embedded dative verb and [24] has conjoined VPs. [26] should be more difficult than both [24] and [25] since it contains an additional CP. [27] should be more difficult than [28] because of the embedding of the second clause and because a linear order strategy cannot be applied.

Some of the universal and language-specific features which help/hinder the assignment and interpretation of syntactic structure still have to be specified. As discussed in Chapter 1, the work of Caplan, Baker and Dehaut (1985) began to show that aphasic comprehension is a function of various sentential variables: number of NPs, number of verbs, number of propositions, number of words, i.e. sentence length, and use/non-use of a language's canonical word order, which may interact with the possibility of a patient using a linear interpretive strategy. Holding some of these variables constant makes it possible to examine in isolation the one that two given structures do not share, thus increasing our awareness of the precise contribution that that variable makes to sentence comprehension.

In order to conduct some of the analyses which we will report on in Chapter 4, we coded all such variables for the first 28 OMB sentence types. The reader is referred to

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[9] These decisions were made while testing the original group of five patients, three of whom (A.G., C.M. and J.T.) often performed flawlessly; the other two (C.D. and J.D.) were very impaired on many simple structures.

Table 3.1.3.[10, 11]

[10] The category "number of Action Verbs" includes all non-copular verbs. "Maximum number of words" utilizes the count obtained with sentences of each type that contain the non-contracted forms of the preposition à. The reason we have not coded the Pronoun OMB (see Section 3.1.3.1) is that it is controversial whether or not the clitics are NPs.

[11] Certain of the variables are not completely independent of each other. For example, sentence length and the number of NPs in a sentence are positively correlated, for as the number of NPs increases so does sentence length. In addition, the number of action verbs establishes the number of propositions a sentence will contain. Ultimately, since most of the NPs in these sentences are arguments or adjuncts of suppressed arguments of some predicate, the argument structure of the verb can be seen to be interlinked with the other variables and really crucial in many instances for processing ease or difficulty. We expect that, as the value of each variable increases, this will be reflected in a decrease in the number of correct responses for certain patients.

Table 3.1.3. Sentential Variables of the OMBs

	SENTENCE TYPE	# NPs	# Action Vs	# Infl Vs	Max # Wds	Linear order
1	OMB1	Two	One	One	Six	LO
2	OMB2	Two	One	One	Eight	NLO
3	OMB3	One	One	One	Five	NLO
4	OMB4	Two	One	One	Nine	NLO
5	OMB5	Three	One	One	Nine	LO
6	OMB6	Three	One	One	Eleven	NLO
7	OMB7	Three	One	One	Twelve	NLO
8	OMB8	Three	Two	Two	Eleven	NLO
9	OMB9	Three	Two	Two	Eleven	NLO
10	OMB10	Three	Two	Two	Eleven	LO
11	OMB11	Three	Two	Two	Eleven	NLO
12	OMB12	Three	Two	Two	Eleven	NLO
13	OMB13	Three	One	One	Nine	LO
14	OMB14	Three	One	One	Eleven	NLO
15	COMB1	Two	Two	One	Eight	LO
16	COMB2	Two	Two	One	Ten	NLO
17	COMB3	Two	Two	One	Seven	NLO
18	COMB4	Two	Two	One	Seven	LO
19	COMB5	Three	Two	One	Ten	LO
20	COMB6	Three	Two	One	Twelve	NLO
21	COMB7	Three	Two	One	Ten	NLO
22	COMB8	Three	Two	One	Ten	NLO
23	COMB9	Three	Two	Two	Thirteen	NLO
24	COMB10	Four	Three	One	Fourteen	NLO
25	COMB11	Four	Two	One	Thirteen	NLO
26	COMB12	Four	Three	Two	Fifteen	NLO
27	COMB13	Four	Two	Two	Fourteen	NLO
28	COMB14	Four	Two	Two	Thirteen	LO

3.1.3.1. Description of the Pronoun OMB (POMB)

A third battery looks at sentences containing clitic pronouns Table 3 1 4. contains the sentence types in this battery

Table 3 1 4 Sentence Types in the POMB

[29] [POMB1] Dative-Theme cliticized (Dat-th cl)
La chèvre l'a offert(e) à la vache
The goat offered it (him/her) to the cow

[30] [POMB2] Dative-Goal cliticized (Dat-G cl)
La vache lui a remis la chèvre
The cow returned the goat to it (him/her)

[31] [POMB3] Causative-Theme cliticized (Caus-Th cl)
Le lapin l'a fait tenir par la chèvre
The rabbit had the goat hold it (him/her)

[32] [POMB4] Causative-Causee cliticized (Caus-Cee cl)
L'éléphant lui a fait attraper la grenouille
The elephant made it (him/her) catch the frog

[33] [POMB5] Causative-Reflexive Causer=Theme (Caus Refl Cer=Th)
La vache se fait saisir par le lapin
The cow got itself caught by the rabbit

[34] [POMB6] Causative-Reflexive Causee (Caus Refl Cee)
La chèvre fait se serrer la vache
The goat made the cow squeeze itself

[35] [POMB7] Causative-Reflexive Causer=Goal (Caus Refl Cer=G)
La vache se fait remettre la chèvre par le lapin.
The cow had the goat returned to it by the rabbit /
The cow got the rabbit to return the goat to it

[36] [POMB8] Causative-Reflexive Causer=Goal, Truncated (Caus Refl Cer=G Tr)
La chèvre se fait offrir le lapin
The goat had the rabbit offered to it.

[37] [POMB9] Causative-Theme cliticized, Truncated (Caus Th cl)
La chèvre le fait serrer.
The goat had it (him) squeezed

[38] [POMB10] Causative-Reflexive Causer=Theme, Truncated (Caus Refl Cer=Th Tr)
La chèvre se fait bousculer
The goat got itself shaken.

[39] [POMB11] Causative-Theme=Causee cliticized, Intransitive Verb (Caus Th=Cee,Iv)
L'éléphant le fait trembler.
The elephant made it (him) shake.

[40] [POMB12] Cleft-Object with Stylistic Inversion (CO2 + SI)
C'est le lapin qu'a flatté l'éléphant.
It was the rabbit that the elephant patted.

[41] [POMB13] Subject-Object Relative with Stylistic Inversion (SO + SI)
Le lapin qu'a gratté l'éléphant a frappé le singe.
The rabbit that the elephant scratched hit the monkey.

[42] [POMB14] Object-Object Relative with Stylistic Inversion (OO + SI)
Le lapin a gratté la chèvre qu'a embrassée le singe.
The rabbit scratched the goat that the monkey kissed.

3.1.3.2. Justification for the POMB (Clitic Pronoun Battery)

We chose to test these sentence types for several reasons:

To further our understanding of the processing of the causative, we investigated the cliticized versions of the sentence types discussed above. What does a person know when they have full access to the lexical entry faire? He must know that there is no one-to-one correspondence between the role of causee and one particular Case. If the 'embedded' verb is intransitive, the Causee is in the accusative Case when cliticized:

(5) Le lapin l'a fait bondir.

'The rabbit it made jump.'

'The rabbit made it jump.'

However, it is in the dative if the verb is transitive:

(6) Le lapin lui a fait frapper la vache.

'The rabbit to it made hit the cow.'

'The rabbit made it hit the cow.'

Sentences containing such clitics, [39 **Causative-Theme=Causee cliticized, Intransitive Verb]**[12] and [32 **Causative-Causee cliticized]**, were compared to their full NP versions, [18] and [21] respectively. These are all instances of the faire-à or faire-inf construction. In addition, the pronominal version, i.e. (6) (or [32]), does not induce the judgment of unacceptability of the full NP version [21]. The HAH predicts

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[12] For reasons which will be discussed below, the tense of the causative was changed for this sentence type and its truncated version from passé composé to present.

that these pronominal versions should be as easy to process as the full versions since the clitics add semantic information[13] to INFL, in spite of the fact that they are not stressed, which reduces their phonological saliency in comparison with Kean's P-words

Sentence types [29 Dative-Theme cliticized] and [30 Dative-Goal cliticized] are contrasted with the above as they involve "simpler" or more canonical case assignments, i e THEME = ACCUSATIVE and GOAL = DATIVE In addition, we will contrast these with the full NP version [05 Dative].

Pronominal versions of the faire-par constructions were also investigated. [31 Causative-Theme cliticized] was used as a contrast to [22 Causative (Faire-par)]. (It was not possible to test this contruction with the faire-à because the cliticized theme would have had to be interpreted as inanimate.)

For the sentences containing reflexive clitics, we adopted the analysis proposed in Rosen (1989) (and Grimshaw 1990) The reflexive clitic se in French is best understood as a valency changing morpheme The external argument, or the most prominent argument within a prominence domain (= the 'subject'), is bound to (and satisfied by) one of the less prominent arguments; the latter will then have to move to Spec of IP to get Case In order to test whether this analysis was correct, we included a variety of such structures and compared them with passivized structures (discussed above), which also contain traces of movement motivated for similar reasons In the latter case, the external argument is suppressed rather than satisfied. We will make the working assumption that this difference between the satisfaction of the most prominent argument and its suppression will not affect the processing of these structures as reflected by acccuracy rates. We predict that causatives with reflexive clitics should be processed as well (or as poorly) as

13 Since they and the empty categories with which they are associated must form a chain consisting of a θ-role and one Case feature.

"synonymous" passives.[14] The patient cannot use a linear order strategy on any of these sentences

Truncated versions of [35 Causative-Reflexive Causer=Goal], [31 Causative-Theme cliticized], and [33 Causative-Reflexive Causer=Theme] were included ([36], [37] and [38] respectively). It was felt that they offered more direct contrasts to [39 Causative-Theme=Causee cliticized, Intransitive Verb] and that their length allowed for more variety In addition, they eliminated the "Causee" in the par-phrase and could thus be compared to [17 Truncated Causative].

The tense in some of the sentence types ([33],[34],[35],[36],[37],[38] and [39]) was changed from the passé composé used elsewhere in the OMBs to the present tense. This was necessary as a change of auxiliary from avoir to être would have been necessary for all the types which contained reflexive clitics; they would then have contrasted more with the non-reflexive counterpart. We did not want to confound the de-transitivizing effect of the reflexive clitic + the causative. In most cases, this permitted a contrast between le/se. In certain cases, la had to be used but the experimental subject might re-segment the incoming string as "l'a fait" rather than "la fait" and thus the additional gender cue might not even be perceived as such.

The last three sentence types involve inverted versions of sentences found in the OMB. **Cleft Object, Subject-Object Relative and Object-Object Relative.** They permit us to add diversity to the test and avoid the overuse of the causative or the clitic pronouns. Some researchers (e.g Kail 1989) have claimed that these inverted structures are more frequent than their non-inverted counterparts in normal discourse; this seems counterintuitive, but we felt that we should put it to the test. Certainly, not all similar non-

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[14] [34 Causative-Reflexive Causee] was also tested as it was not always clear from the linguistic literature whether this is an unacceptable structure. There are frequent examples of verbs such as se raser and se laver. This form is actually quite restricted lexically with the reflexive reading, though it seems somewhat better with the reciprocal reading with a plural NP agent of the embedded verb.

inverted structures have acceptable inverted versions. However, they do allow a case contrast between the relative pronoun que and the qui of the Subject-Subject Relative and Object-Subject Relative, knowledge of the significance of the change in the relative pronoun is unrelated to 'lexical' properties in these constructions.

3.2. Subjects

An unselected sample of nine subjects whose mother tongue was French[15] participated in this study (Unfortunately, four of the original nine could not be tested on the POMB.) The only criterion for inclusion was that they pass the pretests (see below), thus showing sufficient comprehension at the single word level Ten normal controls roughly matched for age were also tested. Subject variables can be found in Table 3 2 for the total aphasic sample, Table 3.3 for the subset sample of aphasics who were tested on all three batteries and Table 3.4 for controls

[15] A tenth patient withdrew from testing without having completed any of the tests.

TABLE 3.2. PATIENT DATA-TOTAL APHASIC SAMPLE

PATIENTS	LG	AGE	SEX	HANDEDNESS	FAMILIAL SINISTRALITY	EDUCATION	ETIOLOGY	HEMISPHERE	TIME POST-ONSET	DIGIT SPAN ORAL	DIGIT SPAN POINTING
DC	F	48	F	R	Y	SECONDARY	STROKE	L	2.5 yrs	4	4
CD	F	37.5	F	R	N	SECONDARY	STROKE	L	5.5 yrs	5	5
JD	F	57	F	R	Y	POST-SECONDARY	EPILEPSY	B	>12 yrs	3	2
AG	F	50	M	R	N	POST-SECONDARY	TRAUMA	B	19 yrs	6	5
CM	F	54.5	F	R	Y	SECONDARY	ANEURYSM	L	23 yrs	5	5
FP	F	49	F	R	N	SECONDARY	STROKE	L	2 yrs	4	4
PR	F	46	M	R	Y	SECONDARY	STROKE/TUMOUR	L/R	4 yrs	4	5
JR	F	48	F	L	Y	SECONDARY	STROKE	L	3 yrs	4	4
JT	F	48	F	R	N	POST-SECONDARY	ANEURYSM	L	7 mos	3	4

Mean Age: 48.7

TABLE 3.3. PATIENT DATA-SUBSET SAMPLE

PATIENTS	LG	AGE	SEX	HANDEDNESS	FAMILIAL SINISTRALITY	EDUCATION	ETIOLOGY	HEMISPHERE	TIME POST-ONSET	DIGIT SPAN ORAL	DIGIT SPAN POINTING
DC	F	48	F	R	Y	SECONDARY	STROKE	L	2.5 yrs	4	4
CM	F	54.5	F	R	Y	SECONDARY	ANEURYSM	L	23 yrs	5	5
FP	F	49	F	R	N	SECONDARY	STROKE	L	2 yrs	4	4
PR	F	46	M	R	Y	SECONDARY	STROKE/TUMOUR	L/R	4 yrs	4	5
JR	F	48	F	L	Y	SECONDARY	STROKE	L	3 yrs	4	4

Mean Age: 49.1

TABLE 3.4. CONTROL DATA

CONTROLS	LG	AGE	SEX	HANDEDNESS	FAMILIAL SINISTRALITY	EDUCATION	DIGIT SPAN ORAL	DIGIT SPAN POINTING
MC	F	60	F	R	N	POST-SECONDARY	7	6
CD2	F	46	F	R	Y	POST-SECONDARY	7	6
OF	F	64	M	R	Y	ELEMENTARY	5	5
MJ	F	55	F	R	N	POST-SECONDARY	6	5
RL	F	63	M	R	N	ELEMENTARY	5	5
LM	F	43	F	L	Y	POST-SECONDARY	7	8
LN	F	61	F	L	Y	SECONDARY	7	7
DP	F	37	F	A	Y	POST-SECONDARY	7	6
FT	F	58	F	R	N	POST-SECONDARY	7	7
CV	F	65	F	R	Y	SECONDARY	7	7

Mean Age: 55.2

3.3. Procedural Methods

Two memory tests were given to the subject, one a digit span (i.e., correct recall of an ordered list of numbers); the other a pretest evaluating the ability to identify the animals. The sentences themselves were pseudo-randomized so that no more than two sentences of the same type followed each other

Sentences were presented auditorily and a subject's comprehension was evaluated by an object manipulation paradigm. In many ways, this paradigm is superior to a sentence-picture matching task, as possible responses are not predetermined and/or constrained by the examiner. In the case of causatives, it would be virtually impossible to picture what the Causer has done to make the Causee perform the action of the embedded verb. Much inferencing would also have to be done by the test subjects to correctly interpret the image. For the OMBs, toy animals were used. They were maintained in a constant array (space permitting) in front of the tester. The animals specifically mentioned in the sentence being tested or which had to be provided for the truncated structures were advanced and placed in close proximity to the patient. Since the use of each animal's name is balanced across positions in the sentence, an order of presentation interpretive strategy cannot confound the results. To demonstrate a correct response, a subject had to act out all verbs including the causatives. Thus, the causative and the direct object control verbs had to be demonstrated in a similar manner; all other verbs were clear action predicates (with the exception of the copula, which cannot be demonstrated).

'Acting out' is defined as clearly demonstrating to the tester 'who' performed the action and 'to whom' the action was done, if this is applicable.

In order to compare the Causative OMB with the regular OMB, the same method for presenting the animals to the patient was utilized, i.e. moving only those animals mentioned toward the patient before reading the sentence.

However, a particular strategy was necessary for Truncated Passive and Truncated **Causative**: the animal mentioned along with one of the other five was presented to the patient. This permitted the patients to respond correctly by.

1. having this unnamed but pragmatically likely animal do some action to the 'mentioned' animal.

2. choosing one of the other four animals in the row directly in front of the tester as the agent (less appropriate but one patient did do this).

3. ignoring this 'possible' distractor and simply mentioning the fact that 'somebody' did the action to the correct animal.

They could also answer incorrectly by choosing the animal mentioned as the subject and agent of an 'active' sentence, doing the action mentioned

a. to the other 'presented' animal;

b. to itself (alternatively, they could interpret the verb intransitively);

c. to one of the other animals in the unpresented array;

d. to some unspecified 'Theme'.

Given the particular nature of the pronoun OMB-- i.e. the non-reflexive pronouns do not uniquely refer to one specific animal -- a strategy similar to the one described above was used.

The test subjects were therefore presented with:

3 animals (3 mentioned) for:

[35 Causative-Reflexive Causer=Goal]

[41 Subject-Object Relative with Stylistic Inversion]

[42 Object-Object Relative with Stylistic Inversion]

3 animals (2 mentioned + 1 non-distractor) for:

[29 Dative-Theme cliticized]

[30 Dative-Goal cliticized]

[31 Causative-Theme cliticized]

[32 Causative-Causee cliticized]

[36 Causative-Reflexive Causer=Goal, Truncated]

3 animals (2 mentioned + 1 distractor - always a male animal)

(contrast se/le)

[33 Causative-Reflexive Causer=Theme]

3 animals (1 mentioned + 1 target with proper gender

+ 1 distractor with opposite gender)

(contrast le/la)

[37 Causative-Theme cliticized, Truncated]

[39 Causative-Theme=Causee cliticized, Intransitive Verb]

2 animals (2 mentioned)

[34 Causative-Reflexive Causee]

[40 Cleft-Object with Stylistic Inversion]

2 animals (1 mentioned + 1 distractor -- always a male animal)

(contrast se/le)

[38 Causative-Reflexive Causer=Theme, Truncated]

3.4. Scoring

For the OMB and the COMB, each NP in the linear string was numbered sequentially from left to right; verbs were represented by commas and a change of clause was signalled by a semi-colon. Given a neutral canonical thematic role order of Agent-Theme(-Goal) (in each clause), by convention the first slot assigned is to the Agent and so on. Therefore, the following sentence would be treated as:

1 2

Le lapin a frappé la vache.

The correct response would be: 1 , 2

Agent , Theme

A sentence containing a causative would be scored as follows :

1 2 3

La chèvre a fait frapper la grenouille par la vache.

the correct reponse to which would be: 1 , (3) , 3 , 2 (the parentheses indicating that patients were permitted to make that portion of the response verbally). This would correctly indicate that la chèvre or the goat (the Causer) made la vache or the cow (the Causee) hit la grenouille or the frog (the Theme). In addition, to be scored as correct (1 as opposed to 0), the subject must have understood the entire sentence. No partial scores were given. Determination of whether sentences containing two action verbs were correctly interpreted disregarded certain, often idiosyncratic, response biases which determined whether the main or embedded verbs were acted out first.[16]

A slightly different scoring procedure had to be utilized for the POMB than for the other OMBs, where only full NPs were numbered. In the POMB, the reflexive and non-reflexive pronouns and with the full NPs were numbered from left to right. "X" was utilized for the animal designated in Truncated structures like Truncated Passive. [17, 18]

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16 This is the same scoring procedure adopted in the original OMB for clause reorderings. All correct responses are encoded for each sentence type in the subjects' Summary Score Sheets.

17 The three inverted structures are not affected; as they contain only full NPs, they maintain a consistent scoring method throughout.

18 In addition, if the reader consults the Summary score sheets in the Appendix he/she will see that for each response, we coded whether or not the test subjects utilized the animal

In addition, those sentence types that required the patient to be sensitive to gender contrasts, i.e.

Causative-Theme clitcized, Truncated

Causative-Theme=Causee cliticized, Intransitive Verb

were scored as correct as long as a non-reflexive response was given. As stated above, the tense of the verb had been changed to permit the contrast between, le and la; all sentences containing la are ambiguous since the heavy use of the passé composé can lead the subject to re-segment the incoming string as l'a, especially since the third person singular present tense of faire is homophonous with the past participle Half of all the sentences of these types have this ambiguity. This leaves only twelve with the clear and unambiguous le clitic pronoun; responses to it were idiosyncratic, though they tended to be consistent Recall that the gender contrasts are grammatical rather than natural, the animals are perhaps presumed to be unspecified as to their natural gender (except for la vache) In addition, at least one patient and one control thought of la grenouille as le crapaud ('the toad') and one person referred to la chèvre as le bouc('the billy goat'). In addition, since some subjects never used the animals which were provided, these contrasts were simply not applicable. Therefore, as long as they did not interpret the pronouns as reflexives (the only unambiguous contrast le/se) and otherwise responded correctly, their answer was scored as correct.

3.5. Data Analysis

For the group study, analyses of variance were performed using both subjects and

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which was presented to them. Therefore, additional information is provided, e.g. 2=P or 2#P, X=P or X#P (in dBase 111 Plus, in which the data was recorded , # is equivalent to 'not equal to'); P= Presented Animal. Please note that the pronoun, being in INFL, is always '2'. In the case of a Truncated structure, it was found that, except in three cases overall, either both animals presented were utilized or neither was; this seems to reside purely in the respondent's individual style and was generally consistent across tests and paradigms. Portions enclosed by parentheses were sometimes conveyed to the tester verbally rather than acted out; however it was always clear what the subject was indicating as his/her response.

sentence types as units[19] in order to establish that the variance was not due to chance. In addition, a post hoc comparison procedure was then applied to verify which of the units were significantly different from each other The test utilized in all cases was the Fisher PLSD (Protected Least Significant Difference) set at a 95% confidence level. The PLSD is a protected t-test-- protected in that its results can be accepted with confidence when the overall ANOVA is significant (Olson 1987). This post hoc test was also chosen because it was the appropriate statistic to apply given the sample size.[20] Other increasingly conservative procedures would increase the likelihood of a Type 2 error, i.e. accepting the null hypothesis when in fact it should be rejected. For the individual case studies, the same criteria were used as were used by Caplan and Hildebrandt (1988. 159-162) to establish non-random performance. Briefly, as explained therein, to calculate the appropriate χ^2 value[21] that would determine whether our subjects' performances were only due to chance, assumptions as to what constitutes chance must be made. Two Stages are postulated:

Stage 1 assumptions presume that the subject is choosing at random from the array of objects in front of him/her in order to act out the sentence.

Stage 2 assumptions are more restrictive since it is assumed that the subject can recall the items mentioned and is choosing randomly from this subset of the items presented.

As is evident, most of the OMBs are usually calculated under Stage 2 assumptions, since

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19 All statistical procedures were performed utilizing the program Statview 512+ from Brainpower, Inc.

20 To mitigate a Type 1 error, i.e. rejecting the null hypothesis when it should be accepted, one overall ANOVA was performed per subject group as multiple ANOVAs cannot be performed on the same data. This was in fact the more conservative approach to take as it allowed fewer of the Fisher PLSDs computed to reach statistical significance than would have been the case with multiple ANOVAs.

21 χ^2 s compare observed and expected distributions of values. These Stage assumptions help us calculate the number of logically possible responses and therefore establish the expected values, i.e. $12_{\text{Total possible correct responses}} - N_{\text{possibilities}} = \text{Expected}_{\text{value}}$.

subjects in most cases (except for truncated structures and many of the sentence types in the POMB) are not presented with more objects than are actually mentioned in the sentence. Whenever possible, the most restrictive assumptions are utilized in order to avoid a Type 1 error, in other words, accepting chance performances as non-random

To further avoid any possibility of a Type 1 error (since this type of object manipulation paradigm permits a larger number of logically possible responses than a sentence-picture matching task, an additional test was performed The test of the significance of the difference between two independent proportions (Ferguson and Takane 1989: pp. 198-200) is performed comparing the scores a subject obtains on two sentences types with the same number of verbs the same number of logically possible responses. We can then more confidently judge whether or not the difference in performance, if there is one, is significant.

Chapter 4- Group Studies

4.1. Test Results

The following chapter presents the results of all the batteries with which the experimental subjects were tested We chose to highlight the results by grouping the sentence types into relevant 'Sentence Contrasts' Only the results for the appropriate aphasic group will be presented in each case The logic of this decision resides in the fact that, to achieve generalizability of the findings, the results of the total aphasic sample on the critical sentence types must be reported. After all, what is of interest is establishing the determinants of sentence complexity in the aphasic population as a whole. [1] Since only five patients could be tested on the P(ronoun) OMB, the means they obtained on sentences containing pronominal forms and the means obtained by the total group of 9 on the full NP versions could not justifiably be contrasted. However, since the aphasic samples are not independent, we expect to find similar results from the statistical analyses performed on the data. Finally, in order to characterize aphasic comprehension deficits with structurally complex material, we must compare the performance of normals on the same materials. The aphasics' response patterns can then be viewed more accurately.

'Sentence Contrasts 1' is the crucial one in that it examines the accuracy rates of aphasics in the receptive processing of the French causatives, which as we have seen, subcategorize for VP rather than IP (or CP) complements. As discussed in Chapter 3, these sentence types permit us to test our hypothesis that structural complexity in general and the additional complexity entailed by the presence of functional projections in particular categories is a major determinant of processing complexity, with increased error rates being a direct consequence of the additional hierarchical structure.

To further our understanding of the processing of these constructions, sentences

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[1] It is precisely because we are aware that nine subjects constitute a small sample that any further attrition to the subset of five was avoided whenever possible.

containing pronominal clitics are compared to equivalent full NP versions of causatives as well as simple datives in 'Sentence Contrasts 2'. Recall that this is also a direct test of the HAH since, although pronominal clitics are in an A-bar position (i.e. in INFL --a functional head), as heads and participants in the θ-module, they increase the saliency of INFL and are thus predicted to be correctly attended to by aphasics. 'Sentence Contrasts 3' examines reflexives in these same constructions, the claim by Grimshaw (1990) and Rosen (1989) that Romance reflexive clitics are valency-changing morphemes rather than anaphors is tested by comparing structures containing reflexives with passive structures. According to these theoretical analyses, both structures with reflexives and those with passives are considered to involve an operation on the external argument (satisfaction for the former and suppression for the latter), with consequent identical movement of the theme to Spec of IP in order to get Case.

'Sentence Contrasts 4' further examines the comprehension of syntactic structures by testing various baseline constructions and manipulating the presence of additional thematic roles by the use of three- vs. two- place predicates (interacting with the argument vs. a-adjunct distinction); by the use of coordination (specifically, conjoined structures such as NPs, VPs, IPs and CPs), and by the use of predication, i.e. by the addition of relative clauses. 'Sentence Contrasts 5' compares only those structures which contain wh-trace; these may on occasion involve Stylistic Inversion. These are predicted to be in general more difficult to process due to the obligatory presence of additional CP (and IP) nodes.

4.1.1. 'Sentence Contrasts 1'

4.1.1.1. Total Aphasic Sample

The first set of contrasts involves 108 sentences, twelve tokens of each of nine sentence types. Three of the types are from the OMB and six are from the COMB. The types being compared are the monoclausal [06 **Dative Passive**] and the causatives as well as the biclausal two-IP passivized direct object control types (intransitive and transitive embedded verb versions) and the two-CP object relatives. The causatives include those with intransitive and transitive complement verbs as well as the two with the passivized complement verbs (truncated and non-truncated versions). Table 4.1.2. contains the results obtained by all the aphasics on these sentence types. The means (and their respective Standard Deviations) are presented in descending order of accuracy. The overall accuracy rate for this set was 58 64%. [2] Table 4 1.2 also encodes all the significantly different means as determined by the PLSDs computed with the overall ANOVA. (The overall ANOVA[3] with repeated measures on the sentence type factor for all OMBs for the total aphasic sample revealed a significant effect of this factor on the number of correct responses: $F(27,216)=13\ 34$, $p=.0001$*. Fisher's PLSD was applied at the experimenterwise error rate of 0.05 to determine which of the means were significantly different from each other.[4])

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[2] The overall accuracy rate of this group on all OMBs was 64.32%.

[3] This statistic will only be reported on once per subject group.

[4] This information for all 28 sentences can be found in Appendix A. Those relevant to the 'Sentence Contrasts' will be reported on within the text. Recall, multiple ANOVAs cannot be performed on the same data.

Table 4.1.1. Group Results – All 9 Aphasics 'Sentence Contrasts 1'

Sentence Type	Mean	SD
[18] Causative + Intransitive Verb	12 000	0
[16] Passivized Direct Object Control, Intransitive Verb	8.000	4.000
[06] Dative Passive	7.444	4.640
[22] Causative (Faire-par)	7.444	4.531
[17] Truncated Causative	7.000	4.272
[11] Object-Object Relative	6.556	4.503
[09] Subject-Object Relative	5.222	4.522
[21] Causative (Faire-à)	5 222	4.206
[20] Passivized Direct Object Control + Transitive Verb	4.444	4.640
	Mean: 7.037	

		[06]			[09]	
[18]	[16]	[22]	[17]	[11]	[21]	[20]

(Sentence types underlined by a common line do not differ on the Fisher PLSD set at a 95% confidence level; sentences not underlined by a common line do differ significantly)

With regard to the crucial sentences, we note that [06 Dative Passive] does not contrast with either [16 Passivized Direct Object Control, Intransitive Verb] or [22 Causative (Faire-par)], which in turn do not contrast with each other [06 Dative Passive] and [22 Causative (Faire-par)] which have identical means, do not contrast significantly with [11 Object-Object Relative]. However, [06 Dative Passive] and [22 Causative (Faire-par) do contrast significantly with [09 Subject-Object Relative], [21 Causative (Faire-à)], and [20 Passivized Direct Object Control + Transitive Verb]. [21 Causative (Faire-à)] and [09 Subject-Object Relative], which also have identical means, as well as [11 Object-Object Relative] and [20 Passivized Direct Object Control + Transitive Verb], do not contrast with each other. [5]

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[5] It may be noted that [21 Causative (Faire-à)] does not contrast with any of the biclausal structures with the same number of NPs. However, this sentence was considered by many experimental subjects to be unacceptable in its present form (i.e. with all animate NPs); therefore, scores were depressed (the normal controls show this more clearly). We do not take this to be evidence of parallel structures though; the partial merger account may still best

Two further issues should be discussed concerning the results. First, the [18 **Causative + Intransitive Verb]** was correctly responded to 100% of the time; in other words, despite the fact that the second V precedes its Agent, the structure is no more difficult than a simple Active. Given the adoption of a linear order strategy, it would be difficult to misinterpret this sentence type. The contrastive [17 **Truncated Causative]** had an accuracy rate of 58.33%; this structure cannot be responded to by applying a linear order stategy since the Agent of the second verb has been suppressed, and no additional information is provided by this suppressed argument which licences an a-adjunct par-phrase. Even by using the severest criterion for determining chance performance, i.e. by considering the two verbs as one unit, patients only have a 1 in 6 chance of obtaining the correct response (if we consider them as two verbs, the odds increase proportionally that their interpretation is non-random). The fact that there is such a strong bias toward [18 **Causative + Intransitive Verb]** makes their performance on the truncated structure all the more remarkable. The means of the truncated and non-truncated versions are very similar--7/12 and 7.444/12 respectively. The aphasics are obviously sensitive to the argument structure of the embedded verb. [6]

The second observation we would like to make is that the difference in accuracy rates between the two passivized direct object control structures is due to the additional functional category in [20 **Passivized Direct Object Control + Transitive Verb]**. [16 **Passivized Direct Object Control, Intransitive Verb]** was the type on which the patients received their second highest score in this contrastive sentence set. Once they have computed that the initial NP is not the Agent of V_1 but the Agent of V_2, why should it be

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account for the construction since the VP nature of the embedded argument may mitigate the full effects of the unacceptability.

[6] Recall that another difference between the faire-à and faire-par constructions resides in the prior passivization of the embedded verb before argument structure merger with faire in the latter.

so much more difficult to interpret the complement of V_2, which after all is in unmarked canonical order in relation to its theta-assigner? The answer must lie in the branching nature of the second VP, i.e. the necessity to compute the DP complement, which then in turn must s-select its semantic head--the NP This is the only difference between these two sentence types, an analysis which posits difficulties with chain formation cannot explain their good performance with the intransitive version nor can it fully account for the transitive version being the sentence type which occasioned their worst performance (only 37% correct). Having seemingly exhausted their processing resources, they most often fall back on a linear order strategy (62/68 errors, i.e. 91.2%).

4.1.1.2. Normal Controls

Table 4.1.2. contains the results obtained by the normals on the 9 sentence types tested. The means (and their respective Standard Deviations) are presented in descending order of accuracy. The overall accuracy rate for these contrasts was 92.03%. [7] Table 4.1.2. also encodes whether the means were significantly different. (Their overall ANOVA with repeated measures on the sentence type factor revealed a significant effect of this factor on the number of correct responses: $F(41,164)=6.579$; $p=.0001^*$; see Appendix A for all the Fisher's PLSD).

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7 Their overall accuracy rate on all three batteries was 92.76%.

Table 4.1.2. Group Results – 10 Controls 'Sentence Contrasts 1'

Sentence Type	Mean	SD
[18] Causative + Intransitive Verb	12.0	0
[22] Causative (Faire-par)	11.7	.675
[11] Object-Object Relative	11.3	.675
[16] Passivized Direct Object Control, Intransitive Verb	11.3	1.059
[17] Truncated Causative	11.3	.949
[06] Dative Passive	11.0	1.054
[20] Passivized Direct Object Control + Transitive Verb	10.8	2.044
[09] Subject-Object Relative	10.2	2.440
[21] Causative (Faire-à)	9.8	2.573
Mean:	11.044	

		[11]				
		[16]				
[18]	[22]	[17]	[06]	[20]	[09]	[21]

(Sentence types underlined by a common line do not differ on the Fisher PLSD set at a 95% confidence level; sentences not underlined by a common line do differ significantly.)

The pattern with the controls is somewhat different than with the aphasics. With regard to the critical sentence types, although **[22 Causative (Faire-par)]** still does not contrast with either **[06 Dative Passive]** or **[16 Passivized Direct Object Control, Intransitive Verb]**, it no longer contrasts with **[20 Passivized Direct Object Control + Transitive Verb]** either. This is no doubt due to their near ceiling performance on seven of the sentence types, on which they scored 90% or more. Their lowest score was for **[21 Causative (Faire-à)]** at 81.7%. This result must be explained. The poorer performance on [21] can only be due to its unacceptability. For them, this sentence type contrasts with five of the others but not with **[06 Dative Passive]**, **[09 Subject-Object Relative]** and **[20 Passivized Direct Object Control + Transitive Verb]**. [06] has a 3,1,2 response and both [09] and [20] have 2,1;1,3 as correct responses. Controls had a tendency to treat the Causee as a sort of locational Goal when they made an error in interpretation.

An additional overall two-factor ANOVA was calculated foı Category of Subject x Sentence Type (repeated measures). [8] The categorization was two level--patient vs. control. This analysis yielded the following: there was a significant main effect for type of subject $F(1,17)=14.693$; $p=.0013$*; a significant main effect for sentence type $F(27,459)=17.444$; $p=.0001$*; and finally a significant interaction of the two $F(27,459)=6.287$; $p=.0001$*. A factorial analysis of variance to see which sentence types differed significantly between the patients and the controls was performed . In general terms, the only sentence types which did not contrast between the two groups were the types in which a linear order strategy would lead to the correct response.

This factorial analysis as it pertains to the present set of contrasts can be found in Table 4 .1.3. All the sentence types differed significantly between subject groups except for **[18 Causative + Intransitive Verb]** on which no errors were made by either.

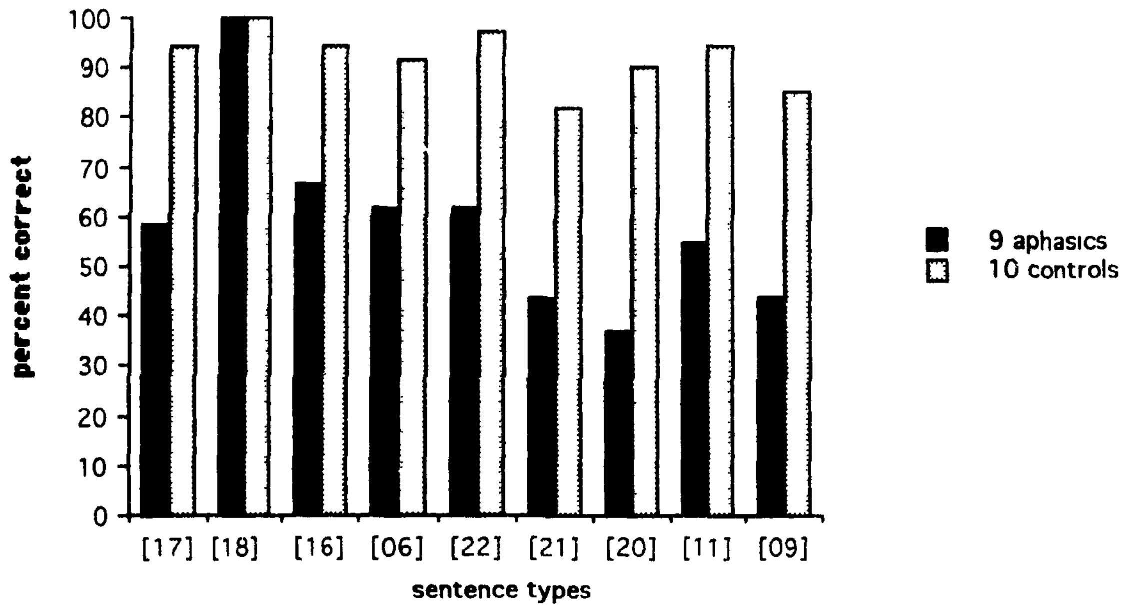
Table 4.1.3. Significantly Different Sentence Types -- Patients x Controls

'Sentence Contrasts1'

Sentence Type		Fisher's PLSD
[17] Truncated Causative	F(1,17)=9.662; p=.0064*	2.919*
[16] Passivized Direct Object Control, Intransitive Verb	F(1,17)=6.350; p=.022*	2.763*
[06] Dative Passive	F(1,17)=5.587; p=.0303*	3.174*
[22] Causative (Faire-par)	F(1,17)=8.664; p=.0091*	3.051*
[21] Causative (Faire-à)	F(1,17)=8.389; p=.01*	3.335*
[20] Passivized Direct Object Control + Transitive Verb	F(1,17)=15.502; p=.0011*	3.406*
[11] Object-Object Relative	F(1,17)=10.898; p=.0042*	3.032*
[09] Subject-Object Relative	F(1,17)=9.188; p=.0075*	3.465*

[8] See footnote 2.

Figure 4.1. Accuracy Rates Patients vs Controls-'Sentence Contrasts 1'



This set of contrasts has confirmed the prediction that a two-proposition (or one proposition + one event) structure where the event is syntactically realized as a VP such as [22 **Causative (Faire-par)**] is no more difficult to process than a single proposition which contains a dative verb such as [06 **Dative Passive**]. We were not able to confirm this finding with [21 **Causative (Faire-à)**], but the control data allowed us to claim that the structure's unacceptability, rather than its complexity, accounted for the depressed scores. This same construction Faire-Inf is also instantiated in [18 **Causative + Intransitive Verb**] but the linear order strategy effectively obscures the role purely structural features play in sentence processing. To further our understanding of the processing of causatives, we will examine aphasics' performance on pronominal as well as full versions of these structures in 'Sentence Contrasts 2'. This will permit us to examine sentence types in which the INFL contains more semantic information, in this case the semantic role of one of the arguments of the embedded verb (or more precisely, the merged verbs).

4.1.2. 'Sentence Contrasts 2'

4.1. 2.1. Subset Aphasic Sample

Table 4.2.1. contains the results obtained by the five aphasics on the 11 sentence types (132 sentences) highlighted in these contrasts. The means (and their respective Standard Deviations) are presented in descending order of accuracy. The overall accuracy rate was 69.54%. [9] The table also encodes all the significantly different means established by their overall ANOVA. An ANOVA with repeated measures on the sentence type factor revealed a significant effect of this factor on the number of correct responses: $F(41,164)=6.579$; $p=.0001$*. Fisher's PLSD was applied at the experimenterwise error rate of 0.05 to determine which of the means were significantly different from each other (see Appendix A for all the contrastive means).

Table 4.2.1. Group Results – 5 Aphasics 'Sentence Contrasts 2'

Sentence Type	Mean	SD
[18] Causative + Intransitive Verb	12.0	0
[05] Dative	11.8	447
[29] Dative-Theme cliticized	9.2	5.167
[39] Causative-Theme=Causee cliticized, Intransitive Verb	9.2	5.215
[22] Causative (Faire-par)	8.6	3.362
[32] Causative-Causee cliticized	8.0	4.950
[30] Dative-Goal cliticized	7.8	4.494
[31] Causative-Theme cliticized	6.8	5.020
[37] Causative-Theme cliticized, Truncated	6.8	4.868
[17] Truncated Causative	6.6	4.615
[21] Causative (Faire-à)	5.0	3.808
Mean:	8.345	

		[29]				[31]		
[18]	[05]	[39]	[22]	[32]	[30]	[37]	[17]	[21]

(Sentences types underlined by a common line do not differ on the Fisher PLSD; sentences not underlined by a common line do differ significantly, p=.05*.)

[9] However, their overall accuracy rate on all three batteries was 62.96%.

We note that [18 Causative + Intransitive Verb] does not contrast with the pronominal version [39 Causative-Theme=Causee cliticized, Intransitive Verb] Neither of them contrasts with either [05 Dative] nor with its clitic version [29 Dative-Theme cliticized]. With the exception of [18 Causative + Intransitive Verb], none of the above contrasts with [22 Causative (Faire-par)]. Only the latter cannot be guessed at by applying a linear order strategy. The reader may have observed that, although the differences were not significant, the clitic versions [39] and [29] (which have identical means) are lower in accuracy than the full NP types [18] and [05] respectively. This depression of the scores is due mainly to one patient (P.R.), who responded significantly below chance on every clitic and truncated structure tested (=0%). Without his scores, the group's results on all the clitic versions are much better:

[29] Dative-Theme cliticized	95.8% correct
[39] Causative-Theme=Causee cliticized, Intransitive Verb	95.8% correct
[32] Causative-Causee cliticized	83.0% correct
[30] Dative-Goal cliticized	81.3% correct
[31] Causative-Theme cliticized	70.8% correct
[37] Causative-Theme cliticized, Truncated	70.8% correct

These sentence types were quite well interpreted despite the indeterminacy of the reference (the minimum average score was 8.5/12).

To return to the analysis of the group of five, sentence type [22 Causative (Faire-par)] and its truncated version [17] do not contrast with their clitic counterparts [31 Causative-Theme cliticized] and [37 Causative-Theme cliticized, Truncated] (which have identical means). In fact none of the types containing clitic pronouns contrasted with each other. [32 Causative-Causee cliticized], the clitic version of [21 Causative (Faire-à)] did not contrast with the latter despite the animacy problem nor did it contrast with [22 Causative (Faire-par)]. The clitic versions of [22] (truncated or not, [31] and [37]) in turn did not contrast with [21 Causative (Faire-à)] though [22] itself did contrast with [21], as was the case with the aphasic sample as a whole.

The performance on [30 Dative-Goal cliticized] is somewhat depressed and it contrasts with [05 Dative] (though it does not contrast with [21 Causative (Faire-à)]). As we can see above, without P.R.' s scores, [30] and [05] would probably not contrast; however, we would still like to explain why [30] is more difficult to process than [29 Dative-Theme cliticized]. The obvious reason is that linear order strategies cannot work here, since the Goal precedes the Theme. Another possible reason may be due to dialectal influences; the sentence type might be perceived as:

1 2 (3)

(1) Le singe, lui (i) a donné le lapin....

' The monkey, he's the one that gave the rabbit....'

i.e. with a emphatic subject and an unmentioned goal. In fact 52.4% of the aphasics' errors were of this type compared to 28.6% attributable to a linear order response.

4.1.2.2. Normal Controls

Table 4.2.2. contains the results obtained by the controls on these 11 sentence types. The means (and their respective Standard Deviations) are presented in descending order of accuracy. The overall accuracy rate was 96.52%. Table 4.2.2. also encodes all the significantly different means.

Table 4.2.2. Group Results - 10 Controls 'Sentence Contrasts 2'

Sentence Type	Mean	SD
[05] Dative	12.0	0
[18] Causative + Intransitive Verb	12.0	0
[39] Causative-Theme=Causee cliticized, Intransitive Verb	12.0	0
[29] Dative-Theme cliticized	11.9	.316
[30] Dative-Goal cliticized	11.9	.316
[22] Causative (Faire-par)	11.7	.675
[31] Causative-Theme cliticized	11.7	.483
[32] Causative-Causee cliticized	11.7	.675
[37] Causative-Theme cliticized, Truncated	11.4	1.075
[17] Truncated Causative	11.3	.949
[21] Causative (Faire-à)	9.8	2.573
Mean:	11.582	

[05]	[29]	[22]			
[18]	[30]	[31]			
[39]		[32]	[37]	[17]	[21]

(Sentences types underlined by a common line do not differ on the Fisher PLSD; sentences not underlined by a common line do differ significantly, $p=.05$*.)

For the controls, no sentence type contrasted except for the [21 Causative (Faire-à)], which contrasted with all the others. This is due to its equivocal status, as was previously discussed. In almost all instances full NP and clitic versions of the sentence types had identical means. Performance on all but [21] was 94.2% or better.

An additional two-factor ANOVA was calculated for Category of Subject x Sentence Type (repeated measures). The categorization was two-level--patients (5) vs. controls (10). This analysis yielded the following results: there was a significant main effect for type of subject $F(1,13)=17.223$; $p=.0011$*; a significant main effect for sentence type $F(41,533)=10.475$; $p=.0001$*; and finally a significant interaction of the two $F(41,533)=4.418$; $p=.0001$*. A factorial analysis of variance to see which sentence types differed significantly between the patients and the controls was performed. This information can be found in Table 4.2.3. Seven of the sentence types differed significantly between subject groups, the exceptions were [05 Dative] and [29 Dative-Theme cliticized], and [18 Causative + Intransitive Verb] and [39 Causative-

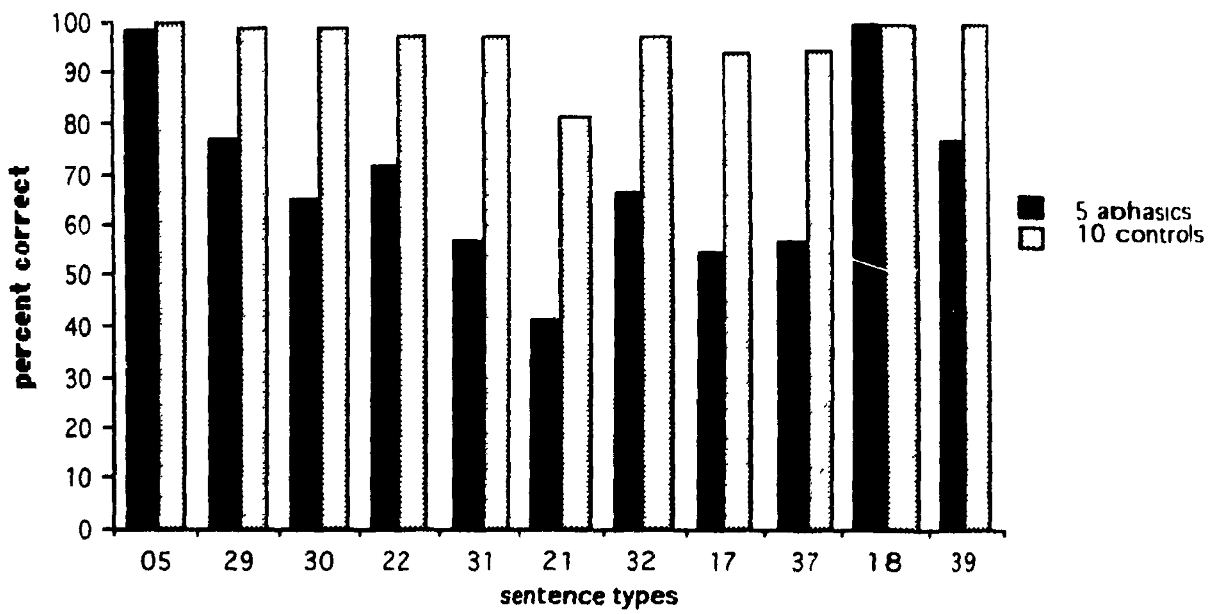
Theme=Causee cliticized, Intransitive Verb].

Table 4.2.3. Significantly Different Sentence Types Patients x Controls

'Sentence Contrasts 2'

Sentence Type		Fisher's PLSD
[30] Dative-Goal cliticized	F(1,13)=8.916; p=.0105*	2.957*
[22] Causative (Faire-par)	F(1,13)=8.447; p=.0123*	2.305*
[31] Causative-Theme cliticized	F(1,13)=10.111, p=.0072*	3.[illegible]29*
[21] Causative (Faire-à)	F(1,13)=8.49; p=.0121*	3.559*
[32] Causative-Causee cliticized	F(1,13)=5.81; p=.0315*	3.316*
[17] Truncated Causative	F(1,13)=10.26; p=.0069*	3.170*
[37] Causative-Theme cliticized, Truncated	F(1,13)=8 716; p=.0112*	3.366*

Figure 4.2. Accuracy Rates Patients vs Controls-'Sentence Contrasts 2'



Our predictions, based on the HAH, concerning the accessibility for purposes of interpretation of an INFL signalled by a clitic chain were supported. For both the subject populations, such structures patterned with the full NP versions. The experimental subjects also demonstrated their ability to understand the grammatical cliticized version of the problematic faire-à, thus clearly showing that their poor performance on [21] is due to another factor, i.e. the structure's unacceptability rather than due to the presence of additional CP and IP nodes.

We wanted to further examine the processing of causatives by including structures containing reflexive clitics. 'Sentence Contrasts 3' below describes the results we obtained.

4.1.3. 'Sentence Contrasts 3'

4.1.3.1. Subset Aphasic Sample

This series of contrasts consists of 96 sentences, twelve tokens of each of eight sentence types. Table 4.3.1. contains the results obtained by the five aphasics. The means (and their respective Standard Deviations) are presented in descending order of accuracy. The overall accuracy rate for this group of sentences was 71.3%.

Table 4.3.1. Group Results – 5 Aphasics 'Sentence Contrasts 3'

Sentence Type	Mean	SD
[02] Passive	10.6	2.074
[33] Causative-Reflexive Causer=Theme	10.4	2.510
[03] Truncated Passive	9.6	5.367
[38] Causative-Reflexive Causer=Theme, Truncated	9.4	5.273
[06] Dative Passive	9.0	2.345
[36] Causative-Reflexive Causer=Goal, Truncated	8.4	4.980
[35] Causative-Reflexive Causer=Goal	7.8	4.764
[34] Causative-Reflexive Causee	3.2	4.604
Mean:	8.55	

[02] [33] [03] [38] [06] [36] [35] [34]

(Sentence types underlined by a common line do not differ on the Fisher PLSD set at a 95% confidence level; sentences not underlined by a common line do differ significantly.)

As predicted, none of the sentence types were significantly different from each other except for [34 Causative-Reflexive Causee], which contrasted with all other sentence types. Without the inclusion of that sentence type, no sentence type would have scored less than

65% correct. P.R., who is relatively good on passivized structures, still does not respond to reflexive clitics. Of the subset of patients tested on these sentence types, he is the only one who seemed not to understand the full NP causative constructions, [10] in his case, there are probably many interacting sentential variables which are causing the difficulty in processing. The patients' mean scores for passivized structures were almost identical to those for the equivalent se-faire constructions (e.g. [02] and [33], [03] and [38]), leading us to accept Rosen's account that there is a similar movement operation which necessitates the creation of a chain. Analyses that view the se as linked to a base-generated agent that is itself linked to a detransitized verb (e.g Grimshaw 1982 and Wehrli 1986) would have predicted better performances on se-faire than on passives

4.1.3.2. Normal Controls

Table 4.3.2. contains the results obtained by the controls on these same eight sentence types. The means (and their respective Standard Deviations) are presented in descending order of accuracy. The overall accuracy rate was 96.3%. Table 4.3.2. also includes all the statistically significantly different means.

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10 With the exception of [18 Causative + Intransitive Verb].

Table 4.3.2. Group Results - 10 Controls 'Sentence Contrasts 3'

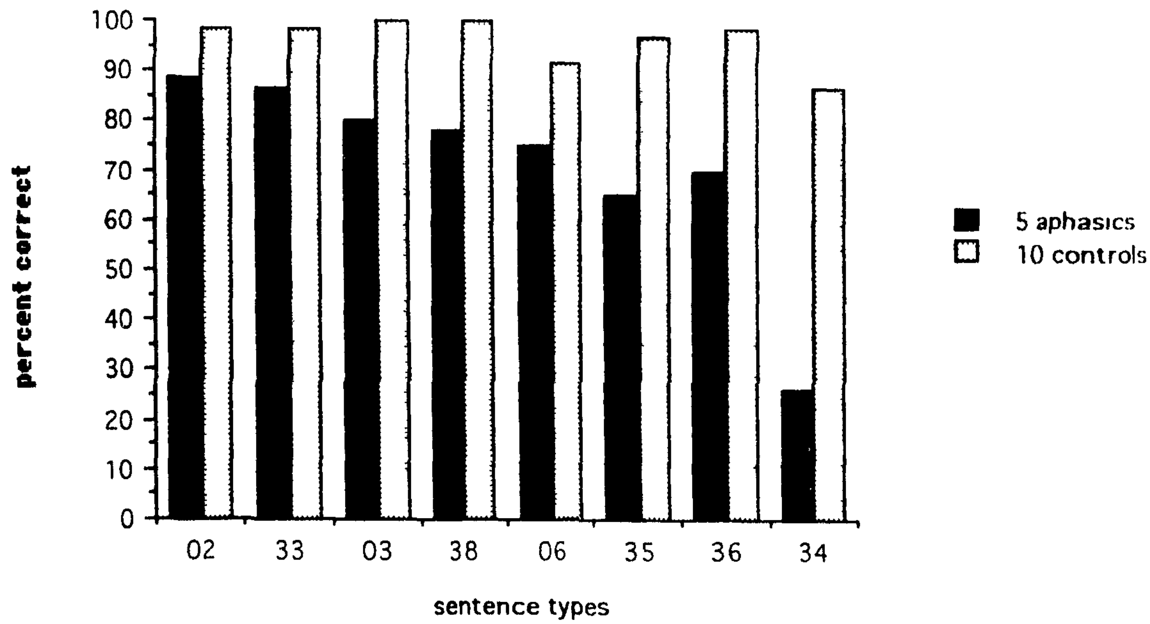
Sentence Type	Mean	SD
[03] Truncated Passive	12.0	0
[38] Causative-Reflexive Causer=Theme, Truncated	12.0	0
[02] Passive	11.8	.422
[33] Causative-Reflexive Causer=Theme	11.8	.422
[36] Causative-Reflexive Causer=Goal, Truncated	11.8	.422
[35] Causative-Reflexive Causer=Goal	11.6	.516
[06] Dative Passive	11.0	1.054
[34] Causative-Reflexive Causee	10.4	3.688
Mean:	11.55	

	[02]			
[03]	[33]			
[38]	[36]	[35]	[06]	[34]

(Sentence types underlined by a common line do not differ on the Fisher PLSD set at a 95% confidence level; sentences not underlined by a common line do differ significantly.)

It would appear that the controls show the same pattern as the patients. Without the presence of [34 Causative-Reflexive Causee], no sentence types would contrast. However, unlike the aphasics, for the controls, who as a group never score less than 87% correct, [34] does not contrast with either [35 Causative-Reflexive Causer=Goal] or [06 Dative Passive]. Without the inclusion of [34], no sentence type would have scored less than 91.7% correct. Controls were vocal in their dislike of [34]. O.F. systematically 'repaired' the structure by clitic climbing the reflexive and attaching it to the matrix verb (thereby producing [33]); he therefore misinterpreted the structure. In most cases, the controls scored identically on passivized and reflexivized structures.

Figure 4.3. Accuracy Rates Patients vs Controls-'Sentence Contrasts 3'



A factorial analysis of variance to see which sentence types differed significantly between the patients and the controls was performed. This information can be found in Table 4.3.3.

Table 4.3.3. Significantly Different Sentence Types - Patients x Controls "Sentence Contrasts 3'

Sentence Type		Fisher's PLSD
[06] Dative Passive	F(1,13)=5.417; p=.0367*	1.857*
[35] Causative-Reflexive Causer=Goal	F(1,13)=6.714; p=.0224*	3.169*
[36] Causative-Reflexive Causer=Goal, Truncated	F(1,13)=4.97; p=.0441*	3.295*
[34] Causative-Reflexive Causee	F(1,13)=10.842; p=.0058*	4.725*

Only half of the sentence types differed significantly between subject groups. Types [02 Passive], [33 Causative-Reflexive Causer=Theme], [03 Truncated Passive], and [38 Causative-Reflexive Causer=Theme, Truncated] do not contrast.

Those sentences that contrast between subject groups are clearly those with the greater hierarchical structure, that is, those which have Goal arguments in addition to

Themes (and the unacceptable [34]). Our prediction that the argument structure of the head, in this case the verb, determines success rates is supported. We will further explore the nature of processing costs of various structures within the same paradigm in 'Sentence Contrasts 4'. However, at this time, with regard to the results of the present set of contrasts, we may say that, although displaced elements were present in the structures tested, the lack of Spec position in the VP may account for the mitigation of the cost of computing a non-transparent structure, with transparency being equated with phrases occupying base-generated positions (we are abstracting away from verb movement to INFL). Rosen's theoretical analysis is also supported by the empirical facts. The controls had identical means for [03] and [38] and [02] and [33]. In fact, these four sentence types did not contrast between the subject groups.

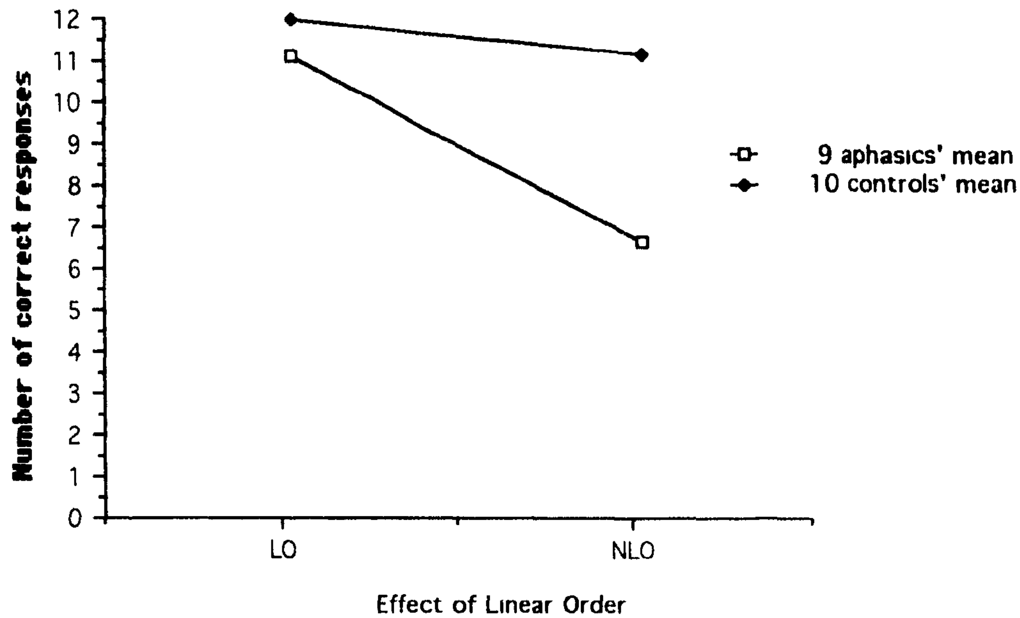
In 'Sentence Contrasts 3', aphasics obtained their highest overall mean score for a subset of the OMB paradigm and this despite the ungrammatical [34 Causative-Reflexive Causee]; without this sentence type, they would have scored 77.7 % correct rather than than 71.3%. Their next best overall subset mean score was in 'Sentence Contrasts 2', which tested the pronominal clitics and their interaction with causatives. The prediction that semantically more 'weighty' elements in INFL would be understood and that the sentence would be properly parsed was borne out for both types of clitics.

4.1.4. 'Sentence Contrasts 4'

4.1.4.0. Obligatory vs. Optional Structural Elements

In this set, it was decided that various structures must be tested that would contrast the optional versus obligatory presence of structure. The only obligatory elements are those which are the arguments of some predicate. All other relations are essentially optional, specifically a-adjuncts such as par-phrases, conjoined NPs (though the presence of at least one is necessary if subcategorized for), VPs, IPs and CPs, as well as clefted or relativized structures which are related to their head nouns through predication. We also wanted to examine these sentence types in this light since linear order strategies so often obscure the effects of increasing sentential complexity in comprehension tasks. Witness our results for this variable computed on tthe OMB and the COMB in Fig. 4.4 : [11]

Fig 4.4. Effect of Linear Order on Subjects' Accuracy Rates



Only by carefully controlling the structural features of sentences which do nct permit the application of a linear order stategy can we truly see precisely what leads to processing breakdown in the aphasic population.

4.1.4.1. Total Aphasic Sample

Table 4.4.1. contains the results obtained by all 9 aphasics on the 20 sentence types which we contrast in this set. The means (and their respective Standard Deviations) are presented in descending order of accuracy. The overall accuracy rate was 63.8%. Table 4.4.1. also encodes all the significantly different means.

11 For the effects of the other sentential variables presented in Table 3.1.3., see Appendix A.

Table 4.4.1. Group Results -- All 9 Aphasics 'Sentence Contrasts 4'[12]

Sentence Type	Mean	SD
[01] Active	12.000	0
[15] Direct Object Control, Intransitive Verb	11.667	.500
[19] Direct Object Control + Transitive Verb	11.667	.707
[13] Active Conjoined Theme	11.222	1.641
[05] Dative	11.111	1.965
[02] Passive	9.889	2.759
[14] Passive Conjoined Agent	8.556	3.712
[04] Cleft Object	8.444	2.963
[08] Conjoined	8.000	3.742
[06] Dative Passive	7.444	4.640
[22] Causative (Faire-par)	7.444	4.531
[28] Conjoined Clauses 4 NPs (No Deletion) (Baseline)	7.444	3.909
[12] Subject-Subject Relative	7.000	4.610
[27] SS Relative + Conjoined Theme	7.000	4.093
[07] Cleft-Object Dative	6.333	3.937
[21] Causative (Faire-à)	5.222	4.206
[24] Conjoined Causative	3.778	4.658
[25] Causative + Dative	3.778	4.086
[26] Causative + SS Relative	2.889	3.333
[23] Cleft-Object Causative (Faire-par)	2.333	3.500
Mean:	7.661	

							[06]							
	[15]						[22]		[12]			[24]		
[01]	[19]	[13]	[05]	[02]	[14]	[04]	[08]	[28]	[27]	[07]	[21]	[25]	[26]	[23]

(Sentence types underlined by a common line do not differ on the Fisher PLSD set at a 95% confidence level; sentences not underlined by a common line do differ significantly.)

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[12] Since our total aphasic sample was small, an attempt was made to see if the overall results were comparable to those obtained by Caplan and Hildebrandt (1988) in their Experiment 3, which tested 49 French-speaking aphasics on nine sentence types of the OMB. In order to compare the present results with this larger sample, equivalent computations were made and confirmed the generalizability of the present results. The interested reader is referred to Appendix A for this analysis. The main difference was the good performance of our subjects on Object-Subject Relative, though this may also be seen as a function of their overreliance on linear order stategies. For more on this aspect of their performance, the reader is directed to Appendix A where a complete tabulation of the total errors made by the aphasics and the controls is presented. For individuals' errors, the reader is directed to the appropriate summary score sheets in Appendix B.

In terms of relevant statistically significant contrasts, we notice again that those structures which permit a linear order response do not contrast with each other so we cannot determine what structural relations constitute loci of difficulty. Nor do they contrast with [02 **Passive**]; it would appear that the base-generated nature of the more hierarchically complex structures is roughly equivalent to the simpler passive, which has the added complication of movement, encoded in the NP-chain linking the theme-subject with its trace in the VP. (Note that each of the sentences [01],[15], [19], [13], [05] and [02] contains only one inflected verb.)[13]

[02 **Passive**], though it contrasts significantly with [06 **Dative Passive**], does not contrast with its conjoined counterpart [14 **Passive Conjoined Agent**]. Both [02] and [14] in turn do not contrast significantly with [04 **Cleft Object**]; note, however, that this structure, with its two inflected verbs and two CPs, is less accurately responded to than monoclausal sentence types (due to the 1 in 2 chance of responding correctly to [04 **Cleft Object**], this difference is not large). In turn, these types do not contrast with [08 **Conjoined**]; this sentence contains two IPs, two inflected verbs and three DPs. However, it is base-generated and it seems that conjoined structures, in and of themselves, do not significantly add to processing costs; it is necessary to look at all the variables which may play a part.

The next grouping of sentence types includes those having at least three or four DPs (with the exception of [04 **Cleft Object**]). [08 **Conjoined**] and [12 **Subject-Subject Relative**] do not contrast with each other, nor do they contrast with [28 **Conjoined Clauses 4 NPs (No Deletion) (Baseline)**] or [27 **SS Relative + Conjoined Theme**]. In fact, [12] and [27] have identical means. In addition, they do not contrast with [06 **Dative Passive**] and [22 **Causative (Faire-par)**]. The latter, however, do not permit either a linear order or, in the case of [22], a parallel function strategy.

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13 Again, we are abstracting away from Spec of VP to Spec of IP movement.

Relativized and clefted structures containing at least three DPs do not contrast with [21 **Causative (Faire-à)**]. ([04 **Cleft Object**] does contrast with [21] though not with its dative counterpart, [07 **Cleft-Object Dative**]. However, the reasons for the low scores for [21] have been discussed elsewhere. The latter structure does not contrast with either [24 **Conjoined Causative**] or [25 **Causative + Dative**], which have identical means. In this case, the conjoining of the two embedded VPs seems to be equivalent in difficulty to the processing of a dative embedded verb.

The last group of sentences is comprised of four-DP sentences with the exception of [23 **Cleft-Object Causative (Faire-par)**] which proved to be the most difficult type to process. This type contrasts with [07 **Cleft-Object Dative**]. We feel that the theme in sentence-initial position seems to violate the strong coalition (discussed in Grimshaw 1990) between the thematic and aspectual arrays which identify the Causer as the most prominent argument; the Causer's position as subject of the embedded sentence is not as salient. We find some confirmation in this in that the most frequent error type for normals (16/29) and the second most frequent type for the aphasics in general (27/87) was to interpret this as if it were a regular faire-par (1,3;3,2).[14]

4.1.4.2. Normal Controls

Table 4.4.2. contains the results obtained by the controls on these 20 sentence types. The means (and their respective Standard Deviations) are presented in descending order of accuracy. The overall accuracy rate was 92.8% and no sentence type was less than 70.8% correct. Table 4.4.2. also encodes all the significantly different means.

[14] The least impaired aphasics most frequently made this mistake.

Table 4.4.2. Group Results - 10 Controls 'Sentence Contrasts 4'

Sentence Type	Mean	SD
[01] Active	12.0	0
[13] Active Conjoined Theme	12.0	0
[05] Dative	12.0	0
[15] Direct Object Control, Intransitive Verb	12.0	0
[04] Cleft Object	11.9	.316
[08] Conjoined	11.9	.316
[02] Passive	11.8	.422
[14] Passive Conjoined Agent	11.8	.422
[19] Direct Object Control + Transitive Verb	11.8	.422
[22] Causative (Faire-par)	11.7	.675
[27] SS Relative + Conjoined Theme	11.5	.707
[28] Conjoined Clauses 4 NPs (No Deletion) (Baseline)	11.2	.422
[06] Dative Passive	11.0	1.054
[12] Subject-Subject Relative	10.8	1.619
[07] Cleft-Object Dative	10.7	1.889
[25] Causative + Dative	10.6	1.075
[24] Conjoined Causative	10.5	1.900
[21] Causative (Faire-à)	9.8	2.573
[23] Cleft-Object Causative (Faire-par)	9.1	3.814
[26] Causative + SS Relative	8.5	2.415
Mean:	11.13	

[01]													
[13]		[02]											
[05]	[04]	[14]											
[15]	[08]	[19]	[22]	[27]	[28]	[06]	[12]	[07]	[25]	[24]	[21]	[23]	[26]

(Sentence types underlined by a common line do not differ on the Fisher PLSD set at a 95% confidence level; sentences not underlined by a common line do differ significantly.)

Due to the controls' good performance on most of the sentence types, fifteen of the types do not contrast at all, contrasts beginning with [25 Causative +Dative]. The controls did better on this sentence type than on the unacceptable [21 Causative (Faire-à)], [23 Cleft-Object Causative (Faire-par)] and [26 Causative + SS Relative]. These three sentence types were not significantly different from each other. Both [23] and [26] contain more functional categories (CPs and IPs) than [25]. The latter in fact does not differ significantly from either [06 Dative Passive] or [22 Causative (Faire-par)]. The controls' performance did not significantly differ on the conjoined version of [12], [27]. The sentence types which were most difficult for the aphasics were also the most difficult for the controls, although the order of accuracy of [23] and [26] is reversed.

A factorial analysis of variance to see which sentence types differed significantly between the patients and the controls was performed. This information can be found in Tables 4.4.3 a and b.

Table 4.4.3. a Significantly Different Sentence Types – Patients x Controls 'Sentence Contrasts 4'

Sentence Type		Fisher's PLSD
[02] Passive	F(1,17)=4.707; p=.0445*	1.859*
[14] Passive Conjoined Agent	F(1,17)=7.58*; p=.0136*	2.486*
[04] Cleft Object	F(1,17)=13.52; p=.0019*	1.983*
[07] Cleft-Object Dative	F(1,17)=9.836; p=.006*	2.938*
[23] Cleft-Object Causative (Faire-par)	F(1,17)=16.108; p=.0009*	3.558*
[06] Dative Passive	F(1,17)=5.587; p=.0303*	3.174*

Figure 4.5a Accuracy Rates Patients vs Controls-'Sentence Contrasts 4'

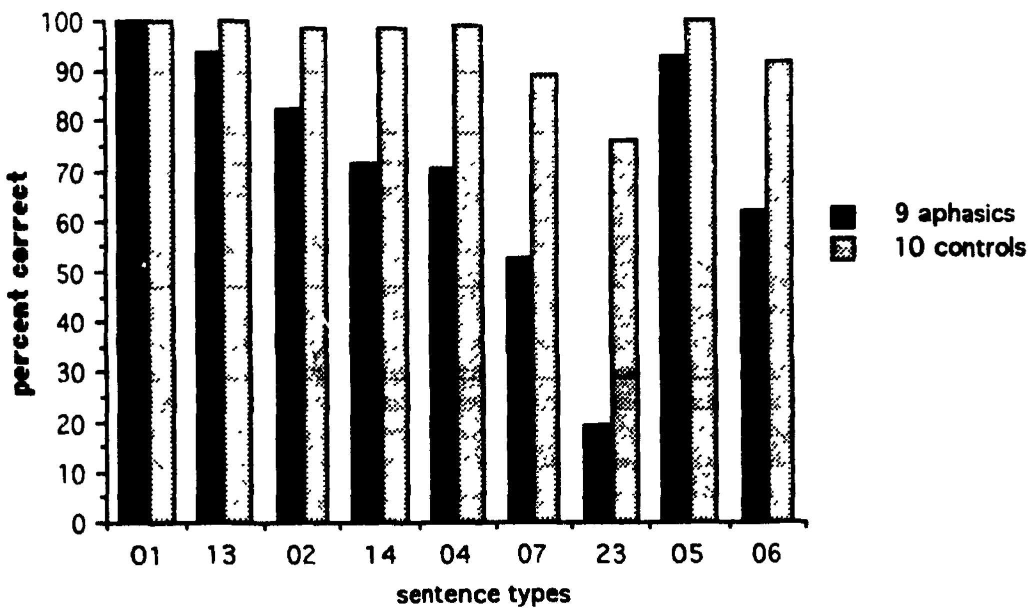
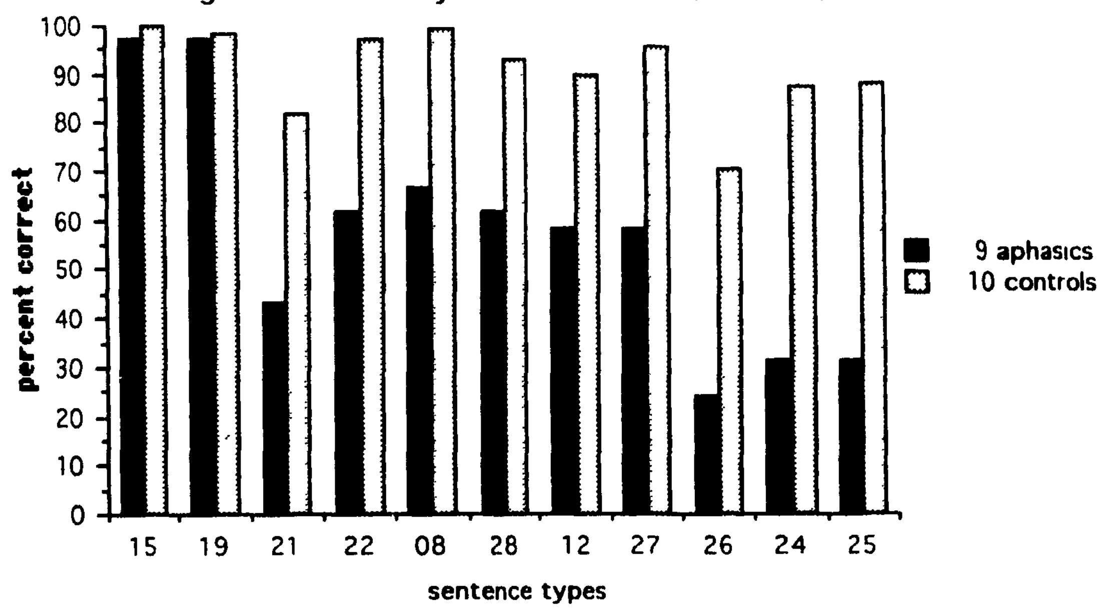


Table 4.4.3. b Significantly Different Sentence Types - Patients x Controls

Sentence Contrasts 4'

Sentence Type		Fisher's PLSD
[15] Direct Object Control, Intransitive Verb	F(1,17)=4.474; p=.0495*	.333*
[21] Causative (Faire-à)	F(1,17)=8.389; p=.01*	3.335*
[22] Causative (Faire-par)	F(1,17)=8.664; p=.0091*	3.051*
[08] Conjoined	F(1,17)=10.849; p=.0043*	2.498*
[28] Conjoined Clauses 4 NPs (No Deletion) (Baseline)	F(1,17)=9 172; p=.0076*	2.617*
[12] Subject-Subject Relative	F(1,17)=6.006; p=.0254*	3.272*
[27] SS Relative + Conjoined Theme	F(1,17)=11.774; p=.0032*	2.767*
[26] Causative + SS Relative	F(1,17)=17.932; p=.0006*	2.796*
[24] Conjoined Causative	F(1,17)=17.66; p=.0006*	3.375*
[25] Causative + Dative	F(1,17)=26.035; p=.0001*	2.821*

Figure 4.5b Accuracy Rates Patients vs Controls-'Sentence Contrasts 4'



Only four sentence types did not contrast, i.e. [01 Active], [13 Active Conjoined Theme], [05 Dative] and [19 Direct Object Control + Transitive Verb], all types where a linear order strategy would be effective. Thus, the linear order strategy camouflages the differing structural complexities of these types.

The additional hierarchical structure, i.e. nodes which permit adjunctions or conjunctions, do not seem to have the same effect on processing as do those necessary to

represent complementation. Since theta-role assignment to arguments must proceed under government, it is clear that the nature of the relationship of adjunction structures and conjoined structures to their attachment site does not involve goverment and it is precisely this structural relation which increases sentential complexity.[15]

4.1.5. 'Sentence Contrasts 5'

4.1.5.1. Subset Aphasic Sample

The final set of contrasts in the OMB paradigm consists of 144 sentences --12 tokens of each of 12 sentence types. The HAH predicts that, since all these sentences have at least two CPs, they will not be very well understood. Only sentences containing wh-traces were included, as 'Sentence Contrasts 4' had shown that these types could be difficult to interpret. In addition to those previously discussed in the other 'Sentence Contrasts', we will also discuss [10 Object-Subject Relative]($N_1V_1N_2V_2N_3$). This is expected to be an easy structure to comprehend because a linear order strategy can be applied, i.e. N_1 acts on N_2 and N_2 on N_3. In addition, we also will discuss inverted versions of CO_2, SO and OO relatives, which permit us to test other structures with displaced elements. Some researchers (e.g. Kail 1989) have claimed that these inverted structures are more frequent than the non-inverted versions in normal discourse; this seems counterintuitive, but it was felt that this claim should be put to the test. Certainly, not all similar structures have acceptable inverted versions. However, they do allow a case contrast between the relative pronouns que and the qui of SS and OS relatives. Such knowledge of the significance of the change in the relative pronoun is unrelated to 'lexical' properties in these constructions.

Table 4.5.1. contains the results obtained by the five aphasics on the 12 sentence

[15] Grodzinsky's (1990) proposal that all governed prepositions are deleted in agrammatic production is related to this but appears stipulative, since it is clear from the present data that the relation of government has widespread consequences.

types tested. The means (and their respective Standard Deviations) are presented in descending order of accuracy. The overall accuracy rate was 45.3% (the lowest mean of the five sets). Table 4.5.1. also encodes all the significantly different means

Table 4.5.1. Group Results - 5 Aphasics 'Sentence Contrasts 5'

Sentence Type	Mean	SD
[10] Object-Subject Relative	10.4	1.673
[04] Cleft Object	8.8	3.271
[07] Cleft-Object Dative	7.2	3.194
[27] SS Relative + Conjoined Theme	7.2	3.701
[12] Subject-Subject Relative	7.0	4.690
[11] Object-Object Relative	6.4	3.578
[09] Subject-Object Relative	5.6	4.219
[42] Object-Object Relative with Stylistic Inversion	3.8	4.207
[26] Causative + SS Relative	3.0	3.674
[40] Cleft-Object with Stylistic Inversion	2.2	2.387
[41] Subject-Object Relative with Stylistic Inversion	2.0	2.915
[23] Cleft-Object Causative (Faire-par)	1.6	2.510
	Mean: 5.433	

[07]
[10] [04] [27] [12] [11] [09] [42] [26] [40] [41] [23]

(Sentence types underlined by a common line do not differ on the Fisher PLSD set at a 95% confidence level; sentences not underlined by a common line do differ significantly.)

[10 Object-Subject Relative] was the structure that was the best interpreted; however, the aphasics only scored 86.7% correct on this structure despite the facilitating effect of the applicability of the linear order strategy. CO_2 was interpreted correctly only 73.3% of the time. Clefted (object) structures are particularly difficult for the aphasics to interpret. The aphasics had identical means for CO_3 and [27 SS Relative + Conjoined Theme]. Only OS relatives were significantly different from SS, OO and SO, which in turn did not contrast with each other. What we do find significant is that [42 OO + Stylistic

Inversion], which should have been the structure to obtain the lowest score since it could have been perceived as an OS relative (with which it contrasts) due to the low perceptual saliency of the relative pronoun, did not contrast with the other relativized structures mentioned above. Two possible explanations are:

1- the recency effect, i.e. because it was the last proposition to be heard it was kept in memory longer.

2-the parallel function strategy: in this case, since the second DP was the affected theme of the first predicate, it was perceived as low in potency and more likely to be the patient of V_2 than its agent.

All of the other inverted structures were neither contrastive with each other nor with the most difficult of the causative structures containing ralatives and clefts.

4.1.5.2. Normal Controls

Table 4.5.2. contains the results obtained by the controls on the 12 sentence types tested. The means (and their respective Standard Deviations) are presented in descending order of accuracy. The overall accuracy rate was 84.6% (the lowest accuracy rate of all five contrastive sets). Table 4.5.2. also encodes all the significantly different means.

Table 4.5.2. Group Results – 10 Controls 'Sentence Contrasts 5'

Sentence Type	Mean	SD
[04] Cleft Object	11.9	.316
[27] SS Relative + Conjoined Theme	11.5	.707
[11] Object-Object Relative	11.3	.675
[10] Object-Subject Relative	11.2	1.317
[12] Subject-Subject Relative	10.8	1.619
[07] Cleft-Object Dative	10.7	1.889
[09] Subject-Object Relative	10.2	2.440
[40] Cleft-Object with Stylistic Inversion	9.7	4.029
[23] Cleft-Object Causative (Faire-par)	9.1	3 814
[42] Object-Object Relative with Stylistic Inversion	8.9	3.573
[26] Causative + SS Relative	8.5	2.415
[41] Subject-Object Relative with Stylistic Inversion	8.0	4.372
Mean:	10.15	

[04] [27] [11] [10] [12] [07] [09] [40] [23] [42] [26] [41]

(Sentence types underlined by a common line do not differ on the Fisher PLSD set at a 95% confidence level; sentences not underlined by a common line do differ significantly.)

CO_2 was responded to correctly 99.2% of the time, the controls being less influenced by linear order. Normals scored better on the OO and OS relatives than on the SO and three-DP SS relatives, although none of these structures contrasted with each other [40 Cleft-Object with Stylistic Inversion] did not contrast with any structure other than its non-inverted counterpart and [41 Subject-Object with Stylistic Inversion]. As with the aphasics, the three-DP inverted relatives did not generally contrast with each other, nor did they contrast with the causatives that contained the relative and the cleft structures.

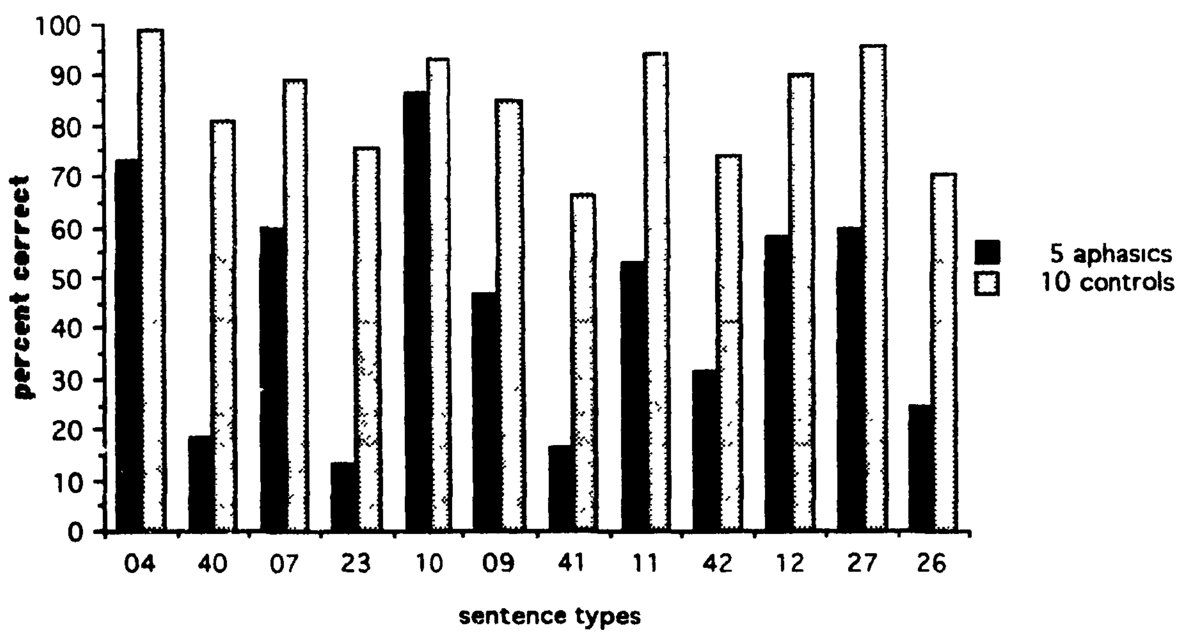
A factorial analysis of variance to see which sentence types differed significantly between the patients and the controls was performed. This information can be found in

Table 4.5.3. Only one sentence type did not contrast--[10 Object-Subject Relative], the one permitting a linear order strategy.

Table 4.5.3. Significantly Different Sentence Types - Patients x Controls 'Sentence Contrasts 5'

Sentence Type		Fisher's PLSD
[04] Cleft Object	F(1,13)=9.529; p=.0087*	2.170*
[40] Cleft-Object with Stylistic Inversion	F(1,13)=14.432; p=.0022*	4.266*
[07] Cleft-Object Dative	F(1,13)=7.282; p=.0182*	2.802*
[23] Cleft-Object Causative (Faire-par)	F(1,13)=15.615; p=.0017*	4.101*
[09] Subject-Object Relative	F(1,13)=7.347; p=.0178*	3.667*
[41] Subject-Object Relative with Stylistic Inversion	F(1,13)=7.573; p=.0165*	4.711*
[11] Object-Object Relative	F(1,13)=18.814; p=.0008*	2.441*
[42] Object-Object Relative with Stylistic Inversion	F(1,13)=6.069; p=.0285*	4.473*
[12] Subject-Subject Relative	F(1,13)=5.607; p=.0341*	3.467*
[27] SS Relative + Conjoined Theme	F(1,13)=13.512; p=.0028*	2.528*
[26] Causative + SS Relative	F(1,13)=12.308; p=.0039*	3.387*

Figure 4.6. Accuracy Rates Patients vs Controls-'Sentence Contrasts 5'



Clefted and relativized structures are more difficult to interpret than many of the other structures previously discussed. Both the aphasics and the controls obtained their lowest mean score on these contrasts. Kail's claim that inverted object relatives are more frequent in discourse seems difficult to maintain since one would expect a more frequent structure to be more easily understood than its less frequent but non-inverted counterpart. As we saw, non-displaced versions are more easily understood by all the test subjects. These structures which clearly contain a minimum of two CPs and two IPs led to processing difficulty, as evidenced by the higher error rates.

4.2. The Effects of Structural Complexity and Educational Level on Syntactic Comprehension

Additional confirmation of the relative processing difficulty of the various sentence types we have investigated comes rather unexpectedly from the controls' data. In computing the repeated measures ANOVAs for the experiments, we obtained F-values both within subject variance and between subject variance. The latter, rather unsurprisingly for the aphasics but very surprisingly for the controls, were statistically significant. In an aphasic population, we expect this type of variance, due either to differences in the severity of the impairment or to some other idiosyncratic response bias However, how are we to account for a between-subject ANOVA showing a F(9,410)=6.476; p=.0001* in a normal population? The answer lies in the subject variables listed in Table 3.4. A two-factor ANOVA was therefore performed: Education x Sentence Type (OMBs). The Education factor has three-levels and the Sentence Type is a repeated measures factor. There were main effects for Education F(2,7)= 80.632; p=.0001* and for Sentence Type F(41,287)= 10.535; p=.0001* and a significant interaction between the two F(82,287)= 7.058*; p=.0001*. Performing a Factorial ANOVA to tease out which sentence types were contrastive for which groups (Elementary, Secondary, and Post-Secondary) revealed the following:

			Fisher's PLSD
Cleft-Object Dative	F(2,7)=21.467; p=.001*	E vs. PS	1.548*
		S vs. PS	1.548*

Subject-Object Relative	F(2,7)=22.082; p=.0009*	E vs. S	2.421*
		E vs. PS	1.976*
		S vs. PS	1.976*
Passivized Direct Object Control + Transitive Verb	F(2,7)=95.2; p=.0001*	E vs. S	1.032*
		E vs. PS	0.843*
Causative (Faire-à)	F(2,7)=29.437; p=.0004*	E vs. PS	1.837*
		S vs. PS	1.837*
Cleft-Object Causative (Faire-par)	F(2,7)=246.4 ; p=.0001*	E vs. S	1.210*
		E vs. PS	0.988*
		S vs. PS	0.988*
Causative + SS Relative	F(2,7)=15.186; p=.0028*	E vs. S	2.803*
		S vs. PS	2.289*
Causative-Causee cliticized	F(2,7)=25.2; p=.0006*	E vs. S	0.632*
		S vs. PS	0.516*
Causative-Reflexive Causee	F(2,7)=3.373; p=.0943	E vs. PS	5.762*
Cleft-Object with Stylistic Inversion	F(2,7)=3.929; p=.0718	E vs. PS	6.055*
Subject-Object Relative with Stylistic Inversion	F(2,7)=24.719; p=.0007*	E vs. PS	3.371*
		S vs. PS	3.371*
Object-Object Relative with Stylistic Inversion	F(2,7)=30.485; p=.0004*	E vs. S	3.075*
		S vs. PS	2.511*

The overall ANOVAs for **Causative-Reflexive Causee** and **Cleft-Object with Stylistic Inversion** only approached significance. The fact that subjects with college or university training are more capable of dealing with semi-grammatical structures **(Causative (Faire-à) and Causative-Reflexive Causee)**, while those with less education do not interpret them properly[16] casts some light on the grammaticality judgments which form the basis for important linguistic analyses.

In addition, the extreme frequency of **Cleft-Subject** constructions in normal discourse leads to more difficulty in discriminating the relative pronoun. The only reason that **Object-Object Relative with Stylistic Inversion** was not contrastive between

16 In fact, the subject with the least schooling, O.F. (5th grade), consistently 'corrected' **Causative-Reflexive Causee** by 'repeating' tokens of it as if they were **Causative-Reflexive Causer=Theme** He got them wrong because of this.

E and PS was because of O.F.'s and R.L.'s near perfect performance on them (92% correct), there seems to be a recency effect operating in their case, i.e. the relative pronoun is more salient in that position than it is in Subject-Object Relative with Stylistic Inversion.[17] Note also that those sentence types which did not contrast between the aphasics and the normals also never contrasted for any of the educational groups The sentence types which are less accurately processed by non-Post-Secondary normal controls are precisely those which the HAH predicts will cause processing difficulties due to their structural complexity.[18]

The next chapter will present each aphasic as an individual case study We hope to show hat the responses to causatives are not random and that the statistically significant group results are not masking some chance individual performances.

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[17] Unfortunately, it will not be possible to study this factor with the aphasic population since there are no Elementary-only aphasics. This effect is mainly seen in contrasts with this group and subjects with higher levels of education. Baruzzi (1985), utilizing an Italian version of a smaller OMB, also found that years of education had an effect on accuracy in comprehending clefted object structures and object relatives. For example, University aphasics showed some of the same patterns of performance on these structures as normal controls with only an elementary education; there was thus more of a deficit when a person with more schooling had a stroke than if a less educated person who had probably never acquired the more complex syntactic structures had one.

[18] Excluding the semi-grammatical sentences, which will be discussed further in Chapter 6.

Chapter 5-Individual Case Studies

This chapter includes individual analyses of every aphasic who participated in our study. It is important to discuss them as individuals to insure that no idiosyncratic comprehension pattern is lost when group results are computed. In all instances, statistical analyses more appropriate to a case study approach have been calculated and are reported on, both in this chapter, and in more detail, in Appendix B, where complete summary descriptions of each individual's performance can be found The nine French aphasics rather neatly divide into three groups of three, based on level of impairment. Discussion of their cases will thus be presented proceeding from least impaired group to most impaired. Finally, some individual differences among the normals will be presented.

5.1. Aphasics without Major Comprehension Deficits

5.1.1. A.G.

A.G. was a 50-year-old right-handed male who suffered a cerebral trauma as a result of a motor vehicle accident on June 9, 1967. He had a right spastic hemiplegia and cerebellar ataxia. Initially, he was also diagnosed as having a motor aphasia, which later evolved into moderate to severe dysarthria.

Speech therapy results showed a net improvement in comprehension over the next two years but he continued to have such severe articulation problems as to be almost unintelligible. His condition seems to have remained the same since that time. He has practiced very hard to articulate more clearly and during the present testing his speech was difficult to understand but became easier as time went by, due no doubt to my increased familiarity with his manner of speaking.

His oral digit span was six and his pointing span was five.

A.G.'s results in terms of percentage correct for the OMB sentence types can be found in Table 5.1. [1]

Table 5.1. Summary Results of Patient AG

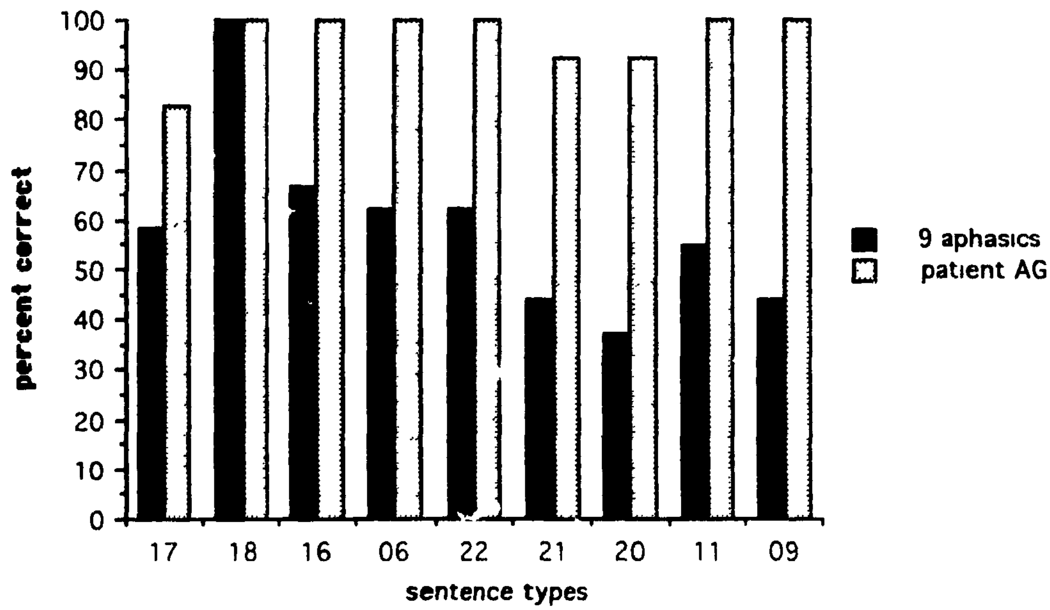
	% Correct
Active	100
Passive	
Truncated Passive	
Dative	
Dative Passive	
Cleft-Object Dative	
Subject-Object Relative	
Object-Subject Relative	
Object-Object Relative	
Active Conjoined Theme	
Passive Conjoined Agent	
Direct Object Control, Intransitive Verb	
Passivized Direct Object Control, Intransitive Verb	
Causative + Intransitive Verb	
Direct Object Control + Transitive Verb	
Causative (Faire-par)	
Conjoined Clauses 4 NPs (No Deletion) (Baseline)	
Cleft Object	92
Conjoined	
Subject-Subject Relative	
Passivized Direct Object Control + Transitive Verb	
Causative (Faire-à)	
Truncated Causative	83
Cleft-Object Causative (Faire-par)	
SS Relative + Conjoined Theme	
Causative + Dative	75
Conjoined Causative	67
Causative + SS Relative	58

A.G.'s results on each sentence type were significantly above chance as computed by χ^2s under the appropriate Stage assumptions (for each value, the reader is referred to Appendix B).

[1] The tables for individual patient performances will follow the convention that the order for the sentence types is OMB before COMB then POMB.

A.G.'s performance on the crucial sentence types of the two OMBs did not vary ; hescored 100% correct on them all, making only one mistake on **Passivized Direct Object Control + Transitive Verb** (for comparison of his results with those of the group, see Fig. 5.1.).

Figure 5.1. Accuracy Rate of Patient AG - 'Sentence Contrasts 1'



[17] Truncated Causative
[18] Causative + Intransitive Verb
[16] Passivized Direct Object Control, Intransitive Verb
[06] Dative Passive
[22] Causative (Faire-par)
[21] Causative (Faire-à)
[20] Passivized Direct Object Control + Transitive Verb
[11] Object-Object Relative
[09] Subject-Object Relative

Additionally, single-factor ANOVAs were calculated for each of the sentential variables previously listed in Table 3.1.3. [2]

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[2] Recall that the category "number of Action Verbs" includes all non-copular verbs (this essentially affects cleft structures). "Maximum number of words" utilizes the count obtained with sentences of each type that contain the non-contracted forms of the preposition à. The linear order variable LO represents the strictest version of that view, i.e. those structures which allow a parallel function interpretation (Conjoined and the two SS Relatives) are coded NLO and

For A.G., the number of NPs (DPs)[3] had a significant effect: F=7.96; p=.0007*. His performance diminished in accuracy when the sentence contained four DPs All sentence types containing fewer than four DPs as a group contrasted significantly with the four DP sentence group by Fisher's PLSD (set at a confidence level of 95%). Since the number of DPs in a sentence strongly correlates with the length (or maximum number of words), there is also a significant effect of sentence length F=5.784; p= 0086*. Performance deteriorates mainly with the very longest sentences, those containing fourteen and fifteen words.

In addition, the number of Action Verbs had a significant effect. F=24.061; p=.0001*, all three-action-verb sentences were the loci of his difficulties. No effect due to the number of Inflected verbs was found. There was also a significant effect for the factor of linear order: F=4.846; p=.0368* [4]

A.G.'s errors, enumerated in Appendix B, totalled 23/336. They are not strictly of the linear order type. Correlations of his error rate on the OMB and COMB with the sentential variables confirmed and were in agreement with the single factor ANOVAs. Error rate correlated positively with number of DPs (.524, p<.005*), Maximum number of words (.584, p<.005*); number of Action Verbs (.652, p<.005*); and linear order (.396, p<.025*).

His performance, therefore,was similar to that of some of the normals. Only the

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Causative + Intransitive Verb is counted as LO since the response is 1,2;2V. Alternatives to this strictest version were calculated, however, and most patients who were affected by linear order showed this under all formulations.

[3] Henceforth, we will refer to these as DPs.

[4] For the group as a whole the number of NPs had a significant effect: F=4.065; p=.0181*, contrasts arising between two- and three- and two- and four-NP sentences. The number of Action Vs also had a significant effect: F=5.425; p=.011*, the contrast being between three-verb sentences and one- and two-verb sentences though not between one- and two-verb sentences. As well, sentence length had a significant effect: F=3.711; p=.0178*, contrasts occurring between the sentences with twelve or more words and the shorter sentences; linear order: F=28.165; p=.0001*. The effect of the number of Inflected Vs approached but did not reach significance F=3.711; p=.065.

very difficult sentences caused a breakdown, i.e. those with the most hierarchical structure (though he never scored fewer than 7/12 correct). This is in line with the predictions of the HAH. As is even more true P.R., A.G. evidenced a dislike of interpreting both truncated structures and sentences containing pronouns with no possible intrasentential antecedents. A possible explanation for this may be lie in the fact that both patients had right hemisphere involvement, which might lead them to have difficulties in arriving at pragmatically appropriate interpretations. [5] In fact, despite A.G.'s effortful articulation, he would ask me at almost every token of these types 'par qui?', i.e. by whom the action had been done. He chose to take on the 'Agent' role in truncated passives and causatives; that is, he chose to become the Causee who was made to perform the action on one animal by the Causer, another animal. A sentence type not reported on in the thesis was the Imperative + clitic pronoun (N=9) in the Pretest to the full NP Causative OMB, e.g. Faites le sauter 'Make him/it jump'.[6] This patient did extremely poorly on them as he kept insisting that there was something 'missing'; it appeared to me that he was interpreting the le, la, les as articles which were missing their nouns, i.e. DPs without their semantic heads. He failed to distinguish gender and number cues precisely because he miscategorized the items.

5.1.2. C.M.

C.M. was a 54/55-year-old right-handed female who suffered a ruptured

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[5] Some support for attributing this phenomenon to RH damage can be found in the case of a patient reported on in Caplan and Hildebrandt (1988): C.V., who was also extremely poor at interpreting pronouns. An EEG indicated focal slowing over both the left and right temporal lobes; she was also diagnosed as having moyamoya syndrome which causes deterioration of the cerebral blood vessels and leads to multiple strokes.

[6] In order not to offend any sensibilities, the polite form of the Imperative, i.e. the plural, was used instead of the singular which, for purposes of contrast, would have been more appropriate.

aneurysm about the circle of Willis on September 7, 1964 while delivering her first and only child. The aneurysm could not be confirmed through radiographic examination Soon after, she became completely aphasic with a right hemiplegia and she became subject to epileptic seizures.

She was diagnosed as having expressive (Broca's) aphasia, which improved with therapy. She has continued to have some word-finding difficulties until the present. C.M.'s father was a professor of French and the home atmosphere emphasized prescriptive grammar usage.

C.M. has an atypical and highly developed metalinguistic attitude to language Both her oral and pointing span were five

C.M.'s results in terms of percentage correct for all the OMBs can be found in Table 5.2.

Table 5.2. Summary Results of Patient CM

	% Correct
Active	100
Passive	
Truncated Passive	
Cleft Object	
Dative	
Conjoined	
Subject-Object Relative	
Object-Subject Relative	
Subject-Subject Relative	
Active Conjoined Theme	
Passive Conjoined Agent	
Passivized Direct Object Control, Intransitive Verb	
Causative + Intransitive Verb	
Direct Object Control + Transitive Verb	
Passivized Direct Object Control + Transitive Verb	
Causative (Faire-par)	
SS Relative + Conjoined Theme	
Dative-Theme cliticized	
Causative-Causee cliticized	
Causative-Reflexive Causer=Theme	
Causative-Reflexive Causer=Goal	
Causative-Reflexive Causer=Goal, Truncated	
Causative-Theme=Causee cliticized, Intransitive Verb	

Dative Passive	92
Cleft-Object Dative	
Direct Object Control, Intransitive Verb	
Truncated Causative	
Causative (Faire-à)	
Causative + Dative	
Conjoined Clauses 4 NPs (No Deletion) (Baseline)	
Causative-Theme cliticized	
Causative-Theme cliticized, Truncated	
Causative-Reflexive Causer=Theme, Truncated	
Object-Object Relative with Stylistic Inversion	
Object-Object Relative	83
Conjoined Causative	
Dative-Goal cliticized	
Causative-Reflexive Causee	
Causative + SS Relative	75
Subject-Object Relative with Stylistic Inversion	58
Cleft-Object Causative (Faire-par)	50
Cleft-Object with Stylistic Inversion	

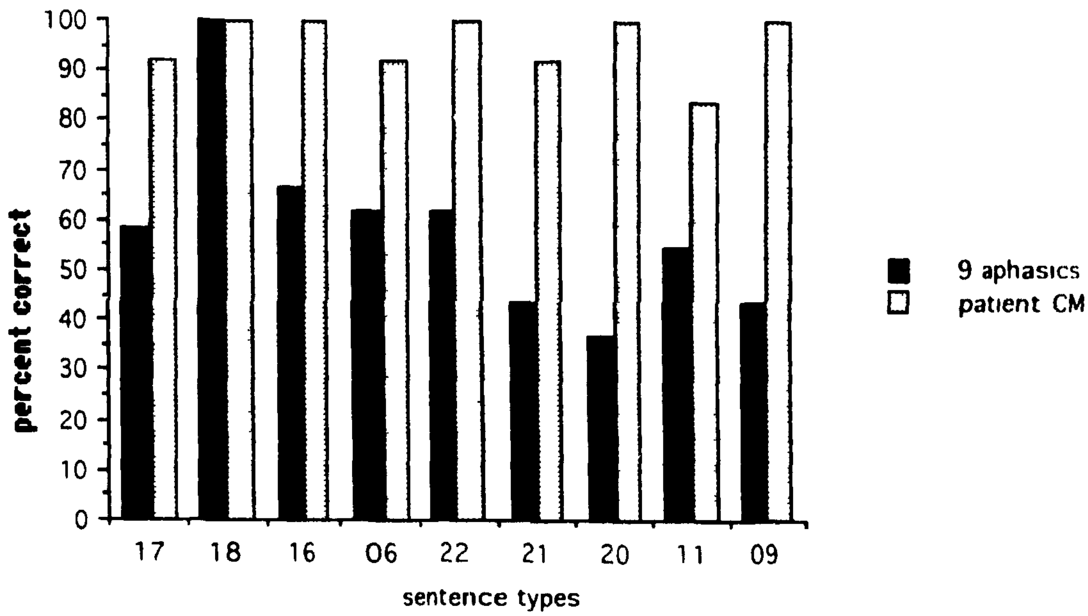
C.M. was the only aphasic from the original group to be tested on the P(ronoun)OMB; in some senses, she served as a barometer for all further subjects as she was quite critical of the **Causative-Reflexive Causee** sentences, as she had been of the **Causative (Faire-à)** sentences, telling me that they were not correct although she could interpret them by analogy with or deduction from other forms.

All sentence types were responded to significantly above chance except for **Cleft-Object with Stylistic Inversion**, which was at chance $\chi^2=0$, p=1. Misperception of the relative pronoun is likely and since **Cleft Subject** sentences pattern so closely with **Actives**, they no longer form a part of the OMB. However, we must also keep in mind that C.M. did distinguish the relative pronoun sufficiently well on half of the tokens of this type.

C.M. responded virtually 100% correct on **Passivized Direct Object Control, Intransitive Verb, Passivized Direct Object Control + Transitive Verb,and Causative (Faire-par)**; she made only one error on each of the following: **Dative**

Passive, Cleft-Object Dative and Causative (Faire-à) (see Fig. 5.2).

Figure 5.2. Accuracy Rate of Patient CM - 'Sentence Contrasts 1'



[17] Truncated Causative
[18] Causative + Intransitive Verb
[16] Passivized Direct Object Control, Intransitive Verb
[06] Dative Passive
[22] Causative (Faire-par)
[21] Causative (Faire-à)
[20] Passivized Direct Object Control + Transitive Verb
[11] Object-Object Relative
[09] Subject-Object Relative

A sentence type she found particularly difficult was **Cleft-Object Causative (Faire-par)**. She tended to interpret the sentence as a **Causative (Faire-par)** which is odd because there can be no **Cleft-*Subject* Causative** sentence, i.e. one in which a NP immediately follows the relative pronoun qui.

Single-factor ANOVAs showed no significant effect for either number of DPs or linear order; the effect of the number of Inflected Vs approached but did not quite reach significance: F=3.657; p=.0669. This is directly linked to her relative difficulty with **cleft** sentences. Recall that these are structures with additional CP nodes. In addition, her scores were such that the effect of the number of Action Vs almost reached significance: F=3.313; p=.0529, one-verb sentences being significantly easier than those with three. No difference was noted between one- and two- or two- and three-verb sentences. She did not have an effect for Maximum number of words, though individual Fisher's PLSD (set at a 95% confidence level) revealed some effects of thirteen- and fifteen-word sentences as compared to nine-, ten- and eleven-word counterparts.

Correlation coefficients were computed between her error rates and the first 28 OMB sentence types.[7] Error rates correlated significantly for the following sentential variables: number of Action Vs (.424, p<.05); number of Inflected Vs (.351, p<.05); and Maximum number of words (.442, p<.01).

5.1.3. J.T.

J.T. was a 46-year-old right-handed female who on August 22, 1985 suffered a severe subarachnoid hemorrhage from an ophthalmic artery aneurysm. A four vessel angiogram showed a left carotid ophthalmic aneurysm and a left cavernous carotid aneurysm. Surgery was successfully performed on September 11, 1985, and this consisted of a left pterional craniotomy and microscopic clipping of the left ophthalmic bifurcation aneurysm under hypotension and general anesthesia. After a repeat angiogram to verify the results of the surgery, the patient developed a global aphasia with right hemiparesis. Her aphasia resolved into nominal aphasia and dyslexia and dysgraphia. She reported having difficulty writing 'certain words' on paper, though she claimed to know them in her head. As a special education teacher, these problems were of great concern to her.

As of the end of February 1986, she still presented with a residual aphasia

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[7] In order to more accurately compare the effects of these variables across all subjects, only those for the first 28 sentences were calculated, since all subjects were tested with these. The groups' scores were also computed in the same way (see footnote 4); this holds for both the ANOVAs and the correlations, though only the group's ANOVAs are reported.

characterized by word-finding difficulties, phonemic paraphasias, alexia, very significant agraphia and mild comprehension problems. She was receiving speech therapy during the course of the present testing. Unfortunately, the speech therapy reports were unavailable.

Her oral digit span was three and her pointing span was four.

J.T.'s results in terms of percentage correct for the OMB sentence types can be found in Table 5.3.

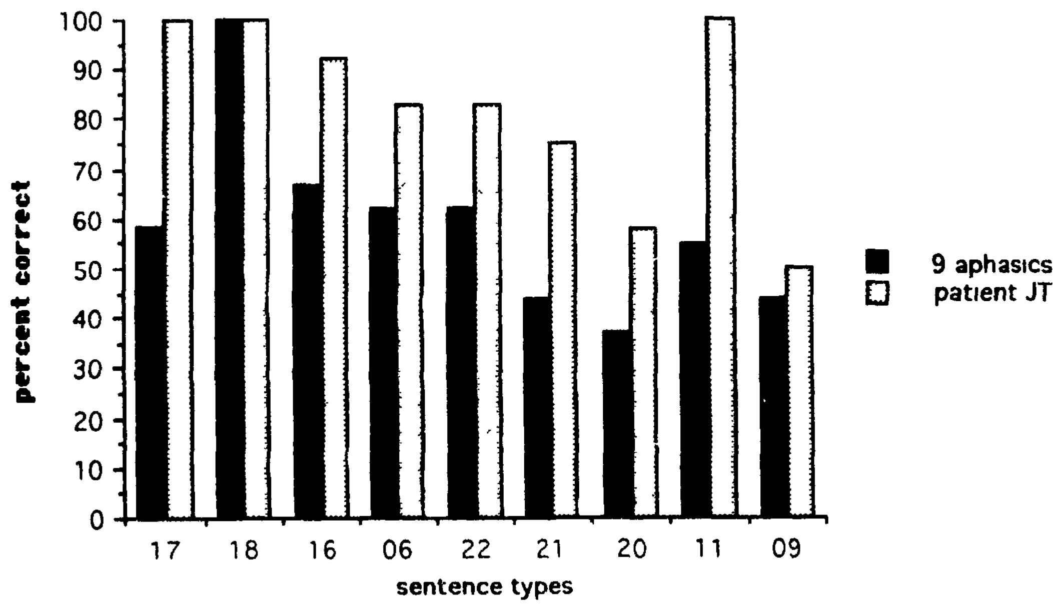
Table 5.3. Summary Results of Patient JT

	% Correct
Active	100
Passive	
Dative	
Conjoined	
Object-Object Relative	
Subject-Subject Relative	
Active Conjoined Theme	
Direct Object Control, Intransitive Verb	
Truncated Causative	
Causative + Intransitive Verb	
Direct Object Control + Transitive Verb	
SS Relative + Conjoined Theme	
Truncated Passive	92
Passive Conjoined Agent	
Passivized Direct Object Control, Intransitive Verb	
Conjoined Causative	
Cleft Object	83
Dative Passive	
Causative (Faire-par)	
Object-Subject Relative	75
Causative (Faire-à)	
Conjoined Clauses 4 NPs (No Deletion) (Baseline)	
Passivized Direct Object Control + Transitive Verb	58
Causative + Dative	
Cleft-Object Dative	50
Subject-Object Relative	

Causative + SS Relative	33
Cleft-Object Causative (Faire-par)	25

J.T.'s performance on the crucial sentence types reveals the typical pattern for the group (see Fig. 5.3.)

Figure 5.3. Accuracy Rate of Patient JT - 'Sentence Contrasts 1'



[17] Truncated Causative
[18] Causative + Intransitive Verb
[16] Passivized Direct Object Control, Intransitive Verb
[06] Dative Passive
[22] Causative (Faire-par)
[21] Causative (Faire-à)
[20] Passivized Direct Object Control + Transitive Verb
[11] Object-Object Relative
[09] Subject-Object Relative

She scored 83% on both **Dative Passive** and **Causative (Faire-par)**, 92% on **Passivized Direct Object Control, Intransitive Verb**; !00% correct on **Dative** but only 75% correct on **Causative (Faire-à)** and, crucially had a much lower accuracy on **Passivized Direct Object Control + Transitive Verb** --58% correct. **Object-Object Relatives** were correctly interpreted 100% of the time (as were

Subject-Subject Relative and SS Relative + Conjoined Theme). However, she had more difficulty with clefted structures as well as Subject-Object Relative, i.e those structures where the initial NP is not the agent of V_1. This explanation seems more adequate than simply invoking a parallel function heuristic (although her difficulty with Object-Subject Relative does seem to favour such an analysis).

All her responses yielded significantly above chance χ^2 values under the appropriate Stage assumptions.

The contribution that the verb faire can make in helping the listener 'chunk' the incoming material can be seen in this patient's accuracy with Conjoined Causative--92% correct (one IP). These sentences cannot simply be interpreted with a linear order heuristic: (1,(4);4,2;4,3). Recall that this patient has the rather limited oral digit span of only three. Her lower scores are in the direction predicted by the HAH, i.e. with clefts and relatives (two CPs).

Single-factor ANOVAs on the OMBs revealed no significant effect for number of either NPs, Action Vs, or Inflected Vs There was a significant effect for Maximum number of words: F=3.986; p= .0061*, problems beginning to surface at twelve-word sentences. When we consider her reduced oral span (=3), her performance is all the more remarkable. There was no effect based on the linear order variable. [8]

J.T. made 58/336 errors on the OMBs. Her error pattern was such that only clefted structures induced an erroneous linear order strategy. As with C.M., however, her most frequent mistake with Cleft-Object Causative (Faire-par) was interpreting it as a Causative (Faire-par) (7/9 times). In effect, cleft structures are examples of the creation of additional categories without the addition of propositional content. Correlation

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[8] One of the other methods of coding this variable discussed previously, i e. coding (1,2;1,3) responses as LO, does reveal such an effect: F=7.428; p=.0113*. This seems to be linked to her occasional adoption of a parallel function strategy, witness her perfect performance on all structures that permit this. Her error patterns are predominantly of this kind· for SO=4/6 errors and for OS =1/3 errors.

coefficients computed between her error rate on the OMBs and the sentential variables were significant for the following. number of DPs (.375, p<.025); Maximum number of words (.492, p=<.005), and linear order (.335, p<.05) they approached significance for Inflected Vs (effect of cleft structures) (.304, p >.05).

5.2. Aphasics with Some Comprehension Deficits

5.2.1. D.C.

D.C. was a 48-year-old right-handed female who suffered a cerebrovascular accident on October 19,1986. The diagnosis was a complete occlusion of the left internal carotid artery. An angiogram also showed a problem with the subclavian artery radiographically, though it seemed asymptomatic. In addition, a certain degree of stenosis of the right internal carotid and the right subclavian was evident. Examination at that time led to a diagnosis of Broca's aphasia with phonetic disintegration, a mild right VIIth nerve central palsy and a monoparesis of the right arm more distal than proximal.

Speech therapy reports in 1987 revealed word-finding difficulties, and the patient did not initiate conversation She continued to have some difficulty with palatal consonants and produced some phonetic errors. Her reading aloud had improved and fewer paralexias were made. Her undeistanding of written material was confined to global comprehension of a short text. Her auditory comprehension improved though the deficit in this area had never been severe. Seven of eight commands were correctly executed while only five of eight had been at the initial evaluation. She had by this time shown a significant improvement on the fifth section of the Token Test [9]: 18/22 (+11).

Her written performance had improved as well. She could use her dominant hand and her writing was satisfactory. She had not written very much pre-onset and had been prone to making mistakes. She could write high frequency words and simple sentences to

[9] A standardized aphasia test used to evaluate receptive disturbances (DeRenzi and Vignolo 1962).

dictation without errors. Speech therapy was interrupted by further health problems which necessitated major surgery.

When I saw the subject, she exhibited the type of speech characterized by the therapist but to a lesser degree. Her digit span was four for both oral and pointing.

D.C.'s results in terms of percentage correct for the OMBs can be found in the Table 5.4.

Table 5.4. Summary Results of Patient DC

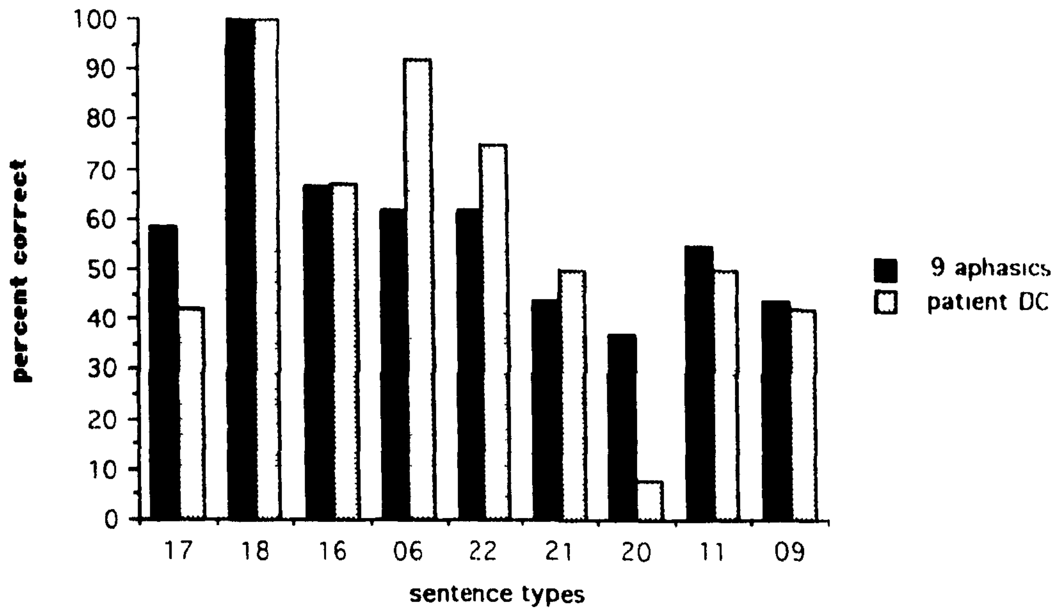
	% Correct
Active	100
Passive	
Truncated Passive	
Dative	
Active Conjoined Theme	
Direct Object Control + Intransitive Verb	
Causative + Intransitive Verb	
Direct Object Control + Transitive Verb	
Dative-Theme cliticized	
Causative-Theme cliticized,Truncated	
Causative-Reflexive Causer=Theme, Truncated	
Causative-Theme=Causee cliticized, Intransitive Verb	
Dative Passive	92
Passive Conjoined Agent	
Causative-Reflexive Causer=Theme	
Cleft Object	75
Conjoined	
Subject-Subject Relatives	
Causative (Faire-par)	
Cleft Object-Dative	67
Object-Subject Relatives	
Passivized Direct Object Control + Intransitive Verb	
Conjoined Clauses 4 NPs (No Deletion) (Baseline)	
Dative-Goal cliticized	
Causative-Reflexive Causer=Goal , Truncated	
Causative-Causee cliticized	58
Causative Reflexive Causer=Goal	

Object-Object Relatives Causative (Faire-à) SS Relative + Conjoined Theme Causative-Reflexive Causee	50
Subject-Object Relatives Truncated Causative	42
Causative-Theme cliticized Object-Object Relative with Stylistic Inversion	25
Passivized Direct Object Control + Transitive Verb Cleft-Object Causative (Faire- Par) Conjoined Causative Causative + SS Relative Cleft-Object with Stylistic Inversion	8
Causative + Dative Subject-Object Relative with Stylistic Inversion	0

D.C.'s performance on most sentence types was non-random except for Cleft **Object**, which was at chance on Stage 2 assumptions.

Her performance on the critical sentences demonstrated statistically significant differences in the expected direction (see Fig.5.4.).

Figure 5.4. Accuracy Rate of Patient DC - 'Sentence Contrasts 1'



[17] Truncated Causative
[18] Causative + Intransitive Verb
[16] Passivized Direct Object Control, Intransitive Verb
[06] Dative Passive
[22] Causative (Faire-par)
[21] Causative (Faire-a)
[20] Passivized Direct Object Control + Transitive Verb
[11] Object-Object Relative
[09] Subject-Object Relative

Notice that she scores better than the group means for **Dative Passive** and **Causative (Faire-par)** and **Causative (Faire-à)** (though only very marginally so for the last type). She also scores lower, however, for **Object-Object Relative** and **Subject-Object Relative** and even more markedly, for **Passivized Direct Object Control + Transitive Verb**. We assume that her performance on the latter is directly related to the fact that the relativized structures are predications while the control verb takes an event complement.

The test of significance of the difference between two independent proportions (Ferguson and Takane, 1989) revealed that **Dative Passive** and **Causative (Faire-**

par) were not significantly different from each other (p=.2733 [10]); however, Dative and Dative Passive were significantly different from Causative (Faire-à) (p=.0047* and p=.0247* respectively). Causative (Faire-par) did not differ significantly from Passivized Direct Object Control, Intransitive Verb (p= .6534) nor from Object-Object Relative or Causative (Faire-à) (both p=.2059); however, there was a significant difference from Passivized Direct Object Control + Transitive Verb and Cleft-Object Causative (Faire-par) (under the original assumptions) (both p=.0009*). In addition, Cleft-Object Dative differed significantly from Cleft-Object Causative (Faire-par) (p=.0032*).

Her responses to the POMB revealed better performances on structures which allowed a linear order strategy to be employed; for example, Dative-Theme cliticized was significantly different in terms of accuracy than Dative-Goal cliticized (p= .0285*). The differences between Causative-Causee cliticized and Causative-Theme cliticized were not significant (p=.0977).

Single-factor ANOVAs performed on the full-NP OMB batteries (OMB and COMB) revealed a significant effect for the number of DPs: F=4.499; p=.0122* problems originating at four DP sentences. Sentence length was also a significant factor: F=3.08; p=.02*, the locus of difficulty beginning at thirteen-word sentences. The number of Action Vs was also highly relevant: F=10.372; p=.0005*. In terms of Action Vs, the group of sentence types containing only one such verb differed from those containing more than one, while those containing two differed from those containing three. There was no significant effect for number of Inflected Vs. The linear order variable yielded a significant effect: F=9.314; p=0052*

[10] In order to compare these sentence types an additional χ^2 value had to computed for the Causative (Faire-à), Causative (Faire-par) and Cleft-Object Causative (Faire-par). Assuming that the causative is processed as one verb, this would in fact further constrain what would count as non-random performance. On these assumptions, all aphasics' performance on these sentence types continued to be non-random except for F.P.'s response on Cleft-Object Causative (Faire-par), which was then at chance levels.

D.C.'s errors were predominantly of the linear order type, though interestingly, on **Cleft-Object Causative (Faire-par)**, she made as many errors using a linear order strategy (5/12) as she did with the pattern we first saw with C.M. and J.T (5/12), i.e interpreting the structure as if it were a simple **Causative (Faire-par)** As to correlations between her error rates on the OMB and COMB and the sentential variables associated with them (118/336), we find .570, $p<.005^*$ for number of DPs, .667, $p<.005^*$ for number of Action Vs; .330, $p<.05^*$ for number of Inflected Vs, 702, $p<.005^*$ for sentence length, .514, $p<.005^*$ for linear order

5.2.2. F.P.

F.P. was a 49-year-old right-handed female who suffered a cerebrovascular accident on October 6,1986. A CT-scan revealed an ischemic attenuation of the area supplied by the left sylvian artery. The diagnosis of a left hemisphere CVA with a right hemiparesis and expressive (Broca's) aphasia was made

Speech therapy reports in 1986 stated that the patient was initially mute but soon began to be able to converse adequately with the therapist Her oral comprehension was better on concrete than abstract words and she had some difficulty with spatial expressions. Shorter, simpler sentences were easier for her to understand (no relative clauses or conjunctions). The subject had trouble integrating more complex material or could only understand a subset or part of the material. Word order was often a determinant of success or failure in understanding arguments in a clause.

Oral expression was good, although word-finding difficulties were still present. Uncorrected phonemic paraphasias were sometimes present. She had great difficulty remembering numbers, which upset her as she had worked as an accountant in a bank pre-stroke.

Reading was possible though she evidenced some slight difficulties with sentences At first, she had trouble identifying numbers. Mathematical operations were slow and not always accurate. The therapist diagnosed a posterior (some contradiction with earlier diagnosis) aphasia with dyscalculia. The patient made good and steady progress in all aspects.

At the time of testing, the patient still suffered from a right hemiparesis and had some word-finding difficulties. Both her oral and pointing digit spans were four.

F.P.'s results in terms of percentage correct for the OMBs can be found in Table 5.5.

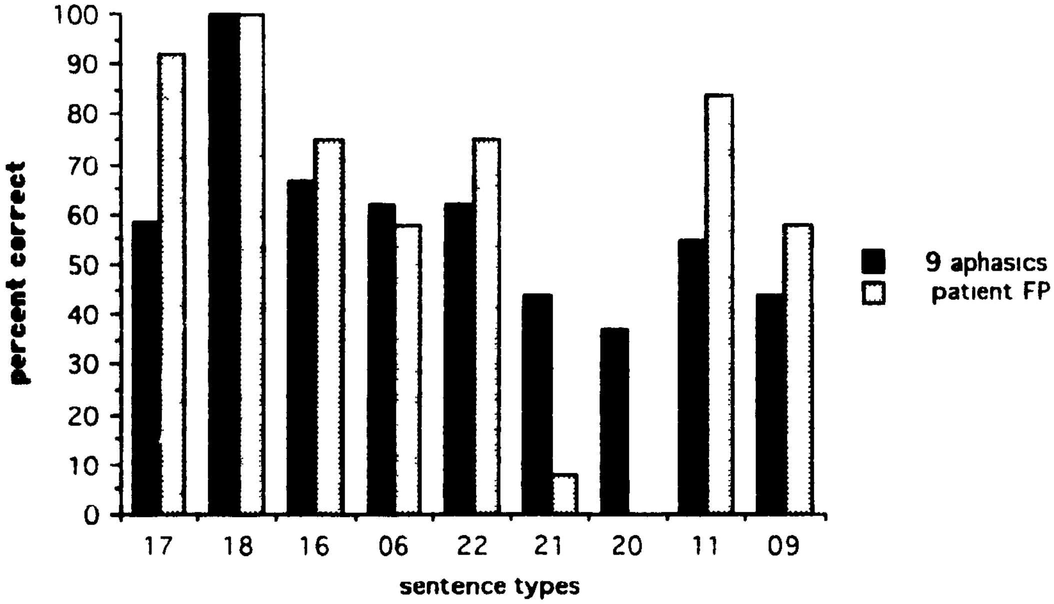
Table 5.5. Summary Results of Patient FP

	% Correct
Active	100
Truncated Passive	
Cleft Object	
Dative	
Active Conjoined Theme	
Direct Object Control, Intransitive Verb	
Causative + Intransitive Verb	
Direct Object Control + Transitive Verb	
Causative-Causee cliticized	
Causative-Reflexive Causer=Theme	
Causative-Reflexive Causer=Goal, Truncated	
Causative-Reflexive Causer=Theme, Truncated	
Passive	92
Passive Conjoined Agent	
Truncated Causative	
Conjoined Clauses 4 NPs (No Deletion) (Baseline)	
Dative-Theme cliticized	
Causative-Reflexive Causer=Goal	
Conjoined	83
Object-Subject Relative	
Object-Object Relative	
Subject-Subject Relative	
SS Relative + Conjoined Theme	
Dative-Goal cliticized	
Causative-Theme=Causee cliticized, Intransitive Verb	
Cleft-Object Dative	75
Passivized Direct Object Control, Intransitive Verb	
Causative (Faire-par)	
Causative-Theme cliticized	

Dative Passive Subject-Object Relative	58
Causative-Theme cliticized, Truncated	50
Conjoined Causative Causative + SS Relative	33
Cleft-Object with Stylistic Inversion Object-Object Relative with Stylistic Inversion	25
Causative (Faire-à) Cleft-Object Causative (Faire-par) Causative + Dative	8
Passivized Direct Object Control + Transitive Verb Causative-Reflexive Causee Subject-Object Relative with Stylistic Inversion	0

F.P.'s responses are non-random under the appropriate Stage assumptions, except in the following cases: Causative + Dative ,where the χ^2 value is 210.322, p=.1609; Cleft-Object with Stylistic Inversion, χ^2 =3, p=.0833; and Cleft-Object Causative (Faire-par), when the causative is treated as one verb, χ^2 = 10, p=.0752. Her responses to the critical sentences are, however, in the expected direction (see Fig. 5.5).

Figure 5.5. Accuracy Rate of Patient FP - 'Sentence Contrasts 1'



[17] Truncated Causative
[18] Causative + Intransitive Verb
[16] Passivized Direct Object Control, Intransitive Verb
[06] Dative Passive
[22] Causative (Faire-par)
[21] Causative (Faire-à)
[20] Passivized Direct Object Control + Transitive Verb
[11] Object-Object Relative
[09] Subject-Object Relative

Her accuracy is the same for **Passivized Direct Object Control, Intransitive Verb** and **Causative (Faire-par)**: she scores 75% correct on these sentence types--in fact, her performance is 17% better on these types than on **Dative Passive**, though this is not significantly different. She also, somewhat atypically, performs better on **Object-Object Relative** than on all these sentence types, 83% correct. However, both **Passivized Direct Object Control, Intransitive Verb** and **Causative (Faire-par)** do contrast significantly with **Passivized Direct Object Control + Transitive Verb** (p=0001*) as well as with **Causative (Faire-à)** (p=.0009*). In addition, accuracy on **Causative + Intransitive Verb** and **Truncated Causative** was high: 100% correct and 92% correct respectively. This patient can be said to have retained intact the lexical information encoded with the verb faire.

Single-factor ANOVAs were performed on her results. Number of DPs failed to achieve significance: F=2 499; p=.0838 . There was no effect for either Inflected Vs or sentence length (though a Fisher's PLSD set at a confidence level of 95% revealed some significant effects, primarily with thirteen-word sentences). There was a significant effect for the linear order variable; LO revealed a F=8.072, p=.0086*. There was also an effect for number of Action Vs which was highly significant F=3.676; p= 0399*, the difference obtaining between one- and three-verb sentences only

F.P. made 98/336 errors on the COMB and the OMB, mostly of the linear order type. In addition, her performance on Cleft-Object Causative (Faire-par) mirrored D.C.'s in that five errors were 1,2;2,3 and four showed the same error made by C.M., J.T., and D.C., i.e. 1,3;3,2 or the response appropriate to Causative (Faire-par). These results clearly support the HAH, as the clefted version of the causative has two CPs. Correlation coefficients between error rates and sentential variables were significant for the following: number of DPs (.477, p<.01*); number of Action Vs (.473, p<.01*); sentence length (.593, p<.005*); and linear order (.487, p<.005*). No correlation was found for number of Inflected Vs.

5.2.3. J.R.

J.R. was a 46-year-old left-handed female who suffered a cerebrovascular accident on December 8, 1985. Diagnosis was of a left hemisphere CVA in the perisylvian region. CT-scan revealed a deep ischemic attack of the nuclei and the internal capsule. Initially, she presented with a right hemiparesis and speech difficulty.

Speech therapy reports stated that she had a mild Broca's aphasia with a mild dysarthria which caused her to sound as if she had a foreign accent. Her voice also had a raucous quality which turned out to be due to polyps on her left vocal cord; these were removed by a polypectomy on November 4, 1986. She appeared to have no comprehension difficulties. She continued to have mild word-finding difficulties and tired easily when reading. Her condition improved fairly rapidly. The patient did not go to a convalescent hospital but went directly home.

When I tested this subject, she no longer evidenced any hemiparesis. Outwardly, she seemed completely recovered. The subject herself stated that, if overly tired in the evenings, she often cannot speak and her family has adjusted to this and allows her to rest. Formal testing revealed some limitations to her comprehension and memory. Her oral and pointing spans were both four.

J.R.'s results in terms of percentage correct for the OMB sentence types can be found in Table 5.6.

Table 5.6. Summary Results of Patient JR

	% Correct
Active	100
Truncated Passive	
Dative	
Object-Subject Relative	
Active Conjoined Theme	
Direct Object Control, Intransitive Verb	
Causative + Intransitive Verb	
Direct Object Control + Transitive Verb	
Causative-Reflexive Causer=Theme, Truncated	
Causative-Theme=Causee cliticized, Intransitive Verb	
Dative-Theme cliticized	92
Dative-Goal cliticized	
Causative-Theme cliticized	
Causative-Reflexive Causer=Theme	
Causative (Faire-par)	83
Causative-Reflexive Causer=Goal, Truncated	
Passivized Direct Object Control, Intransitive Verb	75
Causative-Causee cliticized	
Causative-Reflexive Causer=Goal	

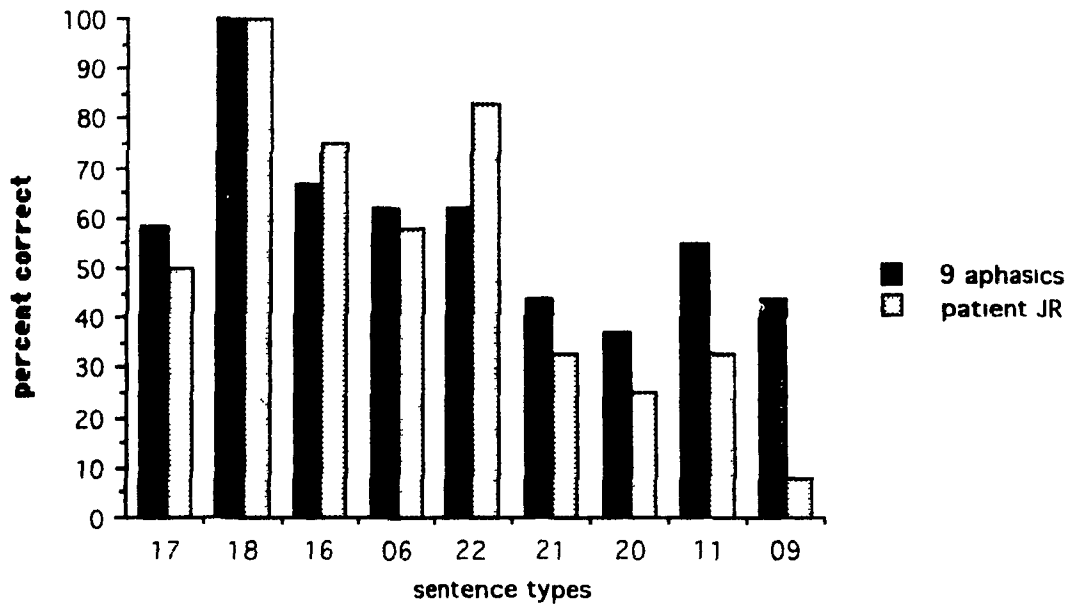
Passive Conjoined Agent	67
Passive Dative Passive	58
Conjoined Truncated Causative	50
Cleft Object Cleft-Object Dative Causative-Theme cliticized, Truncated	42
Object-Object Relative Causative (Faire-à) Conjoined Clauses 4 NPs (No Deletion) (Baseline)	33
Passivized Direct Object Control + Transitive Verb SS Relative + Conjoined Theme	25
Subject-Subject Relative Object-Object Relative with Stylistic Inversion	17
Subject-Object Relative Causative + Dative Causative + SS Relative Cleft-Object with Stylistic Inversion Subject-Object Relative with Stylistic Inversion	8
Cleft-Object Causative (Faire-par) Conjoined Causative Causative-Reflexive Causee	0

J.R.'s performance contrasted sharply with her seemingly unimpaired production. In the OMBs, Passive, Cleft Object and Causative + Dative were responded to at chance levels. As we will see below, this patient has difficulties with empty categories.[11]

[11] The very real effect that empty categories play in sentence processing has been the focus of much work within parsing theory. It is beyond the scope of this thesis, however, to fully examine the impact of each type of empty category--wh-trace, NP-trace, PRO and pro--on our subjects' sentence comprehension. Such an investigation will be part of future work Interested readers should consult Hildebrandt (1986) and Caplan and Hildebrandt (1988) for discussions of precisely this topic, looking more specifically at such categories in English.

With reference to the crucial sentences, see Fig.5.6..

Figure 5.6. Accuracy Rate of Patient JR - 'Sentence Contrasts 1'



[17] Truncated Causative
[18] Causative + Intransitive Verb
[16] Passivized Direct Object Control, Intransitive Verb
[06] Dative Passive
[22] Causative (Faire-par)
[21] Causative (Faire-à)
[20] Passivized Direct Object Control + Transitive Verb
[11] Object-Object Relative
[09] Subject-Object Relative

Her score is above the group's mean for **Causative (Faire-par)**. Her scores are lower for **Causative (Faire-à), Passivized Direct Object Control + Transitive Verb, Object-Object Relative** and **Subject-Object Relative.**

J.R. scores best at **Causative (Faire-par)**--83% correct; she scores75% correct on **Passivized Direct Object Control, Intransitive Verb**; 58% correct on **Dative Passive**; 33% correct on **Object-Object Relative** and **Causative (Faire-à)**; only 25% correct on **Passivized Direct Object Control + Transitive Verb**; and 8% correct on **Subject-Object Relative.** The difference between **Dative** (100%) and **Causative (Faire-à)** is significant on the SDTIP (p=.0005*). There is no such difference with Causative (Faire-par); in fact, there is no difference between Causative (Faire-par) and either Passivized Direct Object Control, Intransitive Verb or Dative Passive. There is a significant difference between Causative (Faire-par) and both Object-Object Relative and Causative (Faire-à) (p=.013*), as well as between Causative (Faire-par) (p=.0041*) and Subject-Object Relative (p=.0002*). Her performance on Cleft-Object Dative is also significantly different from Causative (Faire-par) (p=.035*). Her performance on Cleft-Object Causative (Faire-par) (0%) is significantly below chance, χ^2 = 248.486; p=.0001*.

In addition, we would draw the reader's attention to the fact that this subject is more accurate in her responses to the Causative + Reflexive clitic variants of certain thematic orders; for example, she scores 92% on Causative-Reflexive Causer=Theme but only 58% on Passive, 75% on Causative-Reflexive Causer=Goal and 58% on Dative Passive. However, she scores identically on Truncated Passive and Causative-Reflexive Causer=Theme, Truncated--100%.[12] It must be concluded that the verb faire is aiding her to not apply her preferred linear order strategy. It would appear that the presence of se and faire in the matrix INFL allows her to immediately assign a non-agentive thematic role to the DP in the Spec of IP

Single-factor ANOVAs were performed on her responses to the first 28 sentence types of the OMBs. There was a significant effect for number of DPs (F=4.575; p=.0114*), the difficulty arising with four-DP sentences, which contrasted with each of the other types. The effect for number of Action Vs yielded F=4.251; p=.0258*, the difference arising between one- and three-verb sentences. This patient is the only one who had a significant effect due to the number of Inflected Vs (F=6.912; p=.0142*), the

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12 While the difference between Causative-Reflexive Causer=Theme and Passive approaches significance (p= .0593), there are no statistically significant differences between these sentence types. However, we feel they are suggestive.

difference between one- and two-inflected-verb sentences being significant on a Scheffé F-test =6 912* (at the 0.05 level) Coupled with her extremely poor performance on sentences containing NP and wh-trace, this can be seen as a rather specific problem with functional categories such as IP and CP Sentence length was also significant (F=2.642; p=.0375*), contrasts arising with thirteen+-word sentences. Finally, linear order also was highly determinative for this subject. F=21.045; p=.0001*.

J R made 154/336 errors on the OMB and the COMB. Her most frequent error type was caused by her use of the linear order strategy. Correlation coefficients were calculated between her error rate and the sentential variables The rate correlated .588, p< 005* with number of DPs, .489, p< 005* with number of Action Vs, .458, p<.01* for number of Inflected Vs, 735, p< 005* for sentence length, .669, p< 005* for linear order

J.R.'s difficulties seem to reside in structures which contain moved elements, e g passives, or which have traces which must be governed from an A-bar position in CP, e.g relatives. Indeed this subject's performance also breaks down when there is more than one inflected verb in a sentence Recall that in the latest versions of the theory it is presumed that, in French , verbs must move to INFL to get Tns. In other words, all government of traces whether, NP-trace, wh-trace or verbal t [illegible] seems to be affected However, it is important to note her good performance (never [illegible] ..han 9/12 correct) with pronominal clitics (we have already noted this with reflexives) Though she clearly has a problem with INFL, she can correctly parse the structure when a thematic role is able to be identified there. These are exactly the results predicted by the HAH.

5.3. Aphasics with Major Comprehension Deficits

5.3.1. C.D.

C.D. was a 37-year-old right-handed female who suffered a cerebrovascular accident on December 1 ,1980. The diagnosis was of an embolism in the middle cerebral artery, possibly cardiac in origin An electroencephalogram showed maximal cortical dysfunction centro-temporally with a slight associated subcortical involvement Neurological examination revealed a right hemiparesis, right spastic hemiplegia, a right homonymous hemianopsia and a mixed aphasia, predominantly motor in nature

Speech therapy reports in 1981 showed slow but steady progress in the four language modalities An expressive and receptive deficit in logico-grammatical formulation was present although the patient compensated adequately for this At the end of therapy in 1982, she still showed difficulty in remembering written texts

On November 16,1985, she again suffered a mild left hemisphere CVA There was no evidence of an embolism so a diagnosis of a pathology of the local arterial wall was made She presented with a severe right hemiplegia and an expressive aphasia

When I saw the subject over a period of several months, she appeared to be in a stable condition. She was not at that time following a course of speech therapy Her digit span was five for both oral and pointing.[13]

C.D.'s results in terms of percentage correct for the OMBs can be found in Table 5.7.

Table 5.7. Summary Results of Patient CD

	% Correct
Active Truncated Passive Direct Object Control, Intransitive Verb Causative + Intransitive Verb	100
Dative Active Conjoined Theme Direct Object Control + Transitive Verb	92
Object-Subject Relative	75

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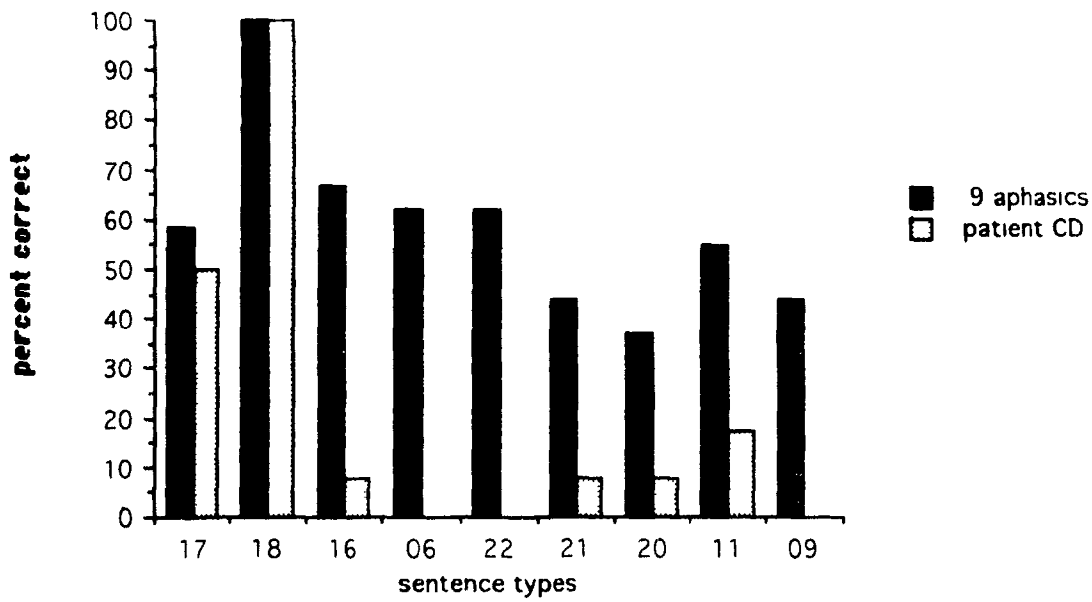
13 Note that her digit span is better than those of the moderately impaired aphasics and that of J.T. from the least impaired group.

Passive	58
Cleft Object Conjoined Truncated Causative	50
Passive Conjoined Agent Conjoined Clauses 4 NPs (No Deletion) (Baseline)	42
SS Relative + Conjoined Theme	33
Subject-Subject Relative	25
Cleft-Object Dative Object-Object Relative Causative + Dative	17
Passivized Direct Object Control, Intransitive Verb Passivized Direct Object Control + Transitive Verb Causative (Faire-à)	8
Dative Passive Subject-Object Relative Causative (Faire-par) Cleft-Object Causative (Faire-par) Conjoined Causative Causative + SS Relative	0

C.D.'s performance was at chance for the following sentence types: Passive (χ^2 =.333, p=.5637) and Cleft Object (χ^2 0, p=1). All other sentences were non-random, either significantly better or worse than chance; with visual inspection of the χ^2 values revealing the nature of the non-chance performance.

C.D. was very aware of her deficits, stating explicitly that, as soon as more than two animals were put before her (or mentioned in the sentence), she could no longer interpret the structure correctly. She would only succeed when a strictly linear order would yield the correct response, e.g. Dative, Active Conjoined Theme, Direct Object Control + Transitive Verb (92%), and Object-Subject Relative (75%). As previously stated, her performance on Passives was no better than chance, with the reversal of normal thematic order obviating the advantage of having only two DPs However, her performance on **Truncated Passive** was 100%, we would therefore suspect that this patient treated these as lexical rather than syntactic passives Her performance on **Truncated Causative**, 50%, was significantly above chance (χ^2 =151.516, p=.0001*); even were the causative considered as one verb, this would be nonrandom Recall that this sentence cannot be interpreted utilising a linear order strategy (1,(X);X,2); in other words, some non-mentioned Causee must, through the Causer's agency, perform an action on N_2 Due to this patient's difficulties with sentences with three overt DPs, **Dative Passive**, **Subject-Object Relative**, **Causative (Faire-par)**, and **Cleft-Object Causative (Faire-par)** were all incorrectly interpreted, she scored 0% on them all **Causative (Faire-à)**, **Passivized Direct Object Control, Intransitive Verb**, and **Passivized Direct Object Control + Transitive Verb** were all at 8% accuracy, **Cleft-Object Dative** and **Object-Object Relative** at 16% None of these sentence types are significantly different from each other (see Fig 5 7.)

Figure 5.7. Accuracy Rate of Patient CD - 'Sentence Contrasts 1'



[17] Truncated Causative
[18] Causative + Intransitive Verb
[16] Passivized Direct Object Control, Intransitive Verb
[06] Dative Passive
[22] Causative (Faire-par)
[21] Causative (Faire-à)
[20] Passivized Direct Object Control + Transitive Verb
[11] Object-Object Relative
[09] Subject-Object Relative

We would draw the reader's attention to the poor performance on cleft-object and object relatives. Her scores on **Subject-Subject Relative and SS Relative + Conjoined Theme** are higher, the latter being statistically significantly different from **Subject-Object Relative, Causative (Faire-par),** and **Cleft-Object Causative (Faire-par)** (.0285* on the SDTIP).

Single-factor ANOVAs were performed on her scores and the sentential variables. The number of DPs was significant (F=3.294; p=.0377*) the Fisher PLSD (at the 0.05 level of significance) revealing a difference between one and four DPs (9.168*), between two and three (3.831*), and between two and four (4.9*). There was no simple effect for either number of Action Vs (F=2.2889; p=.0738) or Inflected Vs (F=2.209;p=.1492).

Sentence length was a determinant of accuracy (F=2 708, p= 0341*), problems arising when the sentence contained 10 words or more Linear order also played an important role (F=34 928, p= 0001*) When the combined effects of number of DPs and LO were calculated, main effects of DPs and LO were also found, although there was no interaction In addition, when the combined effects of number of Inflected Vs and LO were calculated, there were main effects for both factors 4 32, p= 0485* for Inflected Vs and 22 923, p=.0001* for LO, although there was no interaction Clefted structures are a problem for this patient, but within the total picture of her deficits, they have less of an effect than other factors such as number of DPs and number of words

C.D. made 195/336 errors on the OMBs, mostly of the linear order kind With four DP sentences, this may produce 1,2,2,3,3,4 responses or 1,2+3;2+3,4 In addition, her errors do not always respect the proper number of arguments a verb has, e.g Dative may be responded to as 1,2,1,3 or relatives may be treated more like Datives Correlation coefficients were calculated between her error rate and the sentential variables yielding the following significant values: .527*, p<.005* for number of DPs, 428, p< 025* for number of Action Vs; .711, p<.005* for sentence length; .757, p< 005* for linear order.

5.3.2. J.D.

J.D. was a 57-year-old right-handed female with a complex neurologic history She suffers from multiple sclerosis (which has probably caused white matter lesions in both hemispheres), and epilepsy (focalized in the left Rolandic area). In 1963, she was hospitalized for neurological signs stemming from a polysystemic involvement of the central nervous system, which was diagnosed as probably being multiple sclerosis. In 1974, she was again hospitalized with a left peripheral vestibular syndrome with nystagmus. Neurological examination revealed many abnormal signs diagnosed as left homonymous quadranopsia. A tumour or parietal epilepsy was suspected. In August 1974, a nevrectomy of the eighth pair of cranial nerves was performed to control the attacks. In

December 1974, she had a labyrinthectomy to verify the completeness of the previous nevrectomy. An electroencephalogram showed the possibility of a mild cortical involvement in the left fronto-temporal region

In March 1977 she was tested at the Mayo Clinic in Rochester, however, due to the complexity of the case, a more exact diagnosis could not be made In June 1977, Hôpital Notre-Dame diagnosed epilepsy in the left primary motor area. In 1978, she had meningitis (which was probably bilateral) and subsequent to this suffered from speech problems. She spoke five languages before her neurological problems but lost all but her mother tongue, French

Speech therapy reports in 1978 showed severe word-finding problems (i.e. in French). Repetition elicited phonemic transformations with multiple 'conduites d'approche' In narrative discourse, the subject made many paragrammatisms. Reading exhibited parallel deficits, i.e. it was slow and effortful with a moderate dyslexia The subject had word-finding difficulties in writing, exhibiting a dysorthographia. Oral comprehension in context was good but Pierre Marie's test was not performed in the proper order. Comprehension of an auditorily presented text was poor as memory load increased. She performed poorly on the Token Test as well

Comprehension of simple material was considered adequate but, as in the neuropsychological examination, the subject had a significant memory deficit. Oral expression was slow, hesitant, with many aborted sentences due to the word-finding difficulties. A tentative diagnosis of conduction aphasia with involvement of a frontal lesion was made at the time.

A temporal craniotomy and a partial cortectomy were performed on March 20, 1980. Subsequently, she received additional speech therapy although her difficulties were much the same as they had been. Oral expression was hesitant with many phonemic paraphasias especially in repetition. The patient used many circumlocutions as a compensatory stategy for her word-finding difficulties. In oral comprehension she continued to exhibit deficits in all auditorily presented material as length and complexity increased. The Token Test results were poor as soon as three elements were introduced Both expressive and receptive aspects of the written language were now totally impaired She was tentatively diagnosed at that time as a case of Wernicke's aphasia (type 111), predominantly in the written modalities She received therapy over the next three years and her deficits in the written modalities improved and her condition stabilized somewhat

At the time of her participation in this research, she continued to have memory-related problems Hesitant speech, word-finding difficulties and severe comprehension problems persisted Her oral digit span was three while her pointing span was two

J. D.'s results in terms of percentage correct for the OMBs can be found in Table 5.8.

Table 5.8. Summary Results of Patient JD

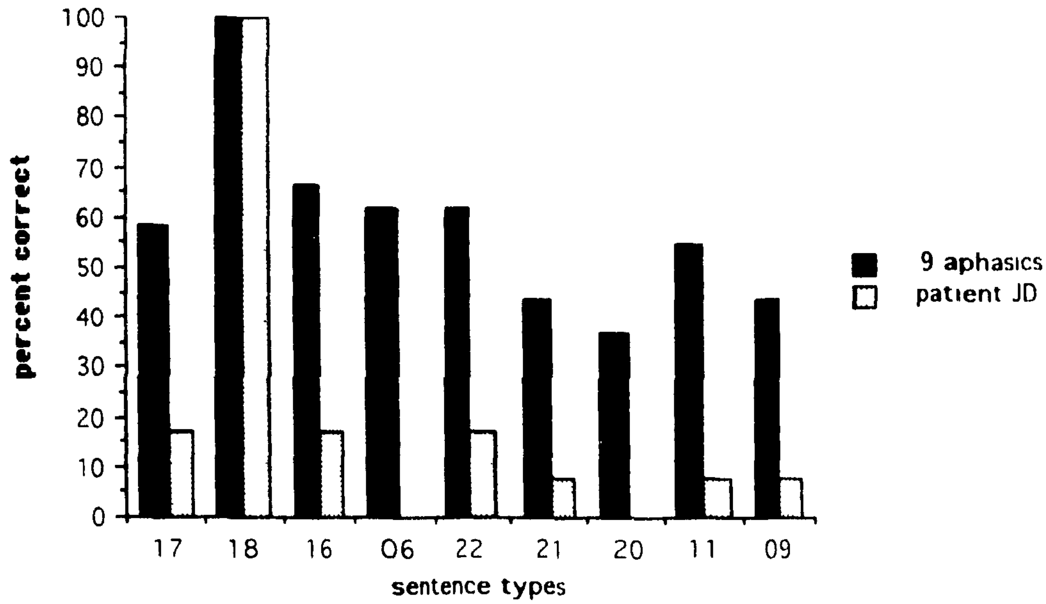
	% Correct
Active Causative + Intransitive Verb	100
Direct Object Control, Intransitive Verb	92
Direct Object Control + Transitive Verb	83
Object-Subject Relative	75
Active Conjoined Theme	58
Dative	50
Passive Cleft Object Conjoined	42
Truncated Passive	25

Subject-Subject Relative Passive Conjoined Agent Passivized Direct Object Control, Intransitive Verb Truncated Causative Causative (Faire-par)	17
Cleft-Object Dative Subject-Object Relative Object-Object Relative Causative (Faire-à) Causative + Dative SS Relative + Conjoined Theme	8
Dative Passive Passivized Direct Object Control + Transitive Verb Cleft-Object Causative (Faire-par) Conjoined Causative Causative + SS Relative Conjoined Clauses 4 NPs (No Deletion) (Baseline)	0

J.D.'s performance was at chance levels for the following: **Passive, Truncated Passive, Cleft Object, Dative Passive, Cleft-Object Dative**. All other sentence types were significantly different from chance.

On the crucial sentences, see Fig.5.8.

Figure 5.8. Accuracy Rate of Patient JD - 'Sentence Contrasts 1'



[17] Truncated Causative
[18] Causative + Intransitive Verb
[16] Passivized Direct Object Control, Intransitive Verb
[06] Dative Passive
[22] Causative (Faire-par)
[21] Causative (Faire-a)
[20] Passivized Direct Object Control + Transitive Verb
[11] Object-Object Relative
[09] Subject-Object Relative

Her performance was so impaired that no meaningful contrasts could be made. She scored 17% for **Passivized Direct Object Control, Intransitive Verb**, and **Causative (Faire-par)**; 8% for **Cleft-Object Dative, Subject-Object Relative, Object-Object Relative**, and **Causative (Faire-à)**; and finally 0% on **Dative Passive, Passivized Direct Object Control + Transitive Verb**, and **Cleft-Object Causative (Faire-par)**. Her responses to four DP sentences degenerated at times to an order of presentation strategy which she had not previously demonstrated and is only ever seen in severely impaired subjects.

Single-factor ANOVAs were computed between her scores on the OMBs and on the sentential variables. There were significant effects for the following: number of DPs

(F=3 811; p=.023*), contrasts occurring between two- and three- as well as two- and four- DP sentences, and linear order (F=39.86; p=.0001*) . In addition, in a 2-factor ANOVA between number of DPs and LO, main effects were found for both factors: DPs: F=20.226; p=.0001* and LO: F=65.829; p=.0001* A significant interaction was also found: F=4.5; p=.0137* . A 2-factor ANOVA was also computed for number of Inflected Vs and LO; again, main effects for the factors were found and there was a significant interaction (Infl.Vs: F=6 741; p=.0158*; LO: F=25.646; p=.0001*, and A x B: F=4.876; p=.037*). In fact, her highest scores were all for sentential structures which allowed a linear order strategy. Differences among these were due to sentential complexity and length.

There were no simple effects for number of Action Vs or Inflected Vs, nor were there effects for sentence length as a whole.[14] It would appear that this patient was too impaired to show such variances in her performance on these variables.

J.D. made 235/336 errors on these sentence types. Correlation coefficients were calculated between her error rates and the sentential variables, the following being statistically significant: number of DPs (.479, p=.005*); maximum number of words (.629, p<.005*); linear order (.778, p<.005*).

5.3.3. P.R.

P.R. was a 46-year-old right-handed male who suffered a cerebrovascular accident on February 7,1985. The diagnosis was a left hemisphere perisylvian thrombosis. CT-scan also revealed a significant focal ischemia in the region of the central nuclei, the internal capsule and the left temporal lobe. It occurred only hours before the subject was due to be operated on to remove a large atypical benign meningioma from the fronto-parietal region of the right hemisphere. He exhibited a moderately severe right spastic

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[14] Though shorter sentences did contrast with the medium-length sentences on the Fisher PLSD.

hemiplegia and mixed aphasia. The surgery was performed on schedule and the entire tumour was successfully removed.

On October 25, 1985, the patient underwent a right fronto-parietal cranioplasty to repair a defect in the bone. An acrylic flap was fixed into position to replace the bone flap removed for analysis during the craniotomy

Speech therapy reports stated that the patient could hardly speak Comprehension was sufficient for simple words and for simple sentences in context The patient could not be tested further. He could not read at all. He was evaluated as having Broca's aphasia Subsequently, he made some progress and could repeat four-syllable words and simple sentences.

At time of testing, he still had the hemiparesis and some word-finding difficulties. His oral digit span was four and his pointing span was five [15]

P.R.'s results in terms of percentage correct for the OMB sentence types can be found in Table 5.9.

Table 5.9. Summary Results of Patient PR

	% Correct
Active Causative + Intransitive Verb Direct Object Control + Transitive Verb	100
Passive Dative Active Conjoined Theme Direct Object Control, Intransitive Verb	92
Object-Subject Relative	83
Dative Passive Passivized Direct Object Control, Intransitive Verb	67

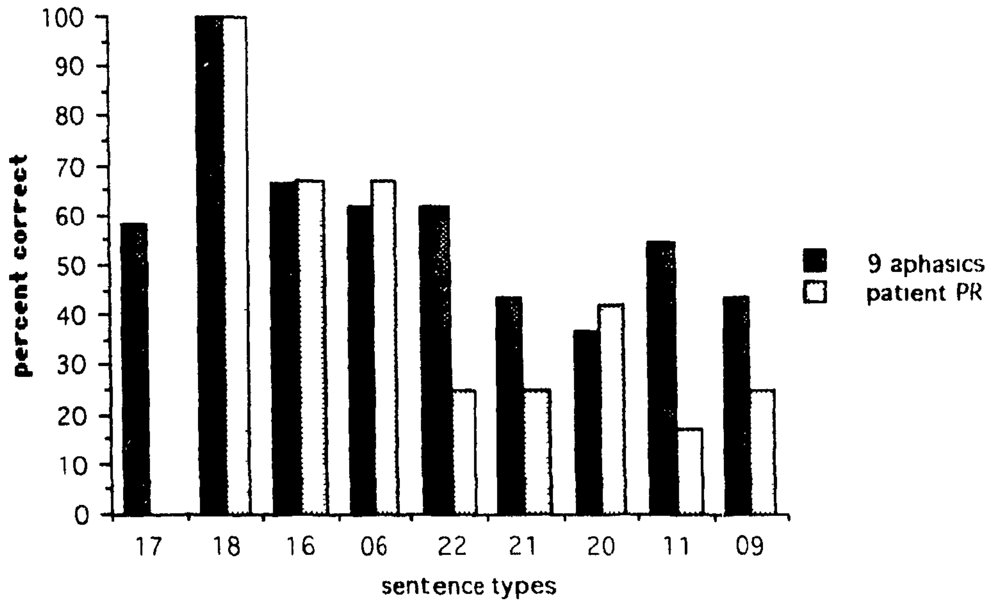
[15] Again, please note the digit span is lower than normal (approx. 7) but better than those of many subjects in the less impaired groups.

Conjoined Clauses 4 NPs (No Deletion) (Baseline)	58
Cleft Object Causative-Reflexive Causer=Theme	50
Passive Conjoined Agent Passivized Direct Object Control + Transitive Verb SS Relative + Conjoined Theme	42
Cleft-Object Dative Subject-Object Relative Causative (Faire-à) Causative (Faire-par)	25
Object-Object Relative Subject-Subject Relative Causative + Dative Subject-Object Relative with Stylistic Inversion	17
Conjoined Causative-Reflexive Causee	8
Truncated Passive Truncated Causative Cleft-Object Causative (Faire-par) Conjoined Causative Causative + SS Relative Dative-Theme cliticized Dative-Goal cliticized Causative-Theme cliticized Causative-Causee cliticized Causative-Reflexive Causer=Goal Causative-Reflexive Causer=Goal, Truncated Causative-Theme cliticized, Truncated Causative-Reflexive Causer=Theme, Truncated Causative-Theme=Causee cliticized, Intransitive Verb Cleft-Object with Stylistic Inversion Object-Object Relative with Stylistic Inversion	0

P.R.'s performance was at chance for Cleft Object. Other sentences demonstrated non-random performance.

On the crucial sentences, see Fig.5.9.

Figure 5.9. Accuracy Rate of Patient PR - 'Sentence Contrasts 1'



[17] Truncated Causative
[18] Causative + Intransitive Verb
[16] Passivized Direct Object Control, Intransitive Verb
[06] Dative Passive
[22] Causative (Faire-par)
[21] Causative (Faire-à)
[20] Passivized Direct Object Control + Transitive Verb
[11] Object-Object Relative
[09] Subject-Object Relative

P.R. performed as well on Dative Passive as on Passivized Direct Object Control, Intransitive Verb--67% correct. This is 25% better than his scores for Passivized Direct Object Control + Transitive Verb --42% correct. This in turn is 17% higher than his scores for Cleft-Object Dative, Subject-Object Relative, Causative (Faire-à), and Causative (Faire-par) and 25% better than his performance on Object-Object Relative. He shows significantly different accuracy on Dative Passive and Causative (Faire-par), a very different pattern than is exhibited by the other subjects (SDTIP p=.0405*). The difference between Passivized Direct Object Control + Transitive Verb and Causative (Faire-par) is not large enough to reach significance.

P. R. is better at passivized structures than at structures that contain wh-trace. If we compare **Passive** with **Cleft Object**, we find a difference of 42%, were the score for **Cleft Object** not at chance, we could perform the SDTIP, which would yield a significant difference, p=.0247*. The difference between **Dative Passive** and **Cleft-Object Dative** is again 42%; since both are different from chance, the SDTIP yields a significant difference, p=.0405*.

Interestingly, considering his problem with wh-trace, P R is better at **SS Relative + Conjoined Theme** than at **Subject-Subject Relative** (42% vs. 17%). It would appear that the additional 'weight' in the subordinate clause helps the subject better segment the incoming string.[16] P.R. is very impaired with two-CP sentences. This was what was predicted by the HAH. The only two types to which he responds with any accuracy are those which allow a linear order interpretive strategy

This subject shows another very idiosyncratic response pattern. All truncated structures yielded 0% correct. Whether he completely misunderstood them or simply rejected them for pragmatic reasons could not be determined with this paradigm; perhaps testing with a sentence-picture matching protocol could tease out the pragmatic factor. In addition to this behaviour, all sentences with clitics in the POMB were equally ignored; only **Causative-Reflexive Causer=Theme**, the one most resembling a passive, obtained a score as high as 6/12. He almost performed at the same level for **Passive Conjoined Agent** (42%);[17] again, this sentence type shows the same reversal of thematic role order. However, in almost all the other cases, this patient was extremely poor with clitics. This problem with clitics and the problem with truncated forms seem to point to the right hemisphere damage being to blame. Recall that, although A.G.' s

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16 Prosodic factors no doubt play a factor here.

17 Within another paradigm, which could not be reported on in this thesis, he did perform at this level with a sentence type which requires that a pronoun be interpreted as coreferential with the first NP of the sentence. The antecedent is therefore present in the discourse.

performance was in general very good, he did not like truncated structures either; no doubt he had bilateral damage due to his automobile accident.

Single-factor ANOVAs were computed on his scores on the OMB and the COMB and the sentential variables. He showed no significant effect due to number of DPs (though it approached significance, F=2.786; p=.0625). There was no effect due to number of Action Vs, though again it approached significance (F=2.917; p=.0727); there was almost an effect due to number of Inflected Vs (F=3.428; p=.0755) (this is probably linked to his problem with wh-trace). There was no overall effect for sentence length, but there was for the linear order variable (F=39.871; p=.0001*). A 2-factor ANOVA of Infl. Vs x LO yielded main effects for the two factors (F=4.561; p=.0431* and F=31.812; p=.0001* respectively).

P.R. made 183/336 errors on these sentence types. His error rate did not correlate with the number of DPs though it did with the number of Action Vs (.416, p<.025*) and the number of Inflected Vs (.341, p< .05*). Correlation coefficients were significant for sentence length (.418, p<.025*) and linear order revealed its influence as well (.778 , p<.005*). Many of his erroneous responses used a linear order strategy (see Appendix B).

5.4. Normal Controls

Single-factor ANOVAs were calculated for each of the 10 controls with relation to the effect that the various sentential variables played in determining their accuracy. Due to the near ceiling performance of most of the controls, most simple effects were not evidenced. Two-factor ANOVAs, however, showed some main effects. For C.D.2, an Infl. Vs x LO yielded a significant effect for Infl. Vs (F=4.77; p=.039*). D.P. and F.T. showed a similar pattern though their results did not actually reach significance. C.V. had no main effect for Infl. Vs but the influence of linear order approached significance. M.J. showed a main effect of number for DPs in a DP x LO contrast (F=7.621; p=.0012*).

L. N.[18] showed a simple effect for number of Action Vs ($F=9.768$; $p=.0007$*), three-verb sentences contrasting with one- and two-verb ones. R.L. had a significant effect for linear order. $F=6.139$, $p=.02$* O.F. demonstrated the most interesting pattern on linear order, $F=4.925$; $p=.0354$*. There was also a variable we have not previously discussed, one we have named 'Agent First'; sentences were coded as possessing this variable if the first action to be enacted was to be performed by N_1. No subject (patient or control) other than O.F. showed any effect for this factor, his scores reached $F=5.715$, $p=.0244$*. This is the experimental subject with the least education (5th grade) and it is hard not to conclude that there is a causal relationship. (For the reader's convenience, summary results of O.F., R.L., and L.N. are included in Appendix B.)

Further implications of the results of both the group studies and the individual cases for understanding sentence comprehension in relation to the Head Accessibility Hypothesis and for pursuing the linguistic analysis of French Causatives will be discussed in the final chapter.

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18 L.N. showed atypically poor performance for her education level for sentence types such as Subject-Object Relatives. We could not rule out the possibility of a hearing loss. Upon questioning, we discovered that the woman was Acadian and that she spoke Spanish, having lived for 10 years in South America. In fact, at the time of testing she was boarding a recent immigrant from South America. Whether these factors account for the discrepancies in her performance is an open question which calls for further exploration. Her poor performance on Causative (Faire-à) may be due in part to the interlingual ambiguity of the cue for her. In Spanish, all animate direct objects are preceded by a.

Chapter 6- General Discussion

6.1. Comprehension of Causatives and its Implication for the Understanding of Aphasic Comprehension

6.1.1. The Processing of VP Complements vs. IP Complements

The central hypothesis of the thesis was that, as causatives (faire-par in particular) have VP complements, subjects' results (number of correct responses) for these structures would pattern with Dative Passives and not with Passivized Direct Object Control + Transitive Verb structures. As a group, the subjects performed 62% correct on both Dative Passive and Causative (Faire-par) and only 37% correct on Passivized Direct Object Control + Transitive Verb. It would seem that our prediction was confirmed. These sentence types hold the number of overt DPs constant (three). None permit a linear order strategy. There is some slight difference in the number of words: Dative Passive=11, Causative (Faire-par)=10, and Passivized Direct Object Control + Transitive Verb=12. However, the difference between Dative Passive and Causative is that the Causative is missing the preposition à. We are therefore not talking about a major lexical category (on the view that à is only a case marker). Between the Causative and the Control structure, the only differences are the additional été and à in the Control structure. Between Dative Passive and the Control structure, the difference is that the latter has an additional verb. In fact, it is with the Passivized Direct Object Control, Intransitive Verb that the group's results on Dative Passive and Causative (Faire-par) tally (66.67% correct). Although it has the same number of words as the Causative, it has only two DPs, one fewer than the other three types; however, it has the same number of IPs as the other Control structure, i.e. one more than the Dative Passive and the Causative (Faire-par).

Naturally, counting only the overt DPs is insufficient. Dative Passive and

Passivized Direct Object Control, Intransitive Verb and **Passivized Direct Object Control + Transitive Verb** contain an NP trace. In addition, the two latter structures contain PRO Under some recent analyses of passives, they may also be considered to have a PRO in the VP which is coindexed with the adjunct by-phrase (Guilfoyle,1990). It is difficult to quantify the level of difficulty of the combination of overt lexical NPs + empty categories Some other structures can also be compared which have an antecedent governing from an A'-position rather than from an A-position as with passivized structures, e.g. **Cleft-Object Dative** (response: 2,1,3) and **Object-Object Relative** (1,2;3,2). The group responded 52.8 % correct and 54.6% correct respectively (both types have three DPs and one wh-trace); this is still below their performance on Causative (Faire-par).[1]

Group results may at times obscure individual deficits and for that reason each patient's results were analyzed on a case-by-case basis. Four of the patients showed the same significant differences between these sentence types as were revealed by the group as a whole--J.T.,[2] D.C., F.P. and J.R. Two other patients' performances were at ceiling for these sentences: A.G. scored 100% on all of these except for making one mistake on **Passivized Direct Object Control + Transitive Verb** and C.M had perfect scores P.R. showed better performance on **Dative Passive** and **Passivized Direct Object Control, Intransitive Verb** (both 67% correct) than on **Passivized Direct Object Control + Transitive Verb** (42% correct). He performed poorly on both versions of the **Causative** (both 25% correct). However, the SDTIP cannot be applied to all of these sentence contrasts; in most cases the differences between the ones that can be compared are

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[1] This is in reference to full NPs only. Clitics are in A'-positions and the aphasics' performance on the clitic version of <u>faire-par</u> was poorer than for the full NP version (56.7% vs. 71.7% respectively).

[2] Although J.T. did score 25% more accurately on Causative (Faire-par) than **Passivized Direct Object Control + Transitive Verb**, the difference between the types approached but did not reach significance.

not significant The one contrast that can be made under a re-calculation of the causatives reveals that he is significantly more accurate when responding to Dative Passive than to either causative This might lead one to believe that the reason for the difference in his performance lies in the lexical entries of the verbs involved If, as we assume, he has little problem with the subcategorization frames of three-place predicates per se, he must be experiencing difficulty because faire subcategorizes for a VP complement, entailing the presence of an additional VP-internal 'Agent', whether expressed or implicit. It may be the case that the semantic specification of faire is too general for P.R., hence the better performance with the more explicit control verbs forcer and inciter. It cannot simply be that he has lost the concept of 'causality', possibly due to the right hemisphere involvement; otherwise, his performance on the verbs of obligatory control would have been worse, or might have shown the pattern exhibited by the group. The last two patients, C.D. and J.D., score so poorly on all these sentence types that no meaningful comparisons are possible.

We feel that the approach taken in this thesis has demonstrated the relationship between a group study approach and case studies Demonstrably, some patients' performances are either too good or too bad to reveal which sentence types are more complex, whether on linguistic or processing grounds. However, the majority of the patients will mirror the group's performance as they do not constitute independent samples. Additionally, although some of the contrasts could not be fully compared statistically, we examined the case of one patient whose performance contrasted with the group's for reasons we could explain on linguistic grounds, and this information was recoverable by the case approach.

6 1.2. The Intactness of the Lexical Representation of Faire

What is it that a person knows when he can interpret a Causative (Faire-par)? (Two-thirds of our aphasic sample scored ≥ 9/12; one-third 1/3 scored ≤ 3/12; no control scored less than 10)

The Causative + Intransitive Verb (an instance of the Faire-inf contruction) was invariably answered correctly (100%) by all French experimental subjects In English, this sentence type would permit a linear order strategy, but in French the one who performs the 'action' is in what would appear to be object position However, with a VP-internal-subject analysis, the NP is still in subject position, although it is 'affected' by the 'Causer' or matrix subject

This sentence type was contrasted with Truncated Causative (this was responded to 94% correctly by the controls) The patients' score dropped to 58.33% correct which, although significantly above chance (since the three participants must be identified), can be accounted for by the strong bias to treat the explicit Theme of the embedded verb as the Agent, in some ways, they seem to be interpreting the structure as having a pro in object position.[3] (How legitimate it would be to accept analyses which have posited just such a pro in Italian--see, for example, Rizzi (1988)-- is presently unclear, this certainly merits further study.) As a group, if Causatives were not understood, the Truncated Causative would be 0% correct. In fact one patient (C.D.) who scored 0 on Causative (Faire-par) actually scored 50% correct on the truncated version; the difference is statistically significant (SDTIP, p=.0047*). This patient also scored significantly better on Truncated Passive than on the full NP version (SDTIP, p=.012*), but any explanation that would involve treating the truncated version of this latter structure as a lexical passive surely cannot be generalized to the Truncated Causative. This patient therefore has retained some knowledge of the syntactic consequences of the subcategorization requirements of faire, though her consciously perceived difficulty with three-overt-NP (DP) sentences precludes her from responding to the full form correctly. (Note that it cannot be a psychological block at the mere presentation of three animals in

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[3] Obviously, since this would be a governed position, this *ec* could not be PRO.

the array since the Truncated Causative requires just such an array.) The two other subjects who did not understand the causative, J.D. and P.R , demonstrated that they are not sensitive to the difference between truncated and non-truncated sentence types. Of those six patients who scored well on the Causative (Faire-par), two did only half as well on the truncated version as on the causative containing the intransitive verb (D.C. and J.R.), while the remaining four performed almost as well on both types.

Similarly, when a person has an intact representation of the lexical entry for faire, he must understand the difference between Causative-Theme=Causee cliticized, Intransitive Verb (2 animals)--76 67% correct--and Causative-Theme cliticized, Truncated (3 animals)--56.67% correct.

	D.C.	C.M.	F.P.	P.R.	J.R.
Causative-Theme=Causee cliticized, Intransitive Verb	100%	100%	83%	0%	100%
Causative-Theme cliticized, Truncated	100%	92%	50%	0%	42%

Of the five subjects who could be tested, only one (P.R.) was among those who scored poorly on the Causative (Faire-par), again, he cannot properly interpret structures containing this verb and this is compounded by his problems with unspecified reference. J.R.'s performance on Causative-Theme cliticized, Truncated parallels her difficulty with the full NP truncated version previously discussed.

What else must a person understand about Causatives? They must be able to distinguish the interpretation of le and lui in dative and causative sentences.

Group: Dative-Theme cliticized	76.67% correct
Dative-Goal cliticized	65.00% correct
Causative-Theme cliticized	56.67% correct
Causative-Causee cliticized [4]	66.67% correct

Both the Dative-Theme cliticized and the Causative-Causee cliticized can be well interpreted by the linear order heuristic (interpretive strategy); however, note that Dative-Goal cliticized (which cannot be so interpreted) and Causative-Causee cliticized are responded to with the same degree of accuracy The same Case-assigning mechanism seems to be operational here despite the difference in the thematic roles that must be played out. The drop in performance we note in Causative-Theme cliticized may be due to the fact that the accusative clitic is used to represent either the Causee or the Theme in the appropriate structures Some dialects or idiolects appear to permit the use of the accusative clitic as Causee even in structures with an embedded transitive verb This sentence type is misinterpreted despite the presence of the par-phrase identifying the Causee. For those for whom the accusative clitic is more ambiguous, there are therefore three possible Agents within the sentence, which provides increased opportunities for misinterpretation

The group scores are substantially lowered by P.R.'s inability to correctly interpret pronouns on this task. If we recalculate the group's results without P.R.'s, we obtain:

Dative-Theme cliticized	95.8% correct
Dative-Goal cliticized	81.3% correct
Causative-Theme cliticized	70.8% correct
Causative-Causee cliticized	83.0% correct

These sentence types were quite well interpreted despite the indeterminacy of the

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[4] This is an instance of faire-à since the Causee cannot surface as a dative clitic when it has been suppressed.

reference (the minimum average score was 8 5/12) These results were predicted by the HAH . Despite the non-stressed nature of clitics, they are well comprehended Their presence adds saliency to the INFL to which they have been adjoined According to other structural account, sentence types containing clitics should be unavailable. Only the HAH accurately predicts the attested performance and explains the reasons for it

6.1.3. Interpretation of the Reflexive Pronoun Se

The reflexive pronoun is generally well understood. No completely acceptable structure containing the reflexive pronoun scored less than 65% correct (the Causative-Reflexive Causee is discussed below in the section on 'ungrammatical' structures) The use of se in causative structures is also well interpreted; the preferred reading is that se + faire is equivalent to a passive, before testing, it had been our hypothesis that this would be the case. [5]

Causative-Reflexive Causer=Theme	86.67% correct
Passive	88.33% correct
Truncated Passive	80.00% correct
Causative-Reflexive Causer=Theme, Truncated	78.33% correct
Causative-Reflexive Causer=Goal, Truncated	70.00% correct
Causative-Reflexive Causer=Goal	65.00% correct
Dative Passive	75.00% correct

Certainly se seems to have a valency-changing effect on the verb with which it is associated; the existence of 'lexicalized' se + V, e.g. s'agenouiller 'to kneel', makes

[5] There is the alternate reading which carries with it the sense that the sentential subject may be somewhat responsible for what happens to him. This nuance does not alter the fact that a reversal of thematic roles must be acted out. The testing of other causative structures may also induce or introduce a bias toward such a reading.

'intransitive' readings likely. However, the addition of se creates unaccusatives not unergatives As we have seen in Chapter 2, the linguistic analysis proposed in Grimshaw (1990) and integrated into an analysis of Romance causatives by Rosen (1989) claims that it attaches to the argument structure of a verb and satisfies the external argument, as well as lexically binding the internal argument When projected to the level of the phrase structure, this will have the same consequences as passivization the Theme (or Goal) argument will have to move into subject position, with causatives, this will normally be the matrix subject position

One patient 'repeated' [6] Le singe se fait frapper par le lapin as Le singe a ete frappe par le lapin, another 'repeated' La grenouille que la chevre a serree a chatouille le singe as La grenouille se fait serrer par la chevre, et a chatouille le singe, and another patient 'repeated' L'elephant a fait gratter la grenouille as La grenouille s'est fait gratter In all cases, after providing these paraphrases, they interpreted the structure correctly Recall that, when the test was designed, the tense of faire was changed from passe compose to the present for these sentences in order not to bias the test subjects toward this reading by the presence of être as auxiliary However, it would appear that the bias is inherent in the structure. These constructions with se + faire are in INFL As with the pronominal clitics, the reflexive clitics are well processed Their presence alerts the experimental subject to the fact that the DP in Spec of IP cannot be an Agent, which is the usual default interpretation.

6.2. Interpretation of the Semi-Grammatical Causative (Faire-à) and Causative-Reflexive Causee

Causative (Faire-à) caused an increase in the error rate, with many linear order errors. The five patients who performed all the tests scored 41.67% correct on these structures, a large drop from their 71.67% correct for **Causative (Faire-par).**

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6 In these cases, subjects acted as if they thought that they were repeating verbatim

The structure, as designed for this test, is not fully acceptable The controls scored 81 67% correct on Causative (Faire-à) but 97 5% on Causative (Faire-par); only the scores of controls with higher levels of education did not show this drop in accuracy However, it is difficult to convey the reactions that most of the experimental subjects had after the sentences were read. There was much grimacing, requests for repetitions of the first few tokens of the type, explicit indications that they would substitute par for à and so on These reactions do not have exactly the same character as those we see when the stimulus is either very long or very complex. Many theorists have failed to discuss the fact that these constructions are not acceptable The Theme of the embedded verb must be inanimate or the structure seems peculiar.[7] Note that the embedded verbs normally have no such restriction . frapper may take either an inanimate or an animate object, e g frapper le mur or frapper Pierre We know that there are animacy restrictions for the other arguments of the causative construction Normally the Causee must be animate to be used in the Causative (Faire-à) construction, if it is not, then the Causative (Faire-par) must be used.

(1) * J'ai fait inonde les prés a l'eau de la riviere

'I made the water from the river flood the meadows.'

(2) J'ai fait inonde les prés par l'eau de la rivière.

'I had the meadows flooded by the water from the river.'

Milner (1982)[8] has claimed that this is linked to the selectional restrictions of the verb faire, e.g.:

(3) J'ai fait des méchancetés à Paul.

'I did malicious things to Paul.'

The Theme here is normally inanimate and the Goal animate. This is exactly the same

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[7] Kayne (1975) discussed some of these animacy restrictions.

[8] These three examples are taken from Milner (1982: p. 151). We have provided the English glosses

restriction we see with the causative To borrow some concepts from Saksena (1982) concerning 'affectedness', we would propose that the NP in the PP complement in (3) is animate and affected while the theme is not affected In the faire-a construction, when the object of the embedded transitive verb is inanimate, the sentence is grammatical However, when it is animate there will be a conflict since the Theme of transitive verbs is normally 'affected' or suffers a change of state, there thus appears to be a constraint against two [+animate/+affected] full NP complements The a-adjunct par-phrase NP is not considered [+affected], at least not in the same way as the Causee in a faire-à causative, which is normally viewed as lacking control over its actions (cf Cannings and Moody 1978, Hyman and Zimmer 1976) The adjunct NP need not be specified for animacy and the constraint is no longer applicable to the Theme of the embedded verb because it is now impossible to have two [+affected] complements in this construction, given that the Causee-argument has been suppressed. This additional selectional restriction imposed on the embedded verb by faire is an additional argument for considering that there is no IP complement to faire in these cases Such restrictions can be accommodated in Rosen's analysis by stipulating that the Lexical Conceptual Structure is changed for this complex predicate. (Even an analysis such as Stowell's (1983) claims that a governing verb can impose semantic restrictions on the verb of a Small Clause complement, i e a clause with no IP node.) We cannot see how a biclausal analysis could account for this phenomenon

As for the processing of the **Causative (Faire-à)** sentences used in this test, even though they are of questionable status grammatically, patients scored somewhat better on **Causative (Faire-à)** (9= 43.52%; 5=41.67%) than on **Passivized Direct Object Control + Transitive Verb** (9=37%; 5=35%), while the reverse pattern can be seen with the controls. **Causative (Faire-à)**=81.67% and **Passivized Direct Object Control + Transitive Verb**=90% correct An interesting error that was made was to treat the Causee as a goal in the sense of location, with à apparently being treated as vers or 'towards'. This rather curiously echoes the analysis of Cannings and Moody (1978) who analyzed the construction as evidencing deictic orientation or 'motion towards' the causee.

The Causative-Reflexive Causee also led to misinterpretations . Although Kayne (1975) and Rosen (1989) state that the structure should be grammatical, this test shows clearly that there are lexical restrictions. A typical example in Kayne would have a psych-noun in the matrix subject position, which describes the causee's state, e.g.:

(4) La crainte du scandale a fait se tuer le frère du juge.

'Fear of scandal made the brother of the judge kill himself.'

(Kayne 1975: 404 ,ex. (4b))

Rosen and many others use examples like se laver and se raser; all these verbs can be translated into English with no reflexive at all. (One of the controls, C.D.2, explicitly stated that only se gratter or 'to scratch' seemed right in this structure.) Italian does not permit anything to come between the causative and the embedded verb; however, the preferred interpretation is the reflexive one, as in English.

Subjects tended either to decode the structure as if it were a puzzle or to have the subject 'displace' the se to pre-complex position, i.e. in front of faire, in 'repeating' the sentence, while also adding a par to a produce **Causative-Reflexive Causer=Theme** structure. Naturally, they then misinterpreted the sentence (recall that control O.F. always did this). Of the patients, only C.M., who has a very metalinguistic attitude to French, scored well on these types. Controls with non-Post-Secondary education did poorly on the **Causative (Faire-à)**, though only the subject with the least education did not score well on **Causative-Reflexive Causee**. Both patients and controls utilized 'repair' strategies on both of these sentence types (even though this did not always lead to improved scores). Repairing ungrammatical sentences is more typically seen in grammaticality judgment tasks (e.g. Wulfeck 1987). Since in a comprehension task no verbal response need be made, it is perhaps significant that so many of the experimental subjects spontaneously did produce one.

6.3. Structures with Stylistic Inversion

These structures were among the most difficult tested (recall that both experimental groups obtained their lowest overall means in 'Sentence Contrasts 5'). The patients (and control O.F., for example) scored better on **Object-Object Relative with Stylistic Inversion** (three DPs + Wh-trace) (31 67% correct) than on the **Cleft-Object with Stylistic Inversion** (two DPs+ Wh-trace) (18 33%). Misinterpreted OOs become OSs, which had the best results of all the relatives (5=86.67% correct). **Cleft Objects**, if misinterpreted, become **Cleft Subjects**, which are not tested by the OMB as patients scored as well on them as on simple Actives in the very earliest versions of the test. Of all the inversion structures, normals as a group performed best on **Cleft-Object with Stylistic Inversion** (80.83% correct vs. 74.17% on **Object-Object Relative with Stylistic Inversion**.)[9] The most misinterpreted structure was the **Subject-Object Relative with Stylistic Inversion**, patients scoring 16.67% correct. SS, with which it could be confused as a type, was 58.33% correct. I have discussed these results with some French speakers and have been told that the i in qui is often dropped in speech, making the structures with inversions homophonic with subject relatives. In addition, the relative pronouns, even when well articulated may be difficult to discriminate. There are therefore both productive and receptive reasons for them to be difficult to process.

6.4. The Significance of the Four DP Sentences.

Contrary to the expectation that these sentences would be harder to process than three-DP sentences, it was a three-DP Causative structure that was the worst interpreted,

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9 There may be a particular facilitative effect in French for O-O relatives in general. Patient R.L., the one francophone case study reported in Caplan and Hildebrandt (1988), scored best on these relatives and worst on S-O in both testing sessions. The relative pronoun que may be more salient in that position. One cannot dismiss a parallel function strategy In terms of Grimshaw's prominence theory, it may be conceptually easier to think of the Theme as the less prominent argument in both domains--that of the matrix and that of the embedded verb.

as demonstrated in 'Sentence Contrasts 5'. The group's score for **Cleft-Object Causative (Faire-par)** was 19.44% for all 9 and 13.33% for the subset of 5 (the controls scored 75.83% correct). The structure contains three-DPs + Wh-trace + causative verb; obviously this is much too complex. Those patients who had evidenced comprehension deficits used a linear order strategy to decode the sentence However, what is most interesting is that the patients with relatively intact comprehension abilities and the controls most often made the mistake of interpreting the structure as if it were a **Causative (Faire-par)**. Therefore, we find further confirmation of the HAH which predicts that lexical properties of a head may signal a non-linear order bias; in most situations with a causative, the chosen answer would have been correct. This is another case where three agents seem to be competing: the head of the relative clause seems to be in the focused position; the DP immediately preceding the causative verb should retain some of its 'potency' and the final DP is preceded by a par. Clefted structures in general were consistently among the worst interpreted by patients and controls alike.

All four-DP sentences containing the causative were fairly difficult for the patients: **Conjoined Causative** =31.48% (though three patients scored ≥ 8) (controls=87.5%); **Causative + Dative** =31.4% (though three scored ≥7) (controls=88.33%); **Causative + SS Relative** (i.e. Causative + Wh-trace + four DPs)=23.17% correct (two scored ≥7) (controls 70.83%). This last structure is extremely complex in French, although the grade-school-educated controls did better than the two high-school-educated ones. The lexical entry for faire cannot help to group the words into phrases in the face of such a lack of transparency. An interesting response strategy which surfaced was that some controls quickly interpreted the sentence-final relative clause first, seemingly to get it out of the way, then responded to the causative structure.

The French patients were often able to interpret sentences with four DPs. Notably, they scored 62% on **Conjoined Clauses 4 NPs (No Deletion) (Baseline)** and

58.33% on SS Relative + Conjoined Theme. In fact, patients found this last structure no harder than Subject-Subject Relative=58.33%. It is fair to say that conjoined DPs seem not to add much difficulty to a structure; this was demonstrated in 'Sentence Contrasts 4'. (The adaptive strategy which emerged for four DP sentences was a linear order one: 1,2+3; 2+3,4). The argument structure of the verb, i.e the number of theta-roles it normally assigns, seems to be the more decisive factor in predicting processing load. Conjunctions are, in fact, one of the functional categories produced by agrammatics, witness Goodglass and Menn (1985) for English, Feyereisen (1985) for French, Kamio (1984, 1985) for Japanese. It would appear that a copy of an identical category either by conjunction or adjunction, does not entail the same processing cost as complementation by a different type of category. Perhaps this is part of the reason for the relatively good performances on causatives, i.e. on the analysis of a partial merger of the argument structures, a VP takes another VP as its complement. Ultimately, it is no doubt the government relation that holds between a head and its complement that is the locus of syntactic complexity.

In addition, in contrasting Conjoined Clauses 4 NPs (No Deletion) (Baseline) =62%[10] and SS Relative + Conjoined Theme =58.33%, the subjects seemed quite sensitive to the addition of the complementizer qui, which was the only overt element that differentiated these two sentence types[11]. Certain functional categories can thus be attended to.

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[10] Although this sentence type contains at least two CPs, the linear order strategy will aid interpretation.

[11] A similar finding was reported by Caplan and Hildebrandt with patient R.L., who appeared sensitive to the difference between the qui of S-S relatives and the et of the Conjoined sentence types, performing consistently better on the Conjoined even though they require the same response (1,2;1,3).

6.5. Extensions of the Head Accessibility Hypothesis

Thus far, we have restricted discussion of the HAH to the syntactic domain. Because the model of grammar assumed within this thesis locates inflectional morphology within the syntactic component, we were able to demonstrate that the HAH accounted for the presence or absence of these spell-outs of phi-features, i.e. agreement, case, tense, etc. The HAH clearly generalizes to the domains of derivational morphology and phonology as well. This is so because the construct head is used at all levels of the grammar. The HAH therefore permits us to deal with the derivational morphological patterns seen in agrammatism. We have only briefly mentioned a characteristic that is often found as part of the symptom complex, i.e the nominalization of verbs. Recall that Kean's hypothesis stated that derivational affixes (as P-clitics) tended to be omitted in agrammatism. Now, we have seen that syntactic category membership differentially affects agrammatic retention. Derivational suffixes determine the syntactic categories of the stems to which they are affixed. Marshall and Newcombe (1966) and Marshall, Newcombe and Marshall (1970) have demonstrated the claim--long made in the literature (see Marshall and Newcombe (1966) for further references)-- that nouns are retained better than adjectives and adjectives better than verbs in a deep dyslexic subject (G.R.) who evidenced 'telegrammatic speech', i.e. he was also agrammatic.[12] In reading tasks, wrong responses tended to be nouns when the stimulus word was either a noun or a verb. Ninety percent of the verbs were read as nouns and ninety percent of the misread nouns had other nouns substituted for them. Whitaker's (1972) non-fluent patient (F.W.) also produced many deverbal nouns instead of the intended verb targets, as in (5):

(5) nominate------------> nomination

destroy-------------> destruction

speak--------------> speaker

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[12] There is a high though not perfect correlation between the syndromes of deep dyslexia and agrammatism.

Patterson (1980) reported the derivational paralexias of deep dyslexic patients Two-thirds of the patients' errors consisted of suffix deletions, as in (6a) and suffix substitutions, as in (6b)

(6) a. soloist------------> solo

b. projection---------> projector

c. contain-----------> container

d. applaud-----------> applause

Surprisingly, however, one-third of the errors consisted of suffix **additions**, as in (6c), or simply changes in part of speech, e g (6d). Of the major lexical categories, verbs were particularly likely to be incorrectly produced, a bias towards producing concrete imageable nouns and adjectives was demonstrated in her results.[13]

These findings cannot be explained by Kean's hypothesis,[14] since the tested items were all phonological words We are led to the conclusion that, contrary to her predictions, nominalizing suffixes seem to contribute to a word's potential for retention, and their loss may place the non-nominal base in 'processing jeopardy' as it were In other cases, where a noun is the base of some derivational process, we would expect that any affix which changes this preferentially processed base to another syntactic category (Adj or V) would be less retained, perhaps even in spite of semantic non-transparency There must then be an interaction between the syntactic category of the base, the syntactic features associated with a given affix and its subcategorization requirements.

For severely afflicted agrammatics, the noun phrase may be the most complex structure possible. We have argued throughout this thesis (see also Gendron 1986) that

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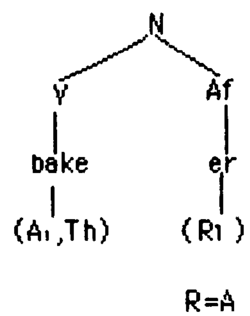
[13] Though these findings are from reading tasks, other patients reported by Whitaker (1972)--K.T. and W.L.--made comparable errors on naming tasks: decide-> decision; conceal-> concealment. Unfortunately, F.W. could only be tested in the reading modality.

[14] Additional evidence that Kean's analysis cannot be maintained can be found in Kehayia (1984), who showed that what determined retention of derivational affixes was a complex interplay between the semantic transparency of the affixes and the nature of the boundary with which they were associated.

the NP is easier to process for anterior aphasics because it is the only category that need not subcategorize for another. It is inherently intransitive, its complements always optional A compensatory strategy that aphasics may utilize to circumvent their expressive difficulties is to use underived nouns and noun-forming suffixes (e.g. in English, the agentive -er) attached to the appropriate categories to mimic some aspects of a sentential structure. In fact, a dyslexic patient of Marshall, Newcombe and Marshall's (1970) made a considerable number of addition errors in reading, producing -er nominals for the related verb stimuli. Agrammatics might be considered to be exploiting the referential uses of nouns.

Consider the following example (adopting Williams' (1981b) notation): in the case of the suffix -er, the external argument R of baker, for example, would be equated to the Actor theta-role of the verbal stem:

(7)



The whole would stand for: The man (or the one) who bakes. This process has the advantage of taking place in the Lexicon. Feyereisen's (1985) case (Mrs.V), who used an "infer [sic] rather than specify" strategy, described a scene in which a man holding a fishing pole was walking towards the river simply as un pêcheur 'a fisherman'. Studies by Danly and Cooper (as cited in Foldi, Cicone, and Gardner 1983) have shown that so-called monotonic telegrammatic utterances show melodic contours appropriate to declarative sentences. By examining the respiration patterns of Broca's aphasics, Schönle (1979) (also cited in Foldi et al. 1983) showed that they were attempting to encode connected discourse and not merely unrelated word lists.

The other linguistic accounts cannot explain the addition of affixes, e.g. nominalizations Our claim that the Head Accessibility Hypothesis generalizes to the morphological domain could in future research work be tested in languages that have morphological causatives.[15]

The construct head also finds an application in phonology, where it is referred to as nucleus. It is beyond the scope of this thesis to fully deal with phonological complexity (see Blumstein (1988: 214-220) for further discussion) Suffice it to say that the basic unmarked syllable structure is CV, i e the syllable licences a non-branching onset (no consonant clusters) and a non-branching rhyme (no coda), which then rewrites as the nucleus. The concept of phonological salience may be linked to sonority, i e. loudness The maximally sonorous segment is the nucleus, with a consequent loss of sonority as one moves further away from that position. Phonological errors found across all aphasic types[16] are those of syllable simplification in that the target tends to be reduced to CV. When substitution errors occur, they, like the morphological errors previously discussed, tend to involve at most one erroneous feature. This demonstrates non-random and principled misselections. The aphasics seem to have the correct target in mind but to have trouble in either access or execution.

An interesting fact which intersects the morphosyntactic and phonological domains is that syllabic inflectional affixes are better retained than non-syllabic ones. There is ample evidence of this in the literature. It is true for English in tasks of production and comprehension of the syllabic plural, for example Kehayia (1990). In addition, it has also been demonstrated in comprehension in Hungarian (Osmán-Sági and MacWhinney 1991 cited in Bates and Wulfeck 1989) that an accusative form containing a strong vowel is

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[15] The Causative tests developed in this thesis were initially inspired by work by Ammon and Slobin (1979), who tested children's comprehension of causatives in English, Italian, Serbo-Croatian and Turkish. Aphasic data from Turkish or Japanese would be invaluable for further investigating the role of the lexical processes in the building-up of syntactic structure

[16] These errors are also reported in the developmental literature.

better attended to by both fluent and non-fluent aphasics (e.g. macska't 'cat-accusative' vs. mókus-t 'squirrel-accusative'). A likely explanation is that they are generally more salient There is a vowel nucleus which is the head of the syllable; it may also at times bear stress In addition, re-syllabification often occurs and, if the stem ends with a consonant, this element may become the onset of a vowel-initial affix, thereby also simplifying the stem-final rhyme Non-syllabic affixes are not headed in this sense, tending to act as codas or appendices to the final syllable of the stem, complicating its structure.

The HAH is constrained to only permit reference across linguistic levels through the notion of head [17] Various other theorists have also mentioned this interactive aspect; for example, Garman (1982,1990) discusses how phonology (syllabicity), word class, and syntactic level interact to explain agrammatics' retention of inflectional morphology alone. Our account generalizes to derivational affixes and phrase structure as well and does so in a principled way.

6.6. Conclusion

We have presented a detailed analysis of aphasics' comprehension of the complex predicate causative verb. The hypothesis that the lexical properties of the French verb in this case entail something akin to a partial merger of two verbs' argument structures was supported not only by the group results but by individual case studies. Additionally , we have shown that it is unlikely that there is an elaborated or even defective IP node between the verbs in the French case, given subjects' responses to obvious case of CPs (and consequently of IPs), i.e. clefted structures and the **Passivized Direct Object Control + Transitive Verb**. We have extended Rosen's (1989) analysis of the **Causative (Faire-à)**, which now accounts for the unacceptability of the structure as a function of

[17] In morphology and syntax, [+N] categories are more accessible for structural reasons. In phonology, structural reasons privilege the feature [+voc] since this will determine what can count as a nucleus and the position any given segment may hold in the syllable.

the animacy of the embedded Theme.

Finally, our re-interpretation of the closed -class hypothesis within a strictly Government-Binding framework has permitted us to parsimoniously account for the pattern of syntactic expressive and receptive deficits in agrammatism and paragrammatism cross-linguistically We locate the primary deficit in the categorial status of the heads of projections (whether on the syntactic level or the morphological level) and the categorial status of the complements these heads require to satisfy constraints of well-formedness. We assume that, as a head, an element acquires structural prominence and is therefore more salient Structural complexity is thus defined in a purely hierarchical fashion at all linguistic levels; branching structures are more difficult to process than non-branching ones. The relation of government, which is defined as the relation holding between a head and its complements, plays a crucial role Language-specific features can clearly, and in many cases redundantly, aid an impaired subject by making functional heads more salient, thereby at times circumventing or minimizing receptive difficulties.

Ease of processing is defined as the syntactic transparency of thematic role order (which in the case of the causative may be item-specific), i.e. D-structure positions--'a pure representation of GF-theta' maintained throughout the derivation Chain formations, whether caused by movement of maximal projections or of governed heads, are the loci of difficulty since the landing site for the moved element may not be available due to the increased processing load the construction of such structures entails (e.g. branching maximal and intermediate projections of functional categories). Our approach has the advantage of unifying what appeared to be disparate phenomena--problems with chain formations (NP and wh- movement) and the difficulty caused by inflectional morphology -- into one by adopting Pollock's (1989) hypothesis that the verb must move to INFL to get Tense, creating a verbal chain. This explains why infinitives, which need not move, are often default forms.

The Head Accessibility Hypothesis is to be preferred to other hypotheses that have been proposed since it can account for a larger body of data, is not modality-specific and cuts across linguistic domains It allows us to account for processing difficulty by locating the initial problems with lexical retrieval of both lexical and, especially, functional categories which, under new assumptions, head their own projections. The head of a phrase dictates the nature of its complements. In addition, its properties will dictate the presence or absence of Specifier positions, sister(s) to one of the head's projections, usually an intermediate level one. If, as Chomsky has recently suggested (1992), subject-verb agreement and Case reduce to instances of Spec-head agreement, the pivotal role played by both phrasal heads and Specifier positions cannot be ignored In future research work, we hope to investigate the nature of this agreement in languages with overt case inflections.

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APPENDICES

APPENDIX A

Summary of Group Results

Table A.A.1.1. Raw Scores, Means, and Percent Correct-
Total Aphasic Sample-OMBs

	SENTENCE TYPE	DC	CD	JD	AG	CM	FP	PR	JR	JT	Mean (9 A)	% Correct (9 A)
1	OMB1	12	12	12	12	12	12	12	12	12	12.000	100.000
2	OMB2	12	7	5	12	12	11	11	7	12	9.889	82.407
3	OMB3	12	12	3	12	12	12	0	12	11	9.556	79.630
4	OMB4	9	6	5	11	12	12	6	5	10	8.444	70.370
5	OMB5	12	11	6	12	12	12	11	12	12	11.111	92.593
6	OMB6	11	0	0	12	12	7	8	7	10	7.444	62.037
7	OMB7	8	2	1	12	11	9	3	5	6	6.333	52.778
8	OMB8	9	6	5	11	12	10	1	6	12	8.000	66.667
9	OMB9	5	0	1	12	12	7	3	1	6	5.222	43.519
10	OMB10	8	9	9	12	12	10	10	12	9	10.111	84.259
11	OMB11	6	2	1	12	10	10	2	4	12	6.556	54.630
12	OMB12	9	3	2	11	12	10	2	2	12	7.000	58.333
13	OMB13	12	11	7	12	12	12	11	12	12	11.222	93.519
14	OMB14	11	5	2	12	12	11	5	8	11	8.556	71.296
15	COMB1	12	12	11	12	11	12	11	12	12	11.667	97.222
16	COMB2	8	1	2	12	12	9	8	9	11	8.000	66.667
17	COMB3	5	6	2	10	11	11	0	6	12	7.000	58.333
18	COMB4	12	12	12	12	12	12	12	12	12	12.000	100.000
19	COMB5	12	11	10	12	12	12	12	12	12	11.667	97.222
20	COMB6	1	1	0	11	12	0	5	3	7	4.444	37.037
21	COMB7	6	1	1	11	11	1	3	4	9	5.222	43.519
22	COMB8	9	0	2	12	12	9	3	10	10	7.444	62.037
23	COMB9	1	0	0	10	6	1	0	0	3	2.333	19.444
24	COMB10	1	0	0	8	10	4	0	0	11	3.778	31.481
25	COMB11	0	2	1	9	11	1	2	1	7	3.778	31.481
26	COMB12	1	0	0	7	9	4	0	1	4	2.889	24.074
27	COMB13	6	4	1	10	12	10	5	3	12	7.000	58.333
28	COMB14	8	5	0	12	11	11	7	4	9	7.444	62.037

Table A.A.1.2. Group Results- All 9 Aphasics (OMBs)

Sentence Type	Mean	SD
[01] Active	12.000	0
[18] Causative + Intransitive Verb	12.000	0
[15] Direct Object Control, Intransitive Verb	11.667	.500
[19] Direct Object Control + Transitive Verb	11.667	.707
[13] Active Conjoined Theme	11.222	1.641
[05] Dative	11.111	1.965
[10] Object-Subject Relative	10.111	1.537
[02] Passive	9.889	2.759
[03] Truncated Passive	9.556	4.640
[14] Passive Conjoined Agent	8.556	3.712
[04] Cleft Object	8.444	2.963
[08] Conjoined	8.000	3.742
[16] Passivized Direct Object Control, Intransitive Verb	8.000	4.000
[06] Dative Passive	7.444	4.640
[22] Causative (Faire-par)	7.444	4.531
[28] Conjoined Clauses 4 NPs (No Deletion) (Baseline)	7.444	3.909
[12] Subject-Subject Relative	7.000	4.610
[17] Truncated Causative	7.000	4.272
[27] SS Relative + Conjoined Theme	7.000	4.093
[11] Object-Object Relative	6.556	4.503
[07] Cleft-Object Dative	6.333	3.937
[09] Subject-Object Relative	5.222	4.522
[21] Causative (Faire-à)	5.222	4.206
[20] Passivized Direct Object Control + Transitive Verb	4.444	4.640
[24] Conjoined Causative	3.778	4.658
[25] Causative + Dative	3.778	4.086
[26] Causative + SS Relative	2.889	3.333
[23] Cleft-Object Causative (Faire-par)	2.333	3.500
Mean OMB + COMB	7.718	

Table A.A.1.3. Significantly Different Sentence Types-
Total Aphasic Sample-OMBs

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
01																												
02		o																										
03	*																											
04	*			o																								
05				*																								
06	*	*			*	o																						
07	*	*	*		*		o																					
08	*				*			o																				
09	*	*	*	*	*	*		*	o																			
10						*	*		*																			
11	*	*	*		*					*	o																	
12	*	*	*		*					*		o																
13				*		*	*	*	*		*	*																
14	*				*		*		*				*	o														
15				*		*	*	*	*		*	*		*	o													
16	*				*				*				*		*	o												
17	*	*	*		*					*			*		*		o											
18			*	*		*	*	*	*		*	*		*		*	*											
19				*		*	*	*	*		*	*		*		*	*											
20	*	*	*	*	*	*		*		*		*	*	*	*	*	*	*	*	o								
21	*	*	*	*	*	*		*		*			*	*	*	*		*	*		o							
22	*	*			*				*	*			*		*			*	*	*	*	o						
23	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*	o					
24	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*			*		o				
25	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*			*			o			
26	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*				o		
27	*	*	*		*					*			*		*			*	*	*			*	*	*	*	o	
28	*	*			*				*	*			*		*			*	*	*	*		*	*	*	*		o

* = Sentence types which differed significantly
(Fisher's PLSD - experimenterwise error rate : 0.05)

o = Sentence types on which patients
differed significantly from controls
(Scheffé F-test - experimenterwise error rate : 0.05)

Table A.A.2.1. Raw Scores, Means, and Percent Correct-Subset Aphasic Sample-OMBs

	SENTENCE TYPE	DC	CM	FP	PR	JR	Mean (5 A)	% Correct (5A)
1	OMB1	12	12	12	12	12	12.000	100.000
2	OMB2	12	12	11	11	7	10.600	88.333
3	OMB3	12	12	12	0	12	9.600	80.000
4	OMB4	9	12	12	6	5	8.800	73.333
5	OMB5	12	12	12	11	12	11.800	98.333
6	OMB6	11	12	7	8	7	9.000	75.000
7	OMB7	8	11	9	3	5	7.200	60.000
8	OMB8	9	12	10	1	6	7.600	63.333
9	OMB9	5	12	7	3	1	5.600	46.667
10	OMB10	8	12	10	10	12	10.400	86.667
11	OMB11	6	10	10	2	4	6.400	53.333
12	OMB12	9	12	10	2	2	7.000	58.333
13	OMB13	12	12	12	11	12	11.800	98.333
14	OMB14	11	12	11	5	8	9.400	78.333
15	COMB1	12	11	12	11	12	11.600	96.667
16	COMB2	8	12	9	8	9	9.200	76.667
17	COMB3	5	11	11	0	6	6.600	55.000
18	COMB4	12	12	12	12	12	12.000	100.000
19	COMB5	12	12	12	12	12	12.000	100.000
20	COMB6	1	12	0	5	3	4.200	35.000
21	COMB7	6	11	1	3	4	5.000	41.667
22	COMB8	9	12	9	3	10	8.600	71.667
23	COMB9	1	6	1	0	0	1.600	13.333
24	COMB10	1	10	4	0	0	3.000	25.000
25	COMB11	0	11	1	2	1	3.000	25.000
26	COMB12	1	9	4	0	1	3.000	25.000
27	COMB13	6	12	10	5	3	7.200	60.000
28	COMB14	8	11	11	7	4	8.200	68.333
29	POMB1	12	12	11	0	11	9.200	76.667
30	POMB2	8	10	10	0	11	7.800	65.000
31	POMB3	3	11	9	0	11	6.800	56.667
32	POMB4	7	12	12	0	9	8.000	66.667
33	POMB5	11	12	12	6	11	10.400	86.667
34	POMB6	6	10	0	0	0	3.200	26.667
35	POMB7	7	12	11	0	9	7.800	65.000
36	POMB8	8	12	12	0	10	8.400	70.000
37	POMB9	12	11	6	0	5	6.800	56.667
38	POMB10	12	11	12	0	12	9.400	78.333
39	POMB11	12	12	10	0	12	9.200	76.667
40	POMB12	1	6	3	0	1	2.200	18.333
41	POMB13	0	7	0	2	1	2.000	16.667
42	POMB14	3	11	3	0	2	3.800	31.667

Table A.A.2.2. Group Results- 5 Aphasics (OMBs)

Sentence Type	Mean	SD
[01] Active	12.0	0
[18] Causative + Intransitive Verb	12.0	0
[19] Direct Object Control + Transitive Verb	12.0	0
[05] Dative	11.8	.447
[13] Active Conjoined Theme	11.8	447
[15] Direct Object Control, Intransitive Verb	11.6	.548
[02] Passive	10.6	2.074
[10] Object-Subject Relative	10.4	1.673
[33] Causative-Reflexive Causer=Theme	10.4	2.510
[03] Truncated Passive	9.6	5.367
[14] Passive Conjoined Agent	9.4	2.881
[38] Causative-Reflexive Causer=Theme, Truncated	9.4	5.273
[16] Passivized Direct Object Control, Intransitive Verb	9.2	1.643
[29] Dative-Theme cliticized	9.2	5.167
[39] Causative-Theme=Causee cliticized, Intransitive Verb	9.2	5.215
[06] Dative Passive	9.0	2 345
[04] Cleft Object	8.8	3.271
[22] Causative (Faire-par)	8.6	3.362
[36] Causative-Reflexive Causer=Goal, Truncated	8.4	4.980
[28] Conjoined Clauses 4 NPs (No Deletion) (Baseline)	8.2	2.950
[32] Causative-Causee cliticized	8.0	4.950
[30] Dative-Goal cliticized	7.8	4.494
[35] Causative-Reflexive Causer=Goal	7.8	4.764
[08] Conjoined	7.6	4.278
[07] Cleft-Object Dative	7.2	3.194
[27] SS Relative + Conjoined Theme	7.2	3.701
[12] Subject-Subject Relative	7.0	4.690
[31] Causative-Theme cliticized	6.8	5.020
[37] Causative-Theme cliticized, Truncated	6.8	4.868
[17] Truncated Causative	6.6	4.615
[11] Object-Object Relative	6.4	3.578
[09] Subject-Object Relative	5.6	4.219
[21] Causative (Faire-à)	5.0	3.808
[20] Passivized Direct Object Control + Transitive Verb	4.2	4.764
[42] Object-Object Relative with Stylistic Inversion	3.8	4.207
[34] Causative-Reflexive Causee	3.2	4.604
[24] Conjoined Causative	3.0	4.243
[25] Causative + Dative	3.0	4.528
[26] Causative + SS Relative	3.0	3.674
[40] Cleft-Object with Stylistic Inversion	2.2	2.387
[41] Subject-Object Relative with Stylistic Inversion	2.0	2.915
[23] Cleft-Object Causative (Faire-par)	1.6	2.510
Mean OMB + COMB	7.943	
Mean OMB + COMB + POMB	7.557	

Table A.A.2.3. Significantly Different Sentence Types-
Subset Aphasic Sample-OMBs

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
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19							*	*	*		*	*					*																									
20	*	*	*	*	*	*		*		*			*	*	*	*		*	*	o																						
21	*	*	*	*	*	*				*			*	*	*	*		*	*		o																					
22	*																	*	*	*	*	o																				
23	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*	o																			
24	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*		*	*		o																		
25	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*			*			o																	
26	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*			*				o																
27	*	*			*								*		*			*	*				*	*	*	*	o															
28	*				*								*		*			*	*	*			*	*	*	*		o														
29									*											*	*		*	*	*	*																
30	*				*								*		*			*	*	*			*	*	*	*				o												
31	*	*			*					*			*		*			*	*				*	*	*	*					o											
32	*				*								*		*			*	*	*			*	*	*	*						o										
33									*		*	*					*			*	*		*	*	*	*					*											
34	*	*	*	*	*	*	*	*		*		*	*	*	*	*	*	*	*			*					*	*	*	*	*	*	*	o								
35	*				*								*		*			*	*	*	*		*	*	*	*								*	o							
36	*				*								*					*	*	*	*		*	*	*	*								*		o						
37	*	*			*					*					*			*	*				*	*	*	*							*	*			o					
38									*				*							*	*		*	*	*	*								*								
39									*											*	*		*	*	*	*								*								
40	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*					*	*	*	*	*	*	*		*	*	*	*	*	o		
41	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*					*	*	*	*	*	*	*		*	*	*	*	*		o	
42	*	*	*	*	*	*	*	*		*			*	*	*	*		*	*			*					*	*	*	*		*	*		*	*		*	*			o

* = Sentence types which differed significantly
(Fisher's PLSD - experimenterwise error rate : 0.05)

o = Sentence types on which patients
differed significantly from controls
(Scheffé F-test - experimenterwise error rate : 0.05)

Table A.A.3.1. Raw Scores, Means, and Percent Correct-
Normal Controls-OMBs

	SENTENCE TYPE	MC	CD2	DF	MJ	RL	LM	LR	DP	FT	CV	Mean (10 Cs)	% Correct (C)
1	OMB1	12	12	12	12	12	12	12	12	12	12	12.000	100.000
2	OMB2	12	12	11	12	11	12	12	12	12	12	11.800	98.333
3	OMB3	12	12	12	12	12	12	12	12	12	12	12.000	100.000
4	OMB4	12	12	11	12	12	12	12	12	12	12	11.900	99.167
5	OMB5	12	12	12	12	12	12	12	12	12	12	12.000	100.000
6	OMB6	12	11	10	12	10	11	9	11	12	12	11.000	91.667
7	OMB7	12	12	8	12	8	12	11	12	12	8	10.700	89.167
8	OMB8	12	12	12	12	11	12	12	12	12	12	11.900	99.167
9	OMB9	12	12	10	11	8	12	5	12	12	8	10.200	85.000
10	OMB10	12	12	11	12	11	12	8	12	10	12	11.200	93.333
11	OMB11	11	11	12	12	10	11	11	11	12	12	11.300	94.167
12	OMB12	12	12	12	12	10	12	11	10	10	7	10.800	90.000
13	OMB13	12	12	12	12	12	12	12	12	12	12	12.000	100.000
14	OMB14	12	12	11	12	12	12	12	12	11	12	11.800	98.333
15	COMB1	12	12	12	12	12	12	12	12	12	12	12.000	100.000
16	COMB2	12	12	9	12	11	11	12	12	12	10	11.300	94.167
17	COMB3	10	12	12	12	11	12	10	12	10	12	11.300	94.167
18	COMB4	12	12	12	12	12	12	12	12	12	12	12.000	100.000
19	COMB5	12	12	12	12	12	12	11	12	11	12	11.800	98.333
20	COMB6	11	12	7	12	7	12	12	12	12	11	10.800	90.000
21	COMB7	11	12	7	11	8	12	5	12	12	8	9.800	81.667
22	COMB8	12	12	11	12	12	10	12	12	12	12	11.700	97.500
23	COMB9	12	12	2	12	3	11	8	12	11	8	9.100	75.833
24	COMB10	12	12	9	10	10	11	6	12	11	12	10.500	87.500
25	COMB11	11	12	11	11	8	10	10	11	11	11	10.600	88.333
26	COMB12	11	11	9	9	8	9	3	10	9	6	8.500	70.833
27	COMB13	12	12	10	11	12	12	12	12	11	11	11.500	95.833
28	COMB14	11	11	11	11	11	11	12	11	12	11	11.200	93.333
29	POMB1	12	12	12	12	12	12	11	12	12	12	11.900	99.167
30	POMB2	11	12	12	12	12	12	12	12	12	12	11.900	99.167
31	POMB3	11	11	12	12	11	12	12	12	12	12	11.700	97.500
32	POMB4	12	12	12	12	12	12	10	12	12	11	11.700	97.500
33	POMB5	12	12	12	12	11	11	12	12	12	12	11.800	98.333
34	POMB6	12	12	0	11	11	12	12	12	11	11	10.400	86.667
35	POMB7	12	11	12	12	11	12	12	12	11	11	11.600	96.667
36	POMB8	12	12	12	11	12	12	12	12	12	11	11.800	98.333
37	POMB9	12	12	12	12	10	12	9	11	12	12	11.400	95.000
38	POMB10	12	12	12	12	12	12	12	12	12	12	12.000	100.000
39	POMB11	12	12	12	12	12	12	12	12	12	12	12.000	100.000
40	POMB12	12	12	0	11	10	12	11	12	12	5	9.700	80.833
41	POMB13	11	11	1	11	6	11	1	11	12	5	8.000	66.667
42	POMB14	12	9	11	10	11	11	4	11	9	1	8.900	74.167

Table A.A.3.2. Group Results- 10 Controls (OMBs)

Sentence Type	Mean	SD
[01] Active	12.0	0
[03] Truncated Passive	12.0	0
[05] Dative	12.0	0
[13] Active Conjoined Theme	12.0	0
[15] Direct Object Control, Intransitive Verb	12.0	0
[18] Causative + Intransitive Verb	12.0	0
[38] Causative-Reflexive Causer=Theme, Truncated	12.0	0
[39] Causative-Theme=Causee cliticized, Intransitive Verb	12.0	0
[04] Cleft Object	11.9	.316
[08] Conjoined	11.9	.316
[29] Dative-Theme cliticized	11.9	.316
[30] Dative-Goal cliticized	11.9	.316
[02] Passive	11.8	.422
[14] Passive Conjoined Agent	11.8	.422
[19] Direct Object Control + Transitive Verb	11.8	.422
[33] Causative-Reflexive Causer=Theme	11.8	.422
[36] Causative-Reflexive Causer=Goal, Truncated	11.8	.422
[22] Causative (Faire-par)	11.7	.675
[31] Causative-Theme cliticized	11.7	.483
[32] Causative-Causee cliticized	11.7	.675
[35] Causative-Reflexive Causer=Goal	11.6	.516
[27] SS Relative + Conjoined Theme	11.5	.707
[37] Causative-Theme cliticized, Truncated	11.4	1.075
[11] Object-Object Relative	11.3	.675
[16] Passivized Direct Object Control, Intransitive Verb	11.3	1.059
[17] Truncated Causative	11.3	.949
[10] Object-Subject Relative	11.2	1.317
[28] Conjoined Clauses 4 NPs (No Deletion) (Baseline)	11.2	.422
[06] Dative Passive	11.0	1.054
[12] Subject-Subject Relative	10.8	1.619
[20] Passivized Direct Object Control + Transitive Verb	10.8	2.044
[07] Cleft-Object Dative	10.7	1.889
[25] Causative + Dative	10.6	1.075
[24] Conjoined Causative	10.5	1.900
[34] Causative-Reflexive Causee	10.4	3.688
[09] Subject-Object Relative	10.2	2.440
[21] Causative (Faire-à)	9.8	2.573
[40] Cleft-Object with Stylistic Inversion	9.7	4.029
[23] Cleft-Object Causative (Faire-par)	9.1	3.814
[42] Object-Object Relative with Stylistic Inversion	8.9	3.573
[26] Causative + SS Relative	8.5	2.415
[41] Subject-Object Relative with Stylistic Inversion	8.0	4.372
Mean OMB + COMB	11.168	
Mean OMB + COMB + POMB	11.131	

Table A.A.3.3. Significantly Different Sentence Types-
Normal Controls-OMBs

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
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41	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*		
42	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*		*		*	*		*	*	*	*	*	*	*	*	*	*	*	*	*			

* = Sentence types which differed significantly
(Fisher's PLSD - experimenterwise error rate : 0.05)

Fig. A.A.1. Effect of Number of NPs on Subjects' Accuracy Rates

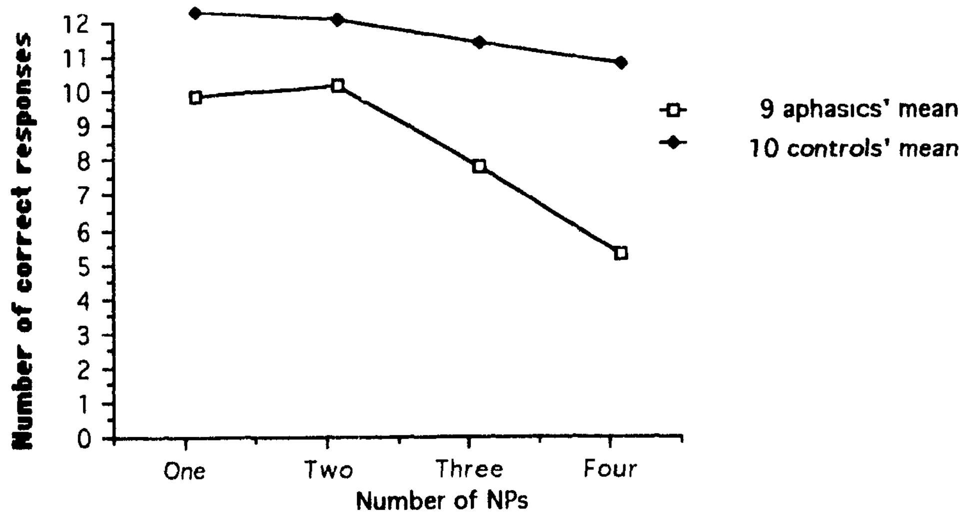


Fig. A.A.2. Effect of Number of Action Verbs on Subjects' Accuracy Rates

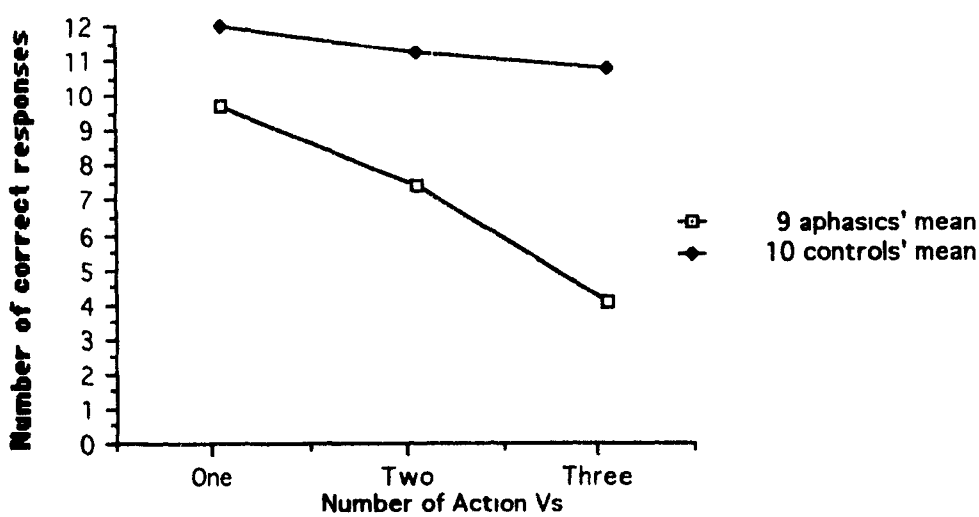


Fig. A.A.3. Effect of Number of Inflected Verbs on Subjects' Accuracy Rates

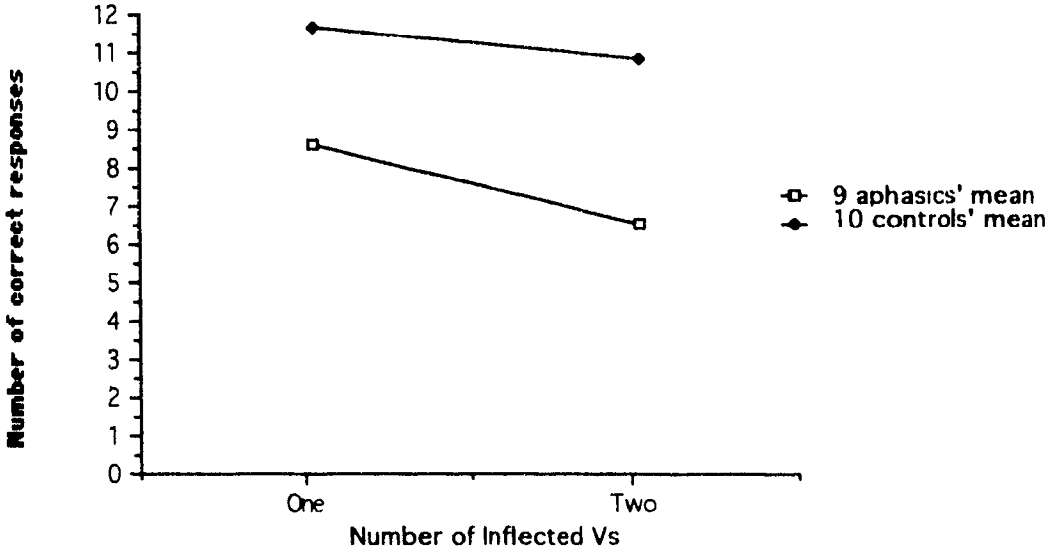


Fig. A.A.4. Effect of Maximum Number of Words on Subjects' Accuracy Rates

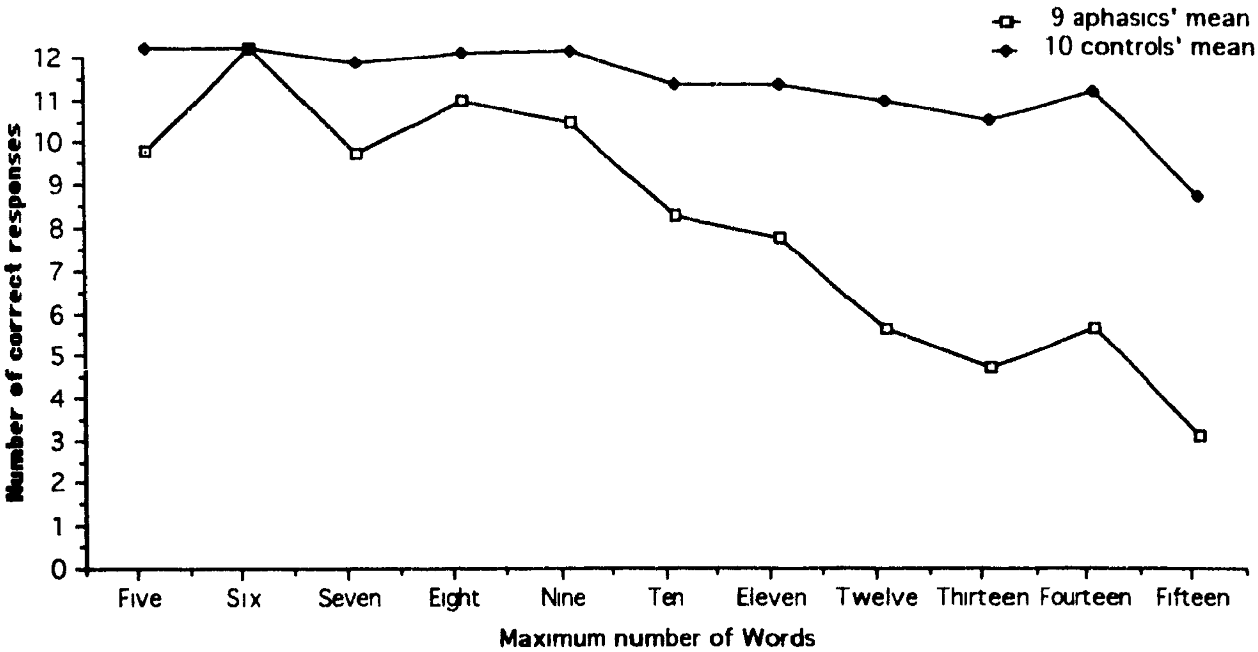


Table A.A.4. Error Patterns for Object Manipulation Batteries

		Aphasics/10	Aphasics/5	Controls
[1] [OMB1] Active				
1,2				
[2] [OMB2] Passive				
2,1	1,2	19	7	2
[3] [OMB3] Truncated Passive				
X,1	1,X	22	12	
[4] [OMB4] Cleft Object				
2,1	1,2	31	15	1
	1,X	1		
[5] [OMB5] Dative				
1,2,3	2,1,3	2	1	1
	1,2;2,3	3		
	1,3;3,2	1		
	1,2;1,3	1		
	1,2+3	1		
[6] [OMB6] Dative Passive				
3,1,2	1,2,3	14	4	2
	3,2,1	4	3	5
	1,3,2	2		1
	2,1,3	10	8	1
	1,2+3	2		
	2,3,1	1		
	1,2;2,3	3		
	1,2;1,3	3		
	1,3;3,2	1		
	2,1;3,1	1		
[7] [OMB7] Cleft-Object Dative				
2,1,3	1,2,3	39	22	13
	1,3,2	3		
	2,3,1	1	1	
	1,2+3	3		
	-,1,3	1	1	
	1,2;2,3	3		
	2,1;3,1	1		
[8] [OMB8] Conjoined				
1,2;1,3	1,2;2,3	34	21	
	1,3;3,2	1	1	
	1,2;3,1	1		
	2,1;2,3			1

[9] [OMB9] Subject-Object Relative

2,1;1,3	1,2;2,3	43	25	4
	1,2;1,3	12	3	2
	2,1;2,3	2	1	10
	2,3;1,2	1		1
	1,3;3,2			1
	1,2;3,2	1		
	3,1;1,3	1		
	2,1;1+2,3	1	1	

[10] [OMB10] Object-Subject Relative

1,2;2,3	1,2;1,3	8	5	6
	1,2;3,2	1		1
	2,1;1,3	3	2	1
	1,3;3,2	3		
	2,1;2,3	1		
	1,2;1+2,3	1	1	

[11] [OMB11] Object-Object Relative

1,2;3,2	1,2;2,3	29	14	3
	1,2;3,1	4	3	1
	1,2;1,3	5	3	1
	3,1;1,2			2
	3,2;2,1	3	3	
	1,3;3,2	2	1	
	2,1;1,3	1	1	
	1,3;1,2	1		
	1,3;-,-	1	1	
	1,2;-,-	1	1	
	1,2;3,-	1	1	
	1,2;3,2;3,1	1		

[12] [OMB12] Subject-Subject Relative

1,2;1,3	1,2;2,3	42	23	11
	3,2;3,1			1
	1,3;2,3	1		
	1,3;2,1	1	1	
	1,3;3,2	1	1	

[13] [OMB13] Active Conjoined Theme

1,2+3	2,1+3	2		
	3+2,1	1		
	2,1,3	1		
	1,2;2,3	2		
	1,2,3	1		

[14] [OMB14] Passive Conjoined Agent

2+3,1	1,2+3	20	12	
	2+1,3			1
	1+2,3	1		1
	2,1+3	2	1	
	1,2;2,3	5		
	1,2;1,3	1		
	2,1;2,3	1		
	3,1;1,2	1		

[15] [COMB1] Direct Object Control, Intransitive Verb

1,2;2V	2,1;1V	2	1	
	1,2;1V	1	1	

[16] [COMB2] Passivized Direct Object Control, Intransitive Verb

2,1;1V	1,2;2V	25	11	6
	1,2;1V	10	2	
	2,1;2V	1		

[17] [COMB3] Truncated Causative

1,(X);X,2	1,2-	20	17	
	1,2	4	1	3
	1,(2);2,2	2	2	2
	X,(1);1,2	2		1
	1,2;2,X	2	2	
	1,(2);2,X	1	1	
	1;1,2	3	3	
	1,2;2V			1
	X,1-	1	1	

[18] [COMB4] Causative + Intransitive Verb

1,2;2V

[19] [COMB5] Direct Object Control + Transitive Verb

1,2;2,3	1,2;3,2	1		1
	1,3;3,2	1		
	2,1;1,3	1		
	2,3;3,1			1

[20] [COMB6] Passivized Direct Object Control + Transitive Verb

2,1;1,3	1,2;2,3	62	36	9
	1,3;3,2	2	1	
	2,3;1,2			2
	3,1;1,2	1	1	
	2,3;2,1	1		
	1,2;1,3	1		
	2,1;2,3			1
	1;-	1		

[21] [COMB7] Causative (Faire-à)

1,(3);3,2	1,(2);2,3	25	25	18
	1,2;2,3	34	9	1
	2,3;1,(2)			1
	1,2;3,2	1		
	1,X;X,2+3			1
	1,(X);X,2,3			1

[22] [COMB8] Causative (Faire-par)

1,(3);3,2	1,2;2,3	28	7	3
	1,(2);2,3	7	7	
	1,2;1,3	2		
	1,2;3,2	2	2	
	1;2,-;3,-	1	1	
	1,2;2,1;2,3	1		

[23] [COMB9] Cleft-Object Causative (Faire-par)

2,(3);3,1	1,2;2,3	32	15	1
	1,(2);2,3	7	7	6
	1,(3);3,2	21	14	16
	1,3;3,2	6	2	
	1,(2);3,2	5		
	1,2;3,2	1		
	2,(1);1,3	1	1	3
	2,1;1,3	2	2	1
	2,1;3,1	2		
	1,3;2,(1)			1
	3,(2);2,1			1
	2,3;3,2	1	1	
	1,2;1,3	1		
	1,3-	2	1	
	1,3	1		
	1;3-	1	1	
	1-	1		
	1,2;3-	1		
	1,2;2,3;3,1	1		
	1,2;2,-;3,2	1	1	

[24] [COMB10] Conjoined Causative

1,(4);4,2;4,3	1,2;4,3	3	3	6
	1,(3);3,2;3,4	3	3	3
	1,3;3,2;3,4	1		
	1,2+3;2+3,4	3	3	
	1,2+3;1,4			1
	1,(2);2,3;2,4			1
	1,2;2,3;2,4	1		1
	1,2;1,4;4,3			1
	1,2;3+4,2	1	1	
	1,3+4;2,4	1	1	
	1,2;2,3;3,4	11	3	
	1,(2);2,3;3,4	1	1	
	1,2;4,3;-	1	1	
	1,(X);X,2;-	1	1	
	1;-,2;-	1	1	
	1;2;2,4;1	1	1	
	1;2-	1	1	
	1,2-	3	2	
	1;-	2	2	
	1-	1	1	
	1,3;4,2	1	1	
	1,4;2,3	1	1	
	1,2;3,2	1	1	
	1;--3+2	1	1	
	1,(4);4,2;-	1	1	
	1,4;4,2;--	1	1	
	1;-2;3,4	1	1	
	1,2;3,4	3	2	
	1;2;3,4	1	1	
	1;-;2;3;4	1	1	
	1,2;3,4-	1		
	1,2;1,3;3,4	1		

[24] ctd	1,2;2,3;4,3	1		
	1,(2);2,4;4,3	1	1	
	1,2;2,4;4,3	2		
	1,3;3,2;2,4	1		
	1,3;1,2;2,4	1		
	1,3;3,4;4,2	1		
	1,2;4,3;2,4	1		
	1,3;3,2;--	1		
	1,-;2,4;4,3	1		
	1,2-4	1	1	
	1;2,3-	1	1	
	1;-2-	1	1	
	1;-,2;4,3	1	1	
	1;3,2;4,-	1	1	
	1,2;2,4-	1		
	2,3;3,1;1,4	1		
	2,3;1,4	2	1	
	2,1+3;1+3,4	1	1	
	2.1;3,4	1	1	
	2,1;1,3;3,4	1	1	
	4,3;4,1;2,(4)			1
	4,3;1,2			1
	4,1;1,3;3,2	1	1	
	N/R	1	1	
[25] [COMB11] Causative + Dative				
1,(4);4,2,3	1,2;2,3;3,4	9	4	
	1,4;4,3,2	5	1	1
	1,(4);4,3,2			3
	1,(3);3,2,4	3	3	6
	1,3;3,2,4			1
	1,2;2,3,4	2		
	1,(2);2,3,4	3	3	1
	1,(2);2,4,3			1
	1,2;2,3;1,4	1		
	1,3;3,2;2,4	4	1	
	1,2;2,3;2,4	1		
	1,2;2,4;2,3	1		
	1,2;2-	1		
	1;2-	2	2	
	1,2-	1	1	
	1;4,2,-	3	3	
	1,3;3,4;4,-	1	1	
	1,(2);2,3,-	1	1	
	1,3;3,2-	1	1	
	1;3,2+4	1	1	
	1,4;4,1;2,3	1		
	1,(4);4,2+3,-	1	1	
	1,(4);4,2+3	3	3	
	1,(4);4,3+2	1	1	
	1;3-	1	1	
	1;3,-2,-4	1	1	
	1,2;2,4	1		
	1,3;2,4	1		
	1,2,3;3,4	1		

[25] ctd		1,2;2,3-	1		
		1,2;3,4	3	2	
		1,2;2,4-	1		
		1,2;4,3	1	1	
		1;2,-3,4	1	1	
		1;-,2+4,3	1	1	
		1;-	5	5	
		1,-	1		
		1;4,-,3	1	1	
		1;3,-;4-	1	1	
		1;-2,3	1	1	
		1,4;4,3;3,2	2		
		2-	1	1	
		2,1;2,3;2,4	1		
		2,1;1,3;3,4	1		
		2(4);4,2+3	1	1	
		4,3,2;1,(4)			1
		4,1;1,2,3	1		
[26] [COMB12] Causative + SS Relative					
	1,(3);3,2;3,4	1,2;3,4	13	13	4
		1,2;2,3;3,4	8	2	
		1,(2);2,3;3,4	4	4	3
		1,(3);3,2;2,4	6	3	8
		1,3;3,2;2,4	6		3
		1,(2);2,3;2,4			4
		1,2;2,3;2,4	1	1	1
		1,(3);3,2;1,4	1		5
		1,3;3,2;1,4	1		
		1,2;2,4;4,3	3		
		1,(2);2,4;4,3	1	1	1
		1,2;2,3;1,4	1		
		1,(2);2,4;2,3			1
		1,4;4,2;4,3	1	1	
		1,4;4,3;3,2	1		
		1,2;4,3	3	3	
		1,2;2,4	1	1	
		1,2+3;2+3,4	2		
		1,2;2,4,3	1	1	
		1,2;2,3;2+3,4	1		
		1,3;4,2	1	1	
		1,2;2,3,4-	1	1	
		1,2+3,4	1	1	
		1,3+2;2,4	1	1	
		1,2;2,3+4	1	1	
		1,(4);4,3	1	1	
		1,2;-;4,-	1	1	
		1;-	1	1	
		1;3,2	1	1	
		1;-;3,4	1	1	
		1,2;1,3+4	1		
		1;3+4,2	1	1	
		1;4,1;2+3	1	1	
		1,X;X,2;4,3	1		
		1,(X);X,2; 2,3+4			1

[26] ctd	2,1;1,3;3,4	1		
	2,4;4,1;1,3	1		
	3,-;3,4;2,1			1
	3,4;1,2;2,3			1
	3,2;2,1;1,4	1		
	3,1;2,4	1	1	
	3,2;3,4	1	1	
	-4-	1	1	
	-,-;3,4;3,2	1		
	N/R	1	1	

[27] [COMB13] SS Relative + Conjoined Theme

1,2+3;1,4	1,2+3;2+3,4	12	5	1
	1,3+2;3+2,4	2	2	
	1,2+3;3+2,4	1	1	
	1,2+3;2+3;1,4	1	1	
	1,3+4;3+4,2	1		
	1,4+3;4+3,2	1		
	1,2+3;2,4	2	2	
	1,2+3;3,4	1	1	
	1,2+4;1,3	3	1	2
	1,2+3;X,2	1		
	1,2+3;4,1	1	1	
	1,4+3;1,2			1
	1,2-	1	1	
	1;-	1	1	
	1,2+3;-	2	2	
	1,2,-;4	1	1	
	1,2;1,2+3	1	1	
	1,2+3;--	1		
	1,2;3,4		1	
	1,3+2;-,4	1	1	
	1,2+3;-,4	1	1	
	1,2,3;4,2+3	1	1	
	1,2+-;4,3	1		
	1,2;2,4;4,3	1		
	1,4+2;4+2,3	2		
	2,1+3;2,4			1
	2,1;3,4;3V	1		
	3,1;1,2;2,4	1		
	4,1;3,2	1	1	
	4,2;3;1+2,4	1	1	

[28] [COMB14] Conjoined Clauses 4 NPs (No Deletion) (Baseline)

1,2;3,4	1,2;4,3	12	10	3
	1,2;2,3;3,4	10	3	
	1,2+3;2+3,4	2	1	
	1,2+3;1,1,4			3
	1,4;4,3;3,2	1		
	1,3;3,4;4,2	1		
	1,2;2,4;3V	1		
	1,2;-	2	2	
	1,3;2,4	1	1	
	1,2;3-	1	1	
	1,2,3,-	1	1	

[28] ctd		1,2;2,4	1	1	
		1,3	1		
		1,2;4,2;2,3	1		
		1,3;1,2;1,4	1		
		1,4;3,2	2		1
		2,1;1,4;4,3	1		
		3,4;2,1			1
		4,2;3,1	1	1	
		N/R	1	1	
[29] [POMB1] Dative-Theme cliticized					
	1,2,3 2=P	1,3,2 2=P		2	
	2≠P	3,2,1 2=P			1
		2,3- 2=P		1	
		1,3-		6	
		1,-,3		5	
[30] [POMB2] Dative-Goal cliticized					
	1,3,2 2=P	1,2,3 2=P		6	1
	2≠P	2,3,1 2=P		1	
		1,3-		11	
		2,3,- 2=P		1	
		1,X;{2/3} 2≠P		1	
		-,1,3		1	
[31] [POMB3] Causative-Theme cliticized					
	1,3;3,2 2=P	1,2;2,3 2=P			1
	2≠P	1,(2);2,3 2=P		4	1
		1,(2);2,3 2≠P		6	
		1,3-		8	
		1;3-		4	
		1;3,1-		1	
		3,1		1	
		3,1;2,3 2≠P		1	
[32] [POMB4] Causative-Causee cliticized					
	1,2;2,3 2=P	1,(3);3,2 2=P		3	3
	2≠P	1,3-		12	
		1,3		1	
		1;2=1,3		2	
		1,(3);3,3		2	
[33] [POMB5] Causative-Reflexive Causer=Theme					
	(1,(3));3,2,1	1,3		4	2
		X,3 X=P		3	
		X,2=1 X=P		1	
[34] [POMB6] Causative-Reflexive Causee					
	(1,(3));3,2=3	1,(3);3,2=1		1	1
		3,2=1		3	8
		1,2;2,3 2≠P		13	1
		1,3;3,2 2≠P		1	1
		1,2			3
		1;1,2			1

[34] ctd	1,(3);3V	2	1
	1,3	18	
	3,1	3	
	3,(1);1,2=1	1	
	1 -	1	
[35] [POMB7] Causative-Reflexive Causer=Goal			
(1,(4));4,3,2=1	1,(3);3,4,2=1	3	
	3,4,2=1	1	2
	1,3,4		1
	4,(1);1,2,3		1
	1,3;3,4	4	
	1,(3);3,4	1	
	1,3,4	2	
	1;2=1,3,4	3	
	1;3+4,-	1	
	1,-3+4,-	1	
	1;-,3+2=1,4	1	
	4,2=1,3	1	
	1,3,-4	1	
	1;-3,4	1	
	1,(4);4,3,-	1	
[36] [POMB8] Causative-Reflexive Causer=Goal, Truncated			
(1,(X));X,3,2=1	1,3-	10	
X=P	1,(X);X,2=1,3 X≠P	1	
X≠P	X,2=1,3 X=P		1
	1,3,X X≠P		1
	1;2=1,3,X X=P	1	
	1,X X=P	1	
	3,1,2 2≠P	1	
	1;2=1,3,-	1	
	1;-3,2=1	1	
	1 -	1	
[37] [POMB9] Causative-Theme cliticized, Truncated			
1,X;X,2	1,2;2V 2=P		1
X=P 2=P	1,(2);2,2 2=P		4
X≠P 2≠P	2,X;X,1 X=P 2=P		1
X≠P 2=P	1,2 2=P	8	
	1,-	11	
	X- X=P	1	
	1,(2);2,X X≠P 2=P	1	
	1,(2);2,X X=P 2≠P	1	
	2,1 2=P	3	
	1;2,1 2=P	1	
[38] [POMB10] Causative-Reflexive Causer=Theme, Truncated			
(1,(X));X,2=1	1 -	11	
X=P	2,1=2	1	
X≠P	1,(X);X,2 X=P 2=P	1	
[39] [POMB11] Causative-Theme=Causee cliticized, Intransitive Verb			
1,2;2V 2=P	1,-	11	
2≠P	2,1;1V 2=P	1	

[39] ctd		2V 2=P	1	
		1,(X);X,2 X=P 2=P	1	

[40] {POMB12] Cleft-Object with Stylistic Inversion

2,1	1,2	49	23

[41] [POMB13] Subject-Object Relative with Stylistic Inversion

2,1;1,3	1,2;2,3	32	19
	1,2;1,3	9	13
	2,1;2,3		5
	1,3;1,2	1	1
	1,3;2,3		1
	2,1;3,1	1	1
	1,2;3,2	2	
	1,3;3,2	2	
	1,2;3,1	1	
	2,1;--	1	
	1,3;-	1	

[42] [POMB14] Object-Object Relative with Stylistic Inversion

1,2;3,2	1,2;2,3	36	18
	1,2;1,3	4	5
	3,2;2,1	1	
	1,2;3,1		2
	3,1;1,2		3
	2,3;1,2		1
	2,1;3,1		1
	1,3;2,3		1

Table A.A.5. Generalizability of the Present Sample to a Larger Population

Present Study

Sentence Types	Means/12	SD
[01] Active	12 000	0
[05] Dative	11 111	1.965
[10] Object-Subject Relative	10.111	1.537
[02] Passive	9.899	2.759
[04] Cleft Object	8.444	2.963
[08] Conjoined	8.000	3.742
[06] Dative Passive	7.444	4 640
[09] Subject-Object Relative	5.222	4.522

[01] [05] [10] [02] [04] [08] [06] [09]

(Sentence types underlined by a common line do not differ on the Fisher PLSD set at a 95% confidence level, sentences not underlined by a common line do differ significantly.)

[01] [05] [10] [02] [04] [08] [06] [09]

(Sentence types underlined by a common line do not differ on Tukey's test set at an experimenterwise error rate of 0 05, sentences not underlined by a common line do differ significantly)

Experiment 3 (Caplan and Hildebrandt,1988)

Sentence Types	Means /5	SD
[01] Active	4.1	1 5
[00] Cleft-Subject	4.0	1.6
[02] Passive	3.2	1.8
[05] Dative	2.9	2.0
[08] Conjoined	2.8	2.0
[04] Cleft Object	2.7	1.8
[10] Object-Subject Relative	2.1	1.9
[06] Dative Passive	1.9	2.1
[09] Subject-Object Relative	1.4	1.6

[01] [02] [05] [08] [04] [10] [06] [09]

(Sentence types underlined by a common line do not differ on Tukey's test set at an experimenterwise error rate of 0.05, sentences not underlined by a common line do differ significantly)

APPENDIX B

Summary Score Sheets for French Patients and Subset of Controls For Each Battery

PATIENT AG
SUMMARY SCORE SHEET

(M001-012) A2
Example: La grenouille a frappé le singe.
CORRECT FORMS: (Stage II: E = 6, df = 1,
1,2 12/12 χ^2 = 12.00, p = .0005*)

(M013-024) P2
Example: Le singe a été frappé par la grenouille.
CORRECT FORMS: (Stage II: E = 6, df = 1,
2,1 12/12 χ^2 = 12.00, p = .0005*)

(M025-036) Truncated Passives
Example: Le singe a été frappé.
CORRECT FORMS: (Stage I: E = 6, df = 1,
X,1 12/12 χ^2 = 12.00, p = .0005*)

(M037-048) CO2
Example: C'est la vache que le lapin a embrassée.
CORRECT FORMS: (Stage II: E = 6, df = 1,
2,1 11/12 χ^2 = 8.333, p = .0039*)

INCORRECT FORMS:
1,2 1/12

(M049-060) A3
Example: Le lapin a confié la vache à la chèvre.
CORRECT FORMS: (Stage II: E = 2, df = 5,
1,2,3 12/12 χ^2 = 60.00, p = .0001*)

(M061-072) P3
Example: L'éléphant a été donné au singe par la grenouille.
CORRECT FORMS: (Stage II: E = 2, df = 5,
3,1,2 12/12 χ^2 = 60.00, p = 0001*)

(M073-084) CO3
Example: C'est la chèvre que le lapin a donnée à la vache.
CORRECT FORMS: (Stage II: E = 2, df = 5,
2,1,3 12/12 χ^2 = 60.00, p = .0001*)

(M085-096) CON
Example: Le singe a gratté le lapin et a caressé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35,
1,2;1,3 11/12 χ^2 = 357.77, p = .0001*)
1,3;1,2 --

INCORRECT FORMS:
1,2;2,3 1/12

PATIENT A6
SUMMARY SCORE SHEET

(M097-108) S-O
Example: Le singe que le lapin a saisi a bousculé la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

2,1;1,3	12/12
1,3;2,1	--

(M109-120) O-S
Example: La chèvre a frappé le lapin qui a saisi la vache.
CORRECT FORMS: (Stage II: E = .33. df = 35, χ^2 = 424.244, p = .0001*)

1,2;2,3	12/12
2,3;1,2	--

(M121-132) O-O
Example: Le singe a chatouillé la grenouille que la chèvre a bousculée.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 357.77, p = .0001*)

1,2;3,2	11/12	
3,2;1,2	1/12	TOTAL CORRECT: 12/12

(M133-144) S-S
Example: La grenouille qui a tenu la vache a attrapé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 296.971, p = .0001*)

1,2;1,3	10/12	
1,3;1,2	1/12	TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,2;2,3	1/12

(M145-156) Active Conjoined Theme
Example: Le lapin a frappé la vache et la chèvre.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 132.00, p = .0001*)

1,2+3	12/12
1,3+2	--

(M157-168) Passive Conjoined Agent
Example: La grenouille a été caressée par la chèvre et la vache.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 110.00, p = .0001*)

2+3,1	11/12	
3+2,1	1/12	TOTAL CORRECT: 12/12

PATIENT A6
SUMMARY SCORE SHEET

(J001-012) Direct Object Control, Intransitive Verb
Example: La grenouille a forcé le singe à bondir.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 69.333, p = .0001*)

1,2;2V	11/12	
2V;1,2	1/12	TOTAL CORRECT: 12/12

(J013-024) Passivized Direct Object Control, Intransitive Verb
Example: La vache a été forcée par le lapin à danser.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, ^{2} = 84.00, p = .0001*)

2,1;1V	12/12
1V;2,1	--

(J025-036) Truncated Causative
Example: Le lapin a fait frapper la vache.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 248.486, p = .0001*)

1,X;X,2	9/12	
1,(X);X,2	--	
X,2;1,X	1/12	
X,2;1,(X)	--	TOTAL CORRECT: 10/12

INCORRECT FORMS:

X,1;1,2	2/12

(J037-048) Causative+Intransitive Verb
Example: La vache a fait danser le lapin.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J049-060) Direct Object Control+Transitive Verb
Example: Le lapin a forcé la chèvre à frapper la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

1,2;2,3	11/12	
2,3;1,2	1/12	TOTAL CORRECT: 12/12

(J061-072) Passivized Direct Object Control+Transitive Verb
Example: La grenouille a été forcée par l'éléphant à caresser le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 248.486, p = .0001*)

2,1;1,3	9/12	
1,3;2,1	2/12	TOTAL CORRECT: 11/12

INCORRECT FORMS:

2,3;2,1	1/12

PATIENT A6
SUMMARY SCORE SHEET

(J073-084) Causative (Faire-à)
Example: La grenouille a fait caresser le singe à l'éléphant.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 296.971, p = .0001*)

1,3;3,2	10/12
1,(3);3,2	--
3,2;1,3	1/12
3,2;1,(3)	--

TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,2;3,2	1/12

(J085-096) Causative (Faire-par)
Example: Le lapin a fait frapper la vache par la chèvre.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,3;3,2	12/12
1,(3);3,2	--
3,2;1,3	--
3,2;1,(3)	--

(J097-108) Cleft Object-Causative (Faire-par)
Example: C'est l'éléphant que le singe a fait saisir par la grenouille.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 303.032, p = .0001*)

2,3;3,1	10/12
3,1;2,3	--
2,(3);3,1	--
3,1;2,(3)	--

INCORRECT FORMS:

2,1;3,1	2/12

(J109-120) Conjoined Causative
Example: La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.

CORRECT FORMS: (Stage II: E = .0007, df = 1727, χ^2 = 7702.382, p < .0001*)

1,4;4,2;4,3	7/12
1,4;4,3;4,2	--
4,2;4,3;1,4	1/12
4,3;4,2;1,4	--
1,(4);4,2;4,3	--

TOTAL CORRECT: 8/12

INCORRECT FORMS:

1,3;3,2;--	1/12
1,2;2,3;2,4	1/12
1,3;3,2;3,4	1/12
1,4;4,2;-,-	1/12

PATIENT A6
SUMMARY SCORE SHEET

(J121-132) Causative+Dative
Example: L'éléphant a fait apporter le singe à la grenouille par la vache.
CORRECT FORMS: (Stage II: E = .063, df = 191, χ^2 = 1353.179, p = .0001*)

1,4;4,2,3	9/12
1,(4);4,2,3	--
4,2,3;1,4	--
4,2,3;1,(4)	--

INCORRECT FORMS:

1,4;4,3,2	2/12
4,1;1,2,3	1/12

(J133-144) Causative+S-S relative
Example: La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.
CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 7702.382, p < .0001*)

1,3;3,2;3,4	6/12
1,3;3,4;3,2	--
3,2;3,4;1,3	--
3,4;3,2;1,3	1/12
3,4;1,3;3,2	--

TOTAL CORRECT: 7/12

INCORRECT FORMS:

-,-;3,4;3,?	1/12
1,3;3,2;2,4	4/12

(J145-156) S-S relative+Conjoined Theme
Example: L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille.
CORRECT FORMS: (Stage II: E = .042, df = 287, χ^2 = 2416.667, p = .0001*)

1,2+3;1,4	10/12
1,3+2;1,4	--
1,4;1,2+3	--
1,4;1,3+2	--

INCORRECT FORMS:

1,2+3;--	1/12
1,2;3,4	1/12

(J157-168) Conjoined clauses-4NPs(no deletion)(Baseline)
Example: La grenouille a frappé le singe et la vache a chatouillé l'éléphant.
CORRECT FORMS: (Stage II: E = .083, df = 143, χ^2 = 1722.892, p = .0001*)

1,2;3,4	12/12
3,4;1,2	--

PATIENT CM
SUMMARY SCORE SHEET

(M001-012) A2
Example: La grenouille a frappé le singe.
CORRECT FORMS:
1,2 12/12
(Stage II: E = 6, df = 1, $\chi^2 = 12.00$, p = .0005*)

(M013-024) P2
Example: Le singe a été frappé par la grenouille.
CORRECT FORMS:
2,1 12/12
(Stage II: E 6, df = 1, $\chi^2 = 12.00$, p = .0005*)

(M025-036) Truncated Passives
Example: Le singe a été frappé.
CORRECT FORMS:
X,1 12/12
(Stage I: E = 6, df = 1, $\chi^2 = 12.00$, p = .0005*)

(M037-048) CO2
Example: C'est la vache que le lapin a embrassée.
CORRECT FORMS:
2,1 12/12
(Stage II: E = 6, df = 1, $\chi^2 = 12.00$, p = .0005*)

(M049-060) A3
Example: Le lapin a confié la vache à la chèvre.
CORRECT FORMS:
1,2,3 12/12
(Stage II: E = 2, df = 5, $\chi^2 = 60.00$, p = .0001*)

(M061-072) P3
Example: L'éléphant a été donné au singe par la grenouille.
CORRECT FORMS:
3,1,2 12/12
(Stage II: E = 2, df = 5, $\chi^2 = 60.00$, p = .0001*)

(M073-084) CO3
Example: C'est la chèvre que le lapin a donnée à la vache.
CORRECT FORMS:
2,1,3 11/12
(Stage II: E = 2, df = 5, $\chi^2 = 49.00$, p = .0001*)

INCORRECT FORMS:
1,2,3 1/12

(M085-096) CON
Example: Le singe a gratté le lapin et a caressé l'éléphant.
CORRECT FORMS:
1,2;1,3 12/12
1,3;1,2 --
(Stage II: E = .33, df = 35, $\chi^2 = 424.244$, p = .0001*)

PATIENT CM
SUMMARY SCORE SHEET

(M097-108) S-O
Example: Le singe que le lapin a saisi a bousculé la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 357.77, p = .0001*)
2,1;1,3 11/12
1,3;2,1 1/12 TOTAL CORRECT: 12/12

(M109-120) O-S
Example: La chèvre a frappé le lapin qui a saisi la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)
1,2;2,3 12/12
2,3;1,2 --

(M121-132) O-O
Example: Le singe a chatouillé la grenouille que la chèvre a bousculée.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 296.971, p = .0001*)
1,2;3,2 10/12
3,2;1,2 --

INCORRECT FORMS:
1,2;3,1 1/12
3,2;2,1 1/12

(M133-144) S-S
Example: La grenouille qui a tenu la vache a attrapé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)
1,2;1,3 12/12
1,3;1,2 --

(M145-156) Active Conjoined Theme
Example: Le lapin a frappé la vache et la chèvre.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 132.00, p = .0001*)
1,2+3 12/12
1,3+2 --

(M157-168) Passive Conjoined Agent
Example: La grenouille a été caressée par la chèvre et la vache.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 132.00, p = .0001 *)
2+3,1 12/12
3+2,1 --

PATIENT CM
SUMMARY SCORE SHEET

(J001-012) Direct Object Control, Intransitive Verb
Example: La grenouille a forcé le singe à bondir.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 32.00, p = .0001*)
1,2;2V 7/12
2V;1,2 4/12 TOTAL CORRECT: 11/12

INCORRECT FORMS:
2,1;1V 1/12

(J013-024) Passivized Direct Object Control, Intransitive Verb
Example: La vache a été forcée par le lapin à danser.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 36.00, p = .0001*)
2,1;1V 6/12
1V;2,1 6/12 TOTAL CORRECT: 12/12

(J025-036) Truncated Causative
Example: Le lapin a fait frapper la vache.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 357.577, p = .0001*)
1,X;X,2 11/12
1,(X);X,2 --
X,2;1,X --
X,2;1,(X) --

INCORRECT FORMS:
1,2;2,X 1/12

(J037-048) Causative+Intransitive Verb
Example: La vache a fait danser le lapin.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 36.00, p = .0001*)
1,2;2V 6/12
2V;1,2 6/12 TOTAL CORRECT: 12/12

(J049-060) Direct Object Control+Transitive Verb
Example: Le lapin a forcé la chèvre à frapper la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 303.032, p = .0001*)
1,2;2,3 10/12
2,3;1,2 2/12 TOTAL CORRECT: 12/12

(J061-072) Passivized Direct Object Control+Transitive Verb
Example: La grenouille a été forcée par l'éléphant à caresser le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 212.122, p = .0001*)
2,1;1,3 5/12
1,3;2,1 7/12 TOTAL CORRECT: 12/12

PATIENT CM
SUMMARY SCORE SHEET

(J073-084) Causative (Faire-à)
Example: La grenouille a fait caresser le singe à l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

1,3;3,2	11/12
1,(3);3,2	--
3,2;1,3	--
3,2;1,(3)	--

INCORRECT FORMS:

1,(2);2,3	1/12

(J085-096) Causative (Faire-par)
Example: Le lapin a fait frapper la vache par la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,3;3,2	12/12
1,(3);3,2	--
3,2;1,3	--
3,2;1,(3)	--

(J097-108) Cleft Object-Causative (Faire-par)
Example: C'est l'éléphant que le singe a fait saisir par la grenouille.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 175.759, p = .0001*)

2,3;3,1	6/12
3,1;2,3	--
2,(3);3,1	--
3,1;2,(3)	--

INCORRECT FORMS:

1,(3);3,2	5/12
2,3;3,2	1/12

(J109-120) Conjoined Causative
Example: La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.
CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 14559.525, p $<$ .0001*)

1,4;4,2;4,3	9/12	
1,4;4,3;4,2	--	
4,2;4,3;1,4	--	
4,3;4,2;1,4	--	
1,(4);4,2;4,3	1/12	TOTAL CORRECT: 10/12

INCORRECT FORMS:

1,(3);3,2;3,4	1/12
1,2;4,3;-	1/12

PATIENT CM
SUMMARY SCORE SHEET

(J121-132) Causative+Dative
Example: L'éléphant a fait apporter le singe à la grenouille par la vache.

CORRECT FORMS: (Stage II: E = .063, df = 191, χ^2 = 1924.607, p = .0001*)

1,4;4,2,3	9/12
1,(4);4,2,3	2/12
4,2,3;1,4	--
4,2,3;1,(4)	--

TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,4;4,3,2	1/12

(J133-144) Causative+S-S relative
Example: La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.

CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 11988.096, p $<$ .0001*)

1,3;3,2;3,4	9/12
1,3;3,4;3,2	--
3,2;3,4;1,3	--
3,4;3,2;1,3	--
3,4;1,3;3,2	--

INCORRECT FORMS:

1,2;2,3;3,4	1/12
1,4;4,2;4,3	1/12
1,3;3,2;2,4	1/12

(J145-156) S-S relative+Conjoined Theme
Example: L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille.

CORRECT FORMS: (Stage II: E = .042, df = 287, χ^2 = 3416.667, p = .0001*)

1,2+3;1,4	12/12
1,3+2;1,4	--
1,4;1,2+3	--
1,4;1,3+2	--

(J157-168) Conjoined clauses-4NPs(no deletion)(Baseline)
Example: La grenouille a frappé le singe et la vache a chatouillé l'éléphant.

CORRECT FORMS: (Stage II: E = .083, df = 143, χ^2 = 1216.868, p = .0001*)

1,2;3,4	10/12
3,4;1,2	1/12

TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,2;4,3	1/12

PATIENT CM
SUMMARY SCORE SHEET

(G001-012) Dative-Theme cliticized
Example: La chèvre l'a offert à la vache.
CORRECT FORMS:
1,2,3 2=P 11/12
1,2,3 2≠P 1/12 TOTAL CORRECT: 12/12

(Stage I: E = 2, df = 5, χ^2 = 60.00, p = .0001*)

(G013-024) Dative-Goal cliticized
Example: La vache lui a remis la chèvre.
CORRECT FORMS:
1,3,2 2=P 10/12
1,3,2 2≠P --

(Stage I: E = 2, df = 5, χ^2 = 40.00, p = .0001*)

INCORRECT FORMS:
1,2,3 2=P 2/12

(G025-036) Causative-Theme cliticized
Example: Le lapin l'a fait tenir par la chèvre.
CORRECT FOPMS:
1,3;3,2 2=P 11/12
1,3;3,2 2≠P --
3,2;1,3 2=P --
3,2;1,3 2≠P --

(Stage I: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

INCORRECT FORMS:
1,(3);3,2=3 1/12

(G037-048) Causative-Causee cliticized
Example: L'éléphant lui a fait attraper la grenouille.
CORRECT FORMS:
1,2;2,3 2=P 12/12
1,2;2,3 2≠P --
2,3;1,2 2=P --
2,3;1,2 2≠P --

(Stage I: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

(G049-060) Causative-Reflexive "Causer"="Theme"
Example: La vache se fait saisir par le lapin.
CORRECT FORMS:
3,2=1 --
1,(3);3,2=1 12/12
3,2=1;1,(3) --
1,3;3,2=1 --
3,2,2=1;1,3 -- TOTAL CORRECT: 12/12

(Stage II: E = 3, df = 3, χ^2 =36.00, p = .0001*)

PATIENT CM
SUMMARY SCORE SHEET

(6061-072) Causative-Reflexive Causee
Example: La chèvre fait se serrer la vache.
CORRECT FORMS: (Stage II: E = 3, df = 3, χ^2 = 22.667, p = .0001*)
1,3;3,2=3 --
3,2=3;1,3 --
1,(3);3,2=3 10/12
3,2=3;1,(3) -- TOTAL CORRECT: 10/12

INCORRECT FORMS:
1,(3);3V 2/12

(6073-084) Causative-Reflexive Causer=Goal
Example: La vache se fait remettre la chèvre par le lapin.
CORRECT FORMS: (Stage II: E = .67, df = 17, χ^2 = 202.985, p = .0001*)
4,3,2=1 --
1,4;4,3,2=1 --
4,3,2=1;1,4 --
1,(4);4,3,2=1 12/12
4,3,2=1;1,(4) -- TOTAL CORRECT: 12/12

(6085-096) Causative-Reflexive Causer=Goal,Truncated
Example: La chèvre se fait offrir le lapin.
CORRECT FORMS: (Stage I: E = .67, df = 17, χ^2 = 202.985, p = .0001*)
X,3,2=1 X=P 1/12
X,3,2=1 X≠P --
1,X;X,3,2=1 X=P 11/12
1,X;X,3,2=1 X≠P -- TOTAL CORRECT: 12/12

(6097-108) Causative-Theme cliticized,Truncated
Example: La chèvre le fait serrer.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 357.577, p = .0001*)
1,X;X,2 X=P 2=P 11/12
1,X;X,2 X≠P 2≠P --
X,2;1,X X=P 2=P --
X,2;1,X X≠P 2≠P --
1,X;X,2 X≠P 2=P --

INCORRECT FORMS:
1,2;2,X X≠P 2=P 1/12

(6109-120) Causative-Reflexive "Causer"="Theme",Truncated
Example: La chèvre se fait bousculer.
CORRECT FORMS: (Stage I: E = 3, df = 3, χ^2 = 28.667, p = .0001*)
X,2=1 X=P ---
X,2=1 X≠P --
1,(X);X,2=1 X=P 3/12
1,(X);X,2=1 X≠P --
1,X;X,2=1 X=P 8/12 TOTAL CORRECT: 11/12

INCORRECT FORMS:
1,X;X,2 X=P 2=P 1/12

PATIENT CM
SUMMARY SCORE SHEET

(G121-132) Causative-Theme=Causee cliticized, Intransitive Verb
Example: L'éléphant le fait trembler.

CORRECT FORMS: (Stage I: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V 2=P	12/12
1,2;2V 2≠P	--
2V;1,2 2=P	--
2V;1,2 2≠P	--

(G133-144) Cleft Object(CO2) with Stylistic Inversion
Example: C'est le lapin qu'a flatté l'éléphant.

CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 0, p = 1

2,1	6/12

INCORRECT FORMS:

1,2	6/12

(G145-156) Subject-Object relative with Stylistic Inversion
Example: Le lapin qu'a gratté l'éléphant a frappé le singe.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 121.213, p = .0001*)

2,1;1,3	6/12	
1,3;2,1	1/12	TOTAL CORRECT: 7/12

INCORRECT FORMS:

2,1;--	1/12
1,3;1,2	1/12
1,2;1,3	2/12
1,2;3,1	1/12

(G157-168) Object-Object relative with Stylistic Inversion
Example: Le lapin a gratté la chèvre qu'a embrassée le singe.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 296.971, p = .0001*)

1,2;3,2	10/12	
3,2;1,2	1/12	TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,2;2,3	1/12

PATIENT JT

SUMMARY SCORE SHEET

(M001-012) A2

Example: La grenouille a frappé le singe.

CORRECT FORMS:

1,2 12/12

(Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

(M013-024) P2

Example: Le singe a été frappé par la grenouille.

CORRECT FORMS:

2,1 12/12

(Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

(M025-036) Truncated Passives

Example: Le singe a été frappé.

CORRECT FORMS:

X,1 11/12

(Stage I: E = 6, df = 1, χ^2 = 8.333, p = .0039*)

INCORRECT FORMS:

1,X 1/12

(M037-048) CO2

Example: C'est la vache que le lapin a embrassée.

CORRECT FORMS:

2,1 10/12

(Stage II: E = 6, df = 1, χ^2 = 5.333, p = .0209*)

INCORRECT FORMS:

1,2 2/12

(M049-060) A3

Example: Le lapin a confié la vache à la chèvre.

CORRECT FORMS:

1,2,3 12/12

(Stage II: E = 2, df = 5, χ^2 = 60.00, p = .0001*)

(M061-072) P3

Example: L'éléphant a été donné au singe par la grenouille.

CORRECT FORMS:

3,1,2 10/12

(Stage II: E = 2, df = 5, χ^2 = 39.00, p = .0001*)

INCORRECT FORMS:

3,2,1 1/12

1,3,2 1/12

(M073-084) CO3

Example: C'est la chèvre que le lapin a donnée à la vache.

CORRECT FORMS:

2,1,3 6/12

(Stage II: E = 2, df = 5, χ^2 = 24.00, p = .0002*)

INCORRECT FORMS:

1,2,3 6/12

PATIENT JT
SUMMARY SCORE SHEET

(M085-096) CON
Example: Le singe a gratté le lapin et a caressé l'éléphant.
CORRECT FORMS:
1,2;1,3 12/12
1,3;1,2 --

(Stage II: E = 0.33, df = 35, χ^2 = 424.24, p = .0001*)

(M097-108) S-O
Example: Le singe que le lapin a saisi a bousculé la chèvre.
CORRECT FORMS:
2,1;1,3 6/12
1,3;2,1 --

(Stage II: E = 0.33, df = 35, χ^2 = 151.516, p = .0001*)

INCORRECT FORMS:
1,2;1,3 4/12
1,2;2,3 1/12
3,1;1,3 1/12

(M109-120) O-S
Example: La chèvre a frappé le lapin qui a saisi la vache.
CORRECT FORMS:
1,2;2,3 9/12
2,3;1,2 --

(Stage II: E = 0.33, df = 35, χ^2 = 248.486, p = .0001*)

INCORRECT FORMS:
1,3;3,2 2/12
1,2;3,2 1/12

(M121-132) O-O
Example: Le singe a chatouillé la grenouille que la chèvre a bousculée.
CORRECT FORMS:
1,2;3,2 12/12
3,2;1,2 --

(Stage II: E = 0.33, fd = 35, χ^2 = 424.24, p = .0001*)

(M133-144) S-S
Example: La grenouille qui a tenu la vache a attrapé l'éléphant.
CORRECT FORMS:
1,2;1,3 12/12
1,3;1,2 --

(Stage II: E = 0.33, df = 35, χ^2 = 424.24, p = .0001*)

(M145-156) Active Conjoined Theme
Example: Le lapin a frappé la vache et la chèvre.
CORRECT FORMS:
1,2+3 12/12
1,3+2 --

(Stage II: E = 1, df = 11, χ^2 = 132.00, p = .0001*)

PATIENT JT

SUMMARY SCORE SHEET

(M157-168) Passive Conjoined Agent

Example: La grenouille a été caressée par la chèvre et la vache.

CORRECT FORMS:

(Stage II: E = 1, df = 11, χ^2 = 90.00, p = .0001)

2+3,1	10/12		
3+2,1	1/12	TOTAL CORRECT:	11/12

INCORRECT FORMS:

2,1+3	1/12

PATIENT JT
SUMMARY SCORE SHEET

(J001-012) Direct Object Control, Intransitive Verb
Example: La grenouille a forcé le singe à bondir.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)
1,2;2V 12/12
2V;1,2 --

(J013-024) Passivized Direct Object Control, Intransitive Verb
Example: La vache a été forcée par le lapin à danser.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 69.333, p = .0001*)
2,1;1V 11/12
1V;2,1 --

INCORRECT FORMS:
1,2;2V 1/12

(J025-036) Truncated Causative
Example: Le lapin a fait frapper la vache.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 424.244, p = .0001*)
1,X;X,2 11/12
1,(X);X,2 1/12
X,2;1,X --
X,2;1,(X) -- TOTAL CORRECT: 12/12

(J037-048) Causative+Intransitive Verb
Example: La vache a fait danser le lapin.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)
1,2;2V 12/12
2V;1,2 --

(J049-060) Direct Object Control+Transitive Verb
Example: Le lapin a forcé la chèvre à frapper la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)
1,2;2,3 12/12
2,3;1,2 --

(J061-072) Passivized Direct Object Control+Transitive Verb
Example: La grenouille a été forcée par l'éléphant à caresser le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 212.122, p = .0001*)
2,1;1,3 7/12
1,3;2,1 --

INCORRECT FORMS:
1,2;2,3 5/12

PATIENT JT
SUMMARY SCORE SHEET

(J073-084) Causative (Faire-à)
Example: La grenouille a fait caresser le singe à l'éléphant.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 260.607, p = .0001*)

1,3;3,2	9/12
1,(3);3,2	--
3,2;1,3	--
3,2;1,(3)	--

INCORRECT FORMS:

1,2;2,3	3/12

(J085-096) Causative (Faire-par)
Example: Le lapin a fait frapper la vache par la chèvre.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 303.032, p = .0001*)

1,3;3,2	10/12
1,(3);3,2	--
3,2;1,3	--
3,2;1,(3)	--

INCORRECT FORMS:

1,2;2,3	2/12

(J097-108) Cleft Object-Causative (Faire-par)
Example: C'est l'éléphant que le singe a fait saisir par la grenouille.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 212.122, p = .0001*)

2,3;3,1	3/12
3,1;2,3	--
2,(3);3,1	--
3,1;2,(3)	--

INCORRECT FORMS:

1,(3);3,2	7/12
1,(2);2,3	1/12
1,3;3,2	1/12

(J109-120) Conjoined Causative
Example: La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.

CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 9416.667, p< .0001*)

1,4;4,2;4,3	3/12
1,4;4,3;4,2	4/12
4,2;4,3;1,4	--
4,3;4,2;1,4	--
1,(4);4,2;4,3	4/12

TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,-;2,4;4,3	1/12

PATIENT JT
SUMMARY SCORE SHEET

(J121-132) Causative+Dative

Example: L'éléphant a fait apporter le singe à la grenouille par la vache.

CORRECT FORMS: (Stage II: E = .063, df = 191, χ^2 = 654.766, p = .0001*)

1,4;4,2,3	3/12		
1,(4);4,2,3	3/12		
4,2,3;1,4	--		
4,2,3;1,(4)	1/12	TOTAL CORRECT:	7/12

INCORRECT FORMS:

1,2;2-	1/12
1,4;4,1;2,3	1/12
1,2;2,4;2,3	1/12
1,4;4,3,2	1/12
1,2;2,3,4	1/12

(J133-144) Causative+S-S relative

Example: La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.

CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 6559.525, p < .0001*)

1,3;3,2;3,4	4/12
1,3;3,4;3,2	--
3,2;3,4;1,3	--
3,4;3,2;1,3	--
3,4;1,3;3,2	--

INCORRECT FORMS:

1,3;3,2;1,4	2/12
1,3;3,2;2,4	5/12
1,2;2,3;3,4	1/12

(J145-156) S-S relative+Conjoined Theme

Example: L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille.

CORRECT FORMS: (Stage II: E = .042, df = 287, χ^2 = 2892.858, p = .0001*)

1,2+3;1,4	11/12		
1,3+2;1,4	1/12		
1,4;1,2+3	--		
1,4;1,3+2	--	TOTAL CORRECT:	12/12

(J157-168) Conjoined clauses-4NPs(no deletion)(Baseline)

Example: La grenouille a frappé le singe et la vache a chatouillé l'éléphant.

CORRECT FORMS: (Stage II: E = .083, df = 143, χ^2 = 1072.289, p = .0001*)

1,2;3,4	9/12
3,4;1,2	--

INCORRECT FORMS:

1,2;4,3	3/12

PATIENT DC
SUMMARY SCORE SHEET

(M001-012) A2
Fxample: La grenouille a frappé le singe.
CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)
1,2 12/12

(M013-024) P2
Example: Le singe a été frappé par la grenouille.
CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)
2,1 12/12

(M025-036) Truncated Passives
Example: Le singe a été frappé.
CORRECT FORMS: Stage I: E = 6, df = 1, χ^2 = 12.00, p = .0005*)
X,1 12/12

(M037-048) CO2
Example: C'est la vache que le lapin a embrassée.
CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 3.00, p = .0833)
2,1 9/12

INCORRECT FORMS:
1,2 3/12

(M049-060) A3
Example: Le lapin a confié la vache à la chèvre.
CORRECT FORMS: (Stage II: E = 2, df = 5, χ^2 = 60.00, p = .0001*)
1,2,3 12/12

(M061-072) P3
Example: L'éléphant a été donné au singe par la grenouille.
CORRECT FORMS: (Stage II: E = 2, df = 5, χ^2 = 49.000, p = .0001*)
3,1,2 11/12

INCORRECT FORMS:
3,2,1 1/12

(M073-084) CO3
Example: C'est la chèvre que le lapin a donnée à la vache.
CORRECT FORMS: (Stage II: E = 2, df = 5, χ^2 = 28.00, p = .0001*)
2,1,3 8/12

INCORRECT FORMS:
1,2,3 3/12
-,1,3 1/12

PATIENT DC
SUMMARY SCORE SHEET

(M085-096) CON
Example: Le singe a gratté le lapin et a caressé l'éléphant.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 260.607, p = .0001*)

1,2;1,3	9/12
1,3;1,2	--

INCORRECT FORMS:

1,2;2,3	3/12

(M097-108) S-O
Example: Le singe que le lapin a saisi a bousculé la chèvre.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 103.032, p = .0001*)

2,1;1,3	5/12
1,3;2,1	--

INCORRECT FORMS:

2,1;2,3	1/12
2,1;1+2,3	1/12
2,3;1,2	1/12
1,2;1,3	3/12
1,2;2,3	1/12

(M109-120) O-S
Example: La chèvre a frappé le lapin qui a saisi la vache.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 212.122, p = .0001*)

1,2;2,3	8/12
2,3;1,2	--

INCORRECT FORMS:

1,2;1+2,3	1/12
1,2;1,3	3/12

(M121-132) O-O
Example: Le singe a chatouillé la grenouille que la chèvre a bousculée.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 133.335, p = .0001*)

1,2;3,2	6/12
3,2;1,2	--

INCORRECT FORMS:

1,2;-,-	1/12
1,2;1,3	3/12
1,2;3,1	1/12
1,2;3,-	1/12

PATIENT DC
SUMMARY SCORE SHEET

(M133-144) S-S
Example: La grenouille qui a tenu la vache a attrapé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 248.486, p = .0001*)

1,2;1,3	9/12
1,3;1,2	--

INCORRECT FORMS:

1,2;2,3	2/12
1,3;2,1	1/12

(M145-156) Active Conjoined Theme
Example: Le lapin a frappé la vache et la chèvre.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 132.00, p = .0001*)

1,2+3	12/12
1,3+2	--

(M157-168) Passive Conjoined Agent
Example: La grenouille a été caressée par la chèvre et la vache.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 74.00, p = .0001*)

2+3,1	9/12
3+2,1	2/12

TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,2+3	1/12

PATIENT DC
SUMMARY SCORE SHEET

(J001-012) Direct Object Control, Intransitive Verb
Example: La grenouille a forcé le singe à bondir.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J013-024) Passivized Direct Object Control, Intransitive Verb
Example: La vache a été forcée par le lapin à danser.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 41.333, p = .0001*)

2,1;1V	8/12
1V;2,1	--

INCORRECT FORMS:

1,2;2V	4/12

(J025-036) Truncated Causative
Example: Le lapin a fait frapper la vache.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 103.032, p = .0001*)

1,X;X,2	--
1,(X);X,2	5/12
X,2;1,X	--
X,2;1,(X)	--

TOTAL CORRECT: 5/12

INCORRECT FORMS:

1,2;2,X	1/12
1,2-	1/12
1,(2);2,2	2/12
1,(2);2,X	1/12
1;1,2	2/12

(J037-048) Causative+Intransitive Verb
Example: La vache a fait danser le lapin.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J049-060) Direct Object Control+Transitive Verb
Example: Le lapin a forcé la chèvre à frapper la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,2;2,3	12/12
2,3;1,2	--

(J061-072) Passivized Direct Object Control+Transitive Verb
Example: La grenouille a été forcée par l'éléphant à caresser le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 242.425, p = .0001*)

2,1;1,3	1/12
1,3;2,1	--

INCORRECT FORMS:

3,1;1,2	1/12
1,2;2,3	9/12
1;-	1/12

PATIENT DC
SUMMARY SCORE SHEET

(J073-084) Causative (Faire-à)
Example: La grenouille a fait caresser le singe à l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 206.062, p = .0001*)

1,3;3,2	--
1,(3);3,2	6/12
3,2;1,3	--
3,2;1,(3)	--

TOTAL CORRECT: 6/12

INCORRECT FORMS:

1,2;2,3	1/12
1,(2);2,3	5/12

(J085-096) Causative (Faire-par)
Example: Le lapin a fait frapper la vache par la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 260.607, p = .0001*)

1,3;3,2	--
1,(3);3,2	9/12
3,2;1,3	--
3,2;1,(3)	--

TOTAL CORRECT: 9/12

INCORRECT FORMS:

1,(2);2,3	3/12

(J097-108) Cleft Object-Causative (Faire-par)
Example: C'est l'éléphant que le singe a fait saisir par la grenouille.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 145.456, p = .0001*)

2,3;3,1	1/12
3,1;2,3	--
2,(3);3,1	--
3,1;2,(3)	--

INCORRECT FORMS:

1,(3);3,2	5/12
1;3-	1/12
1,(2);2,3	5/12

PATIENT DC
SUMMARY SCORE SHEET

(J109-120) Conjoined Causative
Example: La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.
CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 1702.382, $p < .0001$*)

1,4;4,2;4,3	--		
1,4;4,3;4,2	--		
4,2;4,3;1,4	--		
4,3;4,2;1,4	--		
1,(4);4,2;4,3	1/12	TOTAL CORRECT:	1/12

INCORRECT FORMS:

1,(X);X,2;-	1/12
1;-,2;-	1/12
1;2;2,4;1	1/12
1;2-	1/12
1;-	1/12
1;--3+2	1/12
1,(4);4,2;-	1/12
1;-2;3,4	1/12
1;2;3,4	1/12
1;-2;3;4	1/12
0,0;0,0;0,0	1/12

(J121-132) Causative+Dative
Example: L'éléphant a fait apporter le singe à la grenouille par la vache.
CORRECT FORMS: (Stage II: E = .063, df = 191, χ^2 = 496.036, $p = .0001$*)

1,4;4,2,3	--
1,(4);4,2,3	--
4,2,3;1,4	--
4,2,3;1,(4)	--

INCORRECT FORMS:

1;-	5/12
1;2-	1/12
1;4,-,3	1/12
2-	1/12
1;4,2,-	1/12
1;3,-;4-	1/12
1;4,2-	1/12
1;-2,3	1/12

PATIENT DC
SUMMARY SCORE SHEET

(J133-144) Causative+S-S relative
Example: La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.
CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 1702.382, p < .0001)

1,3;3,2;3,4	1/12
1,3;3,4;3,2	--
3,2;3,4;1,3	--
3,4;3,2;1,3	--
3,4;1,3;3,2	--

INCORRECT FORMS:

1,4;4,3	1/12
1,2;4,3	1/12
1,2,-;4,-	1/12
1;-	1/12
1;3,2-	1/12
3,2;3,4	1/12
1,2;2,4	1/12
1;-;3,4	1/12
1,2;3,4	1/12
1,2;1,3+4	1/12
-4-	1/12

(J145-156) S-S relative+Conjoined Theme
Example: L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille.
CORRECT FORMS: (Stage II: E = .042, df = 287, χ^2 = 797.62, p = .0001*)

1,2+3;1,4	5/12
1,3+2;1,4	1/12
1,4;1,2+3	--
1,4;1,3+2	--

TOTAL CORRECT: 6/12

INCORRECT FORMS:

1,2+4;1,3	1/12
1,2-	1/12
1;-	1/12
1,2+3;-	2/12
1,2,-;4	1/12

(J157-168) Conjoined clauses-4NPs(no deletion)(Baseline)
Example: La grenouille a frappé le singe et la vache a chatouillé l'éléphant.
CORRECT FORMS: (Stage II: E = .083, df = 143, χ^2 = 831.325, p = .0001*)

1,2;3,4	8/12
3,4;1,2	--

INCORRECT FORMS:

1,2;-	2/12
0,0;0,0	1/12
1,2;4,3	1/12

PATIENT DC
SUMMARY SCORE SHEET

(G001-012) Dative-Theme cliticized
Example: La chèvre l'a offert à la vache.
CORRECT FORMS: (Stage I: E = 2, df = 5, χ^2 = 60.00, p = .0001*)

1,2,3 2=P	--		
1,2,3 2≠P	12/12	TOTAL CORRECT:	12/12

(G013-024) Dative-Goal cliticized
Example: La vache lui a remis la chèvre.
CORRECT FORMS: (Stage I: E = 2, df = 5, χ^2 = 23.00, p = .0003*)

1,3,2 2=P	--		
1,3,2 2≠P	8/12	TOTAL CORRECT:	8/12

INCORRECT FORMS:

1,X;2,3 2≠P	1/12
-,1,3	1/12
1,2,3 2≠P	2/12

(G025-036) Causative-Theme cliticized
Example: Le lapin l'a fait tenir par la chèvre.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 133.335, p = .0001*)

1,3;3,2 2=P	--		
1,3;3,2 2≠P	3/12		
3,2;1,3 2=P	--		
3,2;1,3 2≠P	--	TOTAL CORRECT:	3/12

INCORRECT FORMS:

1,2;2,3 2≠P	6/12
1;3-	1/12
3,1	1/12
3,1;2,3 2≠P	1/12

(G037-048) Causative-Causee cliticized
Example: L'éléphant lui a fait attraper la grenouille.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 163.638, p = .0001*)

1,2;2,3 2=P	--		
1,2;2,3 2≠P	7/12		
2,3;1,2 2=P	--		
2,3;1,2 2≠P	--	TOTAL CORRECT:	7/12

INCORRECT FORMS:

1,(3);3,3	2/12
1;2=1,3	2/12
1,3	1/12

PATIENT DC
SUMMARY SCORE SHEET

(6049-060) Causative-Reflexive "Causer"="Theme"

Example: La vache se fait saisir par le lapin.

CORRECT FORMS:

(Stage II: E = 3, df = 3, χ^2 = 28.667, p = .0001*)

3,2=1	7/12
1,(3);3,2=1	4/12
3,2=1;1,(3)	--
1,3;3,2=1	--
3,2,2=1;1,3	--

TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,3	1/12

(6061-072) Causative-Reflexive Causee

Example: La chèvre fait se serrer la vache.

CORRECT FORMS:

(Stage I: E = .15 df = 80, χ^2 = 308.15, p = .0001*)

1,3;3,2=3	--
3,2=3;1,3	--
1,(3);3,2=3	6/12
3,2=3;1,(3)	--

TOTAL CORRECT: 6/12

INCORRECT FORMS:

1,(2);2,3 2≠P	3/12
1,(3);3,2 2≠P	1/12
1,3	1/12
3,(1);1,2=1	1/12

(6073-084) Causative-Reflexive Causer=Goal

Example: La vache se fait remettre la chèvre par le lapin.

CORRECT FORMS:

(Stage II: E = .67, df = 17, χ^2 = 77.612, p = .0001*)

4,3,2=1	3/12
1,4;4,3,2=1	--
4,3,2=1;1,4	--
1,(4);4,3,2=1	4/12
4,3,2=1;1,(4)	--

TOTAL CORRECT: 7/12

INCORRECT FORMS:

1;2=1,3,4	3/12
1,-3+4,-	1/12
1;-,3+2=1,4	1/12

(6085-096) Causative-Reflexive Causer=Goal,Truncated

Example: La chèvre se fait offrir le lapin.

CORRECT FORMS:

(Stage I: E = .67, df = 17, χ^2 = 89.553, p = .0001*)

X,3,2=1 X=P	--
X,3,2=1 X≠P	--
1,X;X,3,2=1 X=P	--
1,X;X,3,2=1 X≠P	8/12

TOTAL CORRECT: 8/12

INCORRECT FORMS:

1,-3,2=1	1/12
1;2=1,3,-	1/12
1,X;X,2=1,3 X≠P	1/12
3,1,2 2≠P	1/12

PATIENT DC
SUMMARY SCORE SHEET

(6097-108) Causative-Theme cliticized, Truncated
Example: La chèvre le fait serrer.

CORRECT FORMS:

1,X;X,2 X=P 2=P --
1,X;X,2 X≠P 2≠P 11/12
X,2;1,X X=P 2=P --
X,2;1,X X≠P 2≠P --
1,X;X,2 X≠P 2=P 1/12 TOTAL CORRECT: 12/12

(Stage I: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

(6109-120) Causative-Reflexive "Causer"="Theme", Truncated
Example: La chèvre se fait bousculer.

CORRECT FORMS:

X,2=1 X=P --
X,2=1 X≠P 9/12
1,(X);X,2=1 X=P --
1,(X);X,2=1 X≠P 3/12
1,X;X,2=1 X=P -- TOTAL CORRECT: 12/12

(Stage I: E = 6, df = 1, χ^2 = 12.00, p = .0005 *)

(6121-132) Causative-Theme=Causee cliticized, Intransitive Verb
Example: L'éléphant le fait trembler.

CORRECT FORMS:

1,2;2V 2=P --
1,2;2V 2≠P 12/12
2V;1,2 2=P --
2V;1,2 2≠P -- TOTAL CORRECT: 12/12

(Stage I: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

(6133-144) Cleft Object(CO2) with Stylistic Inversion
Example: C'est le lapin qu'a flatté l'éléphant.

CORRECT FORMS:

2,1 1/12

(Stage II: E = 6, df = 1, χ^2 = 8.333, p = .0039*)

INCORRECT FORMS:

1,2 11/12

(6145-156) Subject-Object relative with Stylistic Inversion
Example: Le lapin qu'a gratté l'éléphant a frappé le singe.

CORRECT FORMS:

2,1;1,3 --
1,3;2,1 --

(Stage II: E = .33, df = 35, χ^2 = 200.001, p = .0001*)

INCORRECT FORMS:

1,2;2,3 8/12
1,2;1,3 2/12
1,3;- 1/12
1,3;3,2 1/12

PATIENT DC

SUMMARY SCORE SHEET

(6157-168) Object-Object relative with Stylistic Inversion

Example: Le lapin a gratté la chèvre qu'a embrassée le singe.

(Stage II: E = .33, df = 35, χ^2 = 151.516, p = .0001**)

CORRECT FORMS:

1,2;3,2	3/12
3,2;1,2	--

INCORRECT FORMS:

1,2;2,3	6/12
1,2;1,3	3/12

PATIENT FP
SUMMARY SCORE SHEET

(M001-012) A2
Example: La grenouille a frappé le singe.
CORRECT FORMS: (Stage II: E = 6, df = 1,
1,2 12/12 χ^2 = 12.00, p = .0005*)

(M013-024) P2
Example: Le singe a été frappé par la grenouille.
CORRECT FORMS: (Stage II: E = 6, df = 1,
2,1 11/12 χ^2 = 8.333, p = .0039*)

INCORRECT FORMS:
1,2 1/12

(M025-036) Truncated Passives
Example: Le singe a été frappé.
CORRECT FORMS: (Stage I: E = 6, df = 1,
X,1 12/12 χ^2 = 12.00, p = .0005*)

(M037-048) CO2
Example: C'est la vache que le lapin a embrassée.
CORRECT FORMS: (Stage II: E = 6, df = 1,
2,1 12/12 χ^2 = 12.00, p = .0005*)

(M049-060) A3
Example: Le lapin a confié la vache à la chèvre.
CORRECT FORMS: (Stage II: E = 2, df = 5,
1,2,3 12/12 χ^2 = 60.00, p = .0001*)

(M061-072) P3
Example: L'éléphant a été donné au singe par la grenouille.
CORRECT FORMS: (Stage II: E = 2, df = 5,
3,1,2 7/12 χ^2 = 19.00, p = .0019*)

INCORRECT FORMS:
3,2,1 2/12
2,1,3 3/12

(M073-084) CO3
Example: C'est la chèvre que le lapin a donnée à la vache.
CORRECT FORMS: (Stage II: E = 2, df = 5,
2,1,3 9/12 χ^2 = 31.00, p = .0001*)

INCORRECT FORMS:
1,2,3 2/12
2,3,1 1/12

PATIENT FP
SUMMARY SCORE SHEET

(M085-096) CON
Example: Le singe a gratté le lapin et a caressé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 303.032, p = .0001*)
1,2;1,3 10/12
1,3;1,2 --

INCORRECT FORMS:
1,2;2,3 2/12

(M097-108) S-O
Example: Le singe que le lapin a saisi a bousculé la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 212.122, p = .0001*)
2,1;1,3 7/12
1,3;2,1 --

INCORRECT FORMS:
1,2;2,3 5/12

(M109-120) O-S
Example: La chèvre a frappé le lapin qui a saisi la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 303.032, p = .0001*)
1,2;2,3 10/12
2,3;1,2 --

INCORRECT FORMS:
1,2;1,3 2/12

(M121-132) O-O
Example: Le singe a chatouillé la grenouille que la chèvre a bousculée.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 242.425, p = .0001*)
1,2;3,2 9/12
3,2;1,2 1/12 TOTAL CORRECT: 10/12

INCORRECT FORMS:
3,2;2,1 1/12
1,2;2,3 1/12

(M133-144) S-S
Example: La grenouille qui a tenu la vache a attrapé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 296.971, p = .0001*)
1,2;1,3 10/12
1,3;1,2 --

INCORRECT FORMS:
1,2;2,3 1/12
1,3;3,2 1/12

PATIENT FP
SUMMARY SCORE SHEET

(M145-156) Active Conjoined Theme
Example: Le lapin a frappé la vache et la chèvre.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 132.00, p = .0001*)

1,2+3	12/12
1,3+2	--

(M157-168) Passive Conjoined Agent
Example: La grenouille a été caressée par la chèvre et la vache.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 110.00, p = .0001*)

2+3,1	11/12
3+2,1	--

INCORRECT FORMS:

2,1+3	1/12

PATIENT FP
SUMMARY SCORE SHEET

(J001-012) Direct Object Control, Intransitive Verb
Example: La grenouille a forcé le singe à bondir.
CORRECT FORMS: (Stage II: E = 1.5, p = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J013-024) Passivized Direct Object Control, Intransitive Verb
Example: La vache a été forcée par le lapin à danser.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 48.00, p = .0001*)

2,1;1V	9/12
1V;2,1	--

INCORRECT FORMS:

1,2;2V	3/12

(J025-036) Truncated Causative
Example: Le lapin a fait frapper la vache.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

1,X;X,2	9/12
1,(X);X,2	2/12
X,2;1,X	--
X,2;1,(X)	--

TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,2	1/12

(J037-048) Causative+Intransitive Verb
Example: La vache a fait danser le lapin.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J049-060) Direct Object Control+Transitive Verb
Example: Le lapin a forcé la chèvre à frapper la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,2;2,3	12/12
2,3;1,2	--

(J061-072) Passivized Direct Object Control+Transitive Verb
Example: La grenouille a été forcée par l'éléphant à caresser le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

2,1;1,3	--
1,3;2,1	--

INCORRECT FORMS:

1,2;2,3	12/12

PATIENT FP
SUMMARY SCORE SHEET

(J073-084) Causative (Faire-à)
Example: La grenouille a fait caresser le singe à l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

1,3;3,2	1/12
1,(3);3,2	--
3,2;1,3	--
3,2;1,(3)	--

INCORRECT FORMS:

1,(2);2,3	7/12
1,2;2,3	4/12

(J085-096) Causative (Faire-par)
Example: Le lapin a fait frapper la vache par la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 260.607, p = .0001*)

1,3;3,2	8/12
1,(3);3,2	1/12
3,2;1,3	--
3,2;1,(3)	--

TOTAL CORRECT: 9/12

INCORRECT FORMS:

1,(2);2,3	2/12
1,2;2,3	1/12

(J097-108) Cleft Object-Causative (Faire-par)
Example: C'est l'éléphant que le singe a fait saisir par la grenouille.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 121.213, p = .0001*)

2,3;3,1	1/12
3,1;2,3	--
2,(3);3,1	--
3,1;2,(3)	--

INCORRECT FORMS:

1,(2);2,3	3/12
1,(3);3,2	3/12
2,(1);1,3	1/12
1,2;2,3	2/12
1,2;2,3;3,1	1/12
1,3;3,2	1/12

PATIENT FP
SUMMARY SCORE SHEET

(J109-120) Conjoined Causative
Example: La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.
CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 3988.096, p < .0001)

1,4;4,2;4,3	--	
1,4;4,3;4,2	2/12	
4,2;4,3;1,4	--	
4,3;4,2;1,4	--	
1,(4);4,2;4,3	2/12	TOTAL CORRECT: 4/12

INCORRECT FORMS:

1,2;4,3	2/12
1,(3);3,2;3,4	2/12
1-	1/12
1,3;4,2	1/12
1;-,2;4,3	1/12
1;3,2;4,-	1/12

(J121-132) Causative+Dative
Example: L'éléphant a fait apporter le singe à la grenouille par la vache.
CORRECT FORMS: (Stage II: E = .063, df = 191, χ^2 = 210.322, p = .1609)

1,4;4,2,3	1/12
1,(4);4,2,3	--
4,2,3;1,4	--
4,2,3;1,(4)	--

INCORRECT FORMS:

1;3-	1/12
1,(4);4,3+2	1/12
1,(4);4,2+3	2/12
1;3,2+4	1/12
1,(4);4,2+3,-	1/12
1;-,2+4,3	1/12
1;4,2+3,-	1/12
1,(3);3,2,4	1/12
1,(2);2,3,4	1/12
2,(4);4,2+3	1/12

(J133-144) Causative+S-S relative
Example: La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.
CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 4273.81, p < .0001)

1,3;3,2;3,4	3/12	
1,3;3,4;3,2	1/12	
3,2;3,4;1,3	--	
3,4;3,2;1,3	--	
3,4;1,3;3,2	--	TOTAL CORRECT: 4/12

INCORRECT FORMS:

1,2;2,3;3,4	4/12
1;4,1;2+3	1/12
1,2;4,3	1/12
1,2;3,4	1/12
1;3+4,2	1/12

PATIENT FP
SUMMARY SCORE SHEET

(J145-156) S-S relative+Conjoined Theme
Example: L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille.

CORRECT FORMS: (Stage II: E = .042, df = 287, χ^2 = 2416.667, p = .0001*)

1,2+3;1,4	10/12
1,3+2;1,4	--
1,4;1,2+3	--
1,4;1,3+2	--

INCORRECT FORMS:

1,2+3;4,1	1/12
1,2;1,2+3	1/12

(J157-168) Conjoined clauses-4NPs(no deletion)(Baseline)
Example: La grenouille a frappé le singe et la vache a chatouillé l'éléphant.

CORRECT FORMS: (Stage II: E = .083, df = 143, χ^2 = 1457.832, p = .0001*)

1,2;3,4	11/12
3,4;1,2	--

INCORRECT FORMS:

1,2;4,3	1/12

PATIENT FP
SUMMARY SCORE SHEET

(G001-012) Dative-Theme cliticized
Example: La chèvre l'a offert à la vache.
CORRECT FORMS:
1,2,3 2=P 11/12
1,2,3 2≠P --

(Stage I: E = 2, df = 5, χ^2 = 49.00, p = .0001*)

INCORRECT FORMS:
1,3,2 2=P 1/12

(G013-024) Dative-Goal cliticized
Example: La vache lui a remis la chèvre.
CORRECT FORMS:
1,3,2 2=P 10/12
1,3,2 2≠P --

(Stage I: E = 2, df = 5, χ^2 = 40.00, p = .0001*)

INCORRECT FORMS:
1,2,3 2=P 2/12

(G025-036) Causative-Theme cliticized
Example: Le lapin l'a fait tenir par la chèvre.
CORRECT FORMS:
1,3;3,2 2=P 9/12
1,3;3,2 2≠P --
3,2;1,3 2=P --
3,2;1,3 2≠P --

(Stage I: E = .33, df = 35, χ^2 = 260.607, p = 0001*)

INCORRECT FORMS:
1,2;2,3 2=P 3/12

(G037-048) Causative-Causee cliticized
Example: L'éléphant lui a fait attraper la grenouille.
CORRECT FORMS:
1,2;2,3 2=P 12/12
1,2;2,3 2≠P --
2,3;1,2 2=P --
2,3;1,2 2≠P --

(Stage I: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

(G049-060) Causative-Reflexive "Causer"="Theme"
Example: La vache se fait saisir par le lapin.
CORRECT FORMS:
3,2=1 12/12
1,(3);3,2=1 --
3,2=1;1,(3) --
1,3;3,2=1 --
3,2,2=1;1,3 --

(Stage I: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

PATIENT FP
SUMMARY SCORE SHEET

(G061-072) Causative-Reflexive Causee
Example: La chèvre fait se serrer la vache.
CORRECT FORMS: (Stage I: E = .15, df = 80, χ^2 = 588.15, p = .0001*)

1,3;3,2=3	--
3,2=3;1,3	--
1,(3);3,2=3	--
3,2=3;1,(3)	--

INCORRECT FORMS:

1,(2);2,3 2≠P	9/12
3,2=1	3/12

(G073-084) Causative-Reflexive Causer=Goal
Example: La vache se fait remettre la chèvre par le lapin.
CORRECT FORMS: (Stage II: E = .67, df = 17, χ^2 = 170.15, p = .0001*)

4,3,2=1	7/12
1,4;4,3,2=1	--
4,3,2=1;1,4	--
1,(4);4,3,2=1	4/12
4,3,2=1;1,(4)	--

TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,(3);3,4,2=1	1/12

(G085-096) Causative-Reflexive Causer=Goal,Truncated
Example: La chèvre se fait offrir le lapin.
CORRECT FORMS: (Stage I: E = .67, df = 17, χ^2 = 202.985, p = .0001*)

X,3,2=1 X=P	10/12
X,3,2=1 X≠P	--
1,X;X,3,2=1 X=P	2/12
1,X;X,3,2=1 X≠P	--

TOTAL CORRECT: 12/12

(G097-108) Causative-Theme cliticized,Truncated
Example: La chèvre le fait serrer.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 133.335, p = .0001*)

1,X;X,2 X=P 2=P	6/12
1,X;X,2 X≠P 2≠P	--
X,2;1,X X=P 2=P	--
X,2;1,X X≠P 2≠P	--
1,X;X,2 X≠P 2=P	--

INCORRECT FORMS:

2,1 2=P	3/12
1,2 2=1	1/12
1,2;2,X X=P 2≠P	1/12
1;2,1 2=P	1/12

PATIENT FP
SUMMARY SCORE SHEET

(G109-120) Causative-Reflexive "Causer"="Theme",Truncated
Example: La chèvre se fait bousculer.

CORRECT FORMS:

X,2=1 X=P	12/12
X,2=1 X≠P	--
1,(X);X,2=1 X=P	--
1,(X);X,2=1 X≠P	--
1,X;X,2=1 X=P	--

(Stage I: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

(G121-132) Causative-Theme=Causee cliticized,Intransitive Verb
Example: L'éléphant le fait trembler.

CORRECT FORMS:

1,2;2V 2=P	9/12
1,2;2V 2≠P	1/12
2V;1,2 2=P	--
2V;1,2 2≠P	--

TOTAL CORRECT: 10/12

(Stage I: E = .67, df = 17, χ^2 = 140.299, p = .0001*)

INCORRECT FORMS:

2,1;1V 2=P	1/12
1,X;X,2 X=P 2=P	1/12

(G133-144) Cleft Object(CO2) with Stylistic Inversion
Example: C'est le lapin qu'a flatté l'éléphant.

CORRECT FORMS:

2,1	3/12

(Stage II: E = 6, df = 1, χ^2 = 3, p = .0833)

INCORRECT FORMS:

1,2	9/12

(G145-156) Subject-Object relative with Stylistic Inversion
Example: Le lapin qu'a gratté l'éléphant a frappé le singe.

CORRECT FORMS:

2,1;1,3	--
1,3;2,1	--

(Stage II: E = .33, df = 35, χ^2 = 200.001, p = .0001*)

INCORRECT FORMS:

1,2;3,2	2/12
1,2;2,3	8/12
2,1;3,1	1/12
1,2;1,3	1/12

(G157-168) Object-Object relative with Stylistic Inversion
Example: Le lapin a gratté la chèvre qu'a embrassée le singe.

CORRECT FORMS:

1,2;3,2	3/12
3,2;1,2	--

(Stage II: E = .33, df = 35, χ^2 = 212.122, p = .0001*)

INCORRECT FORMS:

1,2;2,3	8/12
1,2;1,3	1/12

PATIENT JR
SUMMARY SCORE SHEET

(M001-012) A2
Example: La grenouille a frappé le singe.
CORRECT FORMS: (Stage II: E 6, df = 1, χ^2 = 12.00, p = .0005*)
1,2 12/12

(M013-024) P2
Example: Le singe a été frappé par la grenouille.
CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = .333, p = .5637)
2,1 7/12

INCORRECT FORMS:
1,2 5/12

(M025-036) Truncated Passives
Example: Le singe a été frappé.
CORRECT FORMS: (Stage I: E = 6, df = 1, χ^2 = 12.00, p = .0005*)
2,1 12/12

(M037-048) C02
Example: C'est la vache que le lapin a embrassée.
CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = .333, p = .5637)
2,1 5/12

INCORRECT FORMS:
1,2 7/12

(M049-060) A3
Example: Le lapin a confié la vache à la chèvre.
CORRECT FORMS: (Stage II: E = 2, df = 5, χ^2 = 60.00, p = .0001*)
1,2,3 12/12

(M061-072) P3
Example: L'éléphant a été donné au singe par la grenouille.
CORRECT FORMS: (Stage II: E = 2, df = 5, χ^2 = 21.00, p = .0008*)
3,1,2 7/12

INCORRECT FORMS:
2,1,3 4/12
1,2,3 1/12

(M073-084) C03
Example: C'est la chèvre que le lapin a donnée à la vache.
CORRECT FORMS: (Stage II: E = 2, df = 5, χ^2 = 25.00, p = .0001*)
2,1,3 5/12

INCORRECT FORMS:
1,2,3 7/12

PATIENT JR
SUMMARY SCORE SHEET

(M085-096) CON
Example: Le singe a gratté le lapin et a caressé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 175.759, p = .0001*)

1,2;1,3	6/12
1,3;1,2	--

INCORRECT FORMS:

1,2;2,3	5/12
1,3;3,2	1/12

(M097-108) S-O
Example: Le singe que le lapin a saisi a bousculé la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 296.971, p = .0001*)

2,1;1,3	1/12
1,3;2,1	--

INCORRECT FORMS:

1,2;2,3	10/12
1,2;1,3	1/12

(M109-120) O-S
Example: La chèvre a frappé le lapin qui a saisi la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,2;2,3	12/12
2,3;1,2	--

(M121-132) O-O
Example: Le singe a chatouillé la grenouille que la chèvre a bousculée.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 187.88, p = .0001*)

1,2;3,2	4/12
3,2;1,2	--

INCORRECT FORMS:

1,2;2,3	7/12
1,3;3,2	1/12

(M133-144) S-S
Example: La grenouille qui a tenu la vache a attrapé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 303.032, p = .0001*)

1,2;1,3	2/12
1,3;1,2	--

INCORRECT FORMS:

1,2;2,3	10/12

PATIENT JR
SUMMARY SCORE SHEET

(M145-156) Active Conjoined Theme
Example: Le lapin a frappé la vache et la chèvre.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 132.00, p = .0001*)

1,2+3	12/12
1,3+2	--

(M157-168) Passive Conjoined Agent
Example: La grenouille a été caressée par la chèvre et la vache.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 68.00, p = .0001*)

2+3,1	8/12
3+2,1	--

INCORRECT FORMS:

1,2+3	4/12

PATIENT JR
SUMMARY SCORE SHEET

(J001-012) Direct Object Control,Intransitive Verb
Example: La grenouille a forcé le singe à bondir.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J013-024) Passivized Direct Object Control,Intransitive Verb
Example: La vache a été forcée par le lapin à danser.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 48.00, p = .0001*)

2,1;1V	9/12
1V;2,1	--

INCORRECT FORMS:

1,2;2V	3/12

(J025-036) Truncated Causative
Example: Le lapin a fait frapper la vache.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 175.759, p = .0001*)

1,X;X,2	1/12
1,(X);X,2	5/12
X,2;1,X	--
X,2;1,(X)	--

TOTAL CORRECT: 6/12

INCORRECT FORMS:

1,2-	5/12
1;1,2	1/12

(J037-048) Causative+Intransitive Verb
Example: La vache a fait danser le lapin.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J049-060) Direct Object Control+Transitive Verb
Example: Le lapin a forcé la chèvre à frapper la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,2;2,3	12/12
2,3;1,2	--

(J061-072) Passivized Direct Object Control+Transitive Verb
Example: La grenouille a été forcée par l'éléphant à caresser le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 260.607, p = .0001*)

2,1;1,3	3/12
1,3;2,1	--

INCORRECT FORMS:

1,2;2,3	9/12

PATIENT JR
SUMMARY SCORE SHEET

(J073-084) Causative (Faire-à)
Example: La grenouille a fait caresser le singe à l'éléphant.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 230.304, p = .0001*)

1,3;3,2	1/12		
1,(3);3,2	3/12		
3,2;1,3	--		
3,2;1,(3)	--	TOTAL CORRECT:	4/12

INCORRECT FORMS:

1,2;2,3	2/12
1,(2);2,3	6/12

(J085-096) Causative (Faire-par)
Example: Le lapin a fait frapper la vache par la chèvre.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 303.032, p = .0001*)

1,3;3,2	3/12		
1,(3);3,2	7/12		
3,2;1,3	--		
3,2;1,(3)	--	TOTAL CORRECT:	10/12

INCORRECT FORMS:

1,2;2,3	1/12
1,(2);2,3	1/12

(J097-108) Cleft Object-Causative (Faire-par)
Example: C'est l'éléphant que le singe a fait saisir par la grenouille.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 248.486, p = .0001*)

2,3;3,1	--
3,1;2,3	--
2,(3);3,1	--
3,1;2,(3)	--

INCORRECT FORMS:

1,2;2,3	6/12
1,(2);2,3	3/12
1,3;3,2	1/12
1-	1/12
1,(3);3,2	1/12

PATIENT JR
SUMMARY SCORE SHEET

(J109-120) Conjoined Causative
Example: La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.

(Stage II: E = .007, df = 1727, χ^2 = 2845.239, p < .0001)

CORRECT FORMS:

1,4;4,2;4,3	--
1,4,4,3;4,2	--
4,2;4,3;1,4	--
4,3;4,2;1,4	--
1,(4);4,2;4,3	--

INCORRECT FORMS:

1,2-	2/12
1,2-4	1/12
1,2;2,3;3,4	3/12
1;2,3-	1/12
1,2;3,4	1/12
1;-	1/12
1,2;4,3	1/12
1;-2-	1/12
1,2;3,2	1/12

(J121-132) Causative+Dative
Example: L'éléphant a fait apporter le singe à la grenouille par la vache.

(Stage II: E = .063, df = 191, χ^2 = 210.322, p = .1609)

CORRECT FORMS:

1,4;4,2,3	--
1,(4);4,2,3	1/12
4,2,3;1,4	--
4,2,3;1,(4)	--

TOTAL CORRECT: 1/12

INCORRECT FORMS:

1,2-	1/12
1;4,2-	1/12
1,(2);2,3,4	1/12
1,(3);3,2,4	2/12
1,2;2,3;3,4	1/12
1,3;3,4;4-	1/12
1,(2);2,3,-	1/12
1;2-	1/12
1,2;3,4	1/12
1,-	1/12

PATIENT JR

SUMMARY SCORE SHEET

(J133-144) Causative+S-S relative

Example: La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.

(Stage II: E = .007, df = 1727, χ^2 = 5988.096, p < .0001)

CORRECT FORMS:

1,3;3,2;3,4	1/12
1,3;3,4;3,2	--
3,2;3,4;1,3	--
3,4;3,2;1,3	--
3,4;1,3;3,2	--

INCORRECT FORMS:

0,0;0,0;0,0	1/12
1,2;3,4	6/12
1,3;3,2;2,4	1/12
1,2;2,4;4,3	1/12
1,2;2,3;3,4	1/12
1,2;2,4,3	1/12

(J145-156) S-S relative+Conjoined Theme

Example: L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille.

(Stage II: E = .042, df = 287, χ^2 = 559.525, p = .0001*)

CORRECT FORMS:

1,2+3;1,4	3/12
1,3+2;1,4	--
1,4;1,2+3	--
1,4;1,3+2	--

INCORRECT FORMS:

1,3+2;-,4	1/12
4,2;3;1+2,4	1/12
1,2+3;3,4	1/12
1,2+3;3+2,4	1/12
1,2+3;2+3,4	3/12
1,2+3;-,4	1/12
1,2,3;4,2+3	1/12

(J157-168) Conjoined clauses-4NPs(no deletion)(Baseline)

Example: La grenouille a frappé le singe et la vache a chatouillé l'éléphant.

(Stage II: E = .083, df = 143, χ^2 = 373.494, p = .0001*)

CORRECT FORMS:

1,2;3,4	4/12
3,4;1,2	--

INCORRECT FORMS:

1,2;3,-	1/12
1,2,3-	1/12
1,2;2,4	1/12
1,2;2,3;3,4	3/12
1,2;4,3	2/12

PATIENT JR
SUMMARY SCORE SHEET

(6001-012) Dative-Theme cliticized
Example: La chèvre l'a offert à la vache.
CORRECT FORMS:
1,2,3 2=P 11/12
1,2,3 2≠P --

(Stage I: E = 2, df = 5, χ^2 = 49.00, p = .0001*)

INCORRECT FORMS:
1,3,2 2=P 1/12

(6013-024) Dative-Goal cliticized
Example: La vache lui a remis la chèvre.
CORRECT FORMS:
1,3,2 2=P 11/12
1,3,2 2≠P --

(Stage I: E = 2, df = 5, χ^2 = 49.00, p = .0001*)

INCORRECT FORMS:
2,3,1 2=P 1/12

(6025-036) Causative-Theme cliticized
Example: Le lapin l'a fait tenir par la chèvre.
CORRECT FORMS:
1,3;3,2 2=P 11/12
1,3;3,2 2≠P --
3,2;1,3 2=P --
3,2;1,3 2≠P --

(Stage I: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

INCORRECT FORMS:
1,2;2,3 2=P 1/12

(6037-048) Causative-Causee cliticized
Example: L'éléphant lui a fait attraper la grenouille.
CORRECT FORMS:
1,2;2,3 2=P 9/12
1,2;2,3 2≠P --
2,3;1,2 2=P --
2,3;1,2 2≠P --

(Stage I: E = .33, df = 35, χ^2 = 260.607, p = .0001*)

INCORRECT FORMS:
1,3;3,2 2=P 3/12

(6049-060) Causative-Reflexive "Causer"="Theme"
Example: La vache se fait saisir par le lapin.
CORRECT FORMS:
3,2=1 10/12
1,(3);3,2=1 1/12
3,2=1;1,(3) --
1,3;3,2=1 --
3,2,2=1;1,3 -- TOTAL CORRECT: 11/12

(Stage I: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

INCORRECT FORMS:
X,2=1 X=P 1/12

PATIENT JR
SUMMARY SCORE SHEET

(6061-072) Causative-Reflexive Causee
Example: La chèvre fait se serrer la vache.
CORRECT FORMS: (Stage II: E = 3, df = 3, χ^2 = 36.00, p = .0001*)

1,3;3,2=3	--
3,2=3;1,3	--
1,(3);3,2=3	--
3,2=3;1,(3)	--

INCORRECT FORMS:

1,3	12/12

(6073-084) Causative-Reflexive Causer=Goal
Example: La vache se fait remettre la chèvre par le lapin.
CORRECT FORMS: (Stage II: E = .67, df = 17, χ^2 = 122.388, p = .0001*)

4,3,2=1	4/12
1,4;4,3,2=1	--
4,3,2=1;1,4	--
1,(4);4,3,2=1	5/12
4,3,2=1;1,(4)	--

TOTAL CORRECT: 9/12

INCORRECT FORMS:

1,(3);3,4.2=1	2/12
3,4,2=1	1/12

(6085-096) Causative-Reflexive Causer=Goal,Truncated
Example: La chèvre se fait offrir le lapin.
CORRECT FORMS: (Stage I: E = .67, df = 17, χ^2 = 140.299, p = .0001*)

X,3,2=1 X=P	4/12
X,3,2=1 X≠P	--
1,X;X,3,2=1 X=P	6/12
1,X;X,3,2=1 X≠P	--

TOTAL CORRECT: 10/12

INCORRECT FORMS:

1;2=1,3,X X=P	1/12
1;3,X,2=1 X=P	1/12

(6097-108) Causative-Theme cliticized,Truncated
Example: La chèvre le fait serrer.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 212.122, p = .0001*)

1,X;X,2 X=P 2=P	5/12
1,X;X,2 X≠P 2≠P	--
X,2;1,X X=P 2=P	--
X,2;1,X X≠P 2≠P	--
1,X;X,2 X≠P 2=P	--

INCORRECT FORMS:

1,2 2=P	7/12

PATIENT JR
SUMMARY SCORE SHEET

(6109-120) Causative-Reflexive "Causer"="Theme", Truncated
Example: La chèvre se fait bousculer.
CORRECT FORMS: (Stage I: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

X,2=1 X=P	12/12
X,2=1 X≠P	--
1,(X);X,2=1 X=P	--
1,(X);X,2=1 X≠P	--
1,X;X,2=1 X=P	--

(6121-132) Causative-Theme=Causee cliticized, Intransitive Verb
Example: L'éléphant le fait trembler.
CORRECT FORMS: (Stage I: E =1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V 2=P	12/12
1,2;2V 2≠P	--
2V;1,2 2=P	--
2V;1,2 2≠P	--

(6133-144) Cleft Object(CO2) with Stylistic Inversion
Example: C'est le lapin qu'a flatté l'éléphant.
CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 8.333, p = .0039*)

2,1	1/12

INCORRECT FORMS:

1,2	11/12

(6145-156) Subject-Object relative with Stylistic Inversion
Example: Le lapin qu'a gratté l'éléphant a frappé le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 296.971, p = .0001*)

2,1;1,3	1/12
1,3;2,1	--

INCORRECT FORMS:

1,3;3,2	1/12
1,2;2,3	10/12

(6157-168) Object-Object relative with Stylistic Inversion
Example: Le lapin a gratté la chèvre qu'a embrassée le singe.
CORRECT FORMS: (Stage II: E =.33, df = 35, χ^2 = 248.486, p = .0001*)

1,2;3,2	2/12
3,2;1,2	--

INCORRECT FORMS:

3,2;2,1	1/12
1,2;2,3	9/12

PATIENT CD
SUMMARY SCORE SHEET

(M001-012) A2
Example. La grenouille a frappé le singe.
CORRECT FORMS:
1,2 12/12

(Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

(M013-024) P2
Example: Le singe a été frappé par la grenouille.
CORRECT FORMS:
2,1 7/12

(Stage II: E = 6, df = 1, χ^2 = .333, p = .5637)

INCORRECT FORMS:
1,2 5/12

(M025-036) Truncated Passives
Example: Le singe a été frappé.
CORRECT FORMS:
X,1 12/12

(Stage I: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

(M037-048) CO2
Example: C'est la vache que le lapin a embrassée.
CORRECT FORMS:
2,1 6/12

(Stage II: E = 6, df = 1, χ^2 = 0, p = 1)

INCORRECT FORMS:
1,2 6/12

(M049-060) A3
Example: Le lapin a confié la vache à la chèvre.
CORRECT FORMS:
1,2,3 11/12

(Stage II: E = 2, df = 5, χ^2 = 49.00, p = .0001*)

INCORRECT FORMS:
2,1,3 1/12

(M061-072) P3
Example: L'éléphant a été donné au singe par la grenouille.
CORRECT FORMS:
3,1,2 --

(Stage II: E = 2, df = 5, χ^2 = 22.00, p = .0005*)

INCORRECT FORMS:
1,2,3 8/12
1,2;1,3 1/12
2,1,3 1/12
2,3,1 1/12
2,1;3,1 1/12

PATIENT CD
SUMMARY SCORE SHEET

(M073-084) CO3
Example: C'est la chèvre que le lapin a donnée à la vache.
CORRECT FORMS:
2,1,3 2/12

(Stage II: E = 2, df = 5, χ^2 = 23.00, p = .0003*)

INCORRECT FORMS:
1,3,2 1/12
1,2,3 8/12
2,1;3,1 1/12

(M085-096) CON
Example: Le singe a gratté le lapin et a caressé l'éléphant.
CORRECT FORMS:
1,2;1,3 6/12
1,3;1,2 --

(Stage II: E = .33, df = 35, χ^2 = 175.759 p = .0001*)

INCORRECT FORMS:
1,2;2,3 5/12
1,2;3,1 1/12

(M097-108) S-O
Example: Le singe que le lapin a saisi a bousculé la chèvre.
CORRECT FORMS:
2,1;1,3 --
1,3;2,1 --

(Stage II: E = .33, df = 35, χ^2 = 151.516, p = .0001*)

INCORRECT FORMS:
1,2;1,3 4/12
1,2;3,2 1/12
1,2;2,3 6/12
2,1;2,3 1/12

(M109-120) O-S
Example: La chèvre a frappé le lapin qui a saisi la vache.
CORRECT FORMS:
1,2;2,3 9/12
2,3;1,2 --

(Stage II: E = .33, df = 35, χ^2 = 260.607, p = .0001*)

INCORRECT FORMS:
1,2;1,3 3/12

(M121-132) O-O
Example: Le singe a chatouillé la grenouille que la chèvre a bousculée.
CORRECT FORMS:
1,2;3,2 2/12
3,2;1,2 --

(Stage II: E = .33, df = 35, χ^2 = 96.971, p = .0001*)

INCORRECT FORMS:
1,2;2,3 5/12
1,2;1,3 2/12
1,3;3,2 1/12
1,2;3,1 1/12
1,2;3,2;31 1/12

PATIENT CD
SUMMARY SCORE SHEET

(M133-144) S-S
Example: La grenouille qui a tenu la vache a attrapé l'éléphant.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 212.122, p = .0001*)

1,2;1,3	3/12
1,3;1,2	--

INCORRECT FORMS:

1,2;2,3	8/12
1,3;2,3	1/12

(M145-156) Active Conjoined Theme
Example: Le lapin a frappé la vache et la chèvre.

CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 110.00, p = .0001*)

1,2+3	11/12
1,3+2	--

INCORRECT FORMS:

3+2,1	1/12

(M157-168) Passive Conjoined Agent
Example: La grenouille a été caressée par la chèvre et la vache.

CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 50.00, p = .0001*)

2+3,1	5/12
3+2,1	--

INCORRECT FORMS:

1,2+3	6/12
1+2,3	1/12

PATIENT CD
SUMMARY SCORE SHEET

(J001-012) Direct Object Control, Intransitive Verb
Example: La grenouille a forcé le singe à bondir.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J013-024) Passivized Direct Object Control, Intransitive Verb
Example: La vache a été forcée par le lapin à danser.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 32.00, p = .0001*)

2,1;1V	1/12
1V;2,1	--

INCORRECT FORMS:

1,2;2V	7/12
1,2;1V	4/12

(J025-036) Truncated Causative
Example: Le lapin a fait frapper la vache.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 151.516, p = .0001*)

1,X;X,2	6/12
1,(X);X,2	--
X,2;1,X	--
X,2;1,(X)	--

INCORRECT FORMS:

1,2	3/12
1,2-	3/12

(J037-048) Causative+Intransitive Verb
Example: La vache a fait danser le lapin.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J049-060) Direct Object Control+Transitive Verb
Example: Le lapin a forcé la chèvre à frapper la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

1,2;2,3	11/12
2,3;1,2	--

INCORRECT FORMS:

1,2;3,2	1/12

PATIENT CD
SUMMARY SCORE SHEET

(J061-072) Passivized Direct Object Control+Transitive Verb
Example: La grenouille a été forcée par l'éléphant à caresser le singe.

(Stage II: E = .33, df = 35, χ^2 = 296.971, p = .0001*)

CORRECT FORMS:

2,1;1,3	1/12
1,3;2,1	--

INCORRECT FORMS:

1,2;2,3	10/12
1,2;1,3	1/12

(J073-084) Causative (Faire-à)
Example: La grenouille a fait caresser le singe à l'éléphant.

(Stage II: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

CORRECT FORMS:

1,3;3,2	1/12
1,(3);3,2	--
3,2;1,3	--
3,2;1,(3)	--

INCORRECT FORMS:

1,2;2,3	11/12

(J085-096) Causative (Faire-par)
Example: Le lapin a fait frapper la vache par la chèvre.

(Stage II: E = .33, df = 35, χ^2 = 248.486, p = .0001*)

CORRECT FORMS:

1,3;3,2	--
1,(3);3,2	--
3,2;1,3	--
3,2;1,(3)	--

INCORRECT FORMS:

1,2;1,3	2/12
1,2;2,3	9/12
1,2;2,1;2,3	1/12

(J097-108) Cleft Object-Causative (Faire-par)
Example: C'est l'éléphant que le singe a fait saisir par la grenouille.

(Stage II: E = .33, df = 35, χ^2 = 193.941, p = .0001*)

CORRECT FORMS:

2,3;3,1	--
3,1;2,3	--
2,(3);3,1	--
3,1;2,(3)	--

INCORRECT FORMS:

1,2;2,3	8/12
1,2;1,3	1/12
1,3;3,2	1/12
1,3-	1/12
1,2;3,2	1/12

PATIENT CD
SUMMARY SCORE SHEET

(J109-120) Conjoined Causative
Example: La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.
(Stage II: E = .007, df = 1727, χ^2 = 5988.096, p < .0001*)

CORRECT FORMS:

1,4;4,2;4,3	--
1,4;4,3;4,2	--
4,2;4,3;1,4	--
4,3;4,2;1,4	--
1,(4);4,2;4,3	--

INCORRECT FORMS:

1,2;2,3;3,4	6/12
1,2;1,3;3,4	1/12
1,2-	1/12
1,2;2,3;4,3	1/12
1,2;2,4;4,3	1/12
1,3;3,2;2,4	1/12
1,3;1,2;2,4	1/12

(J121-132) Causative+Dative
Example: L'éléphant a fait apporter le singe à la grenouille par la vache.
(Stage II: E = .063, df = 191, χ^2 = 242.068, p = .0073*)

CORRECT FORMS:

1,4;4,2,3	2/12
1,(4);4,2,3	--
4,2,3;1,4	--
4,2,3;1,(4)	--

INCORRECT FORMS:

1,3;2,4	1/12
1,2,3;3,4	1/12
1,2;2,3;3,4	2/12
1,2;2,3-	1/12
1,2;3,4	1/12
1,3;3,2;2,4	1/12
1,2;2,3;1,4	1/12
1,2;2,4-	1/12
2,1;2,3;2,4	1/12

PATIENT CD
SUMMARY SCORE SHEET

(J133-144) Causative+S-S relative
Example: La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.
CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 5988.096, $p < .0001$*)

1,3;3,2;3,4	--
1,3;3,4;3,2	--
3,2;3,4;1,3	--
3,4;3,2;1,3	--
3,4;1,3;3,2	--

INCORRECT FORMS:

1,2;2,3;2+3,4	1/12
1,2;2,3;1,4	1/12
1,3+2;2,4	1/12
1,2;2,4;4,3	1/12
1,2;2,3+4	1/12
2,4;4,1;1,3	1/12
1,2;2,3;3,4	6/12

(J145-156) S-S relative+Conjoined Theme
Example: L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille.
CORRECT FORMS: (Stage II: E = .042, df = 287, χ^2 = 607.144, $p = .0001$*)

1,2+3;1,4	3/12
1,3+2;1,4	1/12
1,4;1,2+3	--
1,4;1,3+2	--

TOTAL CORRECT: 4/12

INCORRECT FORMS:

1,3+4;3+4,2	1/12
1,2+4;1,3	2/12
1,2+3;2+3,4	3/12
1,2+3;2,4	1/12
1,2+3;X,2	1/12

(J157-168) Conjoined clauses-4NPs(no deletion)(Baseline)
Example: La grenouille a frappé le singe et la vache a chatouillé l'éléphant.
CORRECT FORMS: (Stage II: E = .083, df = 143, χ^2 = 445.783, $p = .0001$*)

1,2;3,4	5/12
3,4;1,2	--

INCORRECT FORMS:

1,2;2,3;3,4	3/12
1,3	1/12
1,2;4,3	1/12
1,2;4,2;2,3	1/12
1,3;1,2;1,4	1/12

PATIENT JD
SUMMARY SCORE SHEET

(M001-012) A2
Example: La grenouille a frappé le singe.
CORRECT FORMS:
1,2 12/12
(Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

(M013-024) P2
Example: Le singe a été frappé par la grenouille.
CORRECT FORMS:
2,1 5/12
(Stage II: E = 6, df = 1, ^{2} = .333, p = .5637)

INCORRECT FORMS:
1,2 7/12

(M025-036) Truncated Passives
Example: Le singe a été frappé.
CORRECT FORMS:
X,1 3/12
(Stage I: E = 6, df = 1, χ^2 = 3.00, p = .0833)

INCORRECT FORMS:
1,X 9/12

(M037-048) CO2
Example: C'est la vache que le lapin a embrassée.
CORRECT FORMS:
2,1 5/12
(Stage II: E = 6, df = 1, ^{2} = .333, p = .5637)

INCORRECT FORMS:
1,2 7/12

(M049-060) A3
Example: Le lapin a confié la vache à la chèvre.
CORRECT FORMS:
1,2,3 6/12
(Stage II: E = 2, df = 5, χ^2 = 12, p = .0348*)

INCORRECT FORMS:
1,3;3,2 1/12
1,2+3 1/12
1,2;2,3 3/12
1,2;1,3 1/12

(M061-072) P3
Example: L'éléphant a été donné au singe par la grenouille.
CORRECT FORMS:
3,1,2 --
(Stage II: E = 2, df = 5, χ^2 = 11, p = .0514)

INCORRECT FORMS:
1,2,3 2/12
1,2;2,3 3/12
2,1,3 1/12
1,3,2 1/12
1,2;1,3 2/12
1,2+3 2/12
1,3;3,2 1/12

PATIENT JD
SUMMARY SCORE SHEET

(M073-084) CO3
Example: C'est la chèvre que le lapin a donnée à la vache.
CORRECT FORMS: (Stage II: E = 2, df = 5, $\chi^2 = 4$, p = .5494)

2,1,3	1/12

INCORRECT FORMS:

1,2,3	3/12
1,3,2	2/12
1,2;2,3	3/12
1,2+3	3/12

(M085-096) CON
Example: Le singe a gratté le lapin et a caressé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, $\chi^2 = 212.122$, p = .0001*)

1,2;1,3	5/12
1,3;1,2	--

INCORRECT FORMS:

1,2;2,3	7/12

(M097-108) S-O
Example: Le singe que le lapin a saisi a bousculé la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, $\chi^2 = 357.577$, p = .0001*)

2,1;1,3	1/12
1,3;2,1	--

INCORRECT FORMS:

1,2;2,3	11/12

(M109-120) O-S
Example: La chèvre a frappé le lapin qui a saisi la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, $\chi^2 = 242.425$, p = .0001*)

1,2;2,3	9/12
2,3;1,2	--

INCORRECT FORMS:

1,3;3,2	1/12
2,1;1,3	1/12
2,1;2,3	1/12

(M121-132) O-O
Example: Le singe a chatouillé la grenouille que la chèvre a bousculée.
CORRECT FORMS: (Stage II: E = .33, df = 35, $\chi^2 = 296.971$, p = .0001*)

1,2;3,2	1/12
3,2;1,2	--

INCORRECT FORMS:

1,2;2,3	10/12
1,3;1,2	1/12

PATIENT JD
SUMMARY SCORE SHEET

(M133-144) S-S
Example: La grenouille qui a tenu la vache a attrapé l'éléphant.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 303.032, p = .0001*)

1,2;1,3	2/12
1,3;1,2	--

INCORRECT FORMS:

1,2;2,3	10/12

(M145-156) Active Conjoined Theme
Example: Le lapin a frappé la vache et la chèvre.

CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 44.00, p = .0001*)

1,2+3	7/12
1,3+2	--

INCORRECT FORMS:

2,1,3	1/12
1,2,3	1/12
1,2;2,3	2/12
2,1+3	1/12

(M157-168) Passive Conjoined Agent
Example: La grenouille a été caressée par la chèvre et la vache.

CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 24.00, p = .0127*)

2+3,1	2/12
3+2,1	--

INCORRECT FORMS:

1,2;2,3	5/12
2,1;2,3	1/12
1,2+3	2/12
1,2;1,3	1/12
3,1;1,2	1/12

PATIENT JD
SUMMARY SCORE SHEET

(J001-012) Direct Object Control, Intransitive Verb
Example: La grenouille a forcé le singe à bondir.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 69.333, p = .0001*)

1,2;2V	11/12
2V;1,2	--

INCORRECT FORMS:

2,1;1V	1/12

(J013-024) Passivized Direct Object Control, Intransitive Verb
Example: La vache a été forcée par le lapin à danser.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 25.333, p = .0007*)

2,1;1V	2/12
1V;2,1	--

INCORRECT FORMS:

1,2;2V	6/12
1,2;1V	4/12

(J025-036) Truncated Causative
Example: Le lapin a fait frapper la vache.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 303.032, p = .0001*)

1,X;X,2	2/12
1,(X);X,2	--
X,2;1,X	--
X,2;1,(X)	--

INCORRECT FORMS:

1,2-	10/12

(J037-048) Causative+Intransitive Verb
Example: La vache a fait danser le lapin.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J049-060) Direct Object Control+Transitive Verb
Example: Le lapin a forcé la chèvre à frapper la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 296.971, p = .0001*)

1,2;2,3	10/12
2,3;1,2	--

INCORRECT FORMS:

1,3;3,2	1/12
2,1;1,3	1/12

PATIENT JD
SUMMARY SCORE SHEET

(J061-072) Passivized Direct Object Control+Transitive Verb
Example: La grenouille a été forcée par l'éléphant à caresser le singe.

(Stage II: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

CORRECT FORMS:

2,1;1,3	--
1,3;2,1	--

INCORRECT FORMS:

1,2;2,3	11/12
1,3;3,2	1/12

(J073-084) Causative (Faire-à)
Example: La grenouille a fait caresser le singe à l'éléphant.

(Stage II: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

CORRECT FORMS:

1,3;3,2	1/12
1,(3);3,2	--
3,2;1,3	--
3,2;1,(3)	--

INCORRECT FORMS:

1,2;2,3	11/12

(J085-096) Causative (Faire-par)
Example: Le lapin a fait frapper la vache par la chèvre.

(Stage II: E = .33, df = 35, χ^2 = 303.032, p = .0001*)

CORRECT FORMS:

1,3;3,2	2/12
1,(3);3,2	--
3,2;1,3	--
3,2;1,(3)	--

INCORRECT FORMS:

1,2;2,3	10/12

(J097-108) Cleft Object-Causative (Faire-par)
Example: C'est l'éléphant que le singe a fait saisir par la grenouille.

(Stage II: E = .33, df = 35, χ^2 = 248.486, p = .0001*)

CORRECT FORMS:

2,3;3,1	--
3,1;2,3	--
2,(3);3,1	--
3,1;2,(3)	--

INCORRECT FORMS:

1,2;2,3	9/12
1,3	1/12
1,3;3,2	2/12

PATIENT JD
SUMMARY SCORE SHEET

(J109-120) Conjoined Causative
Example: La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.

(Stage II: E = .007, df = 1727, χ^2 = 1988.096, p < .0001)

CORRECT FORMS:

1,4;4,2;4,3	--
1,4;4,3;4,2	--
4,2;4,3;1,4	--
4,3;4,2;1,4	--
1,(4);4,2;4,3	--

INCORRECT FORMS:

1,2;2,4;4,3	1/12
1,2;3,4-	1/12
4,1;1,3;3,2	1/12
1,2;2,4-	1/12
1,2;4,3;2,4	1/12
1,2;2,3;3,4	2/12
1,3;3,4;4,2	1/12
2,3;3,1;1,4	1/12
2,3;1,4	1/12
2,1;3,4	1/12
2,1;1,3;3,4	1/12

(J121-132) Causative+Dative
Example: L'éléphant a fait apporter le singe à la grenouille par la vache.

(Stage II: E = .063, df = 191, χ^2 = 337.306, p = .0001*)

CORRECT FORMS:

1,4;4,2,3	1/12
1,(4);4,2,3	--
4,2,3;1,4	--
4,2,3;1,(4)	--

INCORRECT FORMS:

1,2;2,3,4	1/12
1,3;3,2;2,4	2/12
1,2;2,3;3,4	3/12
1,4;4,3;3,2	2/12
1,2;2,4	1/12
2,1;1,3;3,4	1/12
1,2;2,3;2,4	1/12

PATIENT JD
SUMMARY SCORE SHEET

(J133-144) Causative+S-S relative
Example: La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.
CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 5130.953, p < .0001*)

1,3;3,2;3,4	--
1,3;3,4;3,2	--
3,2;3,4;1,3	--
3,4;3,2;1,3	--
3,4;1,3;3,2	--

INCORRECT FORMS:

1,2;2,3;3,4	5/12
1,4;4,3;3,2	1/12
1,2+3;2+3,4	2/12
3,2;2,1;1,4	1/12
1,2;2,4;4,3	2/12
2,1;1,3;3,4	1/12

(J145-156) S-S relative+Conjoined Theme
Example: L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille.
CORRECT FORMS: (Stage II: E = .042, df = 287, χ^2 = 607.144, p = .0001*)

1,2+3;1,4	1/12
1,3+2;1,4	--
1,4;1,2+3	--
1,4;1,3+2	--

INCORRECT FORMS:

2,1;3,4;3V	1/12
1,2+-;4,3	1/12
3,1;1,2;2,4	1/12
1,2+3;2+3,4	4/12
1,2;2,4;4,3	1/12
1,4+3;4+3,2	1/12
1,4+2;4+2,3	2/12

(J157-168) Conjoined clauses-4NPs(no deletion)(Baseline)
Example: La grenouille a frappé le singe et la vache a chatouillé l'éléphant.
CORRECT FORMS: (Stage II: E = .083, df = 143, χ^2 = 301.205, p = .0001*)

1,2;3,4	--
3,4;1,2	--

INCORRECT FORMS:

1,2;2,4;3V	1/12
1,4;4,3;3,2	1/12
1,2;4,3	1/12
1,4;3,2	2/12
1,2+3;2+3,4	1/12
1,2;2,3;3,4	4/12
2,1;1,4;4,3	1/12
1,3;3,4;4,2	1/12

PATIENT PR
SUMMARY SCORE SHEET

(M001-012) A2
Example: La grenouille a frappé le singe.
CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)
1,2 12/12

(M013-024) P2
Example: Le singe a été frappé par la grenouille.
CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 8.333, p = .0039*)
2,1 11/12

INCORRECT FORMS:
1,2 1/12

(M025-036) Truncated Passives
Example: Le singe a été frappé.
CORRECT FORMS: (Stage I: E = 6, df = 1 , χ^2 = 12.00, p = .0005*)
X,1 --

INCORRECT FORMS:
1,X 12/12

(M037-048) CO2
Example: C'est la vache que le lapin a embrassée.
CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 0, p = 1)
2,1 6/12

INCORRECT FORMS:
1,2 5/12
1,X 1/12

(M049-060) A3
Example: Le lapin a confié la vache à la chèvre.
CORRECT FORMS: (Stage II: E = 2, df = 5, χ^2 = 49.00, p = .0001*)
1,2,3 11/12

INCORRECT FORMS:
2,1,3 1/12

(M061-072) P3
Example: L'éléphant a été donné au singe par la grenouille.
CORRECT FORMS: (Stage II: E = 2, df = 5, χ^2 = 25.00, p = .0001*)
3,1,2 8/12

INCORRECT FORMS:
1,2,3 3/12
2,1,3 1/12

PATIENT PR
SUMMARY SCORE SHEET

(M073-084) C03
Example: C'est la chèvre que le lapin a donnée à la vache.
CORRECT FORMS: (Stage II: E = 2, df = 5, χ^2 = 33.00, p = .0001*)
2,1,3 3/12

INCORRECT FORMS:
1,2,3 9/12

(M085-096) CON
Example: Le singe a gratté le lapin et a caressé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 357.577, p = .0001*)
1,2;1,3 1/12
1,3;1,2 --

INCORRECT FORMS:
1,2;2,3 11/12

(M097-108) S-O
Example: Le singe que le lapin a saisi a bousculé la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 260.607, p = .0001*)
2,1;1,3 3/12
1,3;2,1 --

INCORRECT FORMS:
1,2;2,3 9/12

(M109-120) O-S
Example: La chèvre a frappé le lapin qui a saisi la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 303.032, p = .0001*)
1,2;2,3 10/12
2,3;1,2 --

INCORRECT FORMS:
2,1;1,3 2/12

(M121-132) O-O
Example: Le singe a chatouillé la grenouille que la chèvre a bousculée.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 121.213, p = .0001*)
1,2;3,2 2/12
3,2;1,2 --

INCORRECT FORMS:
1,2;2,3 6/12
2,1;1,3 1/12
3,2;2,1 1/12
1,2;3,1 1/12
1,3;-,- 1/12

PATIENT PR
SUMMARY SCORE SHEET

(M133-144) S-S
Example: La grenouille qui a tenu la vache a attrapé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 303.032, p = .0001*)

1,2;1,3	2/12
1,3;1,2	--

INCORRECT FORMS:

1,2;2,3	10/12

(M145-156) Active Conjoined Theme
Example: Le lapin a frappé la vache et la chèvre.
CORRECT FORMS: (Stage II: F = 1, df = 11, χ^2 = 110.00, p .0001*)

1,2+3	11/12
1,3+2	--

INCORRECT FORMS:

2,1+3	1/12

(M157-168) Passive Conjoined Agent
Example: La grenouille a été caressée par la chèvre et la vache.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 62.00, p = .0001*)

2+3,1	5/12
3+2,1	--

INCORRECT FORMS:

1,2+3	7/12

PATIENT PR
SUMMARY SCORE SHEET

(J001-012) Direct Object Control, Intransitive Verb
Example: La grenouille a forcé le singe à bondir.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 69.333, p = .0001*)

1,2;2V	11/12
2V;1,2	--

INCORRECT FORMS:

1,2;1V	1/12

(J013-024) Passivized Direct Object Control, Intransitive Verb
Example: La vache a été forcée par le lapin à danser.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 34.667, p = .0001*)

2,1;1V	8/12
1V;2,1	--

INCORRECT FORMS:

1,2;1V	2/12
1,2;2V	1/12
2,1;2V	1/12

(J025-036) Truncated Causative
Example: Le lapin a fait frapper la vache.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

1,X;X,2	--
1,(X);X,2	--
X,2;1,X	--
X,2;1,(X)	--

INCORRECT FORMS:

1,2-	11/12
X,1-	1/12

(J037-048) Causative+Intransitive Verb
Example: La vache a fait danser le lapin.
CORRECT FORMS: (Stage II: E : 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J049-060) Direct Object Control+Transitive Verb
Example: Le lapin a forcé la chèvre à frapper la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,2;2,3	12/12
2,3;1,2	--

PATIENT PR
SUMMARY SCORE SHEET

(J061-072) Passivized Direct Object Control+Transitive Verb
Example: La grenouille a été forcée par l'éléphant à caresser le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 175.759, p = .0001*)

2,1;1,3	5/12
1,3;2,1	--

INCORRECT FORMS:

1,2;2,3	6/12
1,3;3,2	1/12

(J073-084) Causative (Faire-à)
Example: La grenouille a fait caresser le singe à l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 260.607, p = .0001*)

1,3;3,2	3/12
1,(3);3,2	--
3,2;1,3	--
3,2;1,(3)	--

INCORRECT FORMS:

1,2;2,3	3/12
1,(2);2,3	6/12

(J085-096) Causative (Faire-par)
Example: Le lapin a fait frapper la vache par la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 139.395, p = .0001*)

1,3;3,2	3/12
1,(3);3,2	--
3,2;1,3	--
3,2;1,(3)	--

INCORRECT FORMS:

1,(2);2,3	1/12
1,2;3,2	2/12
1,2;2,3	5/12
1;2,-;3,-	1/12

(J097-108) Cleft Object-Causative (Faire-par)
Example: C'est l'éléphant que le singe a fait saisir par la grenouille.
CORRECT FORMS: (Stage II: E = .33, df - 35, χ^2 = 157.577, p = .0001*)

2,3;3,1	--
3,1;2,3	--
2,(3);3,1	--
3,1;2,(3)	--

INCORRECT FORMS:

1,2;2,3	7/12
1,2;2,-;3,2	1/12
2,1;1,3	2/12
1,3-	1/12
1,2;3-	1/12

PATIENT PR
SUMMARY SCORE SHEET

(J109-120) Conjoined Causative
Example: La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.
CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 2845.239, p < .0001*)

1,4;4,2;4,3	--
1,4;4,3;4,2	--
4,2;4,3;1,4	--
4,3;4,2;1,4	--
1,(4);4,2;4,3	--

INCORRECT FORMS:

1,(2);2,3;3,4	1/12
1,2+3;2+3,4	3/12
1,3+4;2,4	1/12
1,(2);2,4;4,3	1/12
1,4;2,3	1/12
1,2;3,4	2/12
1,2;3+4,2	1/12
2,1+3;1+3,4	1/12
2,3;1,4	1/12

(J121-132) Causative+Dative
Example: L'éléphant a fait apporter le singe à la grenouille par la vache.
CORRECT FORMS: (Stage II: E = .063, df = 287, χ^2 = 400.798, p = .0001*)

1,4;4,2,3	1/12
1,(4);4,2,3	1/12
4,2,3;1,4	--
4,2,3;1,(4)	--

TOTAL CORRECT: 2/12

INCORRECT FORMS:

1,2;3,4	1/12
1;3,-2,-4	1/12
1,3;3,2;2,4	1/12
1,3;3,2-	1/12
1,2;2,3;3,4	3/12
1,(2);2,3,4	1/12
1;2,-3,4	1/12
1,2;4,3	1/12

PATIENT PR

SUMMARY SCORE SHEET

(J133-144) Causative+S-S relative

Example: La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.

CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 4559.525, p < .0001*)

1,3;3,2;3,4	--
1,3;3,4;3,2	--
3,2;3,4;1,3	--
3,4;3,2;1,3	--
3,4;1,3;3,2	--

INCORRECT FORMS:

1,2;3,4	5/12
1,2;2,3;3,4	1/12
1,3;4,2	1/12
3,1;2,4	1/12
1,2;4,3	1/12
1,2;2,3,4-	1/12
1,3;3,2;2,4	1/12
1,2+3,4	1/12

(J145-156) S-S relative+Conjoined Theme

Example: L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille.

CORRECT FORMS: (Stage II: E = .042, df = 288, χ^2 = 654.763, p = .00[illegible])

1,2+3;1,4	4/12
1,3+2;1,4	1/12
1,4;1,2+3	--
1,4;1,3+2	--

TOTAL CORRECT: 5/12

INCORRECT FORMS:

1,2+3;2+3;1,4	1/12
4,1;3,2	1/12
1,2+3;2+3,4	2/12
1,3+2;3+2,4	2/12
1,2+3;2,4	1/12

(J157-168) Conjoined clauses-4NPs(no deletion)(Baseline)

Example: La grenouille a frappé le singe et la vache a chatouillé l'éléphant.

CORRECT FORMS: (Stage II: E = .083, df = 143, χ^2 = 662.651, p = .0001*)

1,2;3,4	7/12
3,4;1,2	--

INCORRECT FORMS:

1,2+3;2+3,4	1/12
4,2;3,1	1/12
1,2;4,3	2/12
1,3;2,4	1/12

PATIENT PR
SUMMARY SCORE SHEET

(G001-012) Dative-Theme cliticized
Example: La chèvre l'a offert à la vache.

(Stage I: E = 2, df = 5, χ^2 = 19.00, p = .0019*)

CORRECT FORMS:

1,2,3 2=P	--
1,2,3 2≠P	--

INCORRECT FORMS:

2,3- 2=P	1/12
1,-,3	5/12
1,3-	6/12

(G013-024) Dative-Goal cliticized
Example: La vache lui a remis la chèvre.

(Stage I: E = 2, df = 5, χ^2 = 49.00, p =.0001*)

CORRECT FORMS:

1,3,2 2=P	--
1,3,2 2≠P	--

INCORRECT FORMS:

1,3-	11/12
2,3,- 2=P	1/12

(G025-036) Causative-Theme cliticized
Example: Le lapin l'a fait tenir par la chèvre.

(Stage I: E = .33, df = 35, χ^2 = 212.122, p = .0001*)

CORRECT FORMS:

1,3;3,2 2=P	--
1,3;3,2 2≠P	--
3,2;1,3 2=P	--
3,2;1,3 2≠P	--

INCORRECT FORMS:

1,3-	8/12
1;3-	3/12
1;3,1-	1/12

(G037-048) Causative-Causee cliticized
Example: L'éléphant lui a fait attraper la grenouille.

(Stage I: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

CORRECT FORMS:

1,2;2,3 2=P	--
1,2;2,3 2≠P	--
2,3;1,2 2=P	--
2,3;1,2 2≠P	--

INCORRECT FORMS:

1,3-	12/12

PATIENT PR
SUMMARY SCORE SHEET

(6049-060) Causative-Reflexive "Causer"="Theme"
Example: La vache se fait saisir par le lapin.
CORRECT FORMS:

(Stage I: E = .33, df = 35, χ^2 = 151.516, p = .0001*)

3,2=1	2/12
1,(3);3,2=1	4/12
3,2=1;1,(3)	--
1,3;3,2=1	--
3,2,2=1;1,3	--

TOTAL CORRECT: 6/12

INCORRECT FORMS:

1,3	3/12
X,3 X=P	3/12

(6061-072) Causative-Reflexive Causee
Example: La chèvre fait se serrer la vache.
CORRECT FORMS:

(Stage I: E = .15, df = 80, χ^2 = 241.483, p = .0001*)

1,3;3,2=3	--
3,2=3;1,3	--
1,(3);3,2=3	1/12
3,2=3;1,(3)	--

TOTAL CORRECT: 1/12

INCORRECT FORMS:

1,(2);2,3 2≠P	1/12
3,1	3/12
1,3	5/12
1,(3);3,2=1	1/12
1-	1/12

(6073-084) Causative-Reflexive Causer=Goal
Example: La vache se fait remettre la chèvre par le lapin.
CORRECT FORMS:

(Stage I: E = .67, df = 17, χ^2 = 38.806, p = .0019*)

4,3,2=1	--
1,4;4,3,2=1	--
4,3,2=1;1,4	--
1,(4);4,3,2=1	--
4,3,2=1;1,(4)	--

INCORRECT FORMS:

4,2=1,3	1/12
1;-,3,4	1/12
1,3,4	2/12
1;3+4,-	1/12
1,3,-,4	1/12
1,3;3,4	4/12
1,(3);3,4	1/12
1,(4);4,3,-	1/12

PATIENT PR
SUMMARY SCORE SHEET

(G085-096) Causative-Reflexive Causer=Goal, Truncated
Example: La chèvre se fait offrir le lapin.

(Stage I: E = .67, df = 17, χ^2 = 140.299, p = .0001*)

CORRECT FORMS:

X,3,2=1 X=P	--
X,3,2=1 X≠P	--
1,X;X,3,2=1 X=P	--
1,X;X,3,2=1 X≠P	--

INCORRECT FORMS:

1-	1/12
1,X X=P	1/12
1,3-	10/12

(G097-108) Causative-Theme cliticized, Truncated
Example: La chèvre le fait serrer.

(Stage I: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

CORRECT FORMS:

1,X;X,2 X=P 2=P	--
1,X;X,2 X≠P 2≠P	--
X,2;1,X X=P 2=P	--
X,2;1,X X≠P 2≠P	--
1,X;X,2 X≠P 2=P	--

INCORRECT FORMS:

1,-	11/12
X- X=P	1/12

(G109-120) Causative-Reflexive "Causer"="Theme", Truncated
Example: La chèvre se fait bousculer.

(Stage I: E = 6, df = 1, χ^2 = 8.333, p = .0039)

CORRECT FORMS:

X,2=1 X=P	--
X,2=1 X≠P	--
1,(X);X,2=1 X=P	--
1,(X);X,2=1 X≠P	--
1,X;X,2=1 X=P	--

INCORRECT FORMS:

1-	11/12
2,1=2	1/12

(G121-132) Causative-Theme=Causee cliticized, Intransitive Verb
Example: L'éléphant le fait trembler.

(Stage I: E = 1.5, df = 7, χ^2 = 69.333, p = .0001*)

CORRECT FORMS:

1,2;2V 2=P	--
1,2;2V 2≠P	--
2V;1,2 2=P	--
2V;1,2 2≠P	--

INCORRECT FORMS:

1,-	11/12
2V 2=P	1/12

PATIENT PR
SUMMARY SCORE SHEET

(6133-144) Cleft Object(CO2) with Stylistic Inversion
Example: C'est le lapin qu'a flatté l'éléphant.
CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)
2,1 --

INCORRECT FORMS:
1,2 12/12

(6145-156) Subject-Object relative with Stylistic Inversion
Example: Le lapin qu'a gratté l'éléphant a frappé le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 157.577, p = .0001*)
2,1;1,3 2/12
1,3;2,1 --

INCORRECT FORMS:
1,2;2,3 6/12
1,2;1,3 4/12

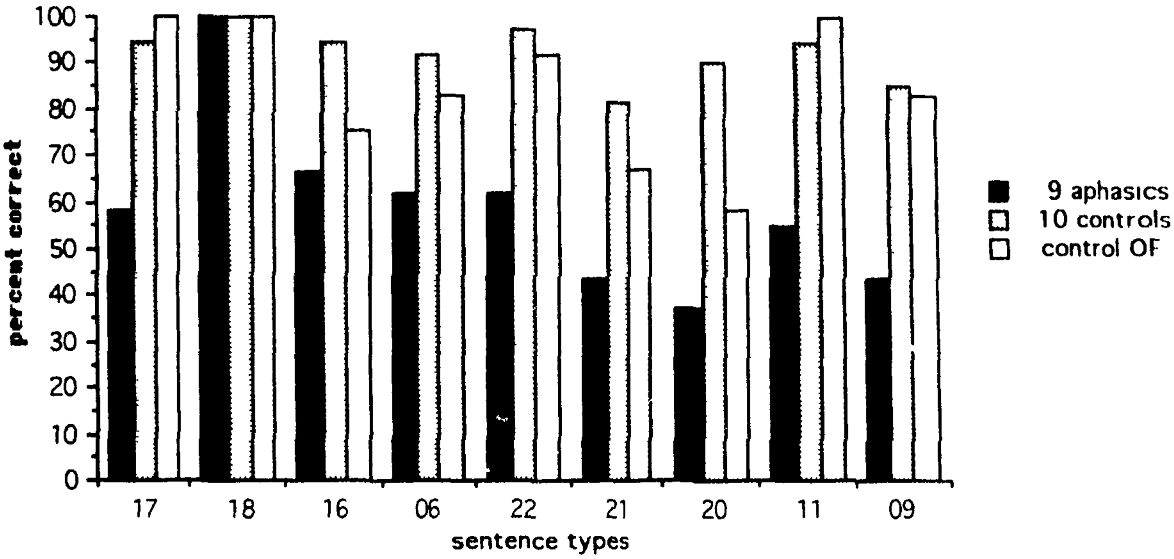
(6157-168) Object-Object relative with Stylistic Inversion
Example: Le lapin a gratté la chèvre qu'a embrassée le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)
1,2;3,2 --
3,2;1,2 --

INCORRECT FORMS:
1,2;2,3 12/12

Table A.B.1. Summary Results of Control OF

	% Correct
Active	100
Truncated Passive	
Dative	
Conjoined	
Object-Object Relative	
Subject-Subject Relative	
Active Conjoined Theme	
Direct Object Control, Intransitive Verb	
Truncated Causative	
Causative + Intransitive Verb	
Direct Object Control + Transitive Verb	
Dative-Theme cliticized	
Dative-Goal cliticized	
Causative-Theme cliticized	
Causative-Causee cliticized	
Causative-Reflexive Causer=Theme	
Causative-Reflexive Causer=Goal	
Causative-Reflexive Causer=Goal, Truncated	
Causative-Theme cliticized, Truncated	
Causative-Reflexive Causer=Theme, Truncated	
Causative-Theme=Causee cliticized, Intransitive Verb	
Passive	92
Cleft Object	
Object-Subject Relative	
Passive Conjoined Agent	
Causative (Faire-par)	
Causative + Dative	
Conjoined Clauses 4 NPs (No Deletion) (Baseline)	
Object-Object Relative with Stylistic Inversion	
Dative Passive	83
Subject-Object Relative	
SS Relative + Conjoined Theme	
Passivized Direct Object Control, Intransitive Verb	75
Conjoined Causative	
Causative + SS Relative	
Cleft-Object Dative	67
Passivized Direct Object Control + Transitive Verb	58
Causative (Faire-à)	
Cleft-Object Causative (Faire-par)	17
Subject-Object Relative with Stylistic Inversion	8
Causative-Reflexive Causee	0
Cleft-Object with Stylistic Inversion	

Figure A.B.1. Accuracy Rate of Control OF - 'Sentence Contrasts 1'



[17] Truncated Causative
[18] Causative + Intransitive Verb
[16] Passivized Direct Object Control, Intransitive Verb
[06] Dative Passive
[22] Causative (Faire-par)
[21] Causative (Faire-à)
[20] Passivized Direct Object Control + Transitive Verb
[11] Object-Object Relative
[09] Subject-Object Relative

CONTROL OF
SUMMARY SCORE SHEET

(M001-012) A2
Example: La grenouille a frappé le singe.
CORRECT FORMS: (Stage II: E = 6, df = 1,
1,2 12/12 χ^2 = 12.00, p = .0005*)

(M013-024) P2
Example: Le singe a été frappé par la grenouille.
CORRECT FORMS: (Stage II: E = 6, df = 1,
2,1 11/12 χ^2 = 8.333, p = .0039*)

INCORRECT FORMS:
1,2 1/12

(M025-036) Truncated Passives
Example: Le singe a été frappé.
CORRECT FORMS: (Stage I: E = 6, df = 1,
X,1 12/12 χ^2 = 12.00, p = .0005*)

(M037-048) CO2
Example: C'est la vache que le lapin a embrassée.
CORRECT FORMS: (Stage II: E = 6, df = 1,
2,1 11/12 χ^2 = 8.333, p = .0039*)

INCORRECT FORMS:
1,2 1/12

(M049-060) A3
Example: Le lapin a confié la vache à la chèvre.
CORRECT FORMS: (Stage II: E = 2, df = 5,
1,2,3 12/12 χ^2 = 60.00, p = .0001*)

(M061-072) P3
Example: L'éléphant a été donné au singe par la grenouille.
CORRECT FORMS: (Stage II: E = 2, df = 5,
3,1,2 10/12 χ^2 = 39.00, p = .0001*)

INCORRECT FORMS:
1,2,3 1/12
3,2,1 1/12

(M073-084) CO3
Example: C'est la chèvre que le lapin a donnée à la vache.
CORRECT FORMS: (Stage II: E = 2, df = 5,
2,1,3 8/12 χ^2 = 28.00, p = .0001*)

INCORRECT FORMS:
1,2,3 4/12

CONTROL OF
SUMMARY SCORE SHEET

(M085-096) CON
Example: Le singe a gratté le lapin et a caressé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,2;1,3	12/12
1,3;1,2	--

(M097-108) S-O
Example: Le singe que le lapin a saisi a bousculé la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 296.971, p = .0001*)

2,1;1,3	10/12
1,3;2,1	--

INCORRECT FORMS:

1,2;2,3	1/12
2,1;2,3	1/12

(M109-120) O-S
Example: La chèvre a frappé le lapin qui a saisi la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 357.77, p = .0001*)

1,2;2,3	11/12
2,3;1,2	--

INCORRECT FORMS:

1,2;1,3	1/12

(M121-132) O-O
Example: Le singe a chatouillé la grenouille que la chèvre a bousculée.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = ,0001*)

1,2;3,2	12/12
3,2;1,2	--

(M133-144) S-S
Example: La grenouille qui a tenu la vache a attrapé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,2;1,3	12/12
1,3;1,2	--

(M145-156) Active Conjoined Theme
Example: Le lapin a frappé la vache et la chèvre.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 132.00, p = .0001*)

1,2+3	12/12
1,3+2	--

CONTROL OF
SUMMARY SCORE SHEET

(M157-168) Passive Conjoined Agent
Example: La grenouille a été caressée par la chèvre et la vache.
(Stage II: E = 1, df = 11, χ^2 = 110.00, p = .0001*)

CORRECT FORMS:

2+3,1	11/12
3+2,1	--

INCORRECT FORMS:

1+2,3	1/12

CONTROL OF
SUMMARY SCORE SHEET

(J001-012) Direct Object Control, Intransitive Verb
Example: La grenouille a forcé le singe à bondir.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p .0001*)
1,2;2V 12/12
2V;1,2 --

(J013-024) Passivized Direct Object Control, Intransitive Verb
Example: La vache a été forcée par le lapin à danser.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 48.00, p = .0001*)
2,1;1V 9/12
1V;2,1 --

INCORRECT FORMS:
1,2;2V 3/12

(J025-036) Truncated Causative
Example: Le lapin a fait frapper la vache.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 424.244, p = .0001*)
1,X;X,2 --
1,(X);X,2 12/12
X,2;1,X --
X,2;1,(X) -- TOTAL CORRECT: 12/12

(J037-048) Causative+Intransitive Verb
Example: La vache a fait danser le lapin.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)
1,2;2V 12/12
2V;1,2 --

(J049-060) Direct Object Control+Transitive Verb
Example: Le lapin a forcé la chèvre à frapper la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 424.244, p = .0001*)
1,2;2,3 12/12
2,3;1,2 --

(J061-072) Passivized Direct Object Control+Transitive Verb
Example: La grenouille a été forcée par l'éléphant à caresser le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 212.122, p = .0001*)
2,1;1,3 7/12
1,3;2,1 --

INCORRECT FORMS:
1,2;2,3 5/12

CONTROL OF
SUMMARY SCORE SHEET

(J073-084) Causative (Faire-à)
Example: La grenouille a fait caresser le singe à l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 187.88, p = .0001*)

1,3;3,2	--
1,(3);3,2	7/12
3,2;1,3	--
3,2;1,(3)	--

TOTAL CORRECT: 7/12

INCORRECT FORMS:

1,(2);2,3	4/12
1,(X);X,2,3	1/12

(J085-096) Causative (Faire-par)
Example: Le lapin a fait frapper la vache par la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

1,3;3,2	3/12
1,(3);3,2	8/12
3,2;1,3	--
3,2;1,(3)	--

TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,2;2,3	1/12

(J097-108) Cleft Object-Causative (Faire-par)
Example: C'est l'éléphant que le singe a fait saisir par la grenouille.
CORRECT FORMS: (Stage II : E = .33, df = 35, χ^2 = 206.062, p = .0001*)

2,3;3,1	--
3,1;2,3	--
2,(3);3,1	2/12
3,1;2,(3)	--

TOTAL CORRECT: 2/12

INCORRECT FORMS:

1,(3);3,2	8/12
1,(2);2,3	2/12

(J109-120) Conjoined Causative
Example: La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.
CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 11988.096, $p < .0001$*)

1,4;4,2;4,3	--
1,4;4,3;4,2	--
4,2;4,3;1,4	--
4,3;4,2;1,4	--
1,(4);4,2;4,3	9/12

TOTAL CORRECT: 9/12

INCORRECT FORMS:

1,(3);3,2;3,4	1/12
1,2+3;1,4	1/12
1,(2);2,3;2,4	1/12

CONTROL OF
SUMMARY SCORE SHEET

(J121-132) Causative+Dative
Example: L'éléphant a fait apporter le singe à la grenouille par la vache.
CORRECT FORMS:

1,4;4,2,3	--	
1,(4);4,2,3	11/12	
4,2,3;1,4	--	
4,2,3;1,(4)	--	TOTAL CORRECT: 11/12

(Stage II: E = .063, df = 191, χ^2 = 1924.607, p = .0001*)

INCORRECT FORMS:

1,(4);4,3,2	1/12

(J133-144) Causative+S-S relative
Example: La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.
CORRECT FORMS:

(Stage II: E = .007, df = 1727, χ^2 = 11988.096, p < .0001*)

1,3;3,2;3,4	9/12
1,3;3,4;3,2	--
3,2;3,4;1,3	--
3,4;3,2;1,3	--
3,4;1,3;3,2	--

INCORRECT FORMS:

1,2;2,3;2,4	1/12
1,2;2,3;3,4	1/12
1,3;3,2;2,4	1/12

(J145-156) S-S relative+Conjoined Theme
Example: L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille.
CORRECT FORMS:

(Stage II: E = .042, df = 287, χ^2 = 1988.096, p = .0001*)

1,2+3;1,4	9/12	
1,3+2;1,4	1/12	
1,4;1,2+3	--	
1,4;1,3+2	--	TOTAL CORRECT: 10/12

INCORRECT FORMS:

1,2+4;1,3	1/12
1,4+3;1,2	1/12

(J157-168) Conjoined clauses-4NPs(no deletion)(Baseline)
Example: La grenouille a frappé le singe et la vache a chatouillé l'éléphant.
CORRECT FORMS:

(Stage II: E = .083, df = 143, χ^2 = 1457.832, p = .0001*)

1,2;3,4	11/12
3,4;1,2	--

INCORRECT FORMS:

1,2+3;1,4	1/12

CONTROL OF
SUMMARY SCORE SHEET

(G001-012) Dative-Theme cliticized
Example: La chèvre l'a offert à la vache.
CORRECT FORMS: (Stage I: E = 2, df = 5, χ^2 = 60.00, p = .0001*)

1,2,3 2=P	--	
1,2,3 2≠P	12/12	TOTAL CORRECT: 12/12

(G013-024) Dative-Goal cliticized
Example: La vache lui a remis la chèvre.
CORRECT FORMS: (Stage I: E = 2, df = 5, χ^2 = 60.00, p = .0001*)

1,3,2 2=P	--	
1,3,2 2≠P	12/12	TOTAL CORRECT: 12/12

(G025-036) Causative-Theme cliticized
Example: Le lapin l'a fait tenir par la chèvre.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,3;3,2 2=P	--	
1,3;3,2 2≠P	12/12	
3,2;1,3 2=P	--	
3,2;1,3 2≠P	--	TOTAL CORRECT: 12/12

(G037-048) Causative-Causee cliticized
Example: L'éléphant lui a fait attraper la grenouille.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,2;2,3 2=P	--	
1,2;2,3 2≠P	12/12	
2,3;1,2 2=P	--	
2,3;1,2 2≠P	--	TOTAL CORRECT: 12/12

(G049-060) Causative-Reflexive "Causer"="Theme"
Example: La vache se fait saisir par le lapin.
CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

3,2=1	12/12
1,(3);3,2=1	--
3,2=1;1,(3)	--
1,3;3,2=1	--
3,2,2=1;1,3	--

(G061-072) Causative-Reflexive Causee
Example: La chèvre fait se serrer la vache.
CORRECT FORMS: (Stage I: E = .15, df = 80, χ^2 = 308.15, p = .0001*)

1,3;3,2=3	--
3,2=3;1,3	--
1,(3);3,2=3	--
3,2=3;1,(3)	--

INCORRECT FORMS:

1,2;2,3 2≠P	1/12
1,3;3,2 2≠P	1/12
1,2	3/12
1;1,2	1/12
3,2=1	6/12

CONTROL OF
SUMMARY SCORE SHEET

(G073-084) Causative-Reflexive Causer=Goal
Example: La vache se fait remettre la chèvre par le lapin.
CORRECT FORMS: (Stage II: E = 2, df = 5, χ^2 = 60.00, p = .0001*)

4,3,2=1 12/12
1,4;4,3,2=1 --
4,3,2=1;1,4 --
1,(4);4,3,2=1 --
4,3,2=1;1,(4) --

(G085-096) Causative-Reflexive Causer=Goal,Truncated
Example: La chèvre se fait offrir le lapin.
CORRECT FORMS: (Stage I: E = 2, df = 5, χ^2 =60.00, p = .0001*)

X,3,2=1 X=P --
X,3,2=1 X≠P 12/12
1,X;X,3,2=1 X=P --
1,X;X,3,2=1 X≠P -- TOTAL CORRECT: 12/12

(G097-108) Causative-Theme cliticized,Truncated
Example: La chèvre le fait serrer.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,X;X,2 X=P 2=P --
1,X;X,2 X≠P 2≠P 12/12
X,2;1,X X=P 2=P --
X,2;1,X X≠P 2≠P --
1,X;X,2 X≠P 2=P -- TOTAL CORRECT: 12/12

(G109-120) Causative-Reflexive "Causer"="Theme",Truncated
Example: La chèvre se fait bousculer.
CORRECT FORMS: (Stage I: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

X,2=1 X=P --
X,2=1 X≠P 12/12
1,(X);X,2=1 X=P --
1,(X);X,2=1 X≠P --
1,X;X,2=1 X=P -- TOTAL CORRECT: 12/12

(G121-132) Causative-Theme=Causee cliticized,Intransitive Verb
Example: L'éléphant le fait trembler.
CORRECT FORMS: (Stage I: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V 2=P --
1,2;2V 2≠P 12/12
2V;1,2 2=P --
2V;1,2 2≠P -- TOTAL CORRECT: 12/12

CONTROL OF
SUMMARY SCORE SHEET

(G133-144) Cleft Object(CO2) with Stylistic Inversion
Example: C'est le lapin qu'a flatté l'éléphant.

CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

2,1 --

INCORRECT FORMS:

1,2 12/12

(G145-156) Subject-Object relative with Stylistic Inversion
Example: Le lapin qu'a gratté l'éléphant a frappé le singe.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 175.759, p = .0001*)

2,1;1,3 --
1,3;2,1 1/12 TOTAL CORRECT: 1/12

INCORRECT FORMS:

1,2;2,3 5/12
1,2;1,3 6/12

(G157-168) Object-Object relative with Stylistic Inversion
Example: Le lapin a gratté la chèvre qu'a embrassée le singe.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

1,2;3,2 11/12
3,2;1,2 --

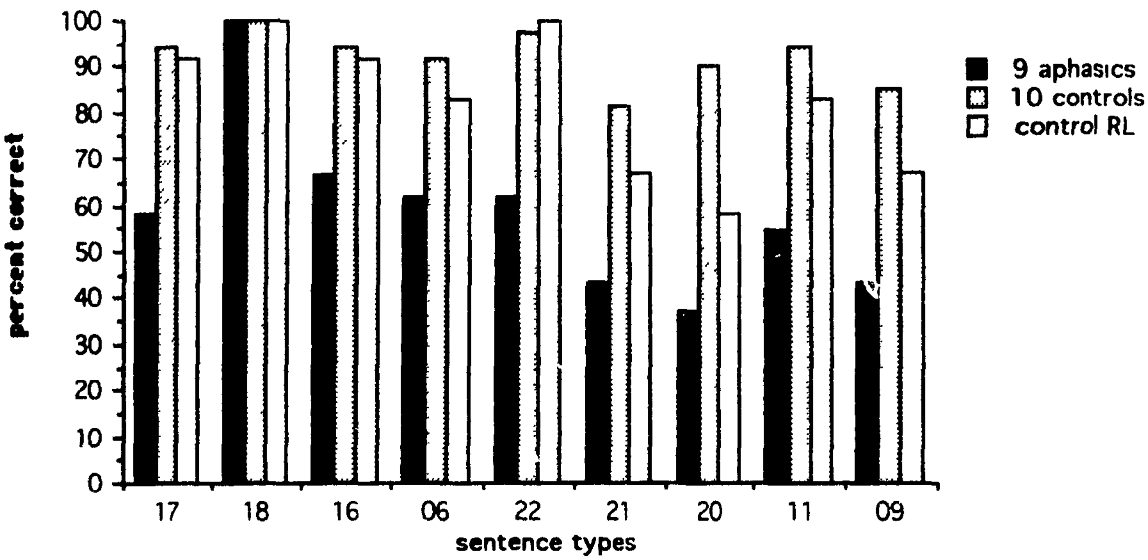
INCORRECT FORMS:

1,2;2,3 1/12

Table A.B.2. Summary Results of Control RL

	% Correct
Active	100
Truncated Passive	
Cleft Object	
Dative	
Active Conjoined Theme	
Passive Conjoined Agent	
Direct Object Control, Intransitive Verb	
Causative + Intransitive Verb	
Direct Object Control + Transitive Verb	
Causative (Faire-par)	
SS Relative + Conjoined Theme	
Dative-Theme cliticized	
Dative-Goal cliticized	
Causative-Causee cliticized	
Causative-Reflexive Causer=Goal, Truncated	
Causative-Reflexive Causer=Theme, Truncated	
Causative-Theme=Causee cliticized, Intransitive Verb	
Passive	92
Conjoined	
Object-Subject Relative	
Passivized Direct Object Control, Intransitive Verb	
Truncated Causative	
Conjoined Clauses 4 NPs (No Deletion) (Baseline)	
Causative-Theme cliticized	
Causative-Reflexive Causer=Theme	
Causative-Reflexive Causee	
Causative-Reflexive Causer=Goal	
Object-Object Relative with Stylistic Inversion	
Dative Passive	83
Object-Object Relative	
Subject-Subject Relative	
Conjoined Causative	
Causative-Theme cliticized, Truncated	
Cleft-Object with Stylistic Inversion	
Cleft-Object Dative	67
Subject-Object Relative	
Causative (Faire-à)	
Causative + Dative	
Causative + SS Relative	
Passivized Direct Object Control + Transitive Verb	58
Subject-Object Relative with Stylistic Inversion	50
Cleft-Object Causative (Faire-par)	25

Figure A.B.2. Accuracy Rate of Control RL - 'Sentence Contrasts 1'



[17] Truncated Causative
[18] Causative + Intransitive Verb
[16] Passivized Direct Object Control, Intransitive Verb
[06] Dative Passive
[22] Causative (Faire-par)
[21] Causative (Faire-à)
[20] Passivized Direct Object Control + Transitive Verb
[11] Object-Object Relative
[09] Subject-Object Relative

CONTROL RL
SUMMARY SCORE SHEET

(M001-012) A2
Example: La grenouille a frappé le singe.
CORRECT FORMS:
1,2 12/12 (Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

(M013-024) P2
Example: Le singe a été frappé par la grenouille.
CORRECT FORMS:
2,1 11/12 (Stage II: E = 6, df = 1, χ^2 = 8.333, p = .0039*)

INCORRECT FORMS:
1,2 1/12

(M025-036) Truncated Passives
Example: Le singe a été frappé.
CORRECT FORMS:
X,1 12/12 (Stage I: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

(M037-048) CO2
Example: C'est la vache que le lapin a embrassée.
CORRECT FORMS:
2,1 12/12 (Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

(M049-060) A3
Example: Le lapin a confié la vache à la chèvre.
CORRECT FORMS:
1,2,3 12/12 (Stage II: E = 2, df = 5, χ^2 = 60.00, p = .0001*)

(M061-072) P3
Example: L'éléphant a été donné au singe par la grenouille.
CORRECT FORMS:
3,1,2 10/12 (Stage II: E = 2, df = 5, χ^2 = 39.00, p = .0001*)

INCORRECT FORMS:
1,3,2 1/12
1,2,3 1/12

(M073-084) CO3
Example: C'est la chèvre que le lapin a donnée à la vache.
CORRECT FORMS:
2,1,3 8/12 (Stage II: E = 2, df = 5, χ^2 = 28.00, p = .0001*)

INCORRECT FORMS:
1,2,3 4/12

CONTROL RL
SUMMARY SCORE SHEET

(M085-096) CON
Example: Le singe a gratté le lapin et a caressé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 187.88, p = .0001*)
1,2;1,3 7/12
1,3;1,2 4/12 TOTAL CORRECT: 11/12

INCORRECT FORMS:
2,1;2,3 1/12

(M097-108) S-O
Example: Le singe que le lapin a saisi a bousculé la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 193.941, p = .0001*)
2,1;1,3 8/12
1,3;2,1 --

INCORRECT FORMS:
1,2;2,3 1/12
2,1;2,3 1/12
1,2;1,3 1/12
2,3;1,2 1/12

(M109-120) O-S
Example: La chèvre a frappé le lapin qui a saisi la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 248.486, p = .0001*)
1,2;2,3 9/12
2,3;1,2 2/12 TOTAL CORRECT: 11/12

INCORRECT FORMS:
1,2;3,2 1/12

(M121-132) O-O
Example: Le singe a chatouillé la grenouille que la chèvre a bousculée.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 175.759, p = .0001*)
1,2;3,2 7/12
3,2;1,2 3/12 TOTAL CORRECT: 10/12

INCORRECT FORMS:
1,2;2,3 2/12

(M133-144) S-S
Example: La grenouille qui a tenu la vache a attrapé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 157.577, p = .0001*)
1,2;1,3 6/12
1,3;1,2 4/12 TOTAL CORRECT: 10/12

INCORRECT FORMS:
1,2;2,3 2/12

CONTROL RL
SUMMARY SCORE SHEET

(M145-156) Active Conjoined Theme
Example: Le lapin a frappé la vache et la chèvre.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 110.00, p = .0001*)

1,2+3	11/12	
1,3+2	1/12	TOTAL CORRECT: 12/12

(M157-168) Passive Conjoined Agent
Example: La grenouille a été caressée par la chèvre et la vache.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 68.00, p = .0001*)

2+3,1	8/12	
3+2,1	4/12	TOTAL CORRECT: 12/12

CONTROL RL
SUMMARY SCORE SHEET

(JC01-012) Direct Object Control, Intransitive Verb
Example: La grenouille a forcé le singe à bondir.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J013-024) Passivized Direct Object Control, Intransitive Verb
Example: La vache a été forcée par le lapin à danser.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 69.333, p = .0001*)

2,1;1V	11/12
1V;2,1	--

INCORRECT FORMS:

1,2;2V	1/12

(J025-036) Truncated Causative
Example: Le lapin a fait frapper la vache.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

1,X;X,2	--	
1,(X);X,2	11/12	
X,2;1,X	--	
X,2;1,(X)	--	TOTAL CORRECT: 11/12

INCORRECT FORMS:

X,(1);1,2	1/12

(J037-048) Causative+Intransitive Verb
Example: La vache a fait danser le lapin.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J049-060) Direct Object Control+Transitive Verb
Example: Le lapin a forcé la chèvre à frapper la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,2;2,3	12/12
2,3;1,2	--

(J061-072) Passivized Direct Object Control+Transitive Verb
Example: La grenouille a été forcée par l'éléphant à caresser le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 =115.153, p = .0001*)

2,1;1,3	5/12	
1,3;2,1	2/12	TOTAL CORRECT: 7/12

INCORRECT FORMS:

1,2;2,3	3/12
2,3;1,2	2/12

CONTROL RL
SUMMARY SCORE SHEET

(J073-084) Causative (Faire-à)
Example: La grenouille a fait caresser le singe à l'éléphant.

(Stage II: E = .33, df = 35, χ^2 = 212.122, p = .0001*)

CORRECT FORMS:

1,3;3,2	--
1,(3);3,2	8/12
3,2;1,3	--
3,2;1,(3)	--

TOTAL CORRECT: 8/12

INCORRECT FORMS:

1,(2);2,3	3/12
2,3;1,(2)	1/12

(J085-096) Causative (Faire-par)
Example: Le lapin a fait frapper la vache par la chèvre.

(Stage II: E = .33, df = 35, χ^2 = 212.22, p = .0001*)

CORRECT FORMS:

1,3;3,2	--
1,(3);3,2	7/12
3,2;1,3	--
3,2;1,(3)	5/12

TOTAL CORRECT: 12/12

(J097-108) Cleft Object-Causative (Faire-par)
Example: C'est l'éléphant que le singe a fait saisir par la grenouille.

(Stage II: E = .33, df = 35, χ^2 = 84.85, p = .0001*)

CORRECT FORMS:

2,3;3,1	--
3,1;2,3	--
2,(3);3,1	3/12
3,1;2,(3)	--

TOTAL CORRECT: 3/12

INCORRECT FORMS:

1,(2);2,3	3/12
2,(1);1,3	2/12
1,(3);3,2	3/12
1,3;2,(1)	1/12

(J109-120) Conjoined Causative
Example: La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.

(Stage II: E = .007, df = 1727, χ^2 =5130.953, p < .0001*)

CORRECT FORMS:

1,4;4,2;4,3	--
1,4;4,3;4,2	1/12
4,2;4,3;1,4	5/12
4,3;4,2;1,4	2/12
1,(4);4,2;4,3	2/12

TOTAL CORRECT: 10/12

INCORRECT FORMS:

1,(2);2,3;2,4	1/12
4,3;4,1;2,4	1/12

CONTROL RL
SUMMARY SCORE SHEET

(J121-132) Causative+Dative

Example: L'éléphant a fait apporter le singe à la grenouille par la vache.

CORRECT FORMS: (Stage II: E = .063, df = 191, χ^2 = 623.02, p = .0001*)

1,4;4,2,3	--
1,(4);4,2,3	3/12
4,2,3;1,4	--
4,2,3;1,(4)	5/12

TOTAL CORRECT: 8/12

INCORRECT FORMS:

1,(3);3,2,4	2/12
1,(2);2,3,4	1/12
4,3,2;1,(4)	1/12

(J133-144) Causative+S-S relative

Example: La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.

CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 3416.667, $p < .0001$*)

1,3;3,2;3,4	3/12
1,3;3,4;3,2	1/12
3,2;3,4;1,3	--
3,4;3,2;1,3	3/12
3,4;1,3;3,2	1/12

TOTAL CORRECT: 8/12

INCORRECT FORMS:

1,3;3,2;2,4	1/12
1,(2);2,4;2,3	1/12
1,(2);2,3;3,4	1/12
3,-;3,4;2,1	1/12

(J145-156) S-S relative+Conjoined Theme

Example: L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille.

CORRECT FORMS: (Stage II: E = .042, df = 287, χ^2 = 1178.572, p = .0001*)

1,2+3;1,4	6/12
1,3+2;1,4	2/12
1,4;1,2+3	3/12
1,4;1,3+2	1/12

TOTAL CORRECT: 12/12

(J157-168) Conjoined clauses-4NPs(no deletion)(Baseline)

Example: La grenouille a frappé le singe et la vache a chatouillé l'éléphant.

CORRECT FORMS: (Stage II: E = .083, df = 143, χ^2 = 783.133, p = .0001*)

1,2;3,4	4/12
3,4;1,2	7/12

TOTAL CORRECT: 11/12

INCORRECT FORMS:

3,4;2,1	1/12

CONTROL RL
SUMMARY SCORE SHEET

(G001-012) Dative-Theme cliticized
Example: La chèvre l'a offert à la vache.

CORRECT FORMS:

1,2,3 2=P	12/12
1,2,3 2≠P	--

(Stage I: E = 2, df = 5, χ^2 = 60.00, p = .0001*)

(G013-024) Dative-Goal cliticized
Example: La vache lui a remis la chèvre.

CORRECT FORMS:

1,3,2 2=P	12/12
1,3,2 2≠P	--

(Stage I: E = 2, df = 5, χ^2 = 60.00, p = .0001*)

(G025-036) Causative-Theme cliticized
Example: Le lapin l'a fait tenir par la chèvre.

CORRECT FORMS:

1,3;3,2 2=P	11/12
1,3;3,2 2≠P	--
3,2;1,3 2=P	--
3,2;1,3 2≠P	--

INCORRECT FORMS:

1,2;2,3 2=P	1/12

(Stage I: E .33, df = 35, χ^2 = 357.577, p = .0001*)

(G037-048) Causative-Causee cliticized
Example: L'éléphant lui a fait attraper la grenouille.

CORRECT FORMS:

1,2;2,3 2=P	12/12
1,2;2,3 2≠P	--
2,3;1,2 2=P	--
2,3;1,2 2≠P	--

(Stage I: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

(G049-060) Causative-Reflexive "Causer"="Theme"
Example: La vache se fait saisir par le lapin.

CORRECT FORMS:

3,2=1	11/12
1,(3);3,2=1	--
3,2=1;1,(3)	--
1,3;3,2=1	--
3,2,2=1;1,3	--

INCORRECT FORMS:

1,3	1/12

(Stage II: E = 6, df = 1, χ^2 = 8.333, p = .0039*)

CONTROL RL
SUMMARY SCORE SHEET

(6061-072) Causative-Reflexive Causee
Example: La chèvre fait se serrer la vache.
CORRECT FORMS: (Stage II: E = 3, df = 3, χ^2 = 28.667, p = .0001*)

1,3;3,2=3	--	
3,2=3;1,3	--	
1,(3);3,2=3	11/12	
3,2=3;1,(3)	--	TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,(3);3V	1/12

(6073-084) Causative-Reflexive Causer=Goal
Example: La vache se fait remettre la chèvre par le lapin.
CORRECT FORMS: (Stage II: E = .67, df = 17, χ^2 = 170.15, p = .0001*)

4,3,2=1	10/12	
1,4;4,3,2=1	--	
4,3,2=1;1,4	--	
1,(4);4,3,2=1	1/12	
4,3,2=1;1,(4)	--	TOTAL CORRECT: 11/12

INCORRECT FORMS:

3,4,2=1	1/12

(6085-096) Causative-Reflexive Causer=Goal,Truncated
Example: La chèvre se fait offrir le lapin.
CORRECT FORMS: (Stage I: E = 2, df = 5, χ^2 = 60.00, p = .0001*)

X,3.2=1 X=P	12/12
X,3,2=1 X≠P	--
1,X;X,3,2=1 X=P	--
1,X;X,3,2=1 X≠P	--

(6097-108) Causative-Theme cliticized,Truncated
Example: La chèvre le fait serrer.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,X;X,2 X=P 2=P	10/12
1,X;X,2 X≠P 2≠P	--
X,2;1,X X=P 2=P	--
X,2;1,X X≠P 2≠P	--
1,X;X,2 X≠P 2=P	--

INCORRECT FORMS:

1,2;2V 2=P	1/12
2,X;X,1 X=P 2=P	1/12

CONTROL RL
SUMMARY SCORE SHEET

(G109-120) Causative-Reflexive "Causer"="Theme", Truncated

Example: La chèvre se fait bousculer.

CORRECT FORMS: (Stage I: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

X,2=1 X=P	12/12
X,2=1 X≠P	--
1,(X);X,2=1 X=P	--
1,(X);X,2=1 X≠P	--
1,X;X,2=1 X=P	--

(G121-132) Causative-Theme=Causee cliticized, Intransitive Verb

Example: L'éléphant le fait trembler.

CORRECT FORMS: (Stage I: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V 2=P	12/12
1,2;2V 2≠P	--
2V;1,2 2=P	--
2V;1,2 2≠P	--

(G133-144) Cleft Object(CO2) with Stylistic Inversion

Example: C'est le lapin qu'a flatté l'éléphant.

CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 5.333, p = .0209*)

2,1	10/12

INCORRECT FORMS:

1,2	2/12

(G145-156) Subject-Object relative with Stylistic Inversion

Example: Le lapin qu'a gratté l'éléphant a frappé le singe.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 90.91, p = .0001*)

2,1;1,3	5/12	
1,3;2,1	1/12	TOTAL CORRECT: 6/12

INCORRECT FORMS:

1,3;1,2	1/12
1,2;2,3	2/12
1,3;2,3	1/12
1,2;1,3	1/12
2,1;2,3	1/12

(G157-168) Object-Object relative with Stylistic Inversion

Example: Le lapin a gratté la chèvre qu'a embrassée le singe.

CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 248.486, p = .0001*)

1,2;3,2	2/12	
3,2;1,2	9/12	TOTAL CORRECT: 11/12

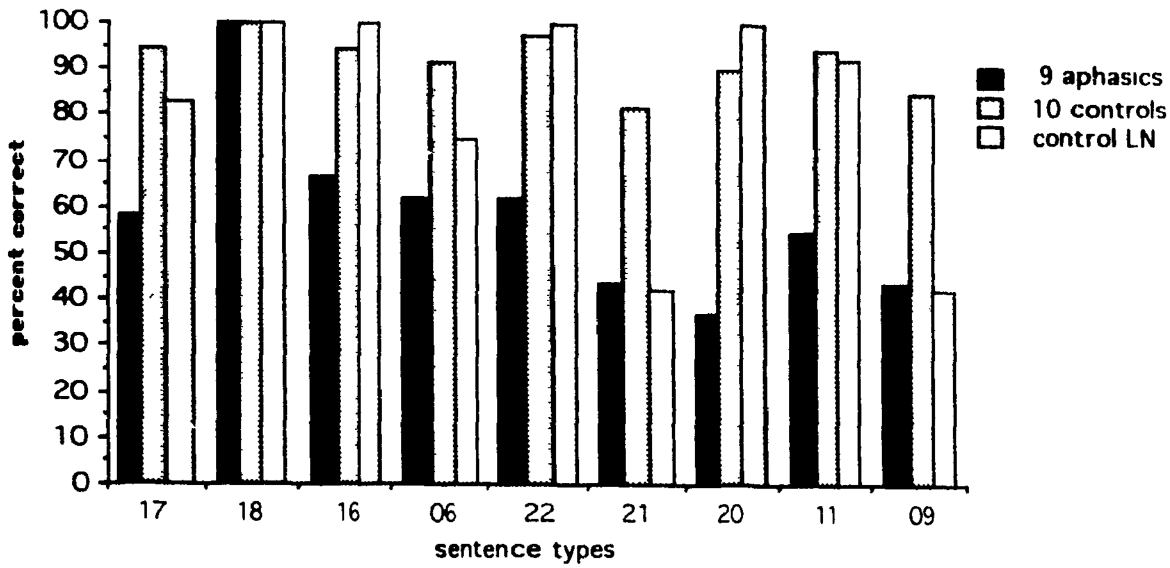
INCORRECT FORMS:

2,3;1,2	1/12

Table A.B.3. Summary Results of Control LN

	% Correct
Active	100
Passive	
Truncated Passive	
Cleft Object	
Dative	
Conjoined	
Active Conjoined Theme	
Passive Conjoined Agent	
Direct Object Control, Intransitive Verb	
Passivized Direct Object Control, Intransitive Verb	
Causative + Intransitive Verb	
Passivized Direct Object Control + Transitive Verb	
Causative (Faire-par)	
SS Relative + Conjoined Theme	
Conjoined Clauses 4 NPs (No Deletion) (Baseline)	
Dative-Goal cliticized	
Causative-Theme cliticized	
Causative-Reflexive Causer=Theme	
Causative-Reflexive Causee	
Causative-Reflexive Causer=Goal	
Causative-Reflexive Causer=Goal, Truncated	
Causative-Reflexive Causer=Theme, Truncated	
Causative-Theme=Causee cliticized, Intransitive Verb	
Cleft-Object Dative	92
Object-Object Relative	
Subject-Subject Relative	
Direct Object Control + Transitive Verb	
Dative-Theme cliticized	
Cleft-Object with Stylistic Inversion	
Truncated Causative	83
Causative + Dative	
Causative-Causee cliticized	
Dative Passive	75
Causative-Theme cliticized, Truncated	
Object-Subject Relative	67
Cleft-Object Causative (Faire-par)	
Conjoined Causative	50
Subject-Object Relative	42
Causative (Faire-à)	
Object-Object Relative with Stylistic Inversion	33
Causative + SS Relative	25
Subject-Object Relative with Stylistic Inversion	8

Figure A.B.3. Accuracy Rate of Control LN - 'Sentence Contrasts 1'



[17] Truncated Causative
[18] Causative + Intransitive Verb
[16] Passivized Direct Object Control, Intransitive Verb
[06] Dative Passive
[22] Causative (Faire-par)
[21] Causative (Faire-à)
[20] Passivized Direct Object Control + Transitive Verb
[11] Object-Object Relative
[09] Subject-Object Relative

CONTROL LN
SUMMARY SCORE SHEET

(M001-012) A2
Example: La grenouille a frappé le singe.
CORRECT FORMS: (Stage II: E = 6, df = 1,
1,2 12/12 χ^2 = 12.00, p = .0005*)

(M013-024) P2
Example: Le singe a été frappé par la grenouille.
CORRECT FORMS: (Stage II: E = 6, df = 1,
2,1 12/12 χ^2 = 12.00, p = .0005*)

(M025-036) Truncated Passives
Example: Le singe a été frappé.
CORRECT FORMS: (Stage I: E = 6, df = 1,
X,1 12/12 χ^2 = 12.00, p = .0005*)

(M037-048) CO2
Example: C'est la vache que le lapin a embrassée.
CORRECT FORMS: (Stage II: E = 6, df = 1,
2,1 12/12 χ^2 = 12 00, p = .0005*)

(M049-060) A3
Example: Le lapin a confié la vache à la chèvre.
CORRECT FORMS: (Stage II: E = 2, df = 5,
1,2,3 12/12 χ^2 = 60.00, p = .0001*)

(M061-072) P3
Example: L'éléphant a été donné au singe par la grenouille.
CORRECT FORMS: (Stage II: E = 2, df = 5,
3,1,2 9/12 χ^2 = 33.00, p = .0001*)

INCORRECT FORMS:
3,2,1 3/12

(M073-084) CO3
Example: C'est la chèvre que le lapin a donnée à la vache.
CORRECT FORMS: (Stage II: E = 2, df = 5,
2,1,3 11/12 χ^2 = 49.00, p = .0001*)

INCORRECT FORMS:
1,2,3 1/12

(M085-096) CON
Example: Le singe a gratté le lapin et a caressé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35,
1,2;1,3 12/12 χ^2 = 424.244 p = .0001*)
1,3;1,2 --

CONTROL LN
SUMMARY SCORE SHEET

(M097-108) S-O
Example: Le singe que le lapin a saisi a bousculé la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 145.456, p = .0001*)

2,1;1,3	5/12
1,3;2,1	--

INCORRECT FORMS:

2,1;2,3	5/12
1,2;1,3	1/12
1,2;2,3	1/12

(M109-120) O-S
Example: La chèvre a frappé le lapin qui a saisi la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = .230.304, p = .0001*)

1,2;2,3	8/12
2,3;1,2	--

INCORRECT FORMS:

1,2;1,3	4/12

(M121-132) O-O
Example: Le singe a chatouillé la grenouille que la chèvre a bousculée.
CORRECT FORMS: (Stage II: E .33, df = 35, χ^2 = 296.971, p = .0001*)

1,2;3,2	10/12
3,2;1,2	1/12

TOTAL CORRECT: 11/12

INCORRECT FORMS:

1,2;2,3	1/12

(M133-144) S-S
Example: La grenouille qui a tenu la vache a attrapé l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 357.577, p = .0001*)

1,2;1,3	11/12
1,3;1,2	--

INCORRECT FORMS:

1,2;2,3	1/12

(M145-156) Active Conjoined Theme
Example: Le lapin a frappé la vache et la chèvre.
CORRECT FORMS: (Stage II: E = 1, df = 11, χ^2 = 110.00, p = .0001*)

1,2+3	11/12
1,3+2	1/12

TOTAL CORRECT: 12/12

CONTROL LN
SUMMARY SCORE SHEET

(M157-168) Passive Conjoined Agent
Example: La grenouille a été caressée par la chèvre et la vache.

CORRECT FORMS:			(Stage II: E = 1, df = 11,
2+3,1	9/12		χ^2 = 78.00, p = .0001*)
3+2,1	3/12	TOTAL CORRECT: 12/12	

CONTROL LN
SUMMARY SCORE SHEET

(J001-012) Direct Object Control, Intransitive Verb
Example: La grenouille a forcé le singe à bondir.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J013-024) Passivized Direct Object Control, Intransitive Verb
Example: La vache a été forcée par le lapin à danser.
CORRECT FORMS: (Stage II: E = 1.5, p = 7, χ^2 = 84.00, p = .0001*)

2,1;1V	12/12
1V;2,1	--

(J025-036) Truncated Causative
Example: Le lapin a fait frapper la vache.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 296.971, p = .0001*)

1,X;X,2	--
1,(X);X,2	10/12
X,2;1,X	--
X,2;1,(X)	--

TOTAL CORRECT: 10/12

INCORRECT FORMS:

1,2	1/12
1,2;2V	1/12

(J037-048) Causative+Intransitive Verb
Example: La vache a fait danser le lapin.
CORRECT FORMS: (Stage II: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V	12/12
2V;1,2	--

(J049-060) Direct Object Control+Transitive Verb
Example: Le lapin a forcé la chèvre à frapper la vache.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,2;2,3	11/12
2,3;1,2	--

INCORRECT FORMS:

2,3;3,1	1/12

(J061-072) Passivized Direct Object Control+Transitive Verb
Example: La grenouille a été forcée par l'éléphant à caresser le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

2,1;1,3	12/12
1,3;2,1	--

CONTROL LN
SUMMARY SCORE SHEET

(J073-084) Causative (Faire-à)
Example: La grenouille a fait caresser le singe à l'éléphant.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 212.122, p = .0001*)

1,3;3,2	--
1,(3);3,2	5/12
3,2;1,3	--
3,2;1,(3)	--

TOTAL CORRECT: 5/12

INCORRECT FORMS:

1,(2);2,3	7/12

(J085-096) Causative (Faire-par)
Example: Le lapin a fait frapper la vache par la chèvre.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

1,3;3,2	--
1,(3);3,2	12/12
3,2;1,3	--
3,2;1,(3)	--

TOTAL CORRECT: 12/12

(J097-108) Cleft Object-Causative (Faire-par)
Example: C'est l'éléphant que le singe a fait saisir par la grenouille.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 212.122, p = .0001*)

2,3;3,1	--
3,1;2,3	--
2,(3);3,1	8/12
3,1;2,(3)	--

TOTAL CORRECT: 8/12

INCORRECT FORMS:

1,(3);3,2	3/12
2,(1);1,3	1/12

(J109-120) Conjoined Causative
Example: La grenouille a fait frapper la vache et chatouiller l'éléphant par le singe.
CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 6273.81, $p < .0001$*)

1,4;4,2;4,3	1/12
1,4;4,3;4,2	1/12
4,2;4,3;1,4	--
4,3;4,2;1,4	--
1,(4);4,2;4,3	4/12

TOTAL CORRECT: 6/12

INCORRECT FORMS:

1,(3);3,2;3,4	1/12
1,2;4,3	4/12
4,3;1,2	1/12

CONTROL LN
SUMMARY SCORE SHEET

(J121-132) Causative+Dative
Example: L'éléphant a fait apporter le singe à la grenouille par la vache.
CORRECT FORMS: (Stage II: E = .063, df = 191, χ^2 = 1638.893, p = .0001*)

1,4;4,2,3	--
1,(4);4,2,3	10/12
4,2,3;1,4	--
4,2,3;1,(4)	--

TOTAL CORRECT: 10/12

INCORRECT FORMS:

1,(3);3,2,4	2/12

(J133-144) Causative+S-S relative
Example: La grenouille a fait chatouiller l'éléphant par le singe qui a frappé la vache.
CORRECT FORMS: (Stage II: E = .007, df = 1727, χ^2 = 5702.382, p < .0001*)

1,3;3,2;3,4	3/12
1,3;3,4;3,2	--
3,2;3,4;1,3	--
3,4;3,2;1,3	--
3,4;1,3;3,2	--

INCORRECT FORMS:

1,2;3,4	2/12
1,3;3,2;2,4	1/12
1,3;3,2;1,4	5/12
1,(X);X,2;3,4	1/12

(J145-156) S-S relative+Conjoined Theme
Example: L'éléphant qui a chatouillé la vache et le singe a frappé la grenouille.
CORRECT FORMS: (Stage II: E = .042, df = 287, χ^2 = 3416.667, p = .0001*)

1,2+3;1,4	12/12
1,3+2;1,4	--
1,4;1,2+3	--
1,4;1,3+2	--

(J157-168) Conjoined clauses-4NPs(no deletion)(Baseline)
Example: La grenouille a frappé le singe et la vache a chatouillé l'éléphant.
CORRECT FORMS: (stage II: E = .083, df = 143, χ^2 = 1722,892, p = .0001*)

1,2;3,4	12/12
3,4;1,2	--

CONTROL LN
SUMMARY SCORE SHEET

(G001-012) Dative-Theme cliticized
Example: La chèvre l'a offert à la vache.
CORRECT FORMS:
1,2,3 2=P 11/12
1,2,3 2≠P --

INCORRECT FORMS:
3,2,1 2=P 1/12

(Stage I: E = 2, df = 5, χ^2 = 49.00, p = .0001*)

(G013-024) Dative-Goal cliticized
Example: La vache lui a remis la chèvre.
CORRECT FORMS:
1,3,2 2=P 12/12
1,3,2 2≠P --

(Stage I: E = 2. df = 5, χ^2 = 60.00, p = .0001*)

(G025-036) Causative-Theme cliticized
Example: Le lapin l'a fait tenir par la chèvre.
CORRECT FORMS:
1,3;3,2 2=P 12/12
1,3;3,2 2≠P --
3,2;1,3 2=P --
3,2;1,3 2≠P --

(Stage I: E = .33, df = 35, χ^2 = 424.244, p = .0001*)

(G037-048) Causative-Causee cliticized
Example: L'éléphant lui a fait attraper la grenouille.
CORRECT FORMS:
1,2;2,3 2=P 10/12
1,2;2,3 2≠P --
2,3;1,2 2=P --
2,3;1,2 2≠P --

INCORRECT FORMS:
1,3;3,2 2=P 2/12

(Stage I: E = .33, df = 35, χ^2 = 303.032, p = .0001*)

(G049-060) Causative-Reflexive "Causer"="Theme"
Example: La vache se fait saisir par le lapin.
CORRECT FORMS:
3,2=1 12/12
1,(3);3,2=1 --
3,2=1;1,(3) --
1,3;3,2=1 --
3,2,2=1;1,3 --

(Stage II: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

CONTROL LN
SUMMARY SCORE SHEET

(G061-072) Causative-Reflexive Causee
Example: La chèvre fait se serrer la vache.
CORRECT FORMS: (Stage II: E = 3, df = 3, χ^2 = 36.00, p = .0001*)

1,3;3,2=3	--
3,2=3;1,3	--
1,(3);3,2=3	12/12
3,2=3;1,(3)	--

TOTAL CORRECT: 12/12

(G073-084) Causative-Reflexive Causer=Goal
Example: La vache se fait remettre la chèvre par le lapin.
CORRECT FORMS: (Stage II: E = .67, df = 17, χ^2 = 202.985, p =.0001*)

4,3,2=1	11/12
1,4;4,3,2=1	--
4,3,2=1;1,4	--
1,(4);4,3,2=1	1/12
4,3,2=1;1,(4)	--

TOTAL CORRECT: 12/12

(G085-096) Causative-Reflexive Causer=Goal,Truncated
Example: La chèvre se fait offrir le lapin.
CORRECT FORMS: (Stage I: E = .67, df = 17, χ^2 = 202.985, p = .0001*)

X,3,2=1 X=P	11/12
X,3,2=1 X≠P	--
1,X;X,3,2=1 X=P	1/12
1,X;X,3,2=1 X≠P	--

TOTAL CORRECT: 12/12

(G097-108) Causative-Theme cliticized,Truncated
Example: La chèvre le fait serrer.
CORRECT FORMS: (Stage I: E = .33, df = 35, χ^2 = 260.607, p = .0001*)

1,X;X,2 X=P 2=P	9/12
1,X;X,2 X≠P 2≠P	--
X,2;1,X X=P 2=P	--
X,2;1,X X≠P 2≠P	--
1,X;X,2 X≠P 2=P	--

INCORRECT FORMS:

1,(2);2,2 2=P	3/12

(G109-120) Causative-Reflexive "Causer"="Theme",Truncated
Example: La chèvre se fait bousculer.
CORRECT FORMS: (Stage I: E = 6, df = 1, χ^2 = 12.00, p = .0005*)

X,2=1 X=P	12/12
X,2=1 X≠P	--
1,(X);X,2=1 X=P	--
1,(X);X,2=1 X≠P	--
1,X;X,2=1 X=P	--

CONTROL LN
SUMMARY SCORE SHEET

(G121-132) Causative-Theme=Causee cliticized, Intransitive Verb
Example: L'éléphant le fait trembler.
CORRECT FORMS: (Stage I: E = 1.5, df = 7, χ^2 = 84.00, p = .0001*)

1,2;2V 2=P	12/12
1,2;2V 2≠P	--
2V;1,2 2=P	--
2V;1,2 2≠P	--

(G133-144) Cleft Object(CO2) with Stylistic Inversion
Example: C'est le lapin qu'a flatté l'éléphant.
CORRECT FORMS: (Stage II: E = 6, df = 1, χ^2 = 8.333, p = .0039*)

2,1	11/12

INCORRECT FORMS:

1,2	1/12

(G145-156) Subject-Object relative with Stylistic Inversion
Example: Le lapin qu'a gratté l'éléphant a frappé le singe.
CORRECT FORMS: (Stage II: E= .33, df = 35, χ^2 = 133.335, p = .0001*)

2,1;1,3	1/12
1,3;2,1	--

INCORRECT FORMS:

1,2;1,3	3/12
1,2;2,3	6/12
2,1;3,1	1/12
2,1;2,3	1/12

(G157-168) Object-Object relative with Stylistic Inversion
Example: Le lapin a gratté la chèvre qu'a embrassée le singe.
CORRECT FORMS: (Stage II: E = .33, df = 35, χ^2 = 121.213, p = .0001*

1,2;3,2	3/12		
3,2;1,2	1/12	TOTAL CORRECT:	4/12

INCORRECT FORMS:

1,2;2,3	3/12
1,2;1,3	5/12
