

The Nature of Configurationality in LFG



Liselotte Snijders

New College
Faculty of Linguistics, Philology & Phonetics
University of Oxford

Thesis submitted for the degree of *Doctor of Philosophy*
Trinity Term 2015

Contents

List of Abbreviations	6
Abstract	8
Acknowledgements	10
1 Introduction	14
2 Configurationality: an Overview	17
2.1 Introduction	17
2.2 The phenomena	18
2.2.1 Word order	18
2.2.2 Discontinuous expressions	27
2.2.3 Null anaphora	30
2.2.4 Subject-object asymmetries	32
2.3 Configurationality	34
2.3.1 Introduction	34
2.3.2 Origin of the distinction	35
2.3.3 Pronominal arguments	40
2.3.4 The role of word order	43
2.3.5 Typologies of configurationality	45
2.3.6 A spectrum of configurationality	49
2.4 Conclusion	52
3 Formal Background	54
3.1 Introduction	54
3.2 Lexical-Functional Grammar	54
3.2.1 The correspondence architecture	55
3.2.2 C-structure and f-structure	58
3.2.3 I-structure and information structure roles	65
3.2.4 Unbounded dependencies	69
3.2.5 C-structure and word order variability	76
3.3 Constituency tests	86

4	Free Word Order	90
4.1	Introduction	90
4.2	Word order variation	93
4.2.1	Relatively strict word order languages	93
4.2.2	Relatively free word order languages	104
4.2.3	Scrambling	112
4.3	Relevant factors in word order variation	120
4.3.1	Factors affecting word order	120
4.3.2	Verb position as an anchor	125
4.4	A space of possibilities	128
4.4.1	Type 1 languages	132
4.4.2	Type 2 languages	144
4.4.3	Type 3 languages	149
4.4.4	Type 4 languages	151
4.4.5	Summary and concluding remarks	152
4.5	Mapping languages onto the space of possibilities	154
4.5.1	Generalisation 1	155
4.5.2	Generalisation 2	162
4.5.3	Generalisations and observations	167
4.6	Unbounded dependencies	171
4.6.1	A UDF in f-structure	173
4.6.2	UDF capturing generalisations	179
4.6.3	An illustration of unboundedness	183
4.6.4	Implications	192
4.7	Conclusion and implications for configurationality	197
5	Discontinuous Expressions	200
5.1	Introduction	200
5.2	Types of discontinuity	202
5.3	Discontinuous nominal phrases	206
5.3.1	Australian languages	207
5.3.2	Latin	211
5.3.3	Slavic languages	212
5.3.4	Different types of nominal discontinuity and discussion	217
5.4	Formal definitions	219
5.4.1	Previous work	219
5.4.2	Discontinuity in LFG	223
5.5	Analysis of discontinuity in LFG	226
5.5.1	Warlpiri	226
5.5.2	Latin	234
5.5.3	Slavic discontinuity and clitics	243
5.5.4	Germanic discontinuous nominal expressions	246
5.6	Free word order and discontinuous expressions: inherently connected?	250
5.7	Conclusion	256

6	Binding	257
6.1	Introduction	257
6.2	Introduction to binding	259
6.2.1	Traditional binding theory	259
6.2.2	Binding in LFG	260
6.3	Structures proposed for Warlpiri in LFG	265
6.3.1	AUX placement	266
6.3.2	Proposed structures	269
6.4	Warlpiri binding and phrase structure configurations	274
6.4.1	Warlpiri non-reflexive possessive binding data	274
6.4.2	Simpson’s arguments for c-command	280
6.4.3	Legate’s new data	286
6.4.4	A more hierarchical structure	295
6.5	An f-command analysis	296
6.5.1	Warlpiri	299
6.5.2	English	305
6.5.3	Additional evidence for lexical specification	308
6.5.4	Binding in other languages traditionally labelled ‘non-configurational’	312
6.6	Conclusion and implications for configurationality	314
7	Conclusion	317
	Bibliography	321

List of Abbreviations

1	first person
2	second person
3	third person
A	adjective
ABL	ablative
ABS	absolute
ACC	accusative
ADJ	adjunct
ADMON	admonitive
Adv	adverb
AF	argument function
ASP	aspect
AUX	auxiliary verb
C	complementiser
CL	classifier
COM	comitative
D	determiner
DAT	dative
DECL	declarative
DEF	definite
DEM	demonstrative
DIR	direct
DU	dual
ERG	ergative
F	feminine
FIN	finite
FOC	focus
FUT	future
GEN	genitive
GF	grammatical function
I	inflection
IMP	imperative
IMPF	imperfect
IND	indirect
INF	infinitive
ISR	information structural role

KN	known
LDD	long distance dependency
M	masculine
N	noun
NEG	negation
NEUT	neuter
NMLZ	nominaliser
NOM	nominative
NPST	nonpast
NSUBJ	nonsubject
NUM	number
OBJ	object
OBL	oblique
P	preposition
PART	particle
PASS	passive
PERF	perfect
PERS	person
PL	plural
POSS	possessive
PRED	predicate
PRES	present
PRO	pronoun
PSTPRT	past perfect
PTCP	participle
PURP	purpose
PV	preverb
Q	question particle
REFL	reflexive
SG	singular
SP	specific
SPEC	specifier
SUBJ	subject
SUFF	suffix
TOP	topic
UDF	unbounded dependency function
V	verb
VM	verbal marker
VR	verb root

The Nature of Configurationality in LFG

Liselotte Snijders

New College, Oxford

Submitted for the degree of Doctor of Philosophy, Trinity Term 2015

Abstract

The central issue in this thesis is configurationality, which has broadly been defined in terms of a division of the world's languages based on their core syntactic structure. Specifically, languages are traditionally divided into so-called configurational and non-configurational languages. Configurational languages are assumed to be languages with many restrictions on word order, and non-configurational languages are assumed to be languages with very few or no word order restrictions. Many linguists posit a strict division between the two different types of languages. In this thesis I propose a non-derivational approach to configurationality, and I discuss in detail three posited characteristics of non-configurational languages (in comparison to configurational languages): free word order, discontinuous expressions and subject-object asymmetries in binding. I propose a four-way classification of languages instead of a two-way one, based on constraints on annotations on phrase structure nodes, both for argument functions and for information structural roles (such as topic and focus). I propose that this four-way distinction is what underlies configurationality. I show that discontinuous expressions and potentially subject-object symmetries follow from the nature of languages that have traditionally been classified as non-configurational. For my analysis I employ Lexical Functional Grammar (LFG), a non-derivational framework which is particularly well-suited to account for languages in which grammatical functions are not tied to specific phrase structural positions, due to its parallel architecture. This characteristic of LFG enables me to provide a straightforward classification of languages, by the ability to separate the influence of grammatical functions and information structural roles on word order and phrase structural configuration.

Acknowledgements

Acknowledgements are due, first, to the funding bodies which made this PhD project possible: the Arts and Humanities Research Council and the Gen Foundation.

I owe a huge debt of gratitude to my supervisors, Dr Ash Asudeh and Professor Mary Dalrymple, for providing extensive advice and guidance, as well as encouragement and inspiration throughout this project and during my postgraduate studies at the University of Oxford. I would like to thank Dr Jocelyn Ballantyne at University College Utrecht for introducing me to syntax and Latin linguistics, as well as encouraging me to apply to the University of Oxford for postgraduate studies. Thanks are also due to Dr Louise Mycock for helpful advice throughout this project, to Dr Anna Kibort for her insights on my confirmation of status project, to Dr Rachel Nordlinger and Professor Jane Simpson for helpful email correspondences, and to Dr Alison Biggs, Margit Bowler and Marjolein Poortvliet for their assistance with some of the data in this project. I am also very grateful to the University of Oxford syntax working group and the audiences of the LFG12 and LFG14 conferences, as well as the SE-LFG09 and SE-LFG14 meetings, for their helpful comments.

I am very grateful for all those who have helped me throughout this process by providing emotional support and welcome distractions from work. Oxford has provided me with the most amazing friends, especially in Worcester College MCR and New College MCR, who I thank for the best postgraduate experience I could ask for. I would also like to say thanks to Sterre Gilsing, Juliette Schuurmans, Colette Grosscurt and Anne Smit for putting up with me always being abroad, but always being so welcoming on my trips home. This work would not

have been possible without the endless emotional support provided by my parents, Marjolijn van der Loo and Geert Snijders: thank you for always being there for me. My final thanks goes to Peter Humphreys for his love and support throughout this project and my time in Oxford.

Voor Geert en Marjolijn

Chapter 1

Introduction

The central issue in this thesis is the issue of configurationality, which has broadly been defined in terms of a division of the world's languages based on their core syntactic structure. Specifically, languages are traditionally divided into so-called configurational and non-configurational languages (Chomsky, 1981; Hale, 1982, 1983). Configurational languages are traditionally assumed to be languages with many restrictions on word order, and non-configurational languages are traditionally assumed to be languages with very few or no word order restrictions. Many linguists assume that there is a strict two-way division between the two different types of languages. A common (strict) definition of a configurational language is that it has a verb phrase (VP) constituent in its phrase structure, whereas non-configurational languages lack a VP constituent (Van Valin, 2001). However, there is more to configurationality than simply VP constituency, because the distinction between configurational languages and non-configurational languages brings forth a whole array of different characteristics, such as strict versus free word order and the absence versus presence of discontinuous expressions. In fact, it is the observation of these different characteristics which led Hale (1981, 1983) (and Chomsky (1981)) to posit the distinction between them. In essence, the distinction between configurational and non-configurational languages is linked to the way in which grammatical functions can be expressed, either via phrase structure (syntax) or via morphology. In relation to this, an important claim is that in non-configurational languages, which are said to have

free word order, word order is in fact determined by information structure.

The aim of this thesis is to provide an account of configurationality within the framework of Lexical-Functional Grammar (LFG). A typology of configurationality has been given within LFG by Nordlinger (1998a), but I expand on this work by taking into account not only the way that argument functions are assigned, but also how information structure plays a role in word order and phrase structure. Moreover, I provide a classification of languages based on annotations on phrase structure rules, which will become clear in Chapters 3 and Chapter 4. Lexical-Functional Grammar is particularly well-suited to this purpose, as the fact that it separates phrase structure configuration from grammatical functions means that it is very capable of accounting for a wide range of different languages in a straightforward fashion. My approach to achieving this overall aim is to discuss three characteristics that have been attributed to non-configurational languages, particularly in comparison to the lack of these characteristics in configurational languages. These three characteristics are free word order, the existence of discontinuous expressions, and subject-object asymmetries in binding. I clarify some of the commonly used terms related to configurationality, and provide a formal space of possibilities of word order variation which divides languages in terms of their configurationality. I propose a four-way distinction that I believe better reflects differences in configurationality compared to the traditional two-way distinction. Moreover, it will be made clear that discontinuous expressions and potentially subject-object asymmetries in binding follow from the nature of the languages that have traditionally been classified as non-configurational.

The thesis is structured as follows. Chapter 2 provides a background to configurationality, first by discussing some of the characteristics that have been attributed to configurational and non-configurational languages, and second by giving an overview of the literature on the issue. Chapter 3 provides an introduction to Lexical-Functional Grammar, the framework that I choose for my analysis, outlining the assumptions that underlie the analysis. The chapter also contains a brief introduction to constituency tests. The three following chapters each discuss one of the three characteristics just mentioned, all of which have been claimed to be

characteristic of non-configurational languages. Chapter 4 discusses free word order, as well as more strict word order found in languages traditionally defined as configurational. Chapter 5 discusses discontinuous expressions. Chapter 6 discusses binding subject-object asymmetries, in Warlpiri specifically, a language which has been classified as non-configurational. The chapter largely focuses on Warlpiri and its binding patterns, but a brief comparison to other languages traditionally classified as non-configurational is made. Chapter 7 concludes this thesis and also provides a short overview of some outstanding issues.

Chapter 2

Configurationality: an Overview

2.1 Introduction

The division of languages based on their configurationality has been discussed in linguistics since the late 1970s, and it is currently still highly debated. This chapter discusses some of the phenomena which have been claimed to be related to or diagnostic of configurationality. Additionally, it provides a theoretical background, showing how different frameworks and approaches have treated and accounted for the distinction between configurational and non-configurational languages. This chapter is structured as follows. Section 2.2 introduces some of the phenomena and characteristics attributed to configurational and non-configurational languages. Section 2.3 provides a background discussion of the concept of configurationality and different ways in which it has been defined and characterised. It also shows that different types of typologies have been proposed for configurationality, and it includes a working definition of configurationality on which the rest of this thesis is based. This chapter concludes with Section 2.4.

2.2 The phenomena

2.2.1 Word order

A central characteristic of languages defined as non-configurational is free word order. Configurational languages, on the other hand, are said to have strict word order. Here the term ‘free’ is used to describe freedom of ordering grammatical functions. The term ‘free’ is not technically correct, as word order in ‘free’ word order languages is generally determined by information structure.¹ This is one of the key issues in this thesis. In this chapter I will use ‘free’ to refer to freedom of ordering in terms of grammatical functions, in line with previous literature. I note from the beginning that in my discussion of relative freedom/strictness in word order the focus is on argument functions and not on adjuncts, as it appears that adjuncts do not have a major impact on word order constraints in the way that argument functions do in languages with strict ordering of constituents.²

In general, it can be observed that some of the world’s languages have a much freer word order than other languages, and a great degree of variation in relative freedom/strictness is attested cross-linguistically. An example of a language with relatively strict word order is English, which displays subject - verb - object (SVO) word order:

(2.1) The woman painted the table.

In this example, *the woman* is syntactically the subject and semantically the agent of the sentence, and *the table* is syntactically the object and semantically the patient. The two determiner phrases (DPs) cannot swap positions in the sentence, while retaining the same semantic roles:³

¹Information structure relates to the packaging of information, and does not affect truth-conditional meaning. Another way of saying that word order is determined by information structure is to say that word order is determined by the discourse. I do not in principle distinguish between ‘discourse’ and ‘information structure’ in discussing factors that play a role in word order. However, there is an important difference, in that ‘information structure’ is an actual level of representation in the formal description of languages, whereas ‘discourse’ is a more general term.

²An alternative approach which assumes that it is the adjuncts that appear in fixed positions is that of Cinque (1999, 2004). I do not follow this approach.

³I assume a DP rather than an NP for English (as well as for other Germanic languages such as Dutch and German), but at this point in the discussion the distinction is not crucial.

(2.2) The table painted the woman.

This sentence is syntactically well-formed, like the example in (2.1), but it forces a different reading than (2.1): in (2.2) *the table* is the subject (and agent) and *the woman* is the object (and patient). This makes the example semantically marked: for it to be acceptable one would have to imagine a possible world in which tables can paint. It is clear that in English the ordering of constituents is important in determining the grammatical functions of the sentence, and thereby also the semantic roles in the sentence. The subject in English (tied to the semantic role of agent in the case of the transitive verb *to paint*) has to occur before the verb, and the object (tied to the semantic role of patient in this case) has to occur after the verb, yielding the standard word order SVO in English. This word order is relatively strict, and it appears necessary in order for grammatical functions to be expressed properly and in order to avoid ambiguity.

There is some degree of word order freedom in English, due to information structure. For example, the following sentence is grammatical in the right context:⁴

(2.3) The first part of the movie John missed, but the second part he saw in its entirety.
(cf. Emonds (2004, p. 85) via Erteschik-Shir (2007))

In this sentence, the two DPs that are underlined are the objects of the two adjacent clauses. Both objects occur clause-initially because they are topics (contrastive topics in this context). This example shows that there is indeed some variety and flexibility in word order in English. Nonetheless, the ordering in (2.3) is marked. The information structure role of *the first part of the movie* could equally be expressed in the less marked order *John missed out on the first part of the movie* with the use of intonation and prosody. The fact that information structure distinctions can be expressed by word order variation in a strict word order language is interesting, however; this issue will be illustrated in more detail in Chapter 4.

⁴Unless otherwise stated, topic constituents are marked with underlining throughout this thesis. Constituents with focus function are marked with small capitals; this does not mean that they are necessarily prosodically stressed.

A language which shows a slightly higher degree of word order freedom than English is German. German is similar to English in many respects, and it has the same unmarked word order in main clauses. A similar sentence to (2.1) in German is the following:⁵

- (2.4) *Die Frau streicht den Tisch.*
 the.NOM woman paint.3SG the.ACC table
 ‘The woman paints the table.’

The word order in this main clause is the same as in English as illustrated in (2.1), namely SVO.⁶ This is the unmarked word order, but in fact, subject and object may be switched in German in specific discourse contexts. This is illustrated by the following example, where the context is given:

- (2.5) a. *WAS streicht die Frau denn?*
 was.ACC paint.3SG the.NOM woman then?
 ‘What is the women painting then?’
 b. *DEN TISCH streicht die Frau.*
 the.ACC table paint.3SG the.NOM woman
 ‘The table, the woman paints.’

The word order in (2.5b) is OVS, which is allowed in this context. The assignment of semantic roles is the same as in (2.4). The context is very important: this word order is triggered by the information structure, but is marked, like the English example in (2.3).

German shows a higher degree of word order variation in embedded clauses than English does. Consider the following examples:

- (2.6) a. *...dass der Kurier dem Spion den Brief zustecken sollte.*
 that the.NOM courier the.DAT spy the.ACC letter slip should
 ‘...that the courier should slip the spy the note.’

⁵The article *die* (in combination with the feminine *Frau* ‘woman’) not only marks nominative case, but also accusative case. The accusative interpretation is ruled out by the accusative case of the article *den* on the second DP; *den* is uniquely accusative and it must therefore be part of the object of the sentence.

⁶Typologically, it is commonly assumed that German’s basic word order is in fact SOV (e.g. Thiersch (1978)). This is evident in subordinate sentences in German, e.g. *dass die Frau den Tisch streicht* (‘that the woman paints the table’). In main clauses, however, the unmarked ordering of constituents is subject - verb - object, as in English. The reason for this is that German is a V2 language, meaning that the verb has to appear in the second position in main clauses.

- b. ...*dass* *der* *Kurier* *den* *Brief* *dem* *Spion* *zustecken* *sollte*.
that the.NOM courier the.ACC letter the.DAT spy slip should
- c. ...*dass* *den* *Brief* *der* *Kurier* *dem* *Spion* *zustecken* *sollte*.
that the.ACC letter the.NOM courier the.DAT spy slip should
- d. ...*dass* *den* *Brief* *dem* *Spion* *der* *Kurier* *zustecken* *sollte*.
that the.ACC letter the.DAT spy the.NOM courier slip should
- e. ...*dass* *dem* *Spion* *der* *Kurier* *den* *Brief* *zustecken* *sollte*.
that the.DAT spy the.NOM courier the.ACC letter slip should
- f. ...*dass* *dem* *Spion* *den* *Brief* *der* *Kurier* *zustecken* *sollte*.
that the.DAT spy the.ACC letter the.NOM courier slip should
- (Choi, 1999, p. 21)

The positions of the complementiser and the verbs are fixed, but the DPs may appear in any order. In the right context, any of the six orders in (2.6) is acceptable. This has been referred to as ‘scrambling’ in German; scrambling is discussed in more detail in Chapter 4. This type of word order freedom is not allowed in English:

- (2.7) a. ...that the courier should slip the spy the note.
b. *...that the courier should slip the note the spy.
c. *...that the spy the courier should slip the note.
d. *...that the note should slip the courier the spy.

In English only the order in (2.7a) is allowed; this is the same order as appears in main clauses. German is thus freer in its word ordering than English is. This correlates with richer case-marking on nominals (especially on the determiners).⁷ The case-marking ensures that in all of the examples in (2.6) the correct grammatical functions are assigned to the DPs.⁸ English does not have this type of case-marking on nonpronominal DPs. This means that the

⁷In German, the main bearers of case are determiners. Nouns in German are not generally marked for case, except for the genitive singular masculine. In that case, *-(e)s* is added as a suffix to the noun: e.g. the genitive singular of *der Hund* (‘the dog’) is *des Hundes*.

⁸Because of case-marking, it should technically be possible for German to have other word orders in main clauses, for example SOV. This specific order is ruled out in German, however, due to its V2 restrictions, which is evident in (2.5).

order needs to be strict, in order to convey the right grammatical relations in the sentence. However, this does not mean that German has free word order: variation is allowed in specific information structural contexts, but there definitely appears to be a preferred order: SVO in main clauses and SOV in embedded clauses. A similar generalisation holds for English: SVO is the default order in discourse neutral or in all-focus contexts, and the order OSV shown in (2.3) only appears in a specific discourse context. Case-marking on nominals thus does not lead to free word order in all cases, but it does appear to make it possible to have greater variety in word order. In both English and German, information structure appears to be the key factor in word order variation, which will be discussed in detail in Chapter 4.

Beside English with its relatively strict word order and German with a somewhat more flexible word order (at least partly allowed because of case-marking) there are languages which are similar to English in not having (full) nominal case-marking, but which show more word order variation than English. An example of this is Swedish, in which some variation is allowed in what is traditionally referred to as the ‘midfield’:⁹

- (2.8) a. *Eva gav förmodligen inte Oscar några pengar.*
 Eva give.PAST probably not Oscar any money
 SUBJ V_{FIN} ADV NEG OBJ_{IND} OBJ_{DIR} OBJ_{DIR}
 ‘Eva probably did not give Oscar any money.’
- b. *Några pengar gav Eva förmodligen inte Oscar.*
 any money give.PAST Eva probably not Oscar
- c. *Förmodligen gav Eva inte Oscar några pengar.*
 probably give.PAST Eva not Oscar any money
- (Börjars *et al.* , 2003, p. 44)

In all three sentences, the content of the midfield is different (an adverb in (2.8a), the subject and an adverb in (2.8b) and the subject by itself in (2.8c)). In (2.8b) and (2.8c) the fronted constituents (object and adverb respectively) bear either a topic or focus function

⁹In traditional analyses of some Germanic languages, the sentence is divided into three *topological fields*: the *prefield*, *midfield* and *postfield*, which are separated by so-called *sentence brackets*. In the current discussion of Swedish, it is important to note that the midfield in Swedish main clauses is between the finite verb (which is in V2 position) and the negation *inte*. The midfield may contain the subject, when not in sentence-initial position, and adverbials (and under certain circumstances an unstressed pronominal object).

(Börjars *et al.*, 2003). The interpretation of grammatical relations in this sentence is the same for all three orders in (2.8). This shows that Swedish, a language with no case-marking on nominals, actually shows a relatively large degree of word order variation. Swedish is a V2 language, like German. Without case-marking, it is potentially linear order (i.e. the fact that in all three sentences the subject comes before the indirect object) or semantic or syntactic factors (i.e. the subject of the verb *gav* ('gave') needs to be animate and may not be introduced by a preposition) that play a role in the identification of grammatical functions. This shows that case-marking, although making it easier for word order variation to arise, is not strictly necessary for word order variation to be possible. It could potentially play a role in the ability of arguments to appear in all possible orders relative to each other. For example, in the German examples in (2.6), arguments may appear in different orders in relation to each other, but this is not the case in the Swedish example in (2.8): the subject always precedes the indirect object.

However, in languages that are said to have free word order and that are traditionally defined to be non-configurational, it seems clear that case differences are an important factor in enabling freedom of word order. Examples of this are Latin and Warlpiri; they are on the other end of the spectrum of word order variation. In these languages, word order is nearly completely free, except for a few constraints.¹⁰ As mentioned, the term 'free word order' should be used with caution, although I do employ it here, largely leaving information structure out of the equation for the moment. To illustrate this 'freedom' of word order in terms of grammatical function placement, consider the following sentence from Warlpiri:

- (2.9) a. *Ngarrka-ngku ka wawirri panti-rni.*
 man-ERG AUX kangaroo spear-NPAST
 'The man is spearing the kangaroo.'
- b. *Wawirri ka panti-rni ngarrka-ngku.*
 kangaroo AUX spear-NPAST man-ERG

¹⁰Examples of constraints are the obligatory second position of auxiliaries in Warlpiri (with a few exceptions) and of certain particles in Latin. The former will be discussed in more detail in Chapter 4 and Chapter 6.

c. *Panti-rni ka ngarrka-ngku wawirri.*
 spear-NPAST AUX man-ERG kangaroo

(Hale, 1983, p. 6)

The AUX in Warlpiri is a complex constituent which expresses negation, modal, aspectual and temporal relations, as well as subject and non-subject person and number features (Laughren, 1999). The AUX will be discussed in more detail in Section 6.3.1. In (2.9a) the order is SUBJ - AUX - OBJ - V. Examples (2.9b) and (2.9c) show that other orderings are also possible, as long as the AUX appears in second position.¹¹ The subject, verb and object may appear in any order. It appears clear that case-marking is needed to assign the right grammatical relations to the nominal constituents, as we have seen for German as well. Word order is freer in Warlpiri than it is in German, however. Especially in terms of placement of verbs (both in main clauses and in subordinate clauses) German is more restricted. This is illustrated by the following set of examples from German:

- (2.10) a. *Er hat der Frau das Buch gegeben.*
 he.NOM AUX the.DAT woman the.ACC book give.PTCP
 ‘He has given the woman the book.’
- b. **Er hat gegeben der Frau das Buch.*
 he.NOM AUX give.PTCP the.DAT woman the.ACC book

(2.10a) is an example of a ditransitive sentence with perfect tense, expressed by an auxiliary and a past participle. The auxiliary appears in second position (because of German’s V2 requirement) and the participle is realised clause-finally. Example (2.10b), in which the participle occurs immediately following the auxiliary, is not grammatical. A similar pattern holds in embedded clauses, as illustrated in the examples in (2.6), in which the finite verb obligatorily occurs clause-finally. The examples in (2.6) are all grammatical, but the following examples are not:

¹¹In Chapter 4 and Chapter 6 we will see that the AUX may in fact also appear in third position, but this position is assumed to be the same phrase structural position as second position. For the moment it is important that the AUX has a relatively set position as compared to the grammatical functions.

- (2.11) a. **...dass der Kurier zustecken sollte dem Spion den Brief.*
 that the.NOM courier slip should the.DAT spy the.ACC
 letter
 ‘...that the courier should slip the spy the note.’
- b. **...dass der Kurier sollte zustecken dem Spion den Brief.*
 that the.NOM courier should slip the.DAT spy the.ACC
 letter
- c. **...dass der Kurier dem Spion den Brief sollte zustecken.*
 that the.NOM courier the.DAT spy the.ACC letter should
 slip
- d. **...dass der Kurier dem Spion zustecken den Brief sollte.*
 that the.NOM courier the.DAT spy slip the.ACC letter
 should

Only examples in which the finite verb appears clause-finally and the infinitive appears immediately preceding the finite verb are grammatical. This contrasts with Warlpiri, in which it appears that also in subordinate clauses, word order including verb placement is free (except for the initial position of the complementiser).¹² The issue of word order in subordinate clauses does not appear to be directly addressed in the literature on Warlpiri, but in general the literature emphasises that word order in Warlpiri is relatively free. Data from Warlpiri shows that the verb and nominal constituents can appear in different positions inside the subordinate clause:

- (2.12) a. *Jakamarra-rlu-ju yimi-ngarru-rnu kuja Japanangka-rlu marlu pantu-rnu.*
 Jakamarra-ERG-1SG.OBJ speech-tell-PAST DECL.C Japanangka-ERG
 kangaroo spear-PAST.
 ‘Jakamarra told me that Japanangka speared a kangaroo.’

¹²The status of subordinate clauses is debated in Warlpiri. Hale (1976) claims that Warlpiri does not have embedded clauses, but rather ‘adjoined relative clauses’. The reason for this seems to be that the clauses always appear at the edge of a sentence and never actually embedded clause-internally, and they are separated by a pause intonationally. Even if not literally ‘embedded’, they might still be subordinate clauses, as argued by Legate (2011). Warlpiri has two types of complementisers introducing subordinate clauses: one type of relational complementiser (*yi* and variants) and one general declarative complementiser *kuj*: in (2.12) this is glossed as DECL.C.

- b. *Nyarrpa-ngku yimi-ngarru-mu Jakamarra-rlu [kuja nyiya*
 how-2SG.OBJ speech-tell-PAST Jakamarra-ERG DECL.C what
pantu-rnu Japanangka-rlu]?
 spear-PAST Japanangka-ERG
 ‘What did Jakamarra tell you Japanangka speared?’

(Granites *et al.* (1976) via Legate (2011, p. 99))

In (2.12a), the word order in the subordinate clause is COMP - SUBJ - OBJ - V, whereas in (2.12b) the word order is COMP - OBJ - V - SUBJ. Word order here thus seems free as well. The position of the *wh*-word *nyiya* (‘what’) in (2.12b) appears immediately following the complementiser *kuja*: this positioning is likely to be due to its information structure role, as *wh*-words are inherently focused and often appear in the left periphery (in this case, of the subordinate clause).

Warlpiri is a Pama-Nyungan language, unrelated to any of the Germanic languages discussed above. Free word order does however occur in languages related to the Germanic family, for example Latin and Ancient Greek. Free word order is also said to be found in Japanese, part of the Japonic language family. Latin, Ancient Greek and Japanese have all been discussed as non-configurational languages because of their free word order. This shows that free word order is not a characteristic of a specific language family. An illustration from Latin is the following:

- (2.13) a. *Caesarem Brutus occidit.*
 Caesar.ACC Brutus.NOM kill.PERF.3SG
 ‘Brutus killed Caesar.’
- b. *Brutus Caesarem occidit*
 Brutus.NOM Caesar.ACC kill.PERF.3SG
- c. *Occidit Brutus Caesarem*
 kill.PERF.3SG Brutus.NOM Caesar.ACC
- d. *Caesarem occidit Brutus.*
 Caesar.ACC kill.PERF.3SG Brutus.NOM

(cf. Devine & Stephens (2006, p. 3))

All these orders are allowed, and any difference between them will lie in information structure or rhythm/metre.¹³ This shows that within one language family, one can have large differences in variation of word order.

To briefly recap, in the world's languages a range in rigidity/freedom of word order is attested. Free word order, said to be one of the hallmarks of non-configurational languages, is attested in languages from different language families. As will be shown later, word order in these languages is not actually free, but constrained by information structure rather than grammatical functions. Case seems to play a role in making it possible to have free word order, but it is not a requirement, as shown by the Swedish examples. A more in-depth discussion of word order variation will be given in Chapter 4.

2.2.2 Discontinuous expressions

A second characteristic attributed to non-configurational languages is the existence of discontinuous expressions. A discontinuous expression is a semantic unit consisting of two or more subparts which are not adjacent to each other in phrase structure. Discontinuous expressions are fairly common in languages with free word order, such as Warlpiri and Latin.¹⁴ Discontinuous expressions may be of different types, which will be discussed in more detail in Chapter 5. The type of discontinuity that is often discussed in relation to non-configurationality is a type of nominal discontinuity, often involving a noun separated from its determiner or adjective. An example of a discontinuous nominal expression in Latin is the following:¹⁵

¹³Even if not all of the orders in (2.13) are actually attested in the Latin data (due to the fact that the set of Latin data is limited in size), it is safe to assume that they are all acceptable based on extensive research on Latin over the years, among others Ross (1967), Kessler (1995), Devine & Stephens (2006) and Ledgeway (2012).

¹⁴Japanese, which has been analysed as non-configurational in some of the literature, does not have discontinuous expressions of the kind found in Warlpiri and Latin.

¹⁵Boldface here marks the subparts of the discontinuous expressions; I continue to use this notation throughout the thesis. When contiguous constituents are shown as a contrast to discontinuous expressions, they will also be marked in bold. The glossing '+ABL' means that the preposition *a* ('of') takes an object with ablative case.

(2.14) ...*a qua ego nullum confiteor aetatis meae*
of+ABL which.ABL I.NOM no.ACC admit.1SG lifetime.GEN my.GEN
tempus abhorruisse...
time.ACC deter.INF.PASS

‘... of which I admit that at no point in my lifetime I have been deterred...’

(Cic. *Arch.* 1)

In this example, the quantifier *nullum* (‘no’) and the noun *tempus* (‘time’) which it morphologically agrees with are separated by a verb and an adjunct genitive phrase. The accusative case-marking ensures that *nullum* (‘no’) is interpreted as the determiner of *tempus* (‘time’) and the two form a semantic unit. Nominal discontinuity of this kind also occurs in other Indo-European languages such as Ancient Greek, Polish and Russian (Siewierska, 1988), as well as in some non-Indo-European languages such as Warlpiri and other Australian languages. An example from Warlpiri is the following:^{16,17}

(2.15) *Kurdu-ngku ka wajili-pi-nyi wita-ngku*
child-ERG PRES chase-VR-NPST small-ERG
‘The small child is chasing it.’

(Simpson, 1991, p. 282)

In this example two nominals with the same case are separated in phrase structure. In Warlpiri adjective-like elements are analysed as nominals: it is assumed that Warlpiri only has N, V and PV (preverb) lexical categories, and AUX and Particle (which covers a range of particles, conjunctions and clitics) as functional categories (Hale, 1983; Hale *et al.*, 1995; Simpson, 1991).

In certain languages it is thus possible for two parts of one semantic unit to appear separated from each other in phrase structure; the two parts are interpreted as related because of the

¹⁶Example (2.15) has two readings, which translate differently. The first is the one shown, the second one is ‘The child is chasing it and he is small’. In the latter reading, *kurdungku* (‘child’) and *witangu* (‘small’) do not form a semantic unit, therefore I do not consider this interpretation to be a case of discontinuity. This will be explored in more detail in Chapter 5.

¹⁷The verb complex in (2.15), *wajili-pi-nyi*, consists of a preverb *wajili* (‘run, chase’), a verb root *pi* and a tense suffix *nyi* (nonpast).

same case-marking on the two (or more) parts of the discontinuous phrase.¹⁸ The case-marking makes clear that the subparts form a unit. However, certain types of discontinuous nominal constituents are attested in languages which do not have full case inflection systems. Consider the following examples from English:

(2.16) English DP-PP split:

A number of stories soon appeared **about Watergate**.

(Kirkwood, 1977, p. 55)

(2.17) English relative clause extraposition:

The man entered **who I met yesterday**.

The difference between these types of examples and the Warlpiri example in (2.15) is that in (2.15) the split is between a noun and its nominal modifier (translated as an adjective in English), and in (2.16) and (2.17) the split is between the ‘main part’ of the DP and its PP or CP modifier. In English nominal discontinuity is only allowed in these two constructions. The DP-PP split could be seen as a type of extraposition; the PP may occur extraposed but it cannot simply appear anywhere in the sentence. The restricted position in which the extraposed PP and extraposed CP can appear is key. This type of restriction is not attested in discontinuous nominals in Latin and Warlpiri. Nominals can be discontinuous quite freely and the ordering is irrelevant for the grammaticality of the sentence.¹⁹ Also, in Latin and Warlpiri the split is not restricted to a CP or a PP being separated from a DP, as shown by the examples in (2.14) and (2.15). In Latin, splits between determiner and noun or adjective and noun are also very common. There appear to be no constraints on where the separated parts of the nominal phrase may occur. Whereas in English the type of sentences in (2.16) and (2.17) are exceptions and appear to involve specific constructions, in Warlpiri and Latin discontinuity can occur between any subpart of a nominal semantic unit, and the different parts of the discontinuous phrase may appear anywhere in the sentence, in any order. Any

¹⁸Three-way splits are also possible in Latin, as shown by Bolkestein (2001).

¹⁹For an overview of constraints on Latin discontinuous nominal phrases, see Bolkestein (2001) and Chapter 5.

constraints on this will be language-specific, but it is clear that the types of discontinuity in (2.16) and (2.17) are of a different, much more constrained kind than the type attested in languages traditionally classified as non-configurational.

However, there is one special type of discontinuous nominal expression present in languages with strict word order that appears similar to the Warlpiri and Latin discontinuity type, namely quantifier float. The following is an example from English:

(2.18) **The boys** must have **all** left.

A version of this sentence without quantifier float is *all the boys must have left*. This type of quantifier float also occurs in German and many other languages which do not have discontinuous nominal constituents of the kind found in Warlpiri and Latin. Quantifier float is a special type of split, which is allowed under certain circumstances in languages which do not generally allow discontinuity of phrases. Also, not all quantifiers are allowed to ‘float’ in this way: in English only the quantifiers *all*, *each* and *both* occur in this type of split (Yoo, 2001).²⁰ I will for the moment assume that quantifier float is a special construction, subject to placement constraints like the DP-PP split shown in (2.16), and that it is an exception involving discontinuity in languages which do not generally allow discontinuity of phrases. The fact that only some and not all quantifiers allow this split strengthens this assumption. Note that in the Latin example in (2.14) the split is between a quantifier and a noun. Whether this can be called quantifier float is a tricky question. It is not like quantifier float in English, as it appears to be subject to different (and importantly, fewer) constraints than English quantifier float. I assume that the Latin example is an instance of the general nominal discontinuity allowed in this language, whereas quantifier float in English is an example of a specific construction.

2.2.3 Null anaphora

A third characteristic attributed to non-configurational languages is null anaphora. Hale (1983) shows that in Warlpiri, arguments do not have to be expressed with overt pronouns:

²⁰According to Yoo (2001), in other languages such as Japanese and Korean the quantifiers occurring in quantifier float are much more numerous than in English.

- (2.19) a. *Ngarrka-ngku ka panti-rni.*
 man-ERG AUX spear-NPST
 ‘The man is spearing him/her/it.’
- b. *Wawirri ka panti-rni.*
 kangaroo AUX spear-NPST
 ‘He/she is spearing the kangaroo.’
- c. *Panti-rni ka.*
 spear-NPST AUX
 ‘He/she is spearing him/her/it.’

(Hale, 1983, p. 7)

The subject or object which is not expressed in phrase structure can be inferred from the context. Warlpiri has pronominal markers on the AUX at its disposal to express grammatical functions:²¹

- (2.20) *Nya-nyi ka-rna-ngku.*
 see-NPST AUX-1SG.SUBJ-2SG.NSUBJ
 ‘I see you.’

Here it is clear from the pronominal markers that the subject is first person singular and that the object is second person singular. In the absence of pronominal markers, the subject and/or object are interpreted as third person singular, as shown in (2.19).

Null anaphora are not attested in, for example, English, assumed to be a highly configurational language:

- (2.21) a. *The woman bought.
 b. *Bought a book.

²¹Pronominal markers in Warlpiri have been analysed as pronominal clitics by some (Jelinek, 1984; Simpson, 1991, 2007; Hale *et al.*, 1995). As there does not appear to be a consensus in the literature, I choose to use affix notation (and not clitic notation, e.g. =X) to represent these markers throughout this thesis. This is the way this is most commonly done in the literature, even by Simpson (1991) and Hale *et al.* (1995).

Clearly, in English pronouns may not generally be dropped.²² However, pronoun drop is in fact attested in some languages that are not assumed to be non-configurational. An example is Spanish, which does not display the degree of freedom of word order that Warlpiri does.

- (2.22) a. *Compra un libro.*
 buy.3SG a book
 ‘He/she buys a book.’
- b. **La mujer compra.*
 the woman buy.3SG
 ‘The woman buys (it).’

Example (2.22) shows that the subject pronoun may be dropped in Spanish (in the right information structural context). The object pronoun may not be dropped, however. This is thus unlike the situation in Warlpiri, in which both subjects and objects may be dropped freely. A likely reason for this is the common topic status of subject pronouns: as they have already been mentioned in context, it is possible to infer them from the context. These examples show that null anaphora/pro-drop is available in configurational languages as well as non-configurational languages like Warlpiri. It will therefore not be discussed in more detail in this thesis.

2.2.4 Subject-object asymmetries

One phenomenon which relates to the discussion of configurational versus non-configurational languages is that of subject-object asymmetries. It has been observed that in many languages, subjects and objects show different syntactic behavior. A prime manifestation of this is in binding/coreference relations. Consider the following examples from English with reflexive pronouns:

- (2.23) a. Peter_i is washing himself_i.
- b. *Himself_i is washing Peter_i.

²²The only exception to this is some contexts in spoken language. One could say: *We’re going to the cinema. (Do you) want to come?*

In (2.23a), the reflexive pronoun is an object coreferring with the subject (in fact, it is bound by the subject), which is permitted. A reflexive pronoun cannot be a subject coreferring with the object, however, as shown in (2.23b). This observation has been taken to be one of the pieces of evidence in favour of a VP in the phrase structure of English, on the assumption that binding relations are governed configurationally. The difference in grammaticality between (2.23a) and (2.23b) is explained by a difference in position in the phrase structure, with the subject appearing external to the VP, and the object occurring internal to the VP. The two positions have different c-command relations to each other. The subject c-commands the object, but not vice versa. With the condition that reflexives need to be bound by their antecedent, and with binding defined in terms of c-command, the phrase structure of English accounts for the difference in grammaticality between (2.23a) and (2.23b). A full discussion of this will be given in Chapter 6; for the moment it is important to note that subject-object asymmetries are often taken as evidence for a VP constituent.²³ This distinction is important, as in some accounts it has been assumed that configurational languages have a VP, but non-configurational languages do not, e.g. Chomsky (1981). Coreference patterns for non-reflexive pronouns in English also show subject-object asymmetries:

- (2.24) a. Peter_i's cat sees him_i.
 b. *He_i sees Peter_i's cat.

These examples illustrate that an object pronoun may corefer with an antecedent embedded in the subject, but that a subject pronoun may not corefer with an antecedent embedded in the object.

As in English, in Warlpiri subject-object asymmetries are attested in reflexive binding:

- (2.25) a. *Napaljarri-rlu ka-nyanu paka-rni.*
 Napaljarri-ERG PRES-REFL hit-NPAST
 'Napaljarri is hitting herself.'

²³As will be shown in Chapter 6, LFG generally assumes that binding relations are defined in terms of f-structural relations rather than c-structural (phrase structural) relations.

- b. **Napaljarri ka-nyanu paka-rni.*
 Napljarri.ABS PRES-REFL hit-NPAST
 ‘Herself is hitting Napaljarri.’

(Bresnan, 2001, p. 7)

The phenomenon of subject-object asymmetries, at least in reflexive binding, thus extends to languages with very different typological characteristics than English. This fact appears surprising if we assume that subject-object asymmetries are evidence for a VP, as Warlpiri is not commonly assumed to have a VP. On the other hand, another set of data from Warlpiri with non-reflexive pronouns lacks subject-object asymmetries:

- (2.26) a. *Jakamarra-kurlangu maliki ka nyanungu-rlu wajili-pi-nyi.*
 Jakamarra-POSS dog PRES he-ERG chase-VR-NPST
 ‘He_{*i/j} chases Jakamarra_i’s dog.’
- b. *Jakamarra-kurlangu maliki-rli ka nyanungu wajili-pi-nyi.*
 Jakamarra-POSS dog-ERG PRES him chase-VR-NPST
 ‘Jakamarra_i’s dog chases him_{*i/j}.’

(Simpson (1991, p. 179-180), elicited by Mary Laughren)

Note that the word order in these sentences is not fixed, due to the free word order possible in Warlpiri. In other orders, also with the pronoun preceding the antecedent, the same coreference patterns are attested (Simpson, 1991). This is interesting: it could be that this attested lack of subject-object asymmetries is somehow connected to the posited non-configurationality of Warlpiri. This will be discussed in more detail in Chapter 6, along with a full discussion of the data in (2.26).²⁴

2.3 Configurationality

2.3.1 Introduction

We have seen that a high degree of variation in terms of how constituents are ordered and how grammatical functions are assigned can be found in the world’s languages. Traditionally,

²⁴Chapter 6 also shows that different grammaticality patterns are attested for the type of data in (2.26).

languages such as English with very limited nominal case inflection and a relatively strict word order are classified as configurational languages, and languages such as Warlpiri with a rich case system and relatively free word order are classified as non-configurational. The distinction is sometimes said to be due to the presence or absence of a VP in the phrase structure, with languages with a VP being configurational and languages without a VP being non-configurational. However, this is rather simplistic. Different definitions of configurationality have been proposed over time, and it is important to establish some clarity in this issue, in order to provide a proper account of configurationality. The key point that most approaches have in common is the idea that in configurational languages, grammatical functions are tied to specific phrase structural positions, whereas in non-configurational languages they are not. This section aims to clarify the different proposed definitions and typologies of configurationality, as well as providing a working definition of configurationality as a starting point for the rest of this thesis. My approach does not assume a strict two-way distinction, but starts with the assumption that there is a spectrum of variation.

2.3.2 Origin of the distinction

The proposed distinction between languages based on their syntactic structure, and specifically a division into ‘configurational’ and ‘non-configurational’ languages, originates in the late 1970s/early 1980s. Hale (1981) proposes this two-way distinction based on the existence of languages like Warlpiri, in which, as shown in Section 2.2.1, word order is fairly free. For non-configurational languages Hale (1981) proposes a flat structure to account for their freedom of word order, with the following rule:

$$(2.27) \quad E \rightarrow W^*$$

In this simple rule, ‘E’ stands for ‘Expression’, and the E node dominates a string of words (‘W’) of arbitrary length, shown by the Kleene star.²⁵ Languages with the rule in (2.27) are called ‘W-Star’ languages. Hale contrasts this type of language with ‘X-Bar’ languages.

²⁵Kleene star is used to indicate that there is zero or more of a specific element. W^* can thus expand to an empty string, to W, to W W, to W W W, etc. in principle to infinity.

X-Bar languages have phrase structural rules with specific structural positions for specific grammatical functions such as subject and object, allowing for empty nodes. His W-Star languages do not really have phrase structure rules, only the string rule in (2.27), meaning they do not have any specific positions for grammatical functions, or any type of X-bar positions such as specifier or head position. There are no empty nodes or gaps.

This idea of two different types of languages is expanded by Chomsky (1981), who analyses Japanese as non-configurational.²⁶ Chomsky (1981) argues, following Hale (1981), that the difference between configurational and non-configurational languages is that the configurations that determine grammatical functions in configurational languages are not represented in the X-bar system in the syntax of non-configurational languages. Chomsky assumes that Japanese has a flat structure, similar to the rule in (2.27) but with a few differences:

$$(2.28) \quad X' \rightarrow W^* X$$

Here X' is a maximal projection, X is its head, and W^* is a sequence of zero or more categories that are maximal projections (e.g. NP). The interpretation of W^* in (2.28) is thus different than in the rule in (2.27): in (2.28) W stands for a maximal projection, whereas in (2.27) it stands for a single word. In Chomsky's (1981) account, grammatical functions are assigned in a random fashion at D-structure. The interaction of the theta-criterion and the Case Filter ensures that at S-structure all NPs are assigned to a specific grammatical function.²⁷ Chomsky assumes that configurational languages like English have a VP in their structure, which distinguishes subjects and objects. Japanese, he claims, is a non-configurational language and lacks a VP. This way of classifying languages as configurational (with a VP) and non-configurational (without a VP) has been quite influential in the literature, but we will see that this assumption is too simple to account for the full range of phenomena associated with configurational and non-configurational languages.²⁸

²⁶Hale (1980) also discusses Japanese in the light of non-configurationality.

²⁷The 'S-structure' that is referred to in the Projection Principle is that of surface structure, not s-structure in the LFG sense, which is used to denote semantic structure; this will be explained in Chapter 3.

²⁸Chomsky (1981) does note that it is very likely that there are subtypes of configurational and non-configurational languages, and that it may turn out that the two types are more abstract properties that subsystems of a language may instantiate rather than being two actual language types.

Hale (1982, 1983) builds on his previous work by further discussing the non-configurational nature of Warlpiri. As mentioned, Hale (1983) lists three characteristics which he regards as the hallmark of non-configurational languages, and he shows that these are present in Warlpiri. These three characteristics are as follows, all of which were illustrated in Section 2.2:

(2.29) **Hale’s (1983) characteristics of non-configurationality:**

- a. free word order
- b. use of syntactically discontinuous expressions
- c. extensive use of null anaphora

Hale (1983) aims to find a unified explanation for these three characteristics. He proposes a relatively flat structure for Warlpiri from which these characteristics are derived. His proposal is more elaborate than the W-star rule from Hale (1981):

- (2.30) a. $X' \rightarrow X'^* X$
- b. $V' \rightarrow AUX X'^* V X'^*$

Rule (2.30a) defines the rule for nominal expressions and infinitive clauses, with X' being a maximal projection and X a head, appearing in final position. Rule (2.30b) defines the structure of finite clauses. Notice that the AUX has a specific position in these rules. Important for the discussion at hand is that the structure is relatively flat. Hale defines the difference between configurational and non-configurational languages in terms of a hierarchical versus a flat structure. In his analysis he formally captures the idea that in configurational languages, there is a strict identity ‘mapping’ between phrase structure nodes and grammatical functions, and that in non-configurational languages this is not the case. He defines a ‘Configurationality Parameter’, with an appeal to the Projection Principle from Government and Binding theory:

(2.31) **Projection Principle** (following Chomsky (1981)):

If *verb* selects *arg* at L_i , then *verb* selects *arg* at L_j (where L_i, L_j range over the 'levels' LF (logical form), D-structure and S-structure in the syntactic representations of clauses)

(Hale, 1983, p. 25)

(2.32) **Configurationality Parameter (CP):**

- a. In configurational languages, the projection principle holds of the pair (LS, PS).
- b. In non-configurational languages, the projection principle holds of LS alone.

(Hale, 1983, p. 26)

Here 'LS' refers to 'lexical structure', a structure including a predicate name and an argument array of this predicate. 'PS' refers to phrase structure. LS and PS are linked to each via the 'Linking Rule':

(2.33) **Linking Rule:**

Co-index N' in PS with *arg* in LS, provided the case category of N' is identical to that of *arg* (assigning a distinct index to each *arg* in LS)

(Hale, 1983, p. 15)

The difference between configurational and non-configurational languages thus lies in the way that the Projection Principle applies. In configurational languages there is a strict relation between LS and PS, a relation of *identity*, implying that specific arguments are tied to specific positions in phrase structure. This link is lacking in non-configurational languages: in these languages not phrase structure but other parts of the grammar (namely, morphological marking) determine grammatical functions.

Hale (1983) argues that the three characteristics of non-configurational languages can be derived from this lack of connection between LS and PS. Free word order is possible because there is no link between arguments and phrase structural positions, making any order possible.

In the same way discontinuous expressions can be derived: different subparts of arguments can occur in different parts of the phrase structure. Null anaphora are accounted for by the fact that it is allowed for elements in LS to not be present in PS, because of the lack of identity between the two structures.

Hale's (1983) definition thus relies on one parameter, capturing the observation that in non-configurational languages grammatical functions are not tied to specific phrase structure positions, whereas in configurational languages they are. Like Chomsky (1981) this gives rise to a two-way distinction. Also like Chomsky (1981), Hale (1983) adds more subtlety to this by saying that there may be subtypes of non-configurational languages. He proposes that potentially one can divide non-configurational languages into further groups, based on the types of structure (LS, PS, or both) which are relevant to Condition C of Binding Theory.²⁹ I use the word 'potentially', as Hale did not have access to the right type of binding data in Warlpiri to make an explicit claim like this with regards to Warlpiri. However, he discusses Japanese, which, like Chomsky (1981), he assumes to be non-configurational. Hale claims that in Japanese, PS plays a role in Condition C data, assuming that linear precedence is crucial to this type of data.³⁰ He claims that this explains the following patterns, assuming a flat structure for Japanese, to reflect its non-configurationality:

- (2.34) a. *John_i-ga zibun_i-o hihan si-ta.*
 John-NOM self-ACC criticise do-PAST
 'John criticised himself.'
- b. **Zibun_i-o John_i-ga hihan si-ta.*
 self-ACC John-NOM criticise do-PAST
 (Hale, 1983, p. 44)

The assumption is that an element (the reflexive *zibun* in this case) may not both c-command and precede an R-expression like *John*. In a flat structure, the reflexive c-commands the R-

²⁹Condition C of Binding Theory, which will be discussed in detail in Chapter 6, states, in the words of Chomsky (1981, p. 188), that *R-expressions must be free*. In other words, an R-expression may not be c-commanded by an element which it is coreferent with. The term *R-expression* is used to refer to nominal constituents that are not pronouns.

³⁰Condition C does not traditionally include linear precedence in its definition, as shown by the definition in the previous footnote.

expression and vice versa, and only in (2.34a) does the reflexive not precede the R-expression, rendering this example grammatical. The pattern in (2.34) can also be explained in terms of the grammatical function hierarchy, if one assumes that a nonsubject reflexive can only be bound by a subject.³¹ Hale also shows that at LS, Condition C plays a role:

- (2.35) **John_i-no sensei-o kare_i-ga syookai si-ta.*
 John-GEN teacher-ACC he-NOM introduce do-PAST
 ‘John_i’s teacher, he_i introduced.’

(Hale, 1983, p. 45)

The LS structure of this is as follows, according to Hale:

- (2.36) [_{V'} kare-ga = *arg_x* [_V John-no sensei-o = *arg_y*, syookai si-ta]]

The pronoun c-commands the R-expression in this LS, Hale claims, and therefore coreference is ruled out. Hale claims that Japanese is a type of non-configurational language in which Condition C is relevant to both PS and LS. He speculates that other potential subtypes are non-configurational languages in which Condition C only applies to LS, and non-configurational languages in which Condition C only applies to PS. He claims not to have found a clear case of a language of the former type, but that there are possible cases for the latter, namely Samoan (Chapin, 1970) and Navajo (Platero, 1982). Hale claims not to have the relevant data from Warlpiri to make predictions about what subtype of non-configurational it falls under. He states only that the Warlpiri data he looked at does not provide clear examples that contradict the tentative claim that Warlpiri falls in the same category as Japanese, with Condition C applying to both LS and PS.

2.3.3 Pronominal arguments

Hale (1981, 1982, 1983) and Chomsky (1981) laid the groundwork for work on configurationality, and the concept was developed further over the following years. It was observed that languages classified as non-configurational have other characteristics beside the three

³¹As will be shown in more detail in Chapter 6, this would reflect Condition A of binding theory.

noted by Hale (1983). For example, it has been pointed out that languages classified as non-configurational often have a rich verbal agreement system, but this is not true for all languages that one might classify as non-configurational based on their free word order, e.g. Jiwari (Austin & Bresnan, 1996). Another characteristic is the apparent lack of subject-object asymmetries in binding as briefly described in Section 2.2.4 (Pensalfini, 2006).

It is the observed lack of subject-object asymmetries that lead to a type of approach of non-configurationality which assumes that the pronominal markers in a language like Warlpiri are the arguments of the predicate, and that nominal constituents have a different function. This has resulted by the proposition of two separate but related hypotheses: the Pronominal Argument Hypothesis (Jelinek, 1984; Baker, 1996b) and the Secondary Predicate Approach (Speas, 1990; Baker, 2001).

The *Pronominal Argument Hypothesis* (PAH) is put forward originally by Jelinek (1984) in a response to Hale's (1983) dual structure hypothesis of non-configurationality. Jelinek (1984) claims that in Warlpiri there is no asymmetry between subjects and objects, as both can equally be expressed as pronominal clitics on the AUX. Jelinek (1984) assumes that the pronominal clitics are the manifestations of the arguments of the verb, and that free pronouns or nominal phrases should be analysed as adjuncts. As adjuncts, nominals may appear anywhere in the sentence, accounting for free word order. The Pronominal Argument Hypothesis is a hypothesis about the structure of certain non-configurational languages, but Jelinek (1984) notes that non-configurationality can come from other sources, because not all non-configurational languages have pronominal clitics, e.g. Japanese. In a language like Japanese she assumes that free word order of grammatical functions, as well as PRO-drop, follows from discourse factors. She also notes that placement of nominals in Warlpiri (all adjuncts in her analysis) is dependent on the same discourse factors. She thus identifies different factors (e.g. the fact that all nominals are adjuncts, or the fact that the discourse plays a role) that lead to free word order and speculates that non-configurational languages can be divided into subtypes depending on which factor(s) play(s) a role in word order.

A hypothesis about non-configurationality similar to the Pronominal Argument Hypothesis is the *Secondary Predicate Approach* (Speas, 1990; Baker, 2001). In the Secondary Predicate Approach, argument functions are also assumed to be filled by (abstract) pronominals, but instead of being analysed as adjuncts, overt nominals are analysed as secondary predicates which are base-generated low in the verb phrase. Legate (2002) observes that the Secondary Predicate Approach has only been entertained for Australian languages. Free word order under these assumptions is explained by assuming that secondary predicates may be moved anywhere after having been base-generated low in the verb phrase. This is also the mechanism that explains discontinuous expressions: a single pronominal may be modified by more than one secondary predicate, each of which may appear in a different position (separated from each other) in the phrase structure. Null anaphora are explained by the optionality of secondary predicates.

The general approach that the PAH and Secondary Predicate Approach share, namely the fact that the pronominal markers are assumed serve as the arguments of the predicate (and not the nominal constituents) is argued against by Austin & Bresnan (1996). They show, first of all, that Jiwarli, an Australian language distantly related to Warlpiri, lacks pronominal markers. However, Jiwarli shows Warlpiri-like W-type non-configurational properties (of the kind that Jelinek (1984) associates with non-configurationality): discontinuous nominal expressions, lack of evidence for a VP, null anaphora and pragmatically-conditioned word order (Austin, 2001) and split ergativity.^{32,33} The fact that Jiwarli does not have pronominal markers rules out a pronominal argument non-configurational approach for this language. However, as noted Jelinek (1984) states that non-configurationality may come from other sources, and she acknowledges that not all languages which have been labelled non-configurational have pronominal markers, e.g. Japanese. Austin & Bresnan (1996) do not want to posit a different analysis for Jiwarli than for Warlpiri in terms of their configurationality (and for example

³²Note that Jelinek (1984), Austin & Bresnan (1996) and Austin (2001) claim that pragmatically-conditioned word order is a characteristic of non-configurational languages, thus taking away the focus of word order as being free (in terms of grammatical functions). This is an important claim, and it will be discussed in more detail in Section 4.2.2.

³³Discontinuous expressions in Jiwarli will be discussed in Chapter 5.

group Jiwarli with Japanese), because Jiwarli and Warlpiri share many syntactic characteristics that Japanese does not have, e.g. lexically governed case on nominals, nominal arguments for which there is no pronominal marker as well as ambiguous null anaphora appearing in contexts where there is no AUX to host pronominal markers. Moreover, from the PAH Jelinek (1984) derives certain characteristics, e.g. split ergative case marking and the absence of D-quantifiers, which are present in Warlpiri and Jiwarli, but not in Japanese. For this reason Austin & Bresnan (1996) assume that Warlpiri and Jiwarli should be grouped together, and the fact that Jiwarli does not have any pronominal markers shows that an analysis such as the PAH or Secondary Predicate Approach cannot account for this. Instead, they propose that a dual structure approach (such as the one proposed by Hale (1983)) can account for the similar characteristics in Warlpiri and Jiwarli. I follow Austin & Bresnan (1996) in this, and do not assume the PAH or Secondary Predicate Approach in this thesis. Rather, I assume that LFG's parallel architecture, to be discussed in more detail in Chapter 3, is able to, in combination with certain phrase structure constraints, is very capable of accounting for the non-configurational characteristics discussed in this chapter.³⁴

2.3.4 The role of word order

By the late 1980s, the property of free word order became dominant in defining non-configurational languages (Pensalfini, 2006). This means that even a language like German, which has relatively flexible word order as shown in Section 2.2.1 but still does not seem to be non-configurational in the way that Warlpiri is, has been analysed as non-configurational, for example by Haider (1986).³⁵ Hale (1989) claims that there is not a unified set of characteristics that non-configurational languages share. Pensalfini (1992) shows that within the Pama-Nyungan language family, a family in which the members display free ordering of constituents, the different languages show varying degrees of word order variation, and that word order freedom on the clausal level, word order freedom on the nominal level, and discontinuous expressions are independent phenomena. Austin & Bresnan (1996) make a similar point:

³⁴The Pronominal Argument Hypothesis has actually been implemented in LFG, namely by Bresnan & Mchombo (1987) and Demuth & Johnson (1989).

³⁵German is also analysed as configurational around the same time, for example by Webelhuth (1985).

they claim that free word order, discontinuous expressions and null anaphora are independent phenomena, based on their evidence from Jiwarli and several other Australian languages.

Starting in the late 1980s, the consensus in transformational frameworks was that for many languages one could posit an underlyingly configurational structure, with any variation derived from this in surface structure. Examples of this are Webelhuth (1989) for German and Saito (1989) for Japanese. This feeds into the literature on ‘scrambling’: deviation from ‘standard’ or underlying word order for discourse reasons.³⁶ In these accounts it is assumed that there is an underlying word order which is set for a language, but that information structure can trigger movement of constituents to other positions. I do not follow approaches like these, as I do not assume movement, following LFG’s standard assumptions.

These observations and assumptions have given rise to two developments. Firstly, in transformational accounts, the idea that all languages are underlyingly configurational has become prominent. Whereas Chomsky (1981), pioneering Government and Binding at that stage, assumes a flat structure without a VP for Japanese to reflect its non-configurationality, many later accounts within transformational theories posit configurational (hierarchical) structures for such languages with different orders explained by movement rules. Examples of this are Legate (2002) for Warlpiri, Ledgeway (2012) for Latin and Hamilton (2014) for Mi’gmaq, an Eastern Algonquian language. A related proposal to these is Kayne (1994), who claims that the only abstract word orders that are possible are SVO and OVS, and that most likely of these two SVO is the one underlying order for all languages, and that any other orders are derived from this. Secondly, the observation that different orders are appropriate in different discourse contexts led to the coining of the term ‘discourse configurational language’ by Kiss (1995a): languages in which (broadly) the discourse determines the word order (and phrase structural configurations). The languages discussed as discourse configurational in Kiss (1995a) are Somali, Basque, Catalan, Modern Greek, Hungarian, Finnish, Korean and Quechua. Russian and Hindi have also been classified as discourse configurational languages

³⁶The concept of ‘scrambling’ has been defined in different ways: this will be discussed in more detail in Section 4.2.3.

in some of the literature (King, 1995; Gambhir, 1981). Note that ‘non-configurational’ and ‘discourse configurational’ are labels used to describe languages. These labels have often been used by disparate scholars, which may give the impression that they are unrelated. However, in Chapter 4 I show that languages traditionally labelled as non-configurational should be grouped with discourse configurational languages, because the word order of these traditionally classified non-configurational languages, although often said to be ‘free’, is actually determined by the information structure.

A paper which does not directly address configurationality, but addresses closely related issues, is Mithun (1987). Mithun shows, contrary to common belief at the time, that there are languages that do not have a basic underlying word order, but in which the word order is determined only by the discourse. The languages she discusses are Cayuga (of the Iroquoian family spoken in North America), Ngandi (of the Gunwinyguan family spoken in Australia) and Coos (of the Coosan family spoken in North America). She finds no evidence for an underlying, pragmatically unmarked word order in these languages, which leads to the claim that discourse configurational languages exist without any set positions for grammatical functions. This idea is important for the issue of configurationality.

2.3.5 Typologies of configurationality

Configurationality has not only been discussed for individual languages, but typologies have also been proposed. Two of these are the one by Nordlinger (1998a) and Pensalfini (2004), which will be discussed here. Nordlinger (1998a) gives a typology of configurationality, or rather, of the expression of grammatical functions, within the LFG framework. Nordlinger (1998a) discusses the issue of how head-marking and dependent-marking languages fit into a typology of configurationality. She argues against the claim made by Jelinek (1984) and Baker (1996a,b) that there is a link between head-marking and non-configurationality, by showing that there are also strongly dependent-marking non-configurational languages, namely Jiwari and Dyirbal. Importantly, in her definition a non-configurational language is a language in which grammatical functions are not identified by means of phrase structural configuration.

Nordlinger (1998a) gives a typology of expression of grammatical relations, based on two factors. One is configurationality, the extent to which grammatical functions are determined by phrase structural position, and the second is morphological marking, whether a language has head- and/or dependent-marking of grammatical functions. The typology based on these two dimensions is shown in in Table 2.1, along with a few languages classified by Nordlinger (1998a, p. 49).^{37,38}

Table 2.1: Nordlinger’s (1998a) Basic Typology of expression of grammatical relations

	\leftarrow <i>more non-configurational</i>	<i>more configurational</i> \rightarrow
\uparrow <i>more head-marking</i>	Mohawk, Mayali	Navajo, Chicheŵa
	Wambaya, Warlpiri	
\downarrow <i>more dependent-marking</i>	Jiwarli, Dyirbal	Icelandic, Martuthunira

Based on these two typological continuums, Nordlinger (1998a) identifies three (broad) language types: (i) the *configurational* type, in which phrase structural positions determine grammatical functions, (ii) the *non-configurational head-marking* type, in which verbal agreement/incorporated pronouns determine grammatical functions and (iii) the *non-configurational dependent-marking* type, in which case marking determines grammatical functions. She states that among Australian languages, one can find both types (ii) and (iii) but not type (i). Crucially, the three types (i), (ii) and (iii) are not mutually exclusive, and types of mixed configurationality are also possible. Nordlinger (1998a) lists a number of languages (German, Finnish and the Australian languages Panyjima (Dench, 1991), Diyari (Austin, 1981) and Uradhi (Crowley, 1983)) which show relatively strict word order, but rich case marking morphology, thus combining type (i) and (iii) in expressing grammatical functions. Warlpiri and Wambaya, as shown in Table 2.1, show a mix of head- and dependent-marking, thus mixing type (ii) and (iii) in expressing grammatical functions. For example, Warlpiri uses case mark-

³⁷Nordlinger (1998a) notes that the positioning of the example languages along the continuum in this typology is approximate only. She also notes that the dimension of head-marking to dependent-marking is obviously not relevant for languages that have little or no morphology.

³⁸Nordlinger (1998a) notes that these are two dimensions of many, but she does not explicitly discuss other dimensions.

ing as well as pronominal markers on the AUX constituent to express grammatical functions. My classification which will be presented in Chapter 4 follows a similar approach to (1998a)’s (1998a) approach, but instead of letting configurationality only depend on the expression of grammatical functions, I also take information structure into account. Nordlinger’s (1998a) formal characterisation of non-configurationality will be discussed in more detail in Section 3.2.5, after LFG has been properly introduced.

A different typology of (non-)configurationality is given by Pensalfini (2004), within the Principles and Parameters framework. Crucial to Pensalfini’s typology is where *encyclopedic features* may occur. Encyclopedic features, according to Pensalfini, are “those that give an element its status as a Saussurean sign, and allow it the possibility of referring to items or events in the world” (Pensalfini, 2004, p. 360). Besides encyclopedic features, there are also formal features. Following Distributed Morphology (Halle & Marantz, 1993; Marantz, 1996), Pensalfini (2004) assumes that lexical words can contain both encyclopedic and formal features, and that functional words only contain formal features. For example, an English verb such as ‘played’ (a lexical item) consists of the encyclopedic information ‘play’ and the formal feature ‘-ed’ which provides functional information, not information about the ‘sense’ of the word. The typology given by Pensalfini (2004, p. 393) is shown in Table 2.2, along with a few language classified by Pensalfini.³⁹

Table 2.2: Pensalfini’s (2004) Typology of Configurationality

		Encyclopedic features in V?	
		Yes	No
Encyclopedic features in argument positions?	Yes	English, Hopi, Japanese	Kalam, Basque
	No	Mohawk, Jiwari, Mayali, Warlpiri, Wambaya	Jingulu

Pensalfini’s typology is dependent on whether encyclopedic information is allowed in the core syntactic positions of a syntactic structure, either in the predicate (V) or in argument

³⁹Pensalfini (2004) also mentions Welsh as a language potentially grouped together with Kalam and Basque, but claims not to have done sufficient research on this to make a positive claim about this.

positions. This is under the assumption that every language has a strict underlying core syntactic structure with set positions for the core functions of verb and argument functions. As mentioned, English verbs contain both formal and encyclopedic information. They occur in ‘normal’ verb position in English, inside the VP. Therefore encyclopedic information is allowed in V position in English. The same thing is true about argument positions: NPs which contain encyclopedic information appear in argument positions in the tree (with subject external to VP and object internal to VP). Pensalfini (2004) puts Japanese in the same category as English in his classification, despite the fact that Japanese shows a wide range of word order variation, as briefly addressed above and to be addressed in more detail in Chapter 4. He claims that Japanese shows a degree of scrambling (this term will be explained in more detail in Chapter 4 as well) which is not the same as free word order in the way that for example Warlpiri shows free word order, but it is more constrained.⁴⁰ He thus classifies the top left cell in Table 2.2 as ‘configurational’, but he also labels the top right cell as ‘configurational’. The top right cell in Table 2.2 differs from the top left cell in not allowing for encyclopedic features to appear in V. He describes Kalam and Basque, the languages classified in the top right cell, as having ‘obligatory periphrastic verbal constructions’, where only particular types of verbal elements, which do not themselves carry encyclopedic information, may appear in core V position. For example, Basque only allows two types of auxiliaries in this position (*ukan* ‘have’ and *izan* ‘be’), which are only used to signal tense and agreement. Kalam and Basque are like English, Pensalfini claims, because of their relative strict ordering of constituents and constrained discontinuity of nominal expressions. All these languages are thus somewhat ‘configurational’ in his view in terms of the position of argument functions, and potentially the two different types are subtypes of the same overarching configurational type. The languages that do not allow for encyclopedic features in argument positions are the ones that are ‘non-configurational’ in allowing free ordering of argument functions. In these languages argument positions are filled by abstract *pros* and the instantiation of the arguments

⁴⁰In Chapter 4 I argue that if in Japanese there are no set positions for argument functions as is the case for Warlpiri, they should be classified as the same type of language. This appears to be the case because Japanese has been classified as a discourse configurational language, with (only) information structure determining word order. English, which has set positions for argument functions, falls into a different category in the classification I present in Chapter 4.

are assumed to be secondary predicates, following Baker (1996b). Pensalfini's (2004) approach to non-configurationality is thus in line with the Secondary Predicate Approach. Languages of this type include Mohawk, Jiwari, Mayali, Warlpiri and Wambaya. Pensalfini (2004) claims that Jingulu is unique in not allowing encyclopedic information to occur either in core V or core argument positions. The categories which do not allow encyclopedic information in argument positions are non-configurational in the sense that they allow for free word order, discontinuous constituents, and null anaphora (as argument NPs are assumed to be secondary predicates).

Like the typologies discussed in this section, my work also aims to provide a classification of languages in terms of their configurationality. However, I take a different set of factors into account, namely argument placement and information structure role placement. In order to go about this, I need a working definition of configurationality as a starting point, which will be presented in the following section.

2.3.6 A spectrum of configurationality

As shown in the previous sections, there are many ways in which configurationality has been defined and analysed. A key overarching factor that comes out of this literature is the idea that configurationality depends on whether a language expresses argument functions via phrase structure or via morphology. I assume this as well, building on work by Nordlinger (1998a) and others in LFG, but crucially, as will become clear in Chapter 4, I also take information structure into account.

The way that I choose to approach the issue of configurationality is to discuss three of the main characteristics that have figured prominently in the debate of configurationality, each of which will be discussed in detail in the subsequent chapters of this thesis. In order to evaluate what kind of predictions these characteristics make about the status of a language in terms of its configurationality, a working definition of configurationality is needed. A large part of the traditional non-configurationality literature assumes a two-way split between configurational

and non-configurational (or discourse configurational languages), but it appears that this assumption is too simplistic based on the range of variation attested.⁴¹ For example, there appears to be a spectrum of possibilities when it comes to freedom versus strictness of word order.

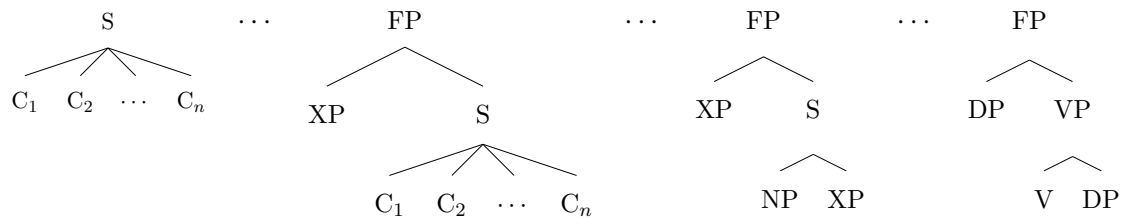
Within the approaches assuming a two-way split, approaches assuming that a VP is present in configurational languages and absent in non-configurational languages have been particularly prominent. This approach runs into problems in the face of evidence that in certain languages, in some sentences/constructions a VP is present and in others it is not. This is for example proposed by Engdahl *et al.* (2004) for Swedish. In their account of Swedish they assume that sentences with only one (finite) verb do not have a VP, and that sentences with more than one verb (including a finite auxiliary) do have a VP. An assumption such as this is problematic for a VP-based configurationality approach, if one allows for different syntactic structures for different constructions such as in Engdahl *et al.*'s (2004) approach. Also, this type of approach predicts subject-object asymmetries for those sentences with a VP, but not for sentences without a VP. Many syntacticians would not allow for the optionality of nodes such as the VP, but argue that it is always present in a language's structure or always absent.⁴² Either way, choosing one single cut-off point is problematic because it is not subtle enough in describing the range of different syntactic structures posited for the world's languages.

For this reason, as a working definition I assume a scale of configurationality, with a spectrum of possibilities. A good starting point for this is the "endocentricity scale", as proposed by Bresnan (2001). She defines a configurationality continuum, on which she defines two extreme points and two intermediate points. This spectrum is shown here:

⁴¹Of course exceptions to a two-way split were shown in the more recently proposed typologies by Nordlinger (1998a) and Pensalfini (2004) discussed in the previous section.

⁴²Payne (2008) even argues against the presence of a VP in English, a language in which the VP is fairly established as a maximal projection. He claims that English lacks a structural VP, but that VP-like constituents play a role in the semantics of English.

(2.37) Points on the endocentricity scale:



(Bresnan, 2001, p. 114)

Here *C* is used to denote ‘constituent’. One extreme of the spectrum, the non-configurational end, has a completely flat structure with an exocentric *S* as root node. The other end of the spectrum, the configurational end, has a functional phrase (*FP*) as root node, and a highly configurational structure with a *VP* and a *VP*-external *DP*. The two other points on the scale are one with a root *FP*, with *XP* and *S* with internal flat structure as daughters (more on the non-configurational end of the spectrum) and one with a root *FP* with *XP* and *S* with internal binary structure as daughters (more on the configurational end of the spectrum). One of the tasks of this thesis is to see if the extremes defined in this scale are actually attested or not. More specifically, I attempt to verify if the most non-configurational structure on the scale is in fact a possible structure or not. As shown by work on free word order languages such as Warlpiri and Latin, there are certain left peripheral positions reserved for specific elements, such as the auxiliary (Warlpiri) and certain enclitics (Latin). Moreover, it appears that the left periphery is also reserved for topic and focus constituents. This is not incorporated into much of the literature on configurationality, such as in the typologies by Nordlinger (1998a) and Pensalfini (2004). However, it is discussed in the literature on discourse configurationality, e.g. Kiss (1995a). In my classification of configurationality I incorporate the observation that languages with free ordering of argument functions have set positions for certain information structural roles.

Another aim of this thesis, to be discussed in Chapter 4, is to investigate to what extent these information structure positions are actually incorporated into the syntactic structure of some of the languages discussed in this thesis. The other end of the spectrum, the strict hierarchical structure, for example for English, is relatively well established due to a large

amount of research on the topic.

It is important to note that this thesis is not a work of typology: it addresses some issues relating to typology, but it is beyond the scope of the thesis to address all possible options of structure. Rather the focus of the thesis is on the proper definition of configurationality, including showing that there is a space of possibilities, but without an exhaustive discussion of the individual structures of different languages.

2.4 Conclusion

This chapter has illustrated the main characteristics that have been attributed to non-configurational languages and configurational languages. Hale (1983) shows that Warlpiri has free word order (in terms of grammatical functions), discontinuous expressions and null anaphora, taking these to be the three defining characteristics of non-configurational languages. It has been shown that the languages discussed so far show a range of strictness/freedom of word order. There are also languages that have been argued to be non-configurational, but which lack discontinuous nominal expressions of the Warlpiri and Latin kind, such as Japanese. At the same time, null anaphora are attested in languages which are not generally assumed to be non-configurational, such as Spanish. A proposed characteristic of configurational languages is subject-object asymmetries, which to some extent also seem to appear in non-configurational languages, however.

The literature which has addressed configurationality has proposed a two-way split (in different formats), but as a working definition I assume a spectrum of configurationality, following Bresnan (2001). A two-way distinction is too simplistic to account for the wide variation in the data relating to this phenomenon. This will become clear in the following chapters of this thesis, in which three different posited characteristics discussed in the configurationality debate are discussed. Word order variation is discussed in Chapter 4, followed by a discussion of discontinuous expressions in Chapter 5. Chapter 6 provides a discussion of subject-object asymmetries and binding patterns in Warlpiri (with a link to other languages

traditionally classified as non-configurational). Null anaphora will not be discussed in detail, as they seem to appear both in languages traditionally defined as non-configurational and languages traditionally defined as configurational.

Chapter 3

Formal Background

3.1 Introduction

This chapter predominantly serves as an introduction to Lexical-Functional Grammar and lays out the assumptions underlying my approach, which is discussed in Section 3.2. The parallel architecture that LFG assumes is well-suited to account for languages that have fairly free ordering of grammatical functions, and therefore fits well with the issues discussed in this thesis. Section 3.3 provides a brief overview of some tests for constituency of phrases, which are important for determining the structure of individual languages.

3.2 Lexical-Functional Grammar

This section introduces the syntactic framework that I assume in this thesis: Lexical-Functional Grammar (LFG). LFG is a non-derivational, constraint-based theory of syntax, developed in the late 1970s as a reaction against the more traditional syntactic views of transformational generative grammar in the Chomskyan tradition. Its grammatical architecture consists of different levels which express different types of information; this is also called the Correspondence Architecture (Asudeh, 2012). LFG is mathematically well-defined and more flexible than transformational theories in its ability to account for a wide range of typologically diverse languages.

The fact that LFG is constraint-based means that grammaticality is determined by the satisfaction of static constraints, rather than by derivations (Falk, 2001). The name ‘Lexical-Functional Grammar’ encodes two major features of LFG. First of all, it is ‘lexical’ in the sense that words and the lexicon play a large role in the theory. A large amount of information is encoded in the lexical specification of words, some of which is specified by phrase structural means in transformational theories.¹ The term ‘functional’ refers to grammatical functions. In LFG information concerning grammatical functions is not derived from phrase structure configurations as it is in transformational theories, but it is represented on a separate level from phrase structure, namely that of f-structure. How phrase structure (c-structure in LFG) and f-structure are connected will be shown in Section 3.2.2.

The foundational paper for LFG is Bresnan & Kaplan (1982), although some of the key arguments behind the framework are discussed in Bresnan (1978). The motivation behind LFG and formal issues in LFG are further discussed in Bresnan (1982), Dalrymple *et al.* (1995), as well as in Kaplan (1987, 1989). LFG is introduced in detail by Dalrymple (2001) and in the textbooks by Bresnan (2001) and Falk (2001). Shorter introductions are found in Dalrymple (2006) and Asudeh & Toivonen (2015).

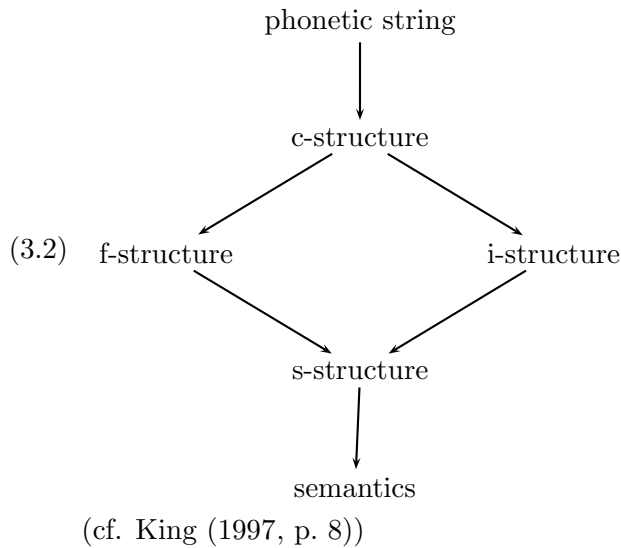
3.2.1 The correspondence architecture

Bresnan & Kaplan (1982) introduced LFG’s two distinct levels of syntactic representation: c-structure and f-structure. C-structures are represented by phrase structure trees, which carry information about linear order, dominance relations and constituency. All information regarding the grammatical functions of individual constituents is represented at the level of f-structure, which takes the form of an attribute-value matrix. F-structure also represents information such as subcategorisation and local and non-local dependencies. Illustrations of c-structure and f-structure and how they are connected are found in Section 3.2.2. The correspondence function ϕ (phi) maps the c-structure to the f-structure:

¹An important principle relating to this is the *Lexical Integrity Principle*, which states that no syntactic rule can refer to elements of morphological structure (Lapointe (1980) via Dalrymple (2001, p. 84)), which is widely accepted in LFG.

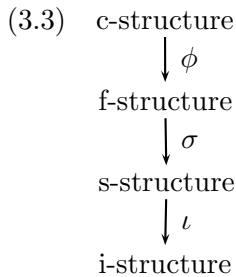
$$(3.1) \begin{array}{c} \text{c-structure} \\ \downarrow \phi \\ \text{f-structure} \end{array}$$

This original architecture was expanded in later works, to include additional levels of representation such as for prosody (p-structure), argument structure (a-structure, containing information about semantic roles), semantics (s-structure) and information structure (i-structure). Different works take into account different levels of representation, and importantly, different works posit different connections between the different levels. An example of this is the different architectures proposed by King (1997) and Dalrymple & Nikolaeva (2011) for the connection of i-structure to the other levels. The following is the proposal by King (1997), with a direct mapping between c-structure and i-structure:²



Dalrymple & Nikolaeva (2011) instead propose an architecture with no direct link between c-structure and i-structure:

²Another proposal which assumes a direct link between c-structure and i-structure is Mycock (2006).



(cf. Dalrymple & Nikolaeva (2011, p. 90))

The reason for positing a direct link between c-structure and i-structure, as in the architecture in (3.2), is to solve the *granularity problem* (King, 1997), which is the observation that f-structure constituents are often either too small or too large to define information structure roles.³ For example, if we want to put only a verb in focus, and its PRED value is ‘verb<SUBJ,OBJ>’, then one would want to avoid also putting the arguments SUBJ and OBJ in focus. Positing a direct link between c-structure and i-structure thus avoids this problem. However, Dalrymple & Nikolaeva (2011) solve the granularity problem in a different way: they allow only the f-structure head(s) to map to a specific information structure role (via their *meaning constructors* contributed by the lexical head of the f-structure). This makes it possible to not have a direct link between c- and i-structure. Their motivation for a direct link between f-structure and i-structure is that it allows one to specify a relation between a grammatical function and an information structure role, which helps account for some of the object marking phenomena described in Dalrymple & Nikolaeva (2011). Having a level of s-structure between f-structure and i-structure in the architecture in (3.3) ensures that a sentence receives the right semantic analysis. For the discussion at hand, it does not make much difference which architecture is chosen, as long as a level of i-structure is present, but I follow Dalrymple & Nikolaeva (2011) and assume the architecture in (3.3) as it provides a satisfactory solution to the granularity problem, as well as a straight-forward semantic analysis via their methods (although I do not concern myself with the details of semantic analysis in this thesis).

³Information structure roles are roles such as topic and focus. The inventory of information structure roles that I assume will be explained in Section 3.2.3.

3.2.2 C-structure and f-structure

LFG's Correspondence Architecture separates phrase structure realisation from grammatical functions (the mapping between the two is shown in (3.1)). This characteristic of LFG is especially useful in accounting for languages in which grammatical functions are not encoded via phrase structure but rather by morphology, as is the case for languages classified as non-configurational. LFG is based on the idea that c-structure and morphology are both capable of expressing the same information (i.e. grammatical functions) and are therefore in competition with each other (although in many cases there is a redundancy of information and grammatical functions can be marked both by structural position and by morphology). C-structure is represented in the form of phrase structure trees and is subject to the principle of *Economy of Expression*:⁴

(3.4) Economy of Expression:

All syntactic phrase structure nodes are optional and are not used unless required by independent principles (Completeness, Coherence, semantic expressivity).

(Bresnan, 2001, p. 91)

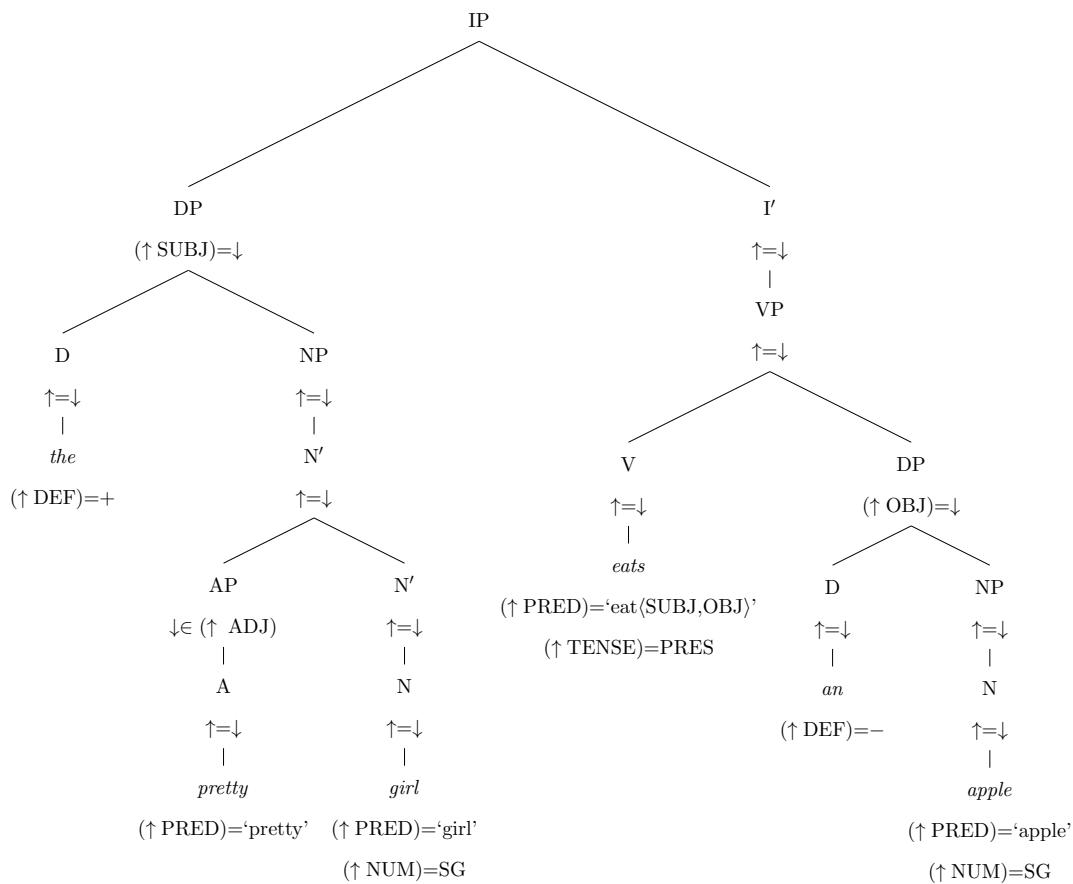
The effect of this principle is that nodes that do not serve a particular function are not present in the c-structure. This means that LFG c-structure trees will generally contain fewer nodes than a transformational tree does, and empty nodes are avoided.⁵ The f-structure constraints Completeness and Coherence, which will be discussed in detail shortly, ensure that the subcategorisation frames of predicates are satisfied, or in other words, that the right number of arguments of a predicate are present in the structure. Semantic expressivity ensures that adjuncts, even though they are not necessary to satisfy the subcategorisation requirements, are allowed to be present in c-structure.

⁴For arguments in favour of exceptions to Economy of Expression, see Snijders (2012b) and Chapter 5 of this thesis.

⁵According to Bresnan (2001), empty categories are allowed as a 'last resort' in highly configurational languages which lack other ways of expressing grammatical categories. Dalrymple *et al.* (2007) argue against this by showing that traceless accounts without any empty categories are possible.

C-structure trees are locally annotated with grammatical functions and lexical information, which is mapped to f-structure via the ϕ function. The annotations on the c-structure ensure that specific words/constituents contributing to the right part of the f-structure, which hosts functional information about the sentence. An f-structure is an attribute-value matrix which contains all the information concerning grammatical relations in a sentence. An example of a corresponding c-structure and f-structure for the sentence ‘the pretty girl eats an apple’ is presented in (3.5) and (3.6):^{6,7}

(3.5)



⁶Note that in the c-structure in (3.5), the determiner D and noun N are both f-structural heads of the DP, although they provide different types of information. D provides the value for DEF and N provides the value for PRED.

⁷Economy of Expression is illustrated in the tree in (3.5). Inside the subject DP, there are two N' nodes, which are posited to show that the adjective *pretty* is an adjunct, and therefore appears in the modifier position of the NP (inside the DP), the usual position of adjuncts in X-bar theory. The object DP does not contain an argument or adjunct meaning that we do not need to posit these N' nodes.

$$(3.6) \left[\begin{array}{l} \text{PRED} \quad \text{'eat(SUBJ,OBJ)'} \\ \text{TENSE} \quad \text{PRES} \\ \text{SUBJ} \left[\begin{array}{l} \text{PRED} \quad \text{'girl'} \\ \text{NUM} \quad \text{SG} \\ \text{DEF} \quad + \\ \text{ADJ} \quad \left\{ \left[\text{PRED} \quad \text{'pretty'} \right] \right\} \end{array} \right] \\ \text{OBJ} \left[\begin{array}{l} \text{PRED} \quad \text{'apple'} \\ \text{NUM} \quad \text{SG} \\ \text{DEF} \quad - \end{array} \right] \end{array} \right]$$

The c-structure in (3.5) encodes linear precedence, dominance relations, and constituency. It is annotated with grammatical functions and lexical information. The f-structure in (3.6) consists of one large overall f-structure (for the whole sentence) and three smaller f-structures: one corresponding to the subject of the sentence, one corresponding to the object and one corresponding to the adjunct inside the subject. The c-structure root node (IP) corresponds to the whole f-structure in (3.6). The annotation $(\uparrow \text{SUBJ}) = \downarrow$ signifies that everything dominated by this node is part of the subject f-structure. The arrow \uparrow signifies the mother node, and the arrow \downarrow signifies the daughter node. The notation $(\uparrow \text{SUBJ})$ stands for the f-structure of the SUBJ (the SUBJ of \uparrow) and the annotation $(\uparrow \text{SUBJ}) = \downarrow$ equates this f-structure to \downarrow , in other words, to the DP (and everything that is contained in it). A similar observation holds for the annotation on the object. The notation $\uparrow = \downarrow$ equates the f-structure of the mother with the f-structure of the daughter. This means, for example, that the f-structure of the noun *girl* is the same as the f-structure of *the pretty girl*. The annotation on the AP, $\downarrow \in (\uparrow \text{ADJ})$, signifies that the f-structure for the daughter is in the set of adjuncts of the mother. In LFG, adjuncts are assumed to be in a set, as there can be multiple adjuncts in one f-structure without violating any subcategorisation requirements. This is shown by the set notation \in on the annotation and by the curly brackets in the f-structure. The terminal nodes

in this tree are annotated with lexical specifications: DEF (definite) value for the determiners, PRED (predicate) values for all lexical content words, NUM (number) for nouns and TENSE for the verb. This information also ends up in the f-structure.

An important concept in f-structure is the operation of *unification*:⁸ the feature structures of different words/constituents unify in the f-structure (Kay, 1979; Shieber, 1986; Dalrymple, 2001). For example, the object of the verb in (3.5) and (3.6) consists of two words: *an* and *apple*. The determiner contributes the DEF value and the noun contributes the PRED and NUM values. All features appear together in the f-structure of the OBJ in (3.6). Unification thus makes it possible to represent features of an f-structure unit together, even if these features are represented in different parts of the phrase structure. The concept of unification will be important in the discussion of discontinuous expressions, as will become evident in Chapter 5.

Phrase structure rules, Completeness and Coherence

In LFG, c-structure is licensed by phrase structure rules. Traditionally, phrase structure rules are thought of as rewrite rules which generate phrase structure in a procedural fashion. They are in this view considered to be instructions to build trees. In LFG, phrase structure rules are not rewrite rules, rather they are ‘node admissability conditions’ (McCawley, 1968); they are constraints rather than procedures. I will refer to them as c-structure rules, to make the distinction clear. C-structure rules in LFG determine which trees are allowed and which ones are not. This way of viewing c-structure rules reflects the constraint-based, descriptive nature of LFG as a theory of syntax as opposed to transformational accounts. Examples of c-structure rules which (partially) allow for the c-structure in (3.5) are the following, annotated for their functions:⁹

⁸Strictly speaking, LFG does not have an operation of unification on structures, as in, e.g., HPSG (Pollard & Sag, 1994). The effect of unification is captured through equalities in f-descriptions like (\uparrow SUBJ) = \downarrow . For my purposes, it is harmless to think of this as unification.

⁹To account for (3.5) one would need additional rules, e.g. for NP and AP, and also a list of lexical entries specifying the actual words of the categories D, N, P and V.

- (3.7) a. $IP \rightarrow DP \quad I'$
 $(\uparrow \text{SUBJ}) = \downarrow \quad \uparrow = \downarrow$
- b. $DP \rightarrow D \quad NP$
 $\uparrow = \downarrow \quad \uparrow = \downarrow$
- c. $I' \rightarrow I \quad VP$
 $\uparrow = \downarrow \quad \uparrow = \downarrow$
- d. $VP \rightarrow V \quad DP$
 $\uparrow = \downarrow \quad (\uparrow \text{OBJ}) = \downarrow$

This set of rules clearly does not account for all sentences in English, but it provides a good illustration of c-structure rules and their annotations. The annotations are crucial in the discussion of free versus strict word order, which will be addressed in more detail in Chapter 4.

Usually in phrase structure rules, the difference between optional and obligatory constituents is signaled by parentheses around optional constituents. Since LFG assumes Economy of Expression, however, this is not necessary, since all nodes are optional (Falk, 2001).¹⁰ I therefore do not choose to use this type of notation in c-structure rules. The ‘obligatory’ optionality means that the c-structure overgenerates: a set of c-structure rules for a specific language admits a large number of possible c-structure configurations, including sentences that are ungrammatical. For example, the set of rules in (3.7) would in principle allow for the following sentence, assuming that nodes are optional:

(3.8) *Hits the man.

In this example, the subject is missing. An ungrammatical sentence like this one is ruled out by a strongly constrained f-structure. F-structure must obey the principles of *Completeness* and *Coherence*. *Completeness* states that all argument functions specified in the PRED of the head

¹⁰I will actually challenge the standard presentation of Economy of Expression in Chapter 5, based on work by Snijders (2012b).

must be present in f-structure (not too few arguments), and *Coherence* states that all argument functions must be selected by their local PRED (not too many arguments) (Falk, 2001). These principles thus ensure that only sentences which are functionally complete and coherent (not containing too little or too much information) are analysed as grammatical sentences. The c-structure cannot in principle make constituents obligatory, but the f-structure can. The example in (3.8) is thus ruled out because Completeness is not satisfied: the verb is missing its subject argument. For this reason, Economy of Expression takes Completeness and Coherence into account. However, the c-structure is capable of ruling out other examples, such as the following:

(3.9) *Man the met woman the.

This is clearly an example which is not well-formed; there is no c-structure rule in English that would allow it. This shows that both c-structure and f-structure constrain which sentences are grammatical and which ones are not. In comparison, in transformational frameworks phrase structure alone is the constraining factor. This is necessarily the case in these frameworks, as phrase structure is the only level of representation, and it contains all functional information. As we will see, LFG's separation of phrase structural configurations and functional information is very useful in the analysis of languages with (relatively) free word order.

Inventory of grammatical functions

So far we have seen that SUBJ, OBJ and ADJ may appear in the f-structure as grammatical functions (attributes in the f-structure), but there are more. For the purpose of this thesis, it is important to specify an inventory, so that one can refer back to this as a reference in later chapters. The total set of grammatical functions in LFG as defined by Bresnan (2001) and Dalrymple (2001) is the following:¹¹

¹¹XCOMP and XADJ are 'open' versions of COMP and ADJ respectively, used in LFG's analyses of predicate complements, raising verbs and controlled adjuncts.

(3.10) LFG’s inventory of grammatical functions based on Bresnan (2001) and Dalrymple (2001):

{ TOP , FOC , SUBJ , OBJ , OBJ_θ , OBL_θ , COMP , XCOMP , ADJ , XADJ }

In Bresnan’s (2001) and Dalrymple’s (2001) views, these may all appear in the f-structure as attributes. The fact that all of these are referred to as grammatical functions means we need to be more specific with the terminology. { TOP, FOC, SUBJ } are commonly referred to as discourse functions (DF). More specifically, they are traditionally referred to as *syntacticised discourse functions*, as they appear in the f-structure and are thus part of the syntax (Bresnan & Mchombo, 1987; Kaplan & Zaenen, 1989; King, 1995; Bresnan, 2001; Dalrymple, 2001). I take a different view, disentangling discourse roles from their syntactic correlates, as will become clear in the next section. { SUBJ, OBJ, OBJ_θ, OBL_θ, COMP, XCOMP } are the argument functions (AF).¹² Notice that in this inventory, SUBJ may serve both as a DF as well as an AF. The reason for this is that the SUBJ is often regarded as the default topic, which is represented by the optional annotation ((↓ SUBJ) = (↓ TOP)) on the root sentential node (Bresnan, 2001).

Assuming that topic and focus appear only on the i-structural (information structural) level, as will be explained in more detail in the following section, we have a different inventory of grammatical functions than the one displayed in (3.10):

(3.11) New inventory of grammatical functions (GF):

{ SUBJ , OBJ , OBJ_θ , OBL_θ , COMP , XCOMP , ADJ , XADJ }

Being able to refer to this set of GFs will be useful in ensuring that each constituent is not only linked to an information structure role, but also to one of the grammatical functions in (3.11). For the classification of languages which will be presented in Chapter 4, the inventory of argument functions is especially important, as I assume that adjuncts ((X)ADJ) do not participate in word order typology in the same way that argument functions do in languages

¹²I will refer to argument functions as AF, following Bresnan (2001). They are sometimes also referred to as *governable grammatical functions*, as for example by Kaplan & Bresnan (1982).

with strict ordering of constituents.¹³ The set of of argument functions is as follows, for reference:

(3.12) Inventory of argument functions (AF):

{ SUBJ , OBJ , OBJ_θ , OBL_θ , COMP , XCOMP }

3.2.3 I-structure and information structure roles

The LFG level of i-structure contains all information relating to the information structure of a sentence, or to its *information structure roles* (abbreviated to ISRs or IS roles). An information structure role is the abstract function that a constituent plays in the discourse. Topic and focus are examples of this, but they are not the only ones. In my choice of inventory of information structure roles I follow Butt & King (1996, 2000), Choi (1999), Dalrymple & Nikolaeva (2011) and Mycock (2013), and assume four distinct information structure roles: TOPIC, FOCUS, BACKGROUND INFORMATION and COMPLETIVE INFORMATION.¹⁴ The definitions of these four information structure roles are as follows (definitions combined from Butt & King (1996, 2000)):

- (3.13)
- **TOPIC:** Informs the hearer what the speaker is talking about. It is given or old information, but is prominent.
 - **FOCUS:** New information introduced into the discourse, filling the informational gap between the speaker and the hearer.
 - **BACKGROUND INFORMATION** Like topic it is old or known information, but it is not prominent and it is not what the utterance is about.
 - **COMPLETIVE INFORMATION:** Like focus it is new information, but it is not prominent.

In certain analyses, e.g. Butt & King (1996), Choi (1999) and Mycock (2013), these roles are decomposed into binary features (PROM(inence) and NEW, as can be inferred from the

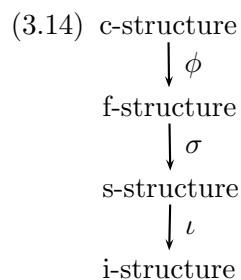
¹³As mentioned, an alternative view of this assuming that adjuncts have a set position and that other constituents are ordered around the is Cinque (1999, 2004). I do not adopt this view.

¹⁴Different inventories are possible, and others have proposed different combinations of IS roles, e.g. including GROUND, RHEME, SCENE; see for example Andréasson (2007) and Mycock (2007a).

descriptions in (3.13)). For the sake of simplicity, I will for the moment simply use the four IS roles without any reference to features.¹⁵ Also, the exact choice of inventory should not make any difference to the claims made in this thesis, as my main concern is the way in which IS roles are annotated, rather than the exact inventory of IS roles.

In order to see how information structure roles are annotated and represented in i-structure, I will start off by explaining the traditional way in which topic and focus are treated in LFG, namely as *syntacticised discourse functions*, as briefly explained in Section 3.2.2. As syntacticised discourse functions, topic and focus appear in the f-structure and are annotated on c-structure rules with $(\uparrow \text{TOP}) = \downarrow$ and $(\uparrow \text{FOC}) = \downarrow$ respectively, to denote the c-structure to f-structure mapping. In the f-structure they appear as the attributes TOP and FOC. However, with the assumption of a level of i-structure, information relating to the information structure of a sentence is not stored in the f-structure (syntactically) but in i-structure only. Information structure roles as explained above are thus different from the syntacticised discourse functions, in not being part of the syntax, but rather being abstract functions on the i-structure level.

Like the mapping from c- to f-structure, mapping to i-structure is made possible by annotations to i-structure. Recall that I assume the architecture proposed by Dalrymple & Nikolaeva (2011):



(cf. Dalrymple & Nikolaeva (2011, p. 90))

The mapping between c-structure and i-structure is represented in a very similar fashion

¹⁵That said, a short discussion of these features and their potential role in the configurationality classification will be presented in Section 4.5.3 of Chapter 4.

to the mapping between c-structure and f-structure, namely via annotations. The difference is addition of subscripts sigma and iota, denoting the mapping to s-structure and to i-structure respectively.¹⁶ This is illustrated in the following set of rules, proposed by Dalrymple & Nikolaeva (2011, p. 83) for unmarked sentences in English:¹⁷

$$(3.15) \quad \begin{array}{l} \text{IP} \rightarrow \quad \text{NP} \quad \text{I}' \\ \quad \quad (\uparrow \text{SUBJ}) = \downarrow \quad \uparrow = \downarrow \\ \quad \quad \quad \uparrow_{\sigma\iota} = \downarrow_{\sigma\iota} \\ \quad \quad ((\uparrow_{\sigma} \text{DF}) = \text{TOPIC}) \end{array}$$

$$\text{I}' \rightarrow \left(\begin{array}{c} \text{I} \\ \uparrow = \downarrow \end{array} \right) \text{VP} \quad \uparrow = \downarrow$$

$$\text{VP} \rightarrow \text{V}' \\ \quad \quad \quad \uparrow = \downarrow$$

$$\text{V}' \rightarrow \text{V} \left(\begin{array}{c} \text{NP} \\ (\uparrow \text{OBJ}) = \downarrow \\ \uparrow_{\sigma\iota} = \downarrow_{\sigma\iota} \end{array} \right)$$

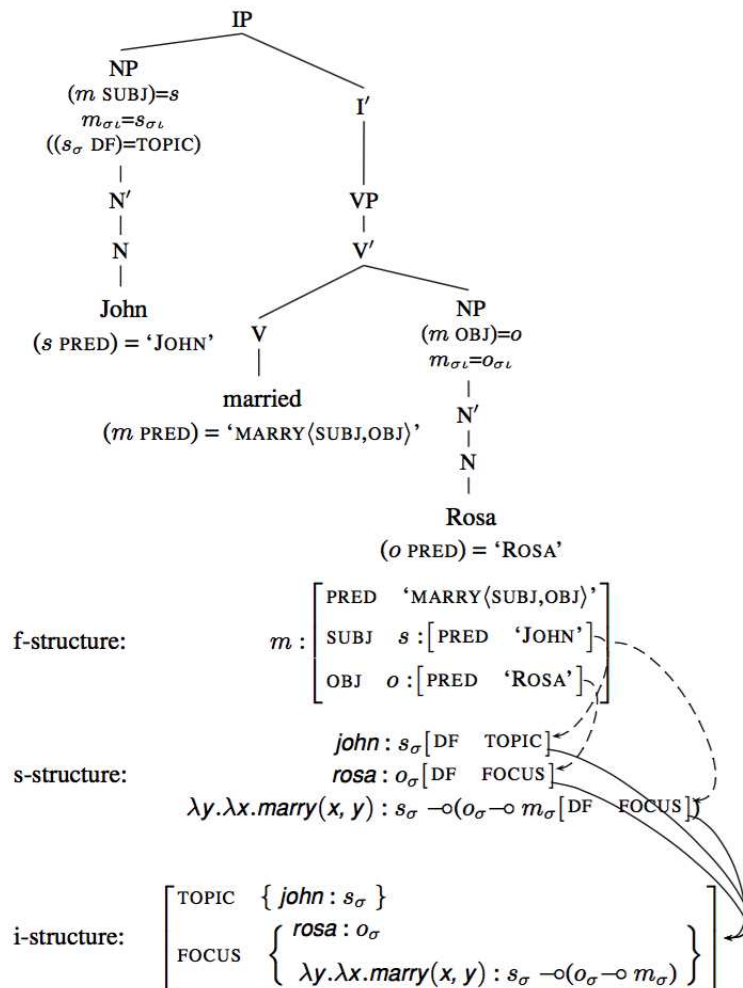
The IP rule includes an NP marked as the subject (by the first annotation). The second annotation on the NP, $\uparrow_{\sigma\iota} = \downarrow_{\sigma\iota}$, signifies that the i-structure of the NP is the same as the i-structure of the whole sentence. The final annotation on the NP is optional, and signifies the default topic function of the subject. DF here stands for discourse function. It is a consequence of Dalrymple & Nikolaeva's (2011) theory, which assumes that every NP must have a DF role, that the default topic is the subject. In the V' rule, the object NP (which is optional, to allow for the possibility of both transitive and intransitive sentences) does not have this standard, optional specification for a discourse function, as there is no default DF

¹⁶In works assuming a direct correspondence between c-structure and i-structure, one can solely subscript ι , as has been done by for example Butt & King (2000), who follow the architecture proposed by King (1997).

¹⁷Here I follow Dalrymple & Nikolaeva's (2011) notation of marking optionality of c-structure nodes by round brackets. For this specific rule I retain their use of NP instead of DP, to stay in line with the structures which will be shown in (3.16).

associated with the object (at least not in English). This does not mean that the object does not have a DF. This is illustrated in the following example structure for the sentence *John married Rosa*, which also clearly illustrates the mapping between different levels:

(3.16) C-structure, f-structure, s-structure and i-structure for *John married Rosa*:



(Dalrymple & Nikolaeva, 2011, p. 91)

Here the dashed arrows represent the σ function, mapping from f- to s-structure, and the solid arrows represent the ι function, mapping from s-structure to i-structure (Dalrymple & Nikolaeva, 2011). The subject is indeed a topic here, and the predicate (verb and its object) have a focus role. Importantly, each word in the sentence is assigned an IS role: this happens via the following specification for the meaning constructors (marked in

bold) for the individual words:

- (3.17) a. **john** $\in (s_{\sigma\iota} (s_{\sigma} \text{ DF}))$
 b. **married** $\in (m_{\sigma\iota} (m_{\sigma} \text{ DF}))$
 c. **rosa** $\in (o_{\sigma\iota} (o_{\sigma} \text{ DF}))$

The general schema of meaning constructors is as follows:

(3.18) **meaning-constructor** $\in (\uparrow_{\sigma\iota} (\uparrow_{\sigma} \text{ DF}))$

The individual meaning constructors in (3.17) determine how meanings are combined in the semantic derivation. In each of the cases, a meaning constructor must bear the discourse function DF (in i-structure, via s-structure) specified by the s-structure of *s* (the subject), *m* (the predicate, *married*) or *o* (the object) respectively. Importantly, in most cases DF is unspecified in the c-structure rule or lexical entry, meaning that linguistic and discourse context determine its value (exceptions to this are for example *wh*-words, which are inherently focused). Leaving aside the details of this, especially the details related to s-structure, the important thing for the discussion here is that there is a mapping from c-structure to i-structure, and that there is thus no need for grammaticised discourse functions in the f-structure. For the sake of simplicity, I will use the annotation $\downarrow_{\sigma\iota} \in (\uparrow_{\sigma\iota} \text{ ISR})$ when discussing the information structure roles of constituents, as it more intuitively captures the annotation from c-structure to i-structure, while adhering to the architecture in (3.14).¹⁸ As I leave the exact details of the semantic analysis out of the discussion for the moment, I believe this annotation will suffice: I assume it can easily be adapted to give a full semantic analysis along the lines of Dalrymple & Nikolaeva (2011).

3.2.4 Unbounded dependencies

Working with a separate level of i-structure, all the information structural functions are present in i-structure only. In certain cases, however, we might still want to signify that

¹⁸The set notation here indicates that there can be multiple TOPIC or FOCUS constituents in i-structure.

there is an unbounded dependency of some kind. We can do this by positing a grammatical function UDF (unbounded dependency function, following Asudeh (2011, 2012)).^{19,20} A UDF is a signal that there is an unbounded dependency present, but the actual function of this dependency (its information structure role) needs to be specified separately, namely by an annotation to the i-structure. Positing a UDF ensures that the syntactic function of a fronted element is separated from its information structure role in the analysis. Also, positing a UDF in the analysis is in line with my use of the term *fronting* rather than *topicalisation*; it gives one name and one analysis to the same phenomena with two different information structure roles (TOPIC and FOCUS).

In Alsina (2008, 2014) and Asudeh (2011, 2012), the UDF (OP in Alsina (2008)) essentially replaces both TOP and FOC in f-structure. This therefore includes cases of ‘simple’ fronting, where the fronted element occurs in the same clause as it would have without fronting:

(3.19) a. Simple fronting:

Mary, John saw.

b. No fronting:

John saw Mary.

c. Fronting across a clausal boundary:

Mary, John thought I saw.

Unbounded dependencies and long distance dependencies are often discussed in one breath, but (3.19a) is not an example of a long distance dependency, because no clausal boundary is crossed. (3.19c) is in fact an example of long distance dependency, as the fronted element crosses a clausal boundary. I follow Asudeh (2011, 2012) and thereby indirectly Alsina (2008, 2014) by positing a UDF for both cases, capturing the unboundedness of the construction.

¹⁹Alsina (2008) proposes a similar function (also a single function in f-structure ranging over both TOP and FOC), which he calls OP(erator).

²⁰Claiming that UDF is a grammatical function means that it is technically part of the inventory in (3.11). For clarity I do not include it for the moment, as UDF has a different nature than the other GFs. For example, the f-structure of a UDF has to be linked to the f-structure of a GF from the inventory in (3.11): UDFs cannot simply occur on their own in the f-structure.

The reasons for this will be discussed in more detail in Section 4.6, accompanied by a more in-depth discussion about the status of UDF in discourse configurational languages. Importantly, it is assumed that UDFs adhere to the Extended Coherence Condition:

(3.20) **Extended Coherence Condition:**

UDF must be linked to the semantic predicate argument structure of the sentence in which they occur, either by functionally or by anaphorically binding an argument.

(cf. Bresnan & Mchombo (1987))

This means that UDFs are connected not only to an information structure role, but also to a non-discourse grammatical function (from the set in (3.11)), whether that GF is inside the same clause or inside an embedded clause. This is achieved by *functional uncertainty*, a concept introduced by Kaplan *et al.* (1987) and Kaplan & Zaenen (1989). Functional uncertainty allows us to capture the fact that an information structure role can be connected to a non-discourse grammatical function inside a matrix clause (GF), inside an embedded clause (COMP GF) or inside even further embedded clauses (e.g. COMP COMP GF). This results in a functional uncertainty path: COMP* GF. Functional uncertainty is key in accounting for unbounded dependencies, as it captures a generalisation about the possible links between an information structure role and the syntactic function that it has inside a sentence. As stated, an information structure role is the abstract function of a constituent in the discourse, rather than a specific structural position. This does not mean that particular information structure roles cannot be bound to specific positions. Important for the moment is that IS roles do not appear in the f-structure and are therefore not part of the syntax.

To recap, positing a separate i-structure level provides a neat way of dealing with information structure roles, as separated from f-structure, although in some cases we might still want to represent them as connected to UDFs in f-structure. It is altogether a ‘cleaner’ way of dealing with information structure. Moreover, it makes it easier and more straightforward to deal with many different types of information structure roles, rather than only topic and focus. Instead of the three syntacticised discourse functions TOP, FOC, SUBJ we

have four different types of information structure roles (TOPIC, FOCUS, BACKGROUND, COMPLETIVE). By positing an i-structure level there is a separation between the syntax and information structure, while allowing the relationship to be captured through standard correspondence functions.

Example of annotations: English fronting

In order to give a proper illustration of all of these terms and concepts, as they will be important for the discussion in Chapter 4, I will discuss an example of English fronting in more detail. Especially important for the discussion at hand is the use of c-structure rules, their annotations constraining f-structure and i-structure, and the way that these annotations are constrained. An example of English fronting is the following:

(3.21) Q. Have you seen John?

A. John we didn't see.

In the answer, A, in (3.21), *John* is a topic, and is syntactically a UDF in f-structure. We can account for fronting in English with the following c-structure rule, based on a rule by Dalrymple (2001, p. 395–396) who follows Bresnan (2001) (both of whom refer to this as topicalisation):^{21,22}

(3.22) English fronting rule:

$$\begin{array}{l}
 \text{ISR} \equiv \{ \text{TOPIC} \mid \text{FOCUS} \} \\
 \text{IP} \rightarrow \quad \quad \quad \text{UDFP} \quad \quad \quad \text{IP} \\
 \quad \quad \quad \quad \quad \quad (\uparrow \text{UDF}) = \downarrow \quad \quad \quad \uparrow = \downarrow \\
 \quad \quad \quad \quad \quad \quad \downarrow_{\sigma_1} \in (\uparrow_{\sigma_1} \text{ISR}) \\
 \quad \quad \quad \quad \quad \quad (\uparrow \text{UDF}) = (\uparrow \text{UDFPath})
 \end{array}$$

(3.23) UDFP in English fronting:

$$\text{UDFP} \equiv \{ \text{DP} \mid \text{PP} \mid \text{VP} \mid \text{AP} \mid \text{CP} \}$$

²¹For this reason, in Dalrymple (2001) UDFP is TopicP and UDFPath is TopicPath.

²²In principle I assume that UDFs can also appear for rightward displacement, the phenomenon discussed in Section 4.5.3. However, in this thesis I mainly focus on word order phenomena in the left periphery, as this already in itself provides a wide range of phenomena to be taken into account. I leave rightward displacement and its possible representation by UDF open for further research.

In (3.22) we see that the fronted element is denoted with UDFP (UDF Phrase), a *constituent structure metacategory abbreviation* (Dalrymple, 2001). It is not a single category, but rather one that ranges over a number of categories. UDFP is defined in (3.23) for English fronting.²³ The fronted constituent, represented by UDF, can have either TOPIC or FOCUS function in i-structure, determined by the context. The final annotation on UDFP, $(\uparrow \text{UDF}) = (\uparrow \text{UDFPath})$, ensures that the UDF receives a GF. This is achieved by a path incorporating functional uncertainty, representing the unboundedness, the uncertainty of the annotation. This path is constrained; only certain GFs are allowed to be linked to the UDF. The constraints are specified in UDFPath. In the fronting example in (3.21), we have a ‘solution’ to the functional uncertainty, namely $(\uparrow \text{UDF}) = (\uparrow \text{OBJ})$. There can also be different instantiations of UDFPath:

(3.24) a. Lily, I believe he has taken out tonight.

b. The man in the black coat we claim that John believes he saw that night.

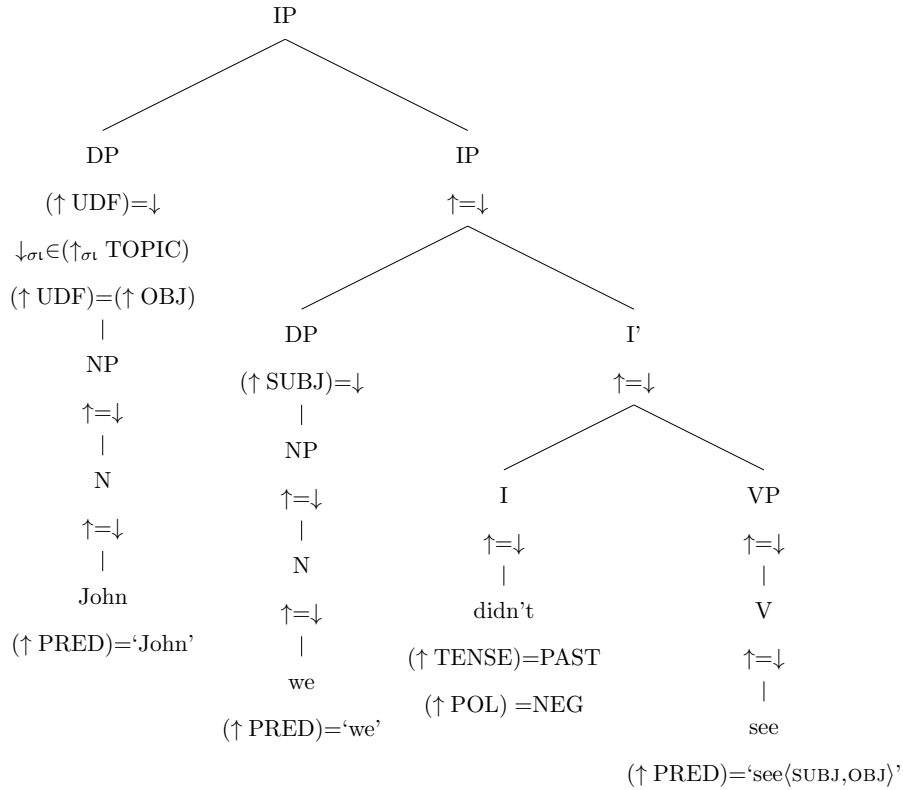
In (3.24a), the instantiation of UDFPath is the OBJ of a COMP, and in (3.24b) it is the OBJ of a COMP inside a COMP. In other words, we could summarise this with $(\uparrow \text{UDF}) = (\uparrow \text{COMP}^* \text{OBJ})$, with the use of functional uncertainty (deeper levels of embedding are also possible, although in reality they might be somewhat confusing for the listener). In fact, there is a complicated range of possibilities for UDFPath. Formalising this is somewhat messy, although it has been done by Dalrymple (2001, p. 396) for TopicPath (without positing a UDF) and adapted to UDF with UDFPath in Asudeh (2012, p. 72). For the purpose of this chapter we do not need the exact path possibilities for English fronting; we merely need the knowledge that functional uncertainty plays a role.

In order to see what this looks like for individual sentences, the c-structure, f-structure and i-structure for example (3.21b) (*John we didn’t see*) are shown in (3.26), (3.27) and (3.28) respectively, making use of the c-structure rules in (3.22) and (3.25).

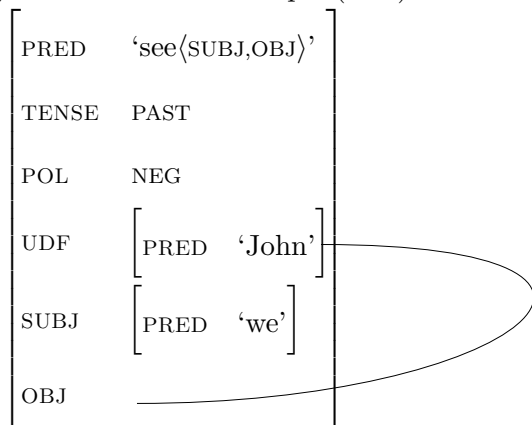
²³In different languages the exact possibilities captured by the metacategory might be different. Positing a metacategory is thus very useful in order to cross-linguistically compare fronting (and potentially other information structural phenomena), as well providing a general rule ranging over several c-structure categories.

(3.25) IP → DP I'
 (↑ SUBJ) =↓ ↑=↓
 I' → I VP
 ↑=↓ ↑=↓

(3.26) C-structure for example (3.21):



(3.27) F-structure for example (3.21):



(3.28) Partial i-structure for example (3.21):

$$\left[\text{TOPIC} \left\{ \left[\text{“JOHN”} \right] \right\} \right]$$

The fronted constituent (with TOPIC information structure role) signified by UDF appears adjoined to IP in (3.26), dominated by a second IP node. We can see that UDFPath is resolved to the object of the predicate. In the f-structure we see that the UDF and OBJ are linked and share their value: they display functional equality.

It is interesting that in the English fronting rule in (3.22) the UDF appears adjoined to IP, and not in the specifier of IP as is the case for the subject, shown by the IP rule in (3.25). In this I follow Bresnan’s (2001) analysis of fronting. As we will see in the next section and in Chapter 4, it is commonly assumed that UDFs (or syntacticised discourse functions in earlier accounts) appear in specifier positions. However, there is a good reason to assume that in English fronting, the UDF is adjoined to IP instead. This is because in English, the fronted constituent appears before the subject, which is hosted by the specifier of IP, as shown in (3.26). Also, consider the following examples:

(3.29) a. Donuts, I think he hates, but I think [_{CP} that [_{IP} bagels, [_{IP} he likes]]].

b. *Donuts, I think he hates, but I think bagels that he likes.

(3.30) English CP rule:

$$\begin{array}{l} \text{CP} \rightarrow \text{C}' \\ \quad \quad \quad \uparrow=\downarrow \\ \text{C}' \rightarrow \text{C} \quad \text{IP} \\ \quad \quad \quad \uparrow=\downarrow \quad \uparrow=\downarrow \end{array}$$

For completeness I show the CP rule in (3.30). Example (3.29a) shows that the fronted constituent *donuts* can appear between the C of the CP and the (second) IP containing the subject, with the subject in specifier of IP. The fronted constituent may not precede the complementiser, as shown by (3.29b). The only structural position that the fronted constituent can thus appear in is as adjoined to (the second) IP, in its own IP projection.

In discourse configurational languages, the status of UDF is potentially more debatable, as the ‘standard’ word order is determined by information structure roles. Positing a UDF for these languages seems less straightforward for this reason, as there would be a UDF in all sentences. However, I assume that this is in fact the case (for languages that have actual unbounded dependencies); the argumentation behind this is discussed in Section 4.6.

3.2.5 C-structure and word order variability

This section discusses some of the work that has been done in LFG in relation to c-structure and word order variability, as a background to some of the issues I will discuss in the further chapters in this thesis, which largely focus on c-structure (except for Chapter 6). I introduce the principles of the theory of annotation proposed by Bresnan (2001), which I use as a starting point in Chapter 4 as principles on endocentric organisation of c-structure. I further discuss Nordlinger’s (1998a) analysis of non-configurationality, which was also addressed in Section 2.3.5. Nordlinger’s (1998a) work is based on previous work in LFG on non-configurationality and assumptions therein, such as Simpson (1983, 1991), Kroeger (1993), Mohanan (1982), Mohanan (1994), Austin & Bresnan (1996), Andrews (1996) and Nordlinger & Bresnan (1996). I conclude the section with a discussion of Kaplan & Zaenen (2003) (building onto Zaenen & Kaplan (1995)), who provide an analysis for word order constraints in West Germanic embedded clauses. Their account is discussed here as it focuses on c-structure rules and annotations, which is exactly what I take as crucial in the classification of languages that I provide in Chapter 4.

Principles of the theory of annotation

Crucial to my classification of languages in terms of their configurationality, which will be presented in Chapter 4, is the assumption that *constraints on annotations* on c-structure rules are the determining factor in dividing languages in terms of their configurationality. As a background and starting point to this, it is important to set out the principles of the theory of annotation as proposed by Bresnan (2001). I take these principles as a starting point of

discussion (for strict word order languages) in Chapter 4. Importantly, c-structure rules are constraints on c-structures. Differences in c-structures between languages can be represented by different constraints, i.e. different c-structure rules. A number of universal principles of annotation for endocentric structure have been suggested by Bresnan (2001). These are as follows, slightly adjusted to fit my assumptions about c-structure (Bresnan, 2001, p. 102):²⁴

- (3.31) a. C-structure heads are f-structure heads.
- b. Specifiers of functional categories host the discourse functions (DF): UDF or SUBJ.²⁵
- c. Complements of functional categories are f-structure coheads.
- d. Complements of lexical categories are the argument functions AF.
- e. Constituents adjoined to phrasal constituents are nonargument functions ADJ or not annotated.²⁶

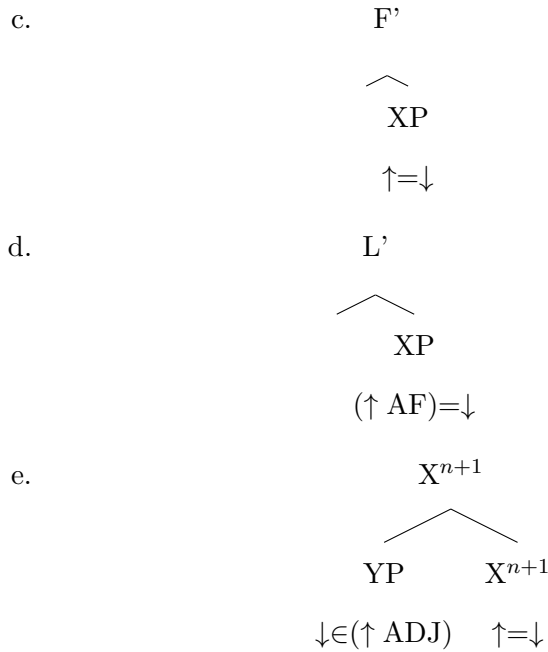
Structurally we can represent these in the following way, in the respective order of (3.31), with $DF = \{UDF \mid SUBJ\}$ (Bresnan, 2001, p. 102):

- (3.32) a. X^{n+1}
 $\quad \quad \quad |$
 $\quad \quad \quad X^n$
 $\quad \quad \quad \uparrow=\downarrow$
- b. FP
 $\quad \quad \quad \wedge$
 $\quad \quad \quad XP$
 $\quad \quad \quad (\uparrow DF)=\downarrow$

²⁴Bresnan (2001) notes that the c-structure patterns that are instantiations of these principles of endocentric structure-function association are unmarked, but that marked constructions can coexist alongside these principles. These irregular forms need to be specified separately. The principles are thus not absolute rules.

²⁵In Bresnan's original notation, specifiers of functional categories are the grammaticalised discourse functions DF, but as explained above, I do not incorporate discourse functions in the syntax. I do refer to them as DF, to capture the grouping of the two.

²⁶'Not annotated' means not annotated automatically based on the structure; any annotation will come from the lexicon, e.g. case-marking giving the specification (OBJ \uparrow) for accusative case.



This set of structure-function mappings results in an endocentric structure; one can easily analyse a language such as English with this set of mappings, as shown by Bresnan (2001). Many languages will also incorporate the exocentric S in their structure, leading to (partially) flat structures. This is achieved by the following rule (Bresnan, 2001, p. 110):

$$(3.33) \quad S \rightarrow C^*$$

Here C can be any constituent. Many languages will have a combination of endocentric structure-function mappings as in (3.31) and the exocentric rule in (3.33).

We can regard the structure-function mappings in (3.31) as constraints on c-structure. This is signified by the obligatoriness of certain annotations, e.g. in (3.31d) the annotation of a complement of a lexical category as an argument function (and not an adjunct function, for example). There is still a level of unconstrainedness (uncertainty), as the particular argument function is not specified in this case.²⁷ This set of principles will be important as a reference in Chapter 4, in which I take it one step further and evaluate what types of combinations of annotations are possible in the world's languages. I look at annotations for argument

²⁷The case for the subject is slightly different, as it is often assumed to occur in SPEC position of FP, see (3.31b).

functions on the one hand and information structure roles on the other hand, and see how they (together) constrain possible structures. I therefore focus the discussion of my own characterisation on constraints on annotations; in other words constraints on constraints.

Nordlinger's concept of configurationality

Configurationality (and word order variation) has been discussed in LFG by Nordlinger (1998a), as described in Section 2.3.5. In this section I will explain her formal LFG analysis of configurationality in more detail. Recall that she proposes a typology of languages dependent on two factors: relative configurationality (the extent to which grammatical functions are determined by phrase structural position) and the use of head- or dependent-marking (or both). Under Nordlinger's assumptions, a language is configurational if grammatical functions are determined by their phrase structural position, and a language is non-configurational if grammatical functions are determined by other parts of the grammar (such as morphology). She claims that these are two extremes, and that variation between the two extremes is possible; as an example she gives German scrambling. She assumes that a language like German that displays scrambling, there is a basic word order, which is overridden in a large majority of contexts by discourse principles that cause argument functions to appear in different orders. Nordlinger (1998a) explicitly claims that languages do not need to have a completely flat c-structure in order to be non-configurational: as long as the c-structure does not uniquely define argument functions, it is non-configurational. This is a claim that I am sympathetic to, as it implicitly seems to make the point that many languages which have been labelled as non-configurational, are in fact discourse configurational. In Chapter 4 I show that languages which have traditionally been labelled non-configurational may actually have a hierarchical c-structure based on information structure, with specific c-structural positions for particular information structure roles. However, a difference between my classification and Nordlinger's (1998a) classification is that I label languages which have a hierarchical structure based on information structure roles (and not on argument functions) as discourse configurational, not non-configurational. The classification I present in Chapter 4 relies not only on whether ar-

gument functions are identified c-structurally, but also on how information structure roles are identified c-structurally. Instead of rendering two types of languages, configurational and non-configurational, I give a four-way classification based on the two aforementioned factors, argument function assignment and information structure role assignment.

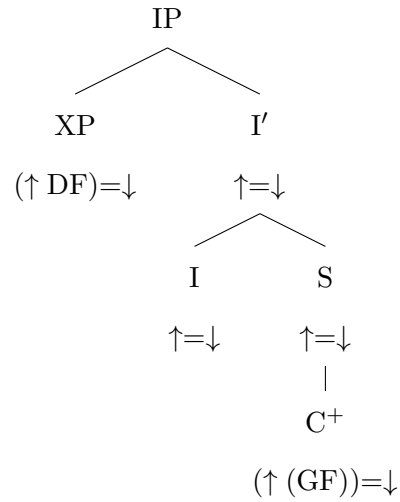
I will briefly illustrate Nordlinger’s formal analysis of non-configurationality, specifically in relation to Wambaya. Under the assumption that c-structure does not uniquely specify argument functions in non-configurational languages, she states that there is no evidence for a VP constituent in Wambaya, which in many accounts is used to express the structural asymmetry between subject and object. Grammatical functions (and therefore by extension argument functions) can be assigned freely to NPs, which is made possible by the exocentric S rule, which was shown in (3.33). Free annotation of grammatical functions can be shown by the annotation $(\uparrow (\text{GF})) = \downarrow$ on this exocentric rule:

$$(3.34) \quad \begin{array}{l} \text{S} \rightarrow \text{C}^* \\ (\uparrow (\text{GF})) = \downarrow \\ \text{(Nordlinger, 1998a, p. 52)} \end{array}$$

This annotation, $(\uparrow (\text{GF})) = \downarrow$ abbreviates two different types of annotations: $\uparrow = \downarrow$ for encoding head relations, and $(\uparrow \text{GF}) = \downarrow$ for encoding non-head relations. For example, verbs will receive the first annotation, and NPs the latter. My assumed inventory of GFs is given in (3.11). As mentioned, Nordlinger assumes that a completely flat structure is not necessary for a non-configurational languages. In the analysis of Wambaya c-structure in Nordlinger (1998a), a language that she assumes to be non-configurational, she shows that some endocentric structure is possible, as long as it does not encode argument functions. Her analysis of Wambaya c-structure contains an endocentric IP which encodes discourse functions (DF, which in my approach would be information structural roles). She proposes the following general c-structure for Wambaya:²⁸

²⁸Notice that the Kleene star from the rule in (3.34) has changed to Kleene plus in (3.35): at least one C is present under S in the c-structure in (3.35). I have copied this notation from Nordlinger (1998a). Also, notice that the exact DF function is unspecified in the specifier of IP position in (3.35). Nordlinger (1998a) does not

(3.35)



Where C = V, NP

(Nordlinger, 1998a, p. 53)

The endocentric IP structure in (3.35) specifies the position for a discourse function (an information structure role under my assumptions), and this is possible in a non-configurational language such as Wambaya according to Nordlinger. This structure is very similar to the structure proposed for Warlpiri by Austin & Bresnan (1996), which will be explained in more detail in Chapter 6. As mentioned, in my classification a structure such as the one in (3.35) would be classified as discourse configurational, as will become clear in the next chapter.

Zaenen and Kaplan's West Germanic word order

A large amount of work on c-structure and argument placement has been done by Zaenen & Kaplan (1995) and Kaplan & Zaenen (2003). They provide a c-structural account for German and Dutch verb clusters in embedded clauses, for several types of constructions. They account for this with the use of c-structure rules, functional uncertainty and f-precedence, a concept that will be explained shortly. In order to show clearly how their analysis works, I will discuss one type of construction that they provide an analysis for, namely cross-serial dependencies in embedded clauses in Dutch. An example of this can be seen in example (3.36), contrasted with the English equivalent in (3.37):

specify the exact DF: she does this, she claims, because at the stage at which she was writing, the discourse role of this initial constituent had not been established solidly in the literature on Wambaya.

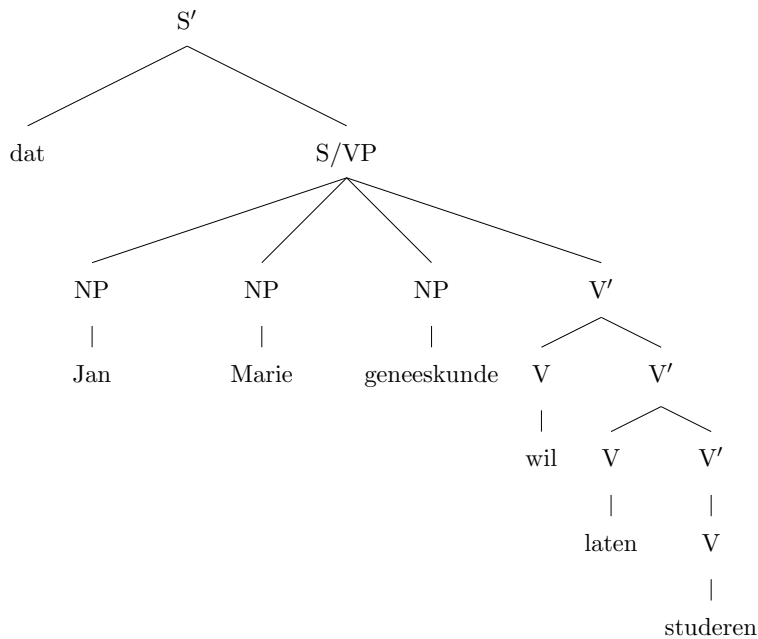
(3.36) ...*dat Jan₁ Marie₂ geneeskunde₃ wil₁ laten₂ studeren₃*.
 that Jan Marie medicine wants let study
 ‘...that John wants to let Mary study medicine.’

(Kaplan & Zaenen, 2003, p. 128)

(3.37) ...that John₁ wants₁ to let₂ Mary₂ study₃ medicine₃.

The interesting fact about the Dutch cross-serial example in (3.36) is that all the arguments appear together and all the verbs appear together, and the verbs and their arguments (whether subject or object) appear in the same order within these clusters. This is marked by the numbers on the arguments and verbs: the order is 1 - 2 - 3 for both argument cluster and verb cluster, where 1 represents the ‘highest’ (matrix) verb and its argument, and 3 the lowest. In English, verb and argument appear next to each other, as shown by the numbering in example (3.37). Kaplan & Zaenen (2003) provide the following c-structure and f-structure for the Dutch example in (3.36):²⁹

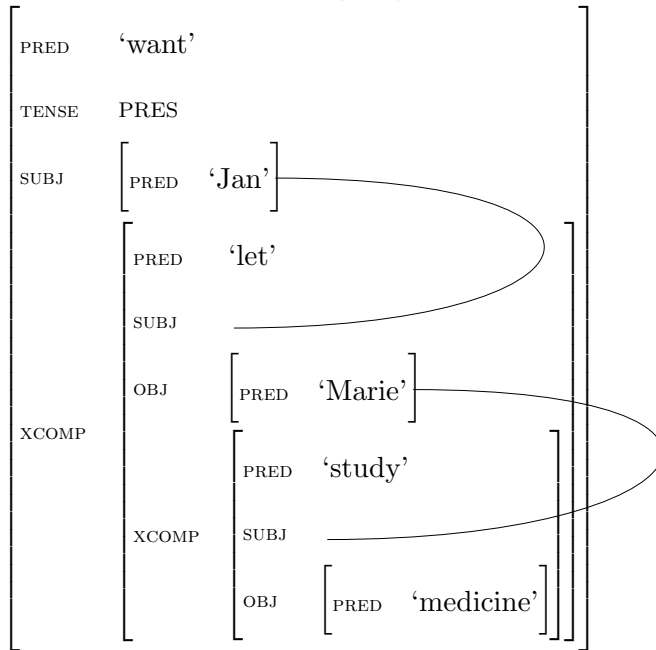
(3.38) C-structure for example (3.36):



(Kaplan & Zaenen, 2003, p. 129)

²⁹Kaplan & Zaenen (2003) claim not to be sure about the exact category of the S/VP node in Dutch, but they state that the distinction does not play a role in their analysis.

(3.39) F-structure for example (3.36):



(Kaplan & Zaenen, 2003, p. 129)

As can be seen from the c-structure in (3.38), the NPs all appear as daughters of S/VP, but one needs a way to ensure that the arguments appear in the correct order. In matrix clauses in Dutch, in which the order is SVO, this is straightforward, as the subject appears VP-externally and the object VP-internally, as in English. This is not the case for the embedded structure in (3.38), as all three arguments are hierarchically in the same position. In order to ensure the strict ordering of these arguments, Zaenen & Kaplan (1995) and Kaplan & Zaenen (2003) constrain the c-structure rules with the use of functional uncertainty and f-precedence constraints. Functional uncertainty was explained in Section 3.2.4: it is a formal device which can be used to describe unbounded dependencies. F-precedence is an f-structural concept which relies on linear precedence, and it is exactly f-precedence that is employed by Zaenen & Kaplan (1995) and Kaplan & Zaenen (2003) to constrain the relative ordering of the arguments (and verbs) in Dutch cross-serial dependencies. The definition of f-precedence is as follows:

(3.40) **F-precedence:** f f-precedes g if the rightmost node in $\phi^{-1}(f)$ precedes the rightmost node in $\phi^{-1}(g)$
 (Bresnan, 2001)

F-precedence, although it is an f-structural concept, is defined in terms of c-structure relations via the inverse mapping ϕ^{-1} and thus relies on linear order. The way that f-precedence is used to constrain argument order in embedded clauses is shown by the c-structure rules for Dutch shown in example (3.41), with the lexical entries for the verbs in (3.36) shown in example (3.42).^{30,31}

(3.41) a.
$$\begin{array}{ccc} \text{VP} & \rightarrow & \text{NP}^* \quad \text{V}' \quad (\text{VP}) \\ & & (\uparrow \{\text{XCOMP}|\text{COMP}\}^* \text{NGF}) =\downarrow \quad (\uparrow \text{XCOMP}^*\text{COMP}) =\downarrow \end{array}$$

$$\begin{array}{ccc} \text{V}' & \rightarrow & \text{V} \quad (\text{V}') \\ \text{b.} & & (\uparrow \text{XCOMP}) =\downarrow \\ & & (\uparrow \text{XCOMP}^+ \text{NGF}) \neg <_f (\uparrow \text{NGF}) \end{array}$$

(Kaplan & Zaenen, 2003, p. 127)

(3.42) a.
$$\begin{array}{l} \text{willen} \quad (\uparrow \text{PRED}) = \text{'want} < (\uparrow \text{SUBJ}) (\uparrow \text{XCOMP}) > \text{' } \\ (\uparrow \text{SUBJ}) = (\uparrow \text{XCOMP SUBJ}) \end{array}$$

$$\begin{array}{l} \text{laten} \quad (\uparrow \text{PRED}) = \text{'let} < (\uparrow \text{SUBJ}) (\uparrow \text{XCOMP}) > (\uparrow \text{OBJ}) \text{' } \\ \text{b.} \quad (\uparrow \text{OBJ}) = (\uparrow \text{XCOMP SUBJ}) \end{array}$$

c.
$$\text{studeren} \quad (\uparrow \text{PRED}) = \text{'study} < (\uparrow \text{SUBJ}) (\uparrow \text{OBJ}) > \text{'}$$

(Kaplan & Zaenen, 2003, p. 128)

Kaplan & Zaenen (2003) state that this rule accounts for embedded extraposed and non-extraposed clauses in Dutch. The example we are concerned with, (3.36), is an example of

³⁰The abbreviation NGF in these rules stands for ‘Nominal Grammatical Function’, and Kaplan & Zaenen (2003) note that this is from a set that includes SUBJ and OBJ without specifying this set explicitly.

³¹The set of rules in (3.41) is taken from Kaplan & Zaenen (2003), who repeat their own c-structure rules from Zaenen & Kaplan (1995). In Kaplan & Zaenen (2003) they develop different c-structure rules which account for a larger set of data, but these rules are rather complicated; I believe that the rules in (3.41) are better capable of illustrating Kaplan and Zaenen’s general methods of analysing word order constraints, namely with the use of functional uncertainty and f-precedence annotations on c-structure rules.

a non-extraposed embedded clause, therefore the optional extraposed VP node in (3.41a) (after the right arrow), used to account for extraposed clauses, is not used in the account of example (3.36). The VP rule in (3.41) renders a flat structure for the arguments in the embedded clause, which is reflected in the c-structure in (3.38). The use of Kleene star (*) on the NP shows that zero or more NPs may appear here adjacent to each other. The annotation $(\uparrow \{XCOMP|COMP\}^* NGF) = \downarrow$ ensures that all NPs are assigned a (nominal) grammatical function, whether of the matrix verb or of an embedded verb: the latter case is made possible by the functional uncertainty notation $\{XCOMP|COMP\}^*$. For the account of the type of cross-serial dependencies as in example (3.36), the XCOMP is used, as shown by the lexical entries for the verbs *willen* ('to want') and *laten* ('to let') in (3.42a) and (3.42b) respectively, both of which subcategorise for an XCOMP. Functional uncertainty makes it possible for *Jan* in (3.36) to serve as the SUBJ, *Marie* as the XCOMP OBJ and *geneeskunde* as the XCOMP XCOMP OBJ. The annotation on NP* does not constrain the order of the NPs relative to each other. This is achieved by the f-precedence annotation on the optional V' inside the rule in (3.41b). The rule in (3.41b) provides a right-branching, hierarchical structure for the verb cluster, and with the order of V before V' ensures that a matrix verb precedes its embedded verb. The local annotation $(\uparrow XCOMP) = \downarrow$ on V' ensures that every next lower verb serves as the head of XCOMP of the previous verb. The ordering of the verbs is thus restricted by this ordering inside the c-structure rule. The second annotation on V', $\uparrow XCOMP^+ NGF) \neg <_f (\uparrow NGF)$, provides an ordering constraint on the arguments of these verbs.³² This annotation ensures that embedded arguments may not f-precede (linearly precede) non-embedded arguments: this ensures the ordering *Jan Marie geneeskunde* in example (3.36). Kaplan and Zaenen's analysis thus relies on an annotation with f-precedence annotation on a verbal c-structure node to ensure the correct ordering of argument functions. The NPs themselves are assigned the correct function with the use of functional uncertainty on the NP* node (in the rule in (3.41a)), and the f-precedence constraint on the verbal node V' ensures that non-embedded arguments precede embedded

³²The notation with Kleene plus (the superscripted plus), XCOMP⁺ signifies that there is one or more XCOMP.

arguments.

This discussion has shown how f-precedence used in an annotation on a node in a c-structure rule can be used to constrain ordering of argument functions. The use of annotations is key in their analysis. As mentioned, in the classification of languages that I provide in Chapter 4 annotations are also the determining factor. One difference between my approach and Kaplan and Zaenen's approach is that I focus on constraints on annotations, rather than on specific annotations. This is due to the different nature of my approach and theirs: I provide a classification with general constraints for abstract language types, and they provide a specific analysis for a particular word order pattern attested in a particular language. Their analysis is a specific case of the general classification of annotated c-structure rules that I propose. The fact that the NPs in Kaplan and Zaenen's account of embedded clauses in Dutch all appear in a similar structural position (sharing the same mother node) is striking. As will become clear in Chapter 4, I assume that if arguments always appear in the same order then one would want to reflect this structurally, if at all possible. The reason for this is that I want to employ X-bar theory where possible, and only assume a flat structure if there is a clear reason for doing so. I use this as a general principle, but note that exceptions are possible, thereby not contradicting the analysis by Zaenen & Kaplan (1995) and Kaplan & Zaenen (2003). Moreover, as it is impossible to make predictions about c-structure for all languages, rather I focus on annotations and on the constraints on these constraints, and I assume that these are crucial in determining the relative configurationality of a language.

3.3 Constituency tests

In Chapter 4 I illustrate a way of characterising different types of languages in terms of their configurationality, and I show that the key in this is annotations on c-structure rules. Importantly, the actual c-structure of an individual language reflects constituency. Even though some languages may appear very similar in terms of how their annotations are constrained, as will be shown in detail in Chapter 4, structures of individual languages may

differ depending on constituency. Constituency can be determined by a range of constituency tests. For completeness I briefly describe a few of these tests here. It should be noted that satisfying one test only is not in general taken to be very strong evidence for constituency; several tests are often necessary to identify a constituent.

The constituency tests described by Tallerman (2011) are the following:

- (3.43)
1. Replacement by a pronoun
 2. The sentence fragment test
 3. The echo question test
 4. The cleft test

The first test, *replacement by pronoun*, is illustrated in the following example:

- (3.44)
- a. The students wondered how [cheap textbooks] could be obtained.
 - b. The students wondered how [they] could be obtained.
 - c. The students wondered [how cheap] [textbooks] could be.
 - d. The students wondered how cheap [they] could be.
 - e. *The students wondered they could be obtained.

(cf. Tallerman (2011, p. 143))

This shows that a constituent, which is marked by square brackets in these examples, can be replaced by a pronoun. In (3.44b), *they* replaces the constituent *cheap textbooks*, and in (3.44d), *they* replaces *textbooks*. The ungrammaticality of example (3.44e) shows that *how cheap textbooks* is not a constituent in (3.44a).

The *sentence fragment test* uses short answers to questions:

(3.45) She bought [the book with the blue cover].

(3.46) Q. [What] did she buy?

A. [The book with the blue cover].

(cf. Tallerman (2011, p. 143))

This shows that constituents can be questioned. In the question in (3.46), a *wh*-word replaces *the book with the blue cover* in (3.45) (pronoun replacement), and the answer in A1 shows that this is indeed a constituent. Another relevant example is the following:

(3.47) She bought [the book] [with her first wages].

(3.48) Q. [What] did Kim buy?

A. *The book with her first wages.

(cf. Tallerman (2011, p. 145))

In the answer in (3.48) it becomes clear that *the book with her first wages* is not one constituent, despite its surface similarity to the example in (3.45).

The *echo question test* makes use of the fact that *wh*-phrases may appear in-situ in some cases, at least in English. The *wh*-phrase replaces a constituent:

(3.49) a. You saw [the big chicken].

b. You saw [what]?

c. You saw [Titanic].

d. You saw [which film]?

This shows that a *wh*-word (in (3.49b)) or a *wh*-phrase (in (3.49d)) may replace a constituent. Examples such as the following show this separates constituent from strings of words that are not constituents:

(3.50) a. Kim bought [what] with her first wages?

b. *Kim wrote what with the blue cover?

(Tallerman, 2011, p. 146)

This shows that whatever *what* is replacing in (3.50b), e.g. *the book*, is not a constituent on its own; *with the blue cover* is part of it as well, e.g. *the book with the blue cover*.

The *cleft test* makes use of the cleft construction:

- (3.51) a. It was [the book with the blue cover] that Kim wrote.
b. *It was the book with her first wages that Kim bought.

(Tallerman, 2011, p. 146).

This test shows that only constituents can be clefted.

Finally, I describe one more constituency test, namely one noted by Van Valin (2001), as this is briefly addressed in Chapter 5. This is the *VP-preposing test*, which tests VP constituency specifically:

- (3.52) a. The new teacher wanted to [read a short book in the library], and [read a short book in the library], she [did].
b. *The new teacher wanted to read a short book in the library, and read she did a short book in the library.

(Van Valin, 2001, p. 113)

This example shows that in the right context, a VP can be preposed, but it has to be preposed as a whole. Also note that *did* in (3.52c) is a case of VP replacement, analogous to the replacement by pronoun illustrated above. Van Valin (2001) describes these two as part of the same test, the *substitution test*.

Chapter 4

Free Word Order

4.1 Introduction

One of the characteristics that Hale (1983) posits for non-configurational languages is ‘free word order’, and as shown in Chapter 2 this has become a prominent characteristic in the discussion of configurationality. Free word order is usually meant to signify that the constituents of a language are ordered freely from a syntactic point of view, i.e. grammatical function placement is free. However, the term ‘free word order’ is misleading, as in fact so-called free word order languages have relatively strict word order if one takes information structure into account, an observation that was hinted at by Mithun (1987). For this reason, I will avoid the use of ‘free word order’ as much as possible, but when it is used it is meant to refer to free word order in terms of syntactic arguments. This chapter not only discusses free word order in terms of syntactic argument functions as a characteristic of languages defined as non-configurational, but it will also more generally examine word order variation. The aim of this chapter is to investigate what implications word order has for the c-structure of a language and its annotations, and how word order variation can be used to characterise languages in terms of their configurationality. In order to achieve this goal, I set out a space of possibilities for word order.

The first part of this chapter gives an overview of the extent of word order variation found in the world's languages, building on data presented in Chapter 2. For this I look at a selection of languages, reflecting what I assume to be the possibilities in word order variation, thus largely focusing on the 'extreme' ends of the configurationality spectrum. I discuss languages from different language families on both sides of the spectrum, in order to show that certain word order restrictions and patterns are not specific to one language family. An important aim of giving an overview of these languages and the terminology that has been used to describe them is to create clarity in the terminology that has been used in relation to word order variation, e.g. terms like non-configurational, discourse configurational and scrambling. On the relatively strict word order end of the spectrum I discuss English, Yoruba and Mandarin Chinese, all unrelated languages. I note from the start that even in these languages, word order is not completely fixed; there does not appear to be such a thing as a completely fixed word order language, but I believe these three languages to be good exemplars of the strict end of the spectrum. On the relatively free word order end of the spectrum I discuss both languages which have been defined as non-configurational and languages that have been defined as discourse configurational. Latin and Warlpiri are discussed as the former group, and Hungarian as the latter. I show that languages which have been labelled as non-configurational, languages labelled as discourse configurational and languages said to have free word order are all of the same type in the classification which I develop in this chapter. I refer to the group as discourse configurational languages. There are also many languages which fall in between the extremes of 'free' and 'strict' word order. For example, languages such as German and Dutch display relatively strict word order, but appear to have more word order variation than English. For this reason, German and Dutch will be looked at in comparison to English.

In terms of word order variation, the focus of this chapter is on arguments of predicates and on information structure roles, but not on adjuncts (as mentioned) or other constituents/elements which might have a specific position, such as verbs and clitics. This is largely due to the fact that discussing word order variation as a whole goes beyond the scope

of this chapter. Also, argument placement is crucial in some languages to correctly express the semantic relations in a sentence. The ordering of adjuncts is often much freer than that of arguments (for example, in English), making them less relevant in a discussion of configurationality. The exact placement of adjuncts can be important for their interpretation, but when this is an issue at any point this will be pointed out. As for verb and clitic placement, these will be relevant in this discussion only in relation to the relative placement of arguments and information structure roles to these elements. They can form an anchor around which argument functions or information structure roles are positioned; this is briefly addressed in Section 4.3.2. The discussion of arguments naturally focuses on subjects and objects, but obliques will be addressed where appropriate.

The main aim of this chapter of setting out a space of possibilities for word order variation is achieved by identifying the two main factors playing a role in word order (argument functions and information structure roles, as just mentioned) and by constructing a four-way characterisation of possible languages. Key in this are constraints on annotations on c-structure nodes, more specifically, whether there is an obligatory annotation for a specific argument function or information structure role on a specific c-structure node. I argue that this four-way distinction is the way to classify languages in terms of their configurationality, and that classifying any potential subtypes must depend on other factors.

The chapter is structured as follows. Section 4.2 introduces a range of data from languages from different parts of the word order variation spectrum, to show the boundaries of what is possible in terms of word order. This section also clears up some of the terminology used in relation to word order variation. Section 4.3 discusses the main factors playing a role in determining word order. Section 4.4 provides the main contribution of this chapter, namely a four-way space of possibilities of word order variation based on the two factors identified as playing a role in word order. In Section 4.5 actual language data is compared to this space of possibilities, in order to see which slots can be filled and which ones cannot, based on some of the data discussed in this thesis. The purpose of this is to give a clearer illustration of the

way that my classification of configurationality works in classifying actual languages, and not only as abstract types. Section 4.6 discusses the role of the UDF (unbounded dependency function) in the configurationality classification, followed by a conclusion and discussion in Section 4.7.

4.2 Word order variation

In Chapter 2, ‘free’ word order was introduced as a characteristic of non-configurational languages (following Hale’s (1983) characterisation of non-configurationality). We have seen that languages such as Latin and Warlpiri show near free ordering of constituents syntactically; in terms of information structure, word order is in fact constrained. Before discussing theoretical issues related to word order and configurationality, I will discuss some of the word order variation attested, in order to give an idea of what is possible cross-linguistically in terms of word order variation. The following subsection discusses languages with a fairly strict word order in terms of argument functions, and is followed by a subsection discussing languages in which the word order is largely determined by the discourse. A third subsection discusses the term ‘scrambling’ and how it relates to the issue at hand.

4.2.1 Relatively strict word order languages

Finding languages with strict ordering of argument functions is not very straightforward. ‘Free word order’ languages are widely discussed in the literature, but ‘strict word order’ languages are addressed much less. One difficulty in identifying rigid word order languages is the fact that some literature discusses data from a specific theoretical viewpoint, e.g. transformational accounts positing strict word order, but only in respect to an abstract structure and not to surface structure (which in those cases might very well be freer). This was described in Section 2.3.4, an example of which is Kayne’s (1994) claim that SVO is the underlying word order for all other surface orders. A specific example of the claim that word order variation is derived from strict word order is Davies (1999), who discusses Madurese and Javanese as free word order languages. He claims that Madurese and Javanese have underlying strict word

order, despite surface word order variation. He provides an analysis in which base word order is always strict, by positing a null pronoun in the place of the base position of the ‘displaced constituent’. As this targets abstract structure rather than surface word order variation, these languages do not have actual strict word order in the sense that I employ the term here, as I focus only on surface word order.

One researcher who has addressed the issue of ‘strict’ word order languages is Givón (2001). He presents examples of strict word order for the basic word orders SVO (English), SOV (Nepali), VSO (Jacaltec), VOS (Malagasy) and OVS (Hixkaryana). Other examples which are found in the literature are Yoruba (SVO) and Mandarin Chinese (SVO). For the latter two languages I have investigated whether their ordering of argument functions is actually as rigid as sometimes claimed. I will start the discussion of strict ordering of argument functions with examples from English, followed by Yoruba and Mandarin Chinese, then followed by the languages discussed by Givón (2001). The aim of this is to show that strict word ordering of argument functions, and any exceptions to this such as fronting triggered by information structure, is not restricted to one language family.

English

According to Givón (2001, p. 235), “English may serve as an example of the upper limits of rigid word order”.¹ The influence of word order on argument assignment in English was discussed in 2.2.1. English is an analytic language, meaning that morphology plays a relatively minor role in the language (Haspelmath & Sims, 2010). Therefore a strict ordering of argument functions is hardly surprising. English has a relatively strict SVO word order, in both matrix (a) and subordinate (b) sentences:

(4.1) a. The dog bites the man.

b. I know that the dog bit the man.

¹It is unclear from Givón (2001) why English has more ‘rigid’ word order than the other languages he discusses in his book. The examples of marked word order he provides for English seem very similar to the ones for the other languages he discusses.

This order is standard in English, and in most cases different orders are not grammatical. However, there are specific cases in which a slightly different ordering of constituents is allowed, triggered by a particular information structure, such as in topicalisation:

(4.2) Q: WHAT did you name your cat?

A: ROSIE I named her.

(cf. Bresnan (2001, p. 97))

(4.3) The first part of the movie he missed out on (but the second part he saw completely).

(cf. Emonds (2004, p. 85) via Erteschik-Shir (2007, p.81))

Here the constituents appearing in the non-canonical position are marked either by small capitals (to mark a focus function) or by underlining (to mark a topic function). For the example in (4.3) one could imagine a context of contrast, as indicated. In both examples the initial DP is the object, but occurs sentence-initially because it has a focus function (in (4.2)) or a (contrastive) topic function (in (4.3)). This renders an OSV order. The term ‘topicalisation’ often used in the literature is somewhat misleading, as the ‘topicalised’ element may actually have a focus function, as in example (4.2). For this reason I will refer to this type of construction as *fronting*, and we can talk about *fronted* elements, with either topic or focus function.^{2,3} I do not take fronting to mean that an element has been moved (as assumed in transformational theories), rather it simply appears in a fronted position where it would not occur in discourse-neutral sentences. Another example in which word order differs from the norm is in *wh*-questions:

(4.4) a. WHO did John see?

²The type of fronting which has been exemplified here is without a resumptive pronoun. Erteschik-Shir (2007) distinguishes between ‘topicalisation’ which she defines as fronting with a gap and ‘left dislocation’ defined as fronting with a resumptive pronoun in the place of where the displaced element was originally base-generated. The discussion here will focus on the type of fronting without a resumptive pronoun, although where necessary I will use the term (left) dislocation to refer to the case with a resumptive pronoun.

³Apart from fronting, one could also have rightward displacement to the right periphery triggered by information structure. I assume that fronting and rightward displacement both exemplify ‘displacement’ which I assume to mean appearance of a constituent in a specific position due to it bearing a specific information structure role. Rightward displacement will be briefly discussed in Section 4.5.3, but is largely left out of the discussion of this thesis.

- b. WHO saw John?
- c. WHEN did John leave?

In (4.4a), the object precedes the subject. The *wh*-word has an inherent focus function, triggering its initial position. Example (4.4b), in which the *wh*-word is the subject, illustrates that the *wh*-word does not necessarily trigger word order variation: this is obvious in this case as the subject itself now has a focus function, so it occurs to the left of the verb, just as a subject would in an unmarked declarative sentence. In (4.4c) the fronted *wh*-word is an adjunct; as a focused constituent it appears in the same position as the focused arguments in (4.4a) and (4.4b).

In English multiple *wh*-questions, only one element is allowed to appear preceding the verb as shown by example (4.5a) and (4.5b) below. This contrasts with a language like Hungarian, in which multiple *wh*-fronting is allowed, which will be shown later.

- (4.5)
- a. Who saw what?
 - b. *Who what saw?
 - c. *What did who see?
 - d. Who saw that film when?
 - e. *When did who see that film?
 - f. Who saw what when?
 - g. *Who saw when what?

Additionally, examples (4.5c-g) show that there is a superiority principle at work, which ensures that the linear order of *wh*-elements is SUBJ > OBJ > ADJ. Adesola (2006) points out that the contrast between an example such as (4.5a) and (4.5c) is not found in Yoruba and other Niger-Congo languages, implying the principle is not universal (Manfredi & Oyelaran, 2000).

Apart from fronting of non-*wh*-elements and constituent question formation as just described, Givón (2001) presents some other examples of word order variation in English, which are shown here:

(4.6) a. Existential presentative:

There's a fly in the ointment.

b. Right dislocation:

She left the house early, Mary.

c. Cleft focus:

It's Mary that they like.

d. *Yes/no*-question:

Did John quit his job?

For the discussion of relative positioning of argument functions, the cleft focus example in (4.6c) is especially interesting, as the object now precedes the verb. Also, the construction is triggered by information structure: focus is positioned initially to give it emphasis. In (4.6a) argument ordering is the same as in the alternative version: *a fly is in the ointment*. The example of right dislocation in (4.6b) shows marked word ordering of argument functions, but the resumptive pronoun is in the position where subjects normally occur, preceding the VP.⁴ As for the *yes/no*-question in (4.6d), the finite verb appears sentence-initially, but the relative ordering of subject and object is not any different than in the declarative sentence *John quit his job*.

The examples of fronting in (4.2) and (4.3), as well as the *wh*-question examples in (4.4), and the cleft focus example in (4.6c), show that word order in English may in fact vary depending on discourse context. *Wh*-words and the cleft construction trigger a specific type of word order in English where the *wh*-word and the clefted constituent appear sentence-initially or

⁴Givón (2001) also gives examples of what he calls left dislocation: *As for John, the guys never saw him*. Huddleston & Pullum (2002) refer to these as 'marked topics'. I follow Asudeh (2012) in assuming that this not a case of word order variation with resumption (which it appears to be at first glance), because there does not need to be an anaphoric connection between the marked topic and the main clause: *As for Best Picture, I can't stay up that late*. (Asudeh, 2012, p. 385)

immediately following the *it* + form of *be* construction respectively. Fronting shows that information structure may be strong enough to trigger a marked word order, illustrating variety and flexibility in word order in English. The element which appears in a marked position in the sentence receives either a topic or a focus information structure role in these cases. Prosody and intonation may also mark information structure in English (as is fairly common), but so can word order to some extent.

Yoruba

Another, unrelated language which shows relatively strict ordering of argument functions is Yoruba. Yoruba is a Niger-Congo language spoken in West Africa (Bamgbose, 1966). Like English it is an analytic language, and (unlike English) it is even classified as an isolating language, a language which is at the extreme end of the analytic language spectrum in using minimal morphology and having a very low number of morphemes per word (Haspelmath & Sims, 2010). Like English, Yoruba has SVO word order:

- (4.7) *wón jẹ ẹ tón pátápátá*
 they ate it finish completely
 ‘They ate it up.’

(Bamgbose, 1966, p. 32)

Interestingly, Yoruba’s possibilities for word order variation are somewhat different than the kind found in English. It appears to be even stricter. For example, the ordering in declarative sentences and *yes/no*-questions (without *wh*-words) is the same:

- (4.8) a. *ó ti lọ.*
 3SG AUX go
 ‘He has gone.’
 b. *ó ti ìlọ.*
 3SG AUX go
 ‘Has he gone?’

(Hewson, 2008, p. 2)

The morphological alternation between the two different forms of ‘go’ (lọ, ìlọ) is not explained explicitly by Hewson (2008), but according to Bamgbose (1967) it appears that *ì* is a question element that can precede verbs to mark questions. Unlike in *yes/no*-questions, Yoruba does show a change in word order in *wh*-questions:⁵

- (4.9) a. *Ta ni ó ra ìwé?*
 who FOC 3SG buy book
 ‘Who bought the books?’

(Adesola, 2010, p. 72)

- b. *Ta ni ìyá rẹ̀ fẹ̀ràn?*
 who FOC mother his like
 ‘Who did his mother like?’

(Adesola, 2006, p. 313)

Wh-words are fronted, but there is one difference with English, namely the use of resumptive pronouns when the *wh*-word functions as the subject, as in (4.9a). In that specific example, the word order SVO is retained. The same is not true for (4.9b), however, as here there is no resumptive pronoun in the place of the object, and the ordering is now different from the declarative sentence word order.⁶ This illustrates that also in Yoruba, the discourse plays a role in word order to some extent. In Yoruba fronting without a *wh*-word is also allowed:⁷

- (4.10) a. *bàbá gbe orí*
 papa respond song
 ‘Papa responds to the song.’

⁵The particle *ni* (marked here as FOC) is ambiguous. It can be a focus particle as well as a copula: according to Bisang & Sonaiya (2000), the focus particle *ni* is derived from the copula *ni*, meaning ‘to be’, in a process of grammaticalisation, and is sometimes glossed as ‘be’. This dual nature makes it dubious as to whether this focus fronting construction is a cleft construction, or simple fronting with a focal marker. As *ni* has been described as a focus marker, and not only a copula in the literature, I will assume this as well and simply gloss *ni* as FOC, following Jones (2006).

⁶It is noteworthy that example (4.9b) is also grammatical under the reading where ‘who’ and ‘his’ are coreferential; this means that weak crossover violations are absent in Yoruba. For more information on this, see Adesola (2006).

⁷The glossing on these examples in their source, Badejo (1983), is not complete, so some pieces were filled in from other Yoruba examples in Adesola (2010).

- b. *orĩ ni bàbá gbè.*
song FOC papa respond
'The song, papa responds to.'

(Badejo, 1983, p. 237)

Notice the change of tone on the verb, marked by the diacritic on the verb, signaling a low tone. According to Badejo (1983) this is due to the order OSV. The dual nature of the focus particle means that the example in (4.10b) could also be analysed as a cleft construction.

Mandarin Chinese

Another language which has been mentioned as a candidate for strict ordering of argument functions, unrelated to English or Yoruba, is Mandarin Chinese. Like English and Yoruba, it is an analytic language (Li & Thompson, 1989). Tremblay (2005) claims that it is a strict word order language with SVO word order, but shows that fronting is also possible. This classification of Mandarin Chinese as a strict SVO word order language is challenged by other work on Mandarin Chinese, e.g. Li & Thompson (1989), LaPolla (1993, 1995) and Van Valin & LaPolla (1997). Li & Thompson (1989) claim that Mandarin Chinese is a topic prominent language, and LaPolla (1993), LaPolla (1995) and Van Valin & LaPolla (1997) all claim that Mandarin Chinese word order is determined by information structural considerations, and not at all by argument functions such as subject and object. Chao (1968, p. 69) describes the order in Mandarin Chinese as follows: "the grammatical meaning of subject and predicate in a Chinese sentence is topic and comment, rather than actor and action". This implies that in Mandarin Chinese, subject and topic are inherently connected, in an even stronger way than for example in English.⁸ It means that subject tends to appear sentence-initially, with SVO word order. Under this assumption, we see that fronting is allowed:

⁸This has led Li & Thompson (1976) to propose that subject and object are in fact not grammaticalised in Chinese.

(4.11) a. Unmarked word order:

ta1 chi1 yi4-long2-jiao3.zi
3SG eat one-CL-dumplings
'He is eating one measure of dumplings.'

(Example (6a), Tremblay (2005))

b. Fronting:⁹

yi4-long2-jiao3.zi — *ta1 chi1*
one-CL-dumplings PAUSE 3SG eat
'One measure of dumplings, he is eating.'

(Example (6b), Tremblay (2005))

Additionally, SOV word order is allowed:

(4.12) *Zhāngsān bǎ tā mà le*
Zhangsan BA 3sg scold PERF
'Zhangsan scolded him/her.'

(Li & Thompson, 1989, p. 25)

This order is said to be specific to the *bǎ*-construction (glossed with BA), in which the object marked by the word *bǎ* precedes the verb (Li & Thompson, 1989).¹⁰ Overall, Mandarin Chinese word order seems to be somewhat strict, but variation is allowed.

Other languages

English, Yoruba and Mandarin Chinese all seem to have fairly strict SVO word order, but all also admit some exceptions. Givón (2001) discusses a few languages with a similarly strict pattern of word ordering, but not SVO: Nepali, Jacalteco, Malagasy and Hixkaryana. He shows that Nepali is generally an SOV language, but that marked word order is allowed in specific constructions/contexts. Consider the following examples of unmarked order in (4.13a) and a fronting example in (4.13b):

⁹According to Tremblay (2005), the pause is necessary to make this order grammatical.

¹⁰There is no agreement on the exact grammatical category of *bǎ*, which grammaticalised from a verb (Bender, 2000).

- (4.13) a. Nepali unmarked S-O-V:

Ava-le Raj(-lay) dekh-yin.
Ava-ERG Raj(-DAT) see-3SG.F
'Ava saw Raj.'

- b. Fronting (O-S-V):

boka Raj-le mar-yo.
goat Raj-ERG kill-PERF/3SG.M
'The goat Raj killed.'

- c. *Wh*-fronting (IO-S-DO-V)

kos-lay Omi-le kitab di-yin
wh-DAT Omi-ERG book.ABS give-PERF.3SG.F
'Who did Omi give the book to?'

(Givón, 2001, p. 236–237)

Also in the fairly strict VSO language Jacaltec and the VOS language Malagasy one can find examples of word order variation. Examples of Jacaltec are shown in (4.14):

- (4.14) a. Jacaltec unmarked V-S-O:

xil naj ix
saw he her
'He saw her.'

- b. Object left dislocation (O, V-S-O):

ix-Malin, smak naj ix
CL-Mary hit he her
'As for Mary, he hit her.'

c. Subject *wh*-question (S-V-O):

mac xwat'e-n te'-mexa tu'
who made-SUFF CL-table that
'Who made that table?'

(Craig (1977) via Givón (2001, p. 238–239))

Notice that there is a resumptive pronoun in the object left dislocation example in (4.14b). Craig (1977) claims that only left dislocation with a resumptive pronoun is possible in Jacaltec, and that fronting without a resumptive pronoun is not. For the VOS language Malagasy we have the following patterns:

(4.15) a. Malagasy unmarked V-O-S:

manasa lamnba Raso
washed clothes Raosa
'Raso is washing clothes.'

b. Subject fronting (S-V-O):

Raso dia manasa lamba
Raso TOP wash clothes
'As for Raso, she's washing clothes.'

c. Object left dislocation (O, V-O-S):

lamba io dia mbola manasa azy Raso
clothes that TOP still wash it Raso
'As for the clothes, Raso is still washing them.'

d. *Wh*-question (O-V-S):

inina no ataon'-ny ankizy?
what FOC do-the children
'What are the children doing?'

(Keenan (1976) via Givón (2001, p. 239-240))

There is no resumptive pronoun in the subject fronting example in (4.15b), but there is in the object left dislocation example in (4.15c), meaning that the word order VOS is retained to some degree, in the part of the sentence after the topic. Givón (2001) gives no examples of left dislocation of the subject (with resumptive pronoun) or examples of fronting of the object (without resumptive pronoun). Finally, he briefly discusses Hixkaryana, an OVS language. It has been described as a strict OVS language by Derbyshire (1977); Derbyshire & Pullum (1981), but Derbyshire (1986) shows that although the order OV is fairly strict, the S can appear either preceding OV or following it, giving either SOV or OVS. Givón (2001) does not mention any examples of OSV languages with strict word order, and I have not found any in the literature myself.

The examples in this section have shown that languages with relatively strict ordering of argument functions are attested, but that in all cases exceptions motivated by information structure are possible. In each language discussed in this section, marked word orders are possible and the ordering is not completely strict in terms of argument functions. Until a language is found which contradicts this tendency, I will assume that on the ‘configurational’ end of the word order variation spectrum, there are no languages that have completely strict word order. For the moment it appears that information structure is always able to overrule strict word order to some extent.

4.2.2 Relatively free word order languages

On the other end of the word order spectrum, there are languages with relatively free ordering of argument functions. These languages have traditionally been referred to as free word order languages, or *non-configurational languages*. As mentioned above, word order in these languages is not completely free; it is constrained by information structure. At the same time, a grouping of languages has been proposed in which the word order is entirely or for the most part determined by the discourse: *discourse configurational languages*. The terms ‘non-configurational’ and ‘discourse configurational’ have been used in the linguistics literature, often by disparate groups of scholars, which may give the impression that these

are labels for wholly distinct phenomena, but they seem to be related.¹¹ This appears to be an easy assumption to make, but it does not actually appear to be stated explicitly very often. Recent scholarship largely uses the terms separately, but there is literature that overtly expresses the idea that non-configurationality and discourse configurationality fall in the same category of languages. The explicit instances that I found of this are Devine & Stephens (2006) and Ledgeway (2012) in their description of Latin, but I have been unable to find any other explicit examples. More implicit instances can be found in Austin & Bresnan (1996) and Nordlinger (1998a). Austin & Bresnan (1996) use the characteristics of ‘free word order’ and ‘pragmatically conditioned word order’ interchangeably in their discussion of Jelinek’s (1984) account of configurationality, as described in Section 2.3.3. As mentioned in Section 3.2.5, Nordlinger (1998a) states that in her view a non-configurational language does not need to have a flat structure, but may have a hierarchical structure determined by discourse functions. This seems to imply that those languages that she calls non-configurational could also in principle be labelled as discourse configurational. She has not adopted this term. These accounts imply that the idea that languages labelled as non-configurational are in fact discourse configurational is present in some of the literature, but it is not stated explicitly very often as far as I am aware.

It appears that the terms were developed at different times, and are used for different emphases in discussion: either focusing on free assignment of argument functions, or on the way that information structure restricts word order. Moreover, certain characteristics, such as allowing for discontinuous expressions, are attributed to non-configurational languages, but they do not occur in many languages which are labelled as discourse configurational.

My aim is to show that languages that have traditionally been classified as non-configurational and languages that have traditionally been classified as discourse configurational are actually the same type of language: languages in which ordering of argument functions is free, but in which the order is determined by information structure. In other words, the two terms appear

¹¹As far as I am aware, the two labels ‘non-configurational’ and ‘discourse configurational’ have not been used by the same scholar(s) within one work to label distinct sets of languages.

to cover the same languages, and I want to make this explicit. Despite arguing that the two terms non-configurational and discourse configurational language cover the same languages, in this next few subsections I will discuss the two different groups separately, in an attempt to show how different emphases of discussion (i.e. a focus on free argument assignment or on the way information structure constraints word order) have led to the coining of the two different terms.

One has to be careful with the terminology here. There are two senses of the term non-configurational, as hinted at by Hamilton (2014): a descriptive and a theoretical one. Descriptively, a non-configurational language is a language with certain characteristics (e.g. the three characteristics posited by Hale (1983)). Theoretically, a non-configurational language is a language with a non-configurational structure syntactically: a flat structure. The two senses are often used interchangeably but should not be confused with one another. Many researchers working in transformational frameworks refer to their analyses as being ‘configurational’ for ‘non-configurational’ languages, assuming that all languages are configurational underlyingly. In this thesis, ultimately I aim to stay true to the theoretical sense of this term, by letting surface word order determine the syntactic structure of a language. Extending this to discourse configurationality: one could assume that the term has two senses as well: a descriptive one stating that discourse configurational languages have word order determined by the discourse, and a theoretical one stating that they have a syntactic structure determined by the discourse, i.e. by information structure roles.

Languages defined as ‘non-configurational’

Languages which have been defined as non-configurational (at least in the descriptive sense) in the literature come from a range of language families. Examples are Latin (Vincent, 1998) and Ancient Greek (Devine & Stephens, 2000) (Indo-European), Mohawk (Baker, 1996b) (Iroquoian), Warlpiri (Hale, 1983; Simpson, 1991; Austin & Bresnan, 1996) and Kalkatungu (Blake, 1983) (Pama-Nyungan) and various other Pama-Nyungan languages as well as non-Pama-Nyungan Australian indigenous languages such as Wambaya, as discussed in Section

3.2.5 (Nordlinger, 1998a).¹² This shows that relatively free ordering of arguments is not restricted to a specific language family, and neither is relatively strict ordering of arguments as we have seen. A large degree of variation in word order freedom is possible within one specific language family. Free ordering of argument functions is illustrated by the following examples from Warlpiri:

- (4.16) a. *Ngarrka-ngku ka wawirri panti-rni.*
 man-ERG AUX kangaroo.ABS spear-NPAST
 ‘The man is spearing the kangaroo.’
- b. *Wawirri ka panti-rni ngarrka-ngku.*
 kangaroo.ABS AUX spear-NPAST man-ERG
- c. *Panti-rni ka ngarrka-ngku wawirri.*
 spear-NPAST AUX man-ERG kangaroo.ABS
- (Hale, 1983, p. 6)

In example (4.16a) the main order is S - AUX - O - V. In Warlpiri, the auxiliary appears obligatorily in a specific position, which most often is second position, and sometimes third position. Apart from this, any other order is allowed, as illustrated by (4.16b) and (4.16c). The ordering in (4.16b) is O - AUX - V - S and in (4.16c) it is V - AUX - S - O. Any ordering is allowed: the subject can precede or follow the object, and the verb can appear anywhere in the sentence, as long as the AUX appears in its set position. Free word order also occurs in Latin, as illustrated here, repeated from (2.13) in Chapter 2:

- (4.17) a. *Caesarem Brutus occidit.*
 Caesar.ACC Brutus.NOM kill.PERF.3SG
 ‘Brutus killed Caesar.’
- b. *Brutus Caesarem occidit*
 Brutus.NOM Caesar.ACC kill.PERF.3SG
- c. *Occidit Brutus Caesarem*
 kill.PERF.3SG Brutus.NOM Caesar.ACC

¹²Note that Mohawk is a head-marking language, and that the others are dependent-marking. This shows that head-marking languages and dependent-marking languages can fall into the same category with respect to word order.

d. *Caesarem occidit Brutus.*
 Caesar.ACC kill.PERF.3SG Brutus.NOM

(cf. Devine & Stephens (2006, p. 3))

All these orders are allowed, based on an overview of the data.

Saying that a language has ‘free word order’ implies that there is complete freedom in word ordering (in terms of argument functions), but in reality things are more complicated than that. There are constraints on this freedom. As stated above, in Warlpiri the auxiliary cluster (AUX) nearly always occurs in second position, but in some cases in third position (Simpson, 2007). It may appear in third position if there are both a topic and a focus constituent appearing before the auxiliary, triggered by a specific information structural context, as for example in the following example:

(4.18) A: *Pangurnu-rlu-rlupa pangi-ni?*
 shovel-ERG-1PL dig-NPST?
 ‘Let’s dig with a shovel?’

B: *Pangurnu-ju NYARRPARA-WIYI ka-nkulu marda-ni?*
 shovel-KN where-before PRES-2PL hold-NPST
 TOPIC FOCUS AUX
 ‘Where have you got a shovel?’

(Hale, 1959) via (Simpson, 2007, p. 409)

There is thus a strong tendency for the AUX to occur in second position, but under specific information structural conditions this may be different. It will always occur in the left periphery of the clause, in a fixed structural position.

Latin has similar constraints. Latin has three connective particles which occur obligatorily in second position, namely *enim* (‘indeed’, ‘because’), *autem* (‘on the other hand’) and *vero* (‘however’). An example of this is the following:

(4.19) *Quid enim horum infirmari, Grati, potest?*
 which because this.NEUT.GEN invalidate.INF.PASS Gratius.IMP can.3SG
 ‘For which of these things can be invalidated, Gratius?’

(Cic. *Arch.* 8)

The definition of ‘second position’ here is from Bolkestein (2001): she states that second position is after the first ‘full word’, but one- and two-syllable prepositions do not count as full words, so for example *de morte* (‘about death’) can occur before these connective particles. Therefore second position can be better stated as ‘appearing after the first phonological word’. This implies that these connective particles are potentially clitics and phonologically conditioned. Whether this is the case in Latin or not, we need to generally distinguish between different causes of ‘fixed’ word order positions, namely syntactic (such as V2) and phonological (such as phonologically conditioned clitics). This brief illustration shows that Latin and Warlpiri, even though they are often cited as ‘free’ word order languages, actually do have some constraints on their word order.

Languages defined as ‘discourse configurational’

Kiss (1995b) defines discourse configurational languages as languages in which topic and/or focus are associated with particular phrase structural positions. In her survey of discourse configurational languages a wide range of languages is discussed, namely Somali, Basque, Catalan, Modern Greek, Hungarian, Finnish, Korean and Quechua. Russian and Hindi have also been classified as discourse configurational languages in some of the literature (King, 1995; Gambhir, 1981). Kiss (1995b) defines three different types of discourse configurationality: in Type A discourse configurational languages topic has a particular structural position and in Type B discourse configurational languages focus has a particular structural position. She notes that Type AB is also possible, in which both topic and focus have specific structural positions.

As a working definition and starting point I largely follow Kiss (1995b) in assuming that a discourse configurational language is a language in which there are specific c-structural positions for information structure roles.¹³ This does not exclude the possibility of information structure roles (e.g. topic and focus) being determined by other means, such as intonation

¹³Adjuncts in these types of languages are also positioned according to the information structure, but the current focus is arguments.

or in some cases morphology.¹⁴ This defines discourse configurationality in a theoretical sense; in a descriptive sense one could simply say that discourse configurational languages are languages in which word order is determined by information structure, but I believe that this definition is too vague. In the current discussion the position of topic and focus are prominent, but I assume that it is in principle very likely that the other constituents in a sentence are also ordered according to information structure, although they are potentially not structurally tied to a specific position in the way that topic and/or focus often are. I assume that a truly discourse configurational language has free word order in terms of argument function (and by extension grammatical function) placement. Notice that in this respect, discourse configurational languages are the same as the languages traditionally defined as non-configurational which were illustrated in the previous section.

As an example of a typical discourse configurational language, consider the following examples from Hungarian:

- (4.20) a. *János* IMRÉT *mutatta* *be* *Zsuzsának.*
 John.NOM Imre.ACC introduce.PAST VM Susan.DAT
 TOPIC FOCUS
 ‘John introduced IMRE to Susan.’
- b. *Zsuzsanák* JÁNOS *mutatta* *be* *Imrét.*
 Susan.DAT John.NOM introduce.PAST VM Imre.ACC
 TOPIC FOCUS
 ‘JOHN introduced Imre to Susan.’
- c. *Imrét* ZSUZSÁNAK *mutatta* *be* *János.*
 Imre.ACC Susan.DAT introduce.PAST VM John.NOM
 TOPIC FOCUS
 ‘John introduced Imre to SUSAN.’

(Kiss, 1998, p. 682)

As one can see, the word order is different in each of the three examples. The first example shows S-DO-V-IO order, the second shows IO-S-V-DO order, and the third DO-IO-V-S order.

¹⁴In some languages, topic and focus can be marked morphologically, e.g. in the case of the topic marker *-wa* in Japanese.

In principle the other orders should be possible as well; we can say that Hungarian actually has free word order syntactically. All three sentences express the same truth-conditional meaning, but the information structure is different in each example. However, note that the verb appears to have a fixed position. Focus is preverbal and the focused constituent is prosodically stressed (Erteschik-Shir, 2007). Preverbal focus is in complementary distribution with verbal modifiers (VM) (in specifier of VP position): if preverbal focus is not present then the VM takes its place (Laczkó, 2014b). The first constituent in each example is topical. We thus see a very clear structure in all of the sentences: TOP-FOC-V-other. This structure is the same in each of the three sentences, despite the word order being different in each of the three sentences.

Tying the two together

We have seen that traditionally non-configurational languages (e.g. Latin, Warlpiri) have word order determined by information structure; this is described, among others, by Devine & Stephens (2006) and Ledgeway (2012) for Latin and by Simpson (2007) and Legate (2002) for Warlpiri. The labels ‘non-configurational’ and ‘discourse configurational’ have been discussed in different contexts, but the languages described by these two terms have the same characteristics of having information structure determine word order, having, in principle, free assignment of argument functions. From a descriptive point of view, they therefore fall into the same category. As has been shown, the left periphery is especially important in expressing information structure roles. For this reason, hierarchical left peripheries have been proposed for these languages, to reflect the role of specific information structure roles in word order. Examples of this within LFG are Simpson (2007) for Warlpiri and Laczkó (2014a) for Hungarian.¹⁵ Assuming that a hierarchical left periphery is desirable for languages of this kind, we can conclude that in a theoretical sense, the languages described as non-configurational and discourse configurational fall into the same category. I refer to the group as a whole with the

¹⁵I choose not to list several other works which propose hierarchical left peripheries for languages such as Latin (Devine & Stephens, 2006; Ledgeway, 2012) and Warlpiri (Legate, 2002), as these accounts make very different assumptions about the role of phrase structure. My aim is to show that within LFG, hierarchical left peripheries based on information structure are a possible assumption.

term ‘discourse configurational’, as the term ‘non-configurational’ implies a flat structure. I hypothesise that all discourse configurational languages have a hierarchical left periphery with positions associated with information structure roles. This does not mean that discourse configurational languages may not have partially non-configurational structures: a hierarchical left periphery determined by the discourse followed by a flat, non-configurational, S structure is proposed for Warlpiri (Simpson, 2007) and for Latin (Ledgeway, 2012). Also, this discussion does not exclude the existence of actual non-configurational languages with a flat structure; it merely makes the point that languages that have been labelled non-configurational are actually better described as discourse configurational.

4.2.3 Scrambling

Apart from the terms non-configurationality and discourse configurationality, another term that is relevant to the study of free word order is ‘scrambling’. Scrambling is a difficult term, as it seems to be used for a range of different types of word order variation. The term ‘scrambling’ was originally coined by Ross (1967) to account for the ‘freedom’ of word order in Latin (as illustrated above). This implies that discourse configurational languages and scrambling languages are the same, which is not true, because there are different degrees of scrambling in different languages, as will be illustrated later in this section. Scrambling as an overarching term could be used to characterise a phenomenon in which “non-canonical” word orders are possible in a language, without changing the core meaning of the sentence (Bailyn, 2002a; Erteschik-Shir, 2007).¹⁶ However, the definition of scrambling is not consistent across the literature. Sometimes it is defined as any type of word order variation triggered by the discourse, thereby including fronting (Van Gelderen, 2003). For Van Gelderen (2003), working within the Minimalist Program, this is modelled by movement. Fronting, like scrambling, does not change the truth-conditional semantic content of a sentence, but we have seen that it changes the information structural content of a sentence.

¹⁶Bailyn (2002a)’s use of the word “non-canonical” is somewhat problematic, as it implies that there is an unmarked word order and scrambling results in marked word orders. This might not always be the case, as will be seen later.

Bailyn (2002a,b) mentions Japanese, German, Hindi and Russian as scrambling languages, among others. Scrambling is also said to occur in Dutch (Van Gelderen, 2003; Thráinsson, 2003). This is thus a wide range of languages, and they fall into different categories of scrambling. Three different types of scrambling have been identified in the literature: VP-internal scrambling, clause-internal scrambling and long distance scrambling (Takano, 1998; Erteschik-Shir, 2007).

Some examples that have been given of clause-internal scrambling and long distance scrambling appear to be instances of discourse configurationality. For example, a language like Japanese has been argued to be discourse configurational, and scrambling is taken as a characteristic of its discourse configurationality (Erteschik-Shir, 2007). It is important to distinguish between a case like this and something like Dutch scrambling, which is restricted to the VP, and in which subjects and objects always have to appear in the same relative order. Scrambling in Dutch (and also German) does not appear to result in discourse configurationality in the theoretical sense, but there is some evidence that information structure does play a role in the type of scrambling attested in these languages. In this section I discuss three languages which have been argued to exhibit scrambling: Japanese, German and Dutch.¹⁷

Japanese scrambling

Scrambling in Japanese leads to a change in information structure, and it can lead to different linear order of the arguments of a clause:

- (4.21) a. *Taroo-ga* SONO HON-O *katta.* (*SOV*)
 Taro-NOM that book-ACC bought
 ‘Taro bought that book.’
- b. *Sono hon-o* TAROO-GA *katta.* (*OSV*)
 that book-ACC Taro-NOM bought
 ‘That book, Taro bought.’

(Ishii (2001) via Erteschik-Shir (2007, p. 132))

¹⁷Another language which is similar to Japanese in terms of scrambling in many ways is Russian; see Van Gelderen (2003).

Japanese is an obligatorily verb-final language. The immediately preverbal position is the focus position, according to Ishii (2001). Erteschik-Shir (2007) refers to (4.21b) as a case of scrambling of the object over the subject, thus assuming that the SOV word order is the canonical word order, and the OSV word order appears in a specific information structural context. This might be due to the fact that subjects are more often associated with the topic role, and therefore SOV occurs more often than OSV. The scrambling of the object from preverbal position to initial position is said to be *altruistic*, as it allows the subject to be interpreted as focus, but the object itself does not receive a particular IS role (Erteschik-Shir, 2007). Assuming this, it seems that Japanese word order is (at least partially) determined by the discourse, implying that it is a discourse configurational language, at least in the descriptive sense. The phenomenon sometimes referred to as ‘scrambling’ in Japanese is thus a type of word order variation which is triggered by information structure. Also, it can actually change the relative ordering of argument functions (this is not the case for ‘scrambling’ in Dutch, as will be shown in the next subsection).

Scrambling is also allowed across clausal boundaries in Japanese:

- (4.22) *Sono hon-o Hanako-ga TAROO-GA katta to omotteiru (koto).*
 that book-ACC Hanako-NOM Taro-NOM bought C think fact
 ‘That book, Hanako thinks that Taro bought.’

(Saito, 1992, p. 69)

Here we see that the subject of the embedded clause bears a focus function (in preverbal position), which is possible because the object of the embedded clause (*sono hon-o*, ‘that book’) is realised sentence-initially and not in preverbal position. In this position the embedded clause object precedes the matrix subject, and appears outside its own clause, creating a long distance dependency.

German and Dutch scrambling

German and Dutch also show a degree of word order variation which has been referred to as scrambling. German and Dutch scrambling appear to be very similar for the most part,

although there are slightly different constraints on ordering, as we will see:

(4.23) German scrambling:

- a. *Jeder weiss dass Hans am Sonntag das Buch gelesen hat.*
everyone knows that Hans on Sunday the book read has
- b. *Jeder weiss dass Hans das Buch am Sonntag gelesen hat.*
everyone knows that Hans the book on Sunday read has
'Everybody knows that Hans has read the book on Sunday.'

(4.24) Dutch scrambling:

- a. *Iedereen weet dat Jan op zondag het boek heeft gelezen.*
everyone knows that Jan on Sunday the book has read
- b. *Iedereen weet dat Jan het boek op zondag heeft gelezen.*
everyone knows that Jan the book on Sunday has read
'Everyone knows that John has read the book on Sunday.'

(Van Gelderen, 2003, p. 166)

At first glance, there does not appear to be an information structural difference between the a. and b. sentences in (4.23) and (4.24). De Hoop (1997, 2000) argues that in Dutch, scrambling only occurs for definite direct objects and that it is optional, with no interpretational differences between the scrambled and unscrambled order. That said, De Hoop lists a number of constraints on which types of constituents may scramble and which types may not, which might indicate something about the information structure of scrambling. For example, De Hoop (1992) shows that in Dutch only 'strong DPs' can scramble, a term that she uses to denote DPs that are referential, partitive, generic or collective. This means that strong quantifiers and weak quantifiers that can receive strong readings can scramble optionally. A strong quantifier is something like *alle mannen* ('all men'), and a weak quantifier which can receive a strong reading is *twee mannen* ('two men'). In a strong reading, this will mean 'two of the men' or 'those two men' (Erteschik-Shir, 2007). Both of these cases are instances of strong DPs. An example of a weak DP is *een man* ('a man'). These are not allowed to scramble:

(4.25) a. Scrambling of a strong DP:

omdat iedereen (dat toneelstuk) nog (dat toneelstuk) wilde zien.
because everyone that play still that play wanted see
'because everyone still wanted to see that play.'

a. No scrambling of a weak DP:

*omdat iedereen (*een toneelstuk) nog (een toneelstuk) wilde zien.*
because everyone a play still a play wanted see
'because everyone still wanted to see a play.'

The strong DPs can scramble, the weak ones cannot. However, De Hoop shows that weak DPs can scramble if they are contrastive:¹⁸

(4.26) *Wist jij dat Els een EENHOORN gisteren heeft gezien?*
knew you that Els a unicorn yesterday has seen
'Did you know that Els saw a unicorn yesterday?'

(De Hoop, 1997)

These constraints on Dutch scrambling are relevant to the discussion at hand, because of the fact that contrastive and strong DPs are potential topics. If they are topics, we could assume that scrambling is similar to topicalisation, with the difference that scrambling in Dutch is VP-bound, and topicalisation can appear within a clause or can even occur across clausal boundaries.

Following on from the claim that scrambling in Dutch is optional and that there are no interpretational differences, De Hoop (2003) claims that, following Neeleman & Reinhart (1998), anaphoricity plays a role: the higher the degree of anaphoricity of a direct object, the more likely it will scramble.¹⁹ Poortvliet (2012) points out that anaphoricity is in fact related to

¹⁸In (4.26) the capitals mark prosodic stress. I will employ this notation to mark stress in the rest of this thesis, also in some of the English translations where I deem it necessary for clarity, following Mycock (2007b).

¹⁹De Hoop (2003) follows Givón's (1983) hierarchy of anaphoricity, which is as follows: zero anaphora > weak pronouns > strong pronouns > right-detachment > neutral order + definite NPs > left-detachment > clefts > indefinite NPs. The higher a direct object is on this hierarchy, the more likely it is that it will scramble.

the topic information structure role, and shows that information structure plays a role in VP-internal scrambling in Dutch, but only for topic constituents. Data collected by her shows that discourse-related topics are predicted to scramble much more often than not, but that this is not an absolute rule. It thus appears that information structure does play a role in Dutch scrambling. I assume that this is true for German as well.

There is a difference between Dutch and German scrambling, however, namely the fact that Dutch scrambling is order-preserving, whereas German scrambling is not. This was illustrated for German in Chapter 2. The German example in (2.6) is repeated here:

- (4.27) a. ...*dass der Kurier dem Spion den Brief zustecken sollte.*
 that the.NOM courier the.DAT spy the.ACC letter slip
 should
 ‘...that the courier should slip the spy the note.’
- b. ...*dass der Kurier den Brief dem Spion zustecken sollte.*
 that the.NOM courier the.ACC letter the.DAT spy slip should
- c. ...*dass den Brief der Kurier dem Spion zustecken sollte.*
 that the.ACC letter the.NOM courier the.DAT spy slip should
- d. ...*dass den Brief dem Spion der Kurier zustecken sollte.*
 that the.ACC letter the.DAT spy the.NOM courier slip should
- e. ...*dass dem Spion der Kurier den Brief zustecken sollte.*
 that the.DAT spy the.NOM courier the.ACC letter slip should
- f. ...*dass dem Spion den Brief der Kurier zustecken sollte.*
 that the.DAT spy the.ACC letter the.NOM courier slip should
- (Choi, 1999, p. 21)

Note that this extent of variation is only allowed in embedded clauses. This extent of variation is not allowed in Dutch:

- (4.28) a. ...*dat de koerier de spion de brief zou moeten geven.*
 that the courier the spy the letter would must give
 ‘...that the courier should give the spy the note.’

- b. *...*dat de koerier de brief de spion zou moeten geven.*
 that the courier the letter the spy would must give
- c. *...*dat de brief de koerier de spion zou moeten geven.*
 that the letter the courier the spy would must give

The order in (4.28b) is only allowed if the recipient *de spion* ('the spy') is an oblique, marked with the preposition *aan* ('to'):

- (4.29) a. ...*dat de koerier de brief aan de spion zou moeten geven.*
 that the courier the letter to the spy would must give
 '... that the courier should give the letter to the spy.'
- b. ...*dat de koerier aan de spion de brief zou moeten geven.*
 that the courier to the spy the letter would must give

Example (4.29b) shows that if the recipient is a PP, it may occur in either order relative to the theme; this is not surprising, as the dative function of the recipient is explicitly marked in a PP (by the use of the preposition), so word order is not needed to provide this information. The subject has to appear first, however, showing that scrambling is VP-bound. This is reinforced by the fact that the following example is grammatical, but expresses a different truth-conditional meaning than the one in (4.28a):

- (4.30) ...*dat de spion de koerier de brief zou moeten geven.*
 that the spy the courier the letter would must give
 '...that the spy should give the courier the note.'

In this example, the two animate arguments, *de spion* ('the spy') and *de koerier* ('the courier'), have reversed their function from (4.28): this is shown by the word order. The first DP is always the subject in embedded clauses in Dutch.

This brief discussion shows that although German and Dutch scrambling are similar in many ways, German scrambling is much freer as it does not necessarily preserve the relative order of arguments, and it is not confined to the VP. Dutch scrambling can only occur within the VP, and only with arguments and adverbs scrambling, never changing the relative order of arguments. This is not surprising, as German case-marks all DPs, whereas Dutch does

not. Only in the case where an oblique is marked explicitly (in the case of the PP in (4.29)), the oblique and object may appear in either order relative to each other. German scrambling is restricted, however, in the sense that it may only appear in embedded clauses. In matrix clauses, fronting and fronted constituent questions are allowed, like in Dutch and English, but one cannot simply move everything around like in many discourse configurational languages. This clearly shows that German is a special case in not having very strict word order in terms of argument functions, but also not being fully discourse configurational. Crucially, I assume that information structure plays a role in German word order variation, and also in the Dutch variation described in this section.

Definition of scrambling

As briefly illustrated in this section, the term scrambling has been used to discuss a wide range of word order variation. In the case of Japanese ‘scrambling’, it simply appears to be another way of expressing that Japanese is discourse configurational (at least in the descriptive sense). This is not the case for German and Dutch, as these languages are not generally assumed to be discourse configurational languages. However, it does appear that information structure is the motivator behind word order variation in these languages, as it is in discourse configurational languages. I assume that scrambling is information structure driven word order variation which does not result in set positions for specific information structure roles. In the next few sections it will become clear that in languages like Hungarian (and many others), there are specific nodes in c-structure trees which are obligatorily annotated for specific information structure roles. I assume this to be a characteristic of discourse configurational languages, as the term already implies. I define scrambling as any type of variation (triggered by information structure) that does not result in discourse configurationality, in the theoretical sense. For example, the type of data in Dutch and German discussed in this section falls under this term, as it does not entail specific nodes being annotated for specific information structure roles. This definition will become especially clear after the discussion of constraints on annotations in the classification of configurationality I present in Section 4.4.

4.3 Relevant factors in word order variation

Let us now explicitly identify the different factors that play a role in word order variation, as well as showing how they might interact or complement each other. Identifying these factors allows us to set out a space of possibilities of annotations on c-structure in LFG, which will be discussed in Section 4.4. This will allow us to propose possible generalisations relating to word order.

4.3.1 Factors affecting word order

There are clearly two main factors playing a role in the determination of word order, namely grammatical functions and information structure. This is evident from the discussion in Section 4.2. This does not mean other factors do not play a role, as will be shown later.

Starting with grammatical functions, we see that these are a determining factor in English word order, where we want to ensure the reading with ‘the man’ as subject and ‘the book’ as object:

- (4.31) a. The man reads the book.
b. The book reads the man.
c. The man the book reads.

Sentence (4.31b) is syntactically well-formed (and is therefore not marked as ungrammatical), but it is not acceptable if we assume that ‘the man’ is the subject (and agent) and ‘the book’ is the object (and patient). Under those assumptions, (4.31c) is also unacceptable, although syntactically it could be a fronted version of (4.31b), thus allowed by the c-structure rules of English. In any case one can definitely say that word order determines grammatical functions, as the only possible reading of (4.31b) or (4.31c) would be one in which ‘the book’ is the subject and ‘the man’ is the object, which is a different reading than the one in (4.31a). On the other end of the ‘spectrum’ there are languages like Hungarian, as discussed in Section

4.2.2. Hungarian's free assignment of grammatical functions was shown in example (4.20), repeated here in (4.32):

- (4.32) a. *János* IMRÉT *mutatta* *be* *Zsuzsának*.
 John.NOM Imre.ACC introduce.PAST VM Susan.DAT
 'John introduced IMRE to Susan.'
- b. *Zsuzsanák* JÁNOS *mutatta* *be* *Imrét*.
 Susan.DAT John.NOM introduce.PAST VM Imre.ACC
 'JOHN introduced Imre to Susan.'
- c. *Imrét* ZSUZSÁNAK *mutatta* *be* *János*.
 Imre.ACC Susan.DAT introduce.PAST VM John.NOM
 'John introduced Imre to SUSAN.'

(Kiss, 1998, p. 682)

This is clearly very different from the English examples in (4.31). In the Hungarian examples, a change in word order does not lead to a change in interpretation of grammatical functions. However, the ordering of specific discourse functions is very strict in the Hungarian example set. This shows that in English, word order is (largely) dictated by the order of its grammatical (argument) functions and in Hungarian word order is dictated by information structure. In different respective information structural contexts, the examples in (4.32) would not appear acceptable, as confirmed by a native speaker.

Grammatical functions and information structure can both determine word order but they are not mutually exclusive. In many languages, both play a role in word order. Even in a language such as English, information structure actually does play a role, as exemplified by English fronting, as briefly mentioned in Section 4.2.1:

(4.33) Q. Are you going to eat everything?

A. THAT BIT OF BLUE CHEESE, I won't eat.

In this example the constituent *that bit of blue cheese* has a focus function. The order in the answer (A) in (4.33) differs from the standard SVO word order in English and this needs to be captured in a theory accounting for word order.

Two other phenomena in which word order somewhat deviates from the norm are relative clause formation and constituent question formation. Relative clause formation is a type of long distance dependency (LDD), and constituent question formation is very much like fronting, and like fronting it can in principle form long distance dependencies. Relative clause formation is not directly triggered by argument function position or by the discourse, although the relative pronoun is assumed to bear a topic function. The following is an example of this:

(4.34) Lisa, who Mary saw earlier today, was going to the market.

Here the object of the verb ‘saw’ (‘who’) appears fronted within the relative clause, and this is simply a rule of English. Unlike in the case of fronting, there is no alternative ‘unmarked’ order: the relative pronoun always appears first in its clause. Constituent question formation is also a specific construction, in which the question word receives a focus information structure role. For languages with displaced *wh*-phrases, one can thus argue that ordering in questions is triggered by the discourse, by fronting the focus element:

(4.35) WHO did Mary see?

Grammatical functions and information structure are the primary factors in the determination of word order, but other factors might also contribute. Some of these are discussed by Wasow (2002), who specifically discusses postverbal ordering inside the VP. One example of this is *heavy NP shift*.²⁰ Heavy NP shift is the occurrence of a prosodically ‘heavy’ NP or DP (a grammatically complex NP/DP, or an NP/DP consisting of a large amount of phonological material, definitions differ) in a position that would normally be ungrammatical or marked. An example is the following:

- (4.36) a. I gave the book to Peter.
b. ?I gave to Peter the book.
c. I gave to Peter the book that my grandmother had given to me last Christmas.

²⁰Assuming a DP for English, we could also use the term ‘heavy DP shift’, but as this phenomenon also occurs in other languages and I want to stay close to the terminology used in the literature, I will use the term ‘heavy NP shift’.

(4.36c) is a case of heavy NP shift, and is contrasted with the usual order in (4.36a), with a ‘non-heavy’ constituent. The ‘shifted’ word order in (4.36b) is somewhat odd compared to (4.36a) (possibly because there is a version available without the preposition ‘to’), but with a heavy object DP as in (4.36c) it is much more acceptable.

Besides discussing heaviness of constituents (also in its relation to information structure), Wasow (2002) also brings forth a few other factors. One of these is *semantic connectedness*:

(4.37) On this side of the Atlantic, the Lancaster-Oslo/Bergen corpus was designed to **replicate as closely as possible the Brown corpus**, the only difference being that this corpus contains British rather than American English texts.

(Wasow, 2002, p. 84)

The relevant part of the example is marked in bold: here we have a verb *replicate*, a modifier *as closely as possible* and the object DP *the Brown corpus*. In an unmarked order, the object would follow the verb immediately, and heavy NP shift cannot account for this example as *as closely as possible* is longer and syntactically more complex than the object *the Brown corpus*. Wasow (2002) argues that the ordering in (4.37) is due to the semantic connectedness of the verb and its modifier; the modifier is highly context-sensitive, and the strong connection between the modifier and its head is made clear via ordering. Another factor that Wasow (2002) mentions is *lexical bias*: for example certain verbs which allow for the dative alternation (e.g. *tell, give, bring, fax*) seem to prefer the indirect object construction (or in LFG terms, the construction with an object and an oblique) over the double object construction or vice versa. This leads to a preference of ordering of the two complements, one way or the other. Importantly, however, in the two different variants one of the complements appears either as a second object or as an oblique, thus in a different form.²¹

²¹Wasow (2002) also discusses *ambiguity avoidance* as a factor which researchers have assumed to play a role in word order: these researchers assume that in sentences that can be parsed in more than one way, one might choose to put one constituent before another to avoid structural ambiguity from the outset. However, Wasow’s (2002) experimental evidence shows that this is not the case.

4.3.2 Verb position as an anchor

It appears that the placement of certain grammatical functions and information structure roles is commonly constrained in relation to a verb or verb-like element (e.g. the AUX in Warlpiri). For this reason, this section briefly discusses the concept of a verb as an anchor around which specific constituents are positioned. As mentioned, I am not taking verbs into account in my classification of configurationality, but I do want to give an idea of how verbs aid in the placement of argument functions and information structure roles, in order to give a more detailed overview of the data.

This verb ‘anchoring’ can be observed in several languages, some of which will be illustrated here. Consider for example the Hungarian example in (4.39) (repeated from (4.20)):

- (4.39) a. *János* IMRÉT *mutatta* *be* *Zsuzának*.
 John.NOM Imre.ACC introduce.PAST VM Susan.DAT
 TOPIC FOCUS VERB
 ‘John introduced IMRE to Susan.’
- b. *Zsuzsanák* JÁNOS *mutatta* *be* *Imrét*.
 Susan.DAT John.NOM introduce.PAST VM Imre.ACC
 TOPIC FOCUS VERB
 ‘JOHN introduced Imre to Susan.’

(Kiss, 1998, p. 682)

We can see a clear order of topic - focus - verb. The verb serves as an anchor, and the topic and focus constituents are positioned relative to this anchor in preverbal topic and focus position. A similar pattern can be seen in Warlpiri, with the anchor not being the main verb, but rather the AUX constituent (example (4.18) repeated):

- (4.40) A: *Pangurnu-rlu-rlupa pangi-ni?*
 shovel-ERG-1PL dig-NPST?
 ‘Let’s dig with a shovel?’

M: *Pangurnu-ju* NYARRPARA-WIYI *ka-nkulu* *marda-ni?*
 shovel-KN where-before PRES-2PL hold-NPST
 TOPIC FOCUS AUX
 ‘Where have you got a shovel?’

(Hale, 1959) via Simpson (2007, p. 409)

Also in this Warlpiri example we have a topic and focus constituent appearing before a specific element, the AUX in this case. In many Warlpiri sentences, only one constituent appears before the AUX, in which case it has either topic or focus interpretation depending on the context.

Another case in which the verb acts as an anchor is in the case of preverbal focus in Hindi/Urdu and Turkish (Butt & King, 1996, 2000). This becomes clear from the following examples from Urdu, where the focus constituent obligatorily occurs in preverbal position:²²

(4.41) Urdu:

- a. *naadyaa-ne* *hassan-ko* TOFII *d-ii*
 Nadya.F-ERG Hassan-DAT toffee.F.NOM give-PERF.F.SG
 TOPIC COMPLETIVE FOCUS
 ‘Nadya gave TOFFEE to Hassan.’
- b. **naadyaa-ne* HASSAN-KO *tofi* *d-ii*
 Nadya.F-ERG Hassan.M-DAT toffee.F.NOM give-PERF.F.SG
 FOCUS
 ‘Nadya gave toffee to HASSAN.’

(Butt & King, 1996, p. 3)

(4.42) Turkish:

[*bu* *kitab-ı*] *Hasan* BAN-A *ver-di*
 this book-ACC Hasan.NOM I-DAT give-PAST.3SG
 TOPIC COMPLETIVE FOCUS
 ‘This book Hasan gave to ME.’

²²This is the case when there is only one focus constituent. If there are multiple foci, the non-preverbal foci may remain in situ, but they always have the role of contrastive focus, relative to the preverbal focus (Butt & King, 1996).

We see a clear case of preverbal focus in both the Urdu and Turkish examples. Butt & King (1996) also note that the clause-initial position hosts the topic constituent, as marked in the examples. Note that in the grammatical Urdu example, (4.41a), there is one constituent between topic and focus, *hassan-ko*: Butt & King (1996) claim that this constituent has the IS role of completive information, as will be discussed in more detail in the next section.

Japanese, assumed to be a strictly verb-final language, has also been discussed as a preverbal focus language (Kim, 1988; Ishihara, 2000; Miura, 2008).²³ This appears true both for *wh*-placement, as well as other types of focus NPs:²⁴

(4.43) a. *Kono hana DARE-GA motte kita-no?*
 this flower who-NOM bring came-Q
 ‘Who brought (you) this flower?’

b. *#Dare-ga kono hana motte kita-no?*
 who-NOM that flower bring came-Q

(Kim, 1988, p. 159)

(4.44) Q. *Taroo-ga NANI-O katta-no?*
 Taro-NOM what-ACC bought-Q
 ‘What did Taro buy?’

A.1. *Taroo-ga HON-O katta.*
 Taro-NOM book-ACC bought
 ‘Taro bought A BOOK.’

A.2. *#Hon-o TARO-GA katta.*
 book-ACC Taro-NOM bought
 ‘TARO bought a book.’

(cf. Miura (2008, p.220))

These examples illustrate that having focus in preverbal position is acceptable, but if the focus constituent appears in a different position (not preverbal, but preceding the topic), the

²³Kim (1988) discusses a number of languages that seem to have a fairly strict preverbal focus position. In his overview he includes Telugu, Laccadive Malayalam and Tamil (Dravidian family); Dogri, Bengali, Gujarati and Hindi/Urdu as discussed (Indo-Aryan family); Sherpa (Sino-Tibetan family); Turkish and Mongolian (Altaic family) and Japanese and Korean (‘Altaic-like’). Kim (1988) restricts his discussion to *wh*-elements.

²⁴As mentioned, Japanese is able to mark topic morphologically, by the topic marker *-wa*. This marker does not appear in the examples in (4.43) and (4.44).

sentence is unacceptable. In (4.44) this is made explicit by the focus in capitals in the English translation.²⁵ It appears that in Japanese, like in Urdu and Turkish, as well as in Hungarian and Warlpiri, there is a clear ordering of IS roles around a verbal anchor of some kind. This makes it more straightforward to give specific structural positions to IS roles, as has been done in LFG by Butt & King (1996, 2000) for Urdu and Turkish, by Simpson (2007) for Warlpiri, and by Laczkó (2014a) for Hungarian.

4.4 A space of possibilities

As the main contribution of this chapter, in this section I sketch out a space of possibilities of annotations, in order to show what different types of languages LFG is able to differentiate, and to show how languages can be divided into different categories based on types of rule annotations. This is directly related to the status of a language in terms of its configurationality. As discussed in Chapter 3, argument functions (AFs) and information structure roles (IS roles) are marked in LFG by annotations on c-structure nodes. If certain AFs or IS roles always appear in the same structural position, this is marked as an obligatory annotation on a c-structure rule. General principles for this structure-function association were presented by Bresnan (2001) as discussed in Section 3.2.5. If, for example, argument function assignment comes from the morphology, then the annotation on a c-structure node in a structure will be contributed by the word itself. The annotation on the c-structure node then will be general, allowing any grammatical function: e.g. $(\uparrow \text{GF}) = \downarrow$. It is therefore unconstrained and not tied a particular c-structure node. It is exactly the obligatoriness or unconstrainedness of these annotations on nodes in c-structure rules that I am interested in. For example, to capture the common claim that in languages traditionally defined as non-configurational argument functions are not defined structurally, one can say that there are no constraints on the annotations for AFs in such languages. The interaction of this claim about argument functions with facts about assignment of information structure roles is central in

²⁵Miura (2008) compares Japanese to Hungarian and notes that preverbal focus position in Japanese is weaker than in Hungarian, meaning that focus does not necessarily need to appear in preverbal position; it can also be marked for its function by a focus particle or by stress (prosody).

my classification.

Important in this is the assumption that if a specific constituent appears to have a set position in the linear ordering of sentences of a language, we want to represent this structurally. This is true both for constituents bearing a specific grammatical function, and those bearing a specific information structure role. When applicable, I would like to use the universality of X-bar theory to capture the distributional properties of word order. This assumption is implicit in much of the literature but never explicitly stated. I thus assume the following principle:^{26,27}

(4.45) Working Principle of Word Order:

If a grammatical function (GF) or information structure role (ISR) appears to have a set position in the linear order of a clause, it must be represented in c-structure by means of an annotation on a particular daughter in a c-structure rule.

Taking into account two main factors influencing word order, we have four different types of languages, in terms of the extent to which the two factors play a role, as shown in Table 4.1.

Table 4.1: Types of languages allowed by LFG, based on word order configuration

Type	Influencing Factors on Word Order
1.	Only argument functions (AF)
2.	Only information structure roles (IS roles)
3.	Both AFs and IS roles
4.	Neither AFs nor IS roles

²⁶Recall from the discussion in Chapter 3 on the work of Kaplan & Zaenen (2003) that their analysis of cross-serial dependencies in Dutch forms an exception to this. In their account, arguments in embedded clauses appear in a specific order relative to each other, but they cannot be distinguished c-structurally, as they all share the same mother node. Rather, only linear order distinguishes them, which is incorporated into Kaplan & Zaenen's (2003) annotation on the verbal nodes. By assuming a principle such as (4.45) I am not arguing against an analysis such as theirs in any way. I am merely aiming to stay true to X-bar theory where this is possible, as I am aiming to tackle a wide range of variation and do not discuss analyses of individual constructions in specific languages at this stage. The principle in (4.45) simply forms a starting point for the classification and discussion in this section.

²⁷I assume that the same principle holds for verbs and verb-like elements, but I note from the beginning that in the space of possibilities, I do not take verb placement into account. The only exception to this would be if a verb appears in a specific position due to its information structure role, assuming that it can be assigned an IS role. Verbal anchors are in principle not taken into account, however.

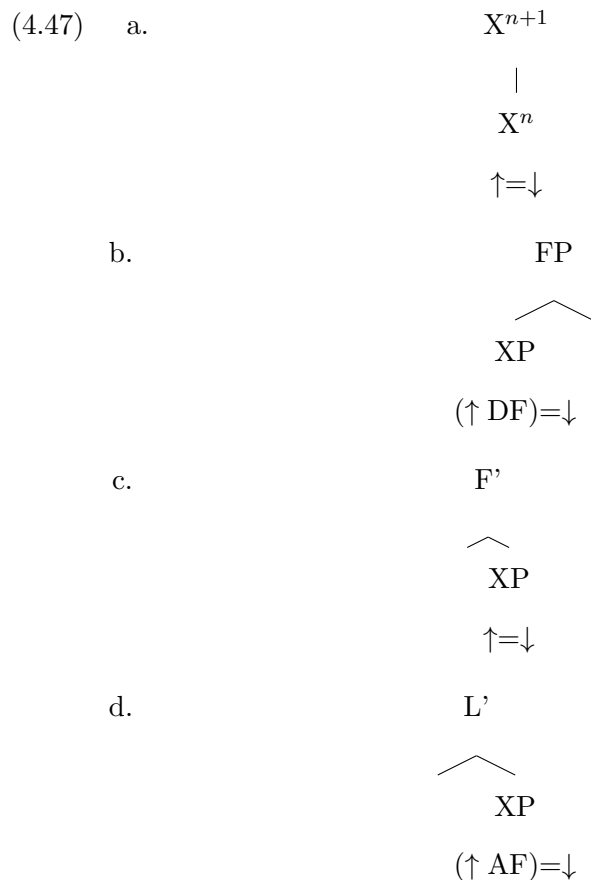
I will refer to the four groups in Table 4.1 as ‘types’ of word order/language from this point onward. In my classification of types of constraints on annotations, it is crucial not only that argument functions and/or IS roles influence word order, but also that they do not lead to a specific annotation on a specific c-structural node, as we are talking about configurationality. This is under the assumption of the Working Principle of Word Order in (4.45). This will become clear throughout the rest of this section.

It is important to remember that these are hypothetical types, which are all possible in LFG and together make up the space of possibilities of word ordering within LFG with respect to these two factors. They might not actually all exist in the word orderings of the world’s languages (or by extension the languages discussed in this thesis). Type 1 is what one could refer to as a ‘truly grammatically configurational language’: an absolute case of what is traditionally referred to as a configurational language, in which argument functions alone determine the position of constituents in a sentence. Type 2 is a classic example of a discourse configurational language, in which word order (and phrase structure) is determined only by information structure. Type 3 is a language in which both AFs and IS roles determine word order and structural positions. Type 4, in which neither AFs nor IS roles are realised in specific c-structural positions, seems to be a flat structure language. Based on what is known about the world’s languages, in which it appears that the left periphery always hosts either a specific argument function or a specific IS role structurally, this type seems unlikely to exist, but it is formally possible in LFG and therefore needs to be addressed properly.

As mentioned, important for the discussion at hand is how nodes are annotated for argument functions and information structure roles in these four different types. Specifically, it is important what predictions these four different types make about whether annotations are obligatory on specific c-structural nodes (whether for IS roles or for AFs). All these issues are addressed in detail in the following sections, in which each of the four possible types of language is discussed individually.

For clarity, I repeat Bresnan's principles of endocentric structure-function association here, as they will be referred to in the following few subsections. In principle I assume that these principles should apply whenever possible, but that where necessary the exocentric rule needs to be called upon. The endocentric principles are shown in (4.46), with their structural correlates in (4.47) (repeated from (3.31) and (3.32) respectively):

- (4.46) a. C-structure heads are f-structure heads.
 b. Specifiers of functional categories host the discourse functions (DF): UDF or SUBJ.
 c. Complements of functional categories are f-structure coheads.
 d. Complements of lexical categories are the argument functions AF.
 e. Constituents adjoined to phrasal constituents are nonargument functions ADJ or not annotated.



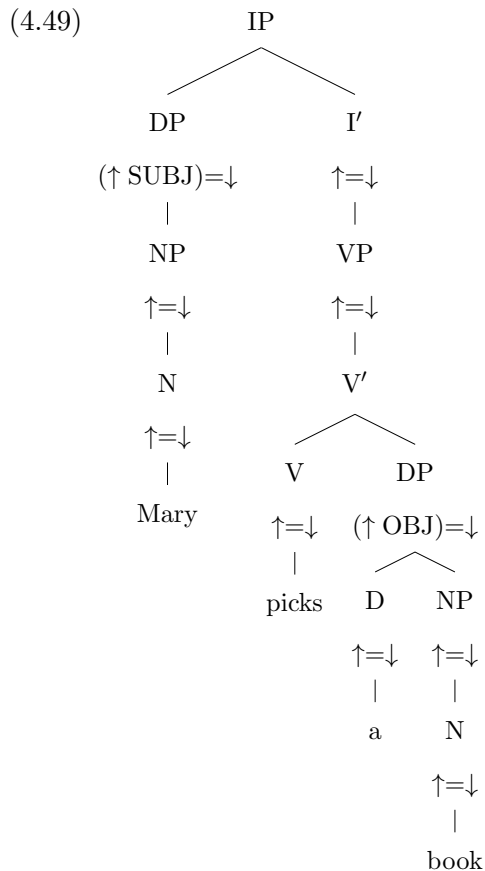


The exocentric rule is as follows, repeated from example (3.33), with C as the abbreviation for Constituent:

$$(4.48) \quad S \rightarrow C^*$$

4.4.1 Type 1: Grammatically configurational languages

In a Type 1 language, word order configuration is determined solely by (specific) argument functions. In principle, argument functions can be distinguished by their phrase structural position (as for example in English by a partial rule such as (3.32b)) or by morphology, or by both. I am thus interested in the case in which structural positions are associated with argument functions (though this does not rule out the use of morphological marking to signal AFs at the same time). In this case, specific c-structure nodes are annotated for their argument function. This is a local annotation of the general form $(\uparrow \text{ AF}) = \downarrow$. An illustration of this is the following example from English:



The subject and object have a set position in English (in discourse neutral sentences): subject in the SPEC of IP (see the principle in (4.46b) and (4.47b)) and object embedded in the VP as sister of V (adhering to the principle in (4.46d) and (4.47d)).

Characterising Type 1 languages: example structures

Now let us see how one can formally characterise a language of Type 1. For this, c-structure rules are key, specifically the annotations on these c-structure rules. As an example, we will imagine a language with strict SVO word order. As mentioned, I assume the principle stated in (4.45). This principle implies that for a strict SVO language, positing a flat structure (dominated by S) is not desirable, even though it is the simplest structure one can imagine. Previous work on strict word order languages in terms of argument functions (e.g. English) shows that these types of languages generally have a very hierarchical structure. This becomes clear from constituency tests (such as the ones described in Chapter 3), and it is in line with

the principle in (4.45). Moreover, where possible I assume that the principles posited by Bresnan (2001), shown in (4.46) and (4.47) apply. For these reasons, for a language of Type 1 with SVO word order, I assume an, at least partially, hierarchical structure:²⁸

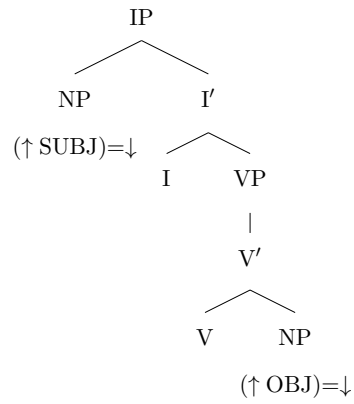
$$\begin{array}{l}
 (4.50) \quad \text{IP} \rightarrow \quad \text{NP} \quad \text{I}' \\
 \qquad \qquad \qquad (\uparrow \text{SUBJ}) =\downarrow \quad \uparrow =\downarrow \\
 \\
 \text{I}' \rightarrow \quad \text{I} \quad \text{VP} \\
 \qquad \qquad \qquad \uparrow =\downarrow \quad \uparrow =\downarrow \\
 \\
 \text{VP} \rightarrow \quad \text{V}' \\
 \qquad \qquad \qquad \uparrow =\downarrow \\
 \\
 \text{V}' \rightarrow \quad \text{V} \quad \text{NP} \\
 \qquad \qquad \qquad \uparrow =\downarrow \quad (\uparrow \text{OBJ}) =\downarrow
 \end{array}$$

In this set of rules, the SUBJ and OBJ annotations are assumed to be obligatory on their respective nodes. The rules in (4.50) are in fact rules that apply to simple sentences in English. Note that under the assumption of Economy of Expression, as explained in Chapter 3, in principle all nodes are optional in the rules in (4.50). Also note that these rules are in accordance with Bresnan’s endocentric principles of structure-function association: the specifier of the functional category IP hosts the SUBJ (see principle (4.46b)), and the complement of the lexical category V is an AF, namely OBJ (see principle (4.46d)).

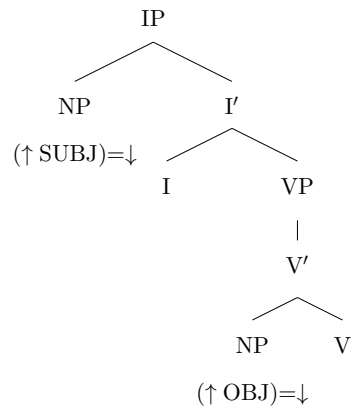
The set of rules in (4.50) gives SVO word order, but the same level of obligatoriness on annotations is true about any other ordering. With any ordering in which V and O appear next to each other (SOV, VOS, OVS), we can imagine a set of rules as in (4.50) with a VP, but with its daughters in a different order. This becomes clear from example (4.51), which illustrates an abstract c-structure with partial annotation for each of the orders SVO, SOV, VOS and OVS, all of which adhere to Bresnan’s endocentric principles as listed in (4.46) and (4.47):

²⁸In principle I also take OBJ_θ and OBL_θ into account, but SUBJ and OBJ provide a nice clean-cut example for illustrative purposes. Also in these examples I use NP instead of DP (as I assume for English), in order not to make overly narrow claims about nominal constituents in other languages.

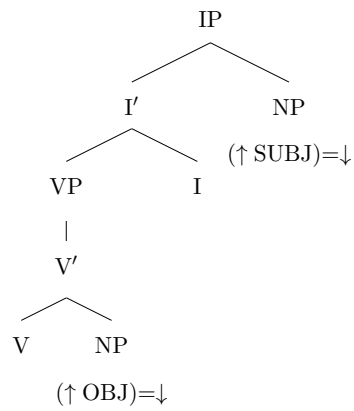
(4.51) a. Strict SVO order:



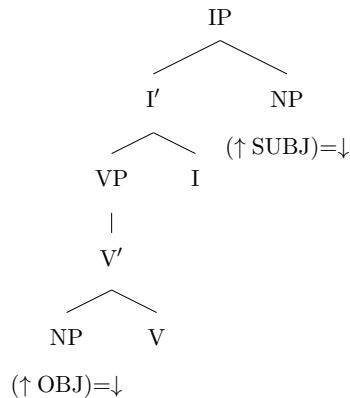
b. Strict SOV order:



c. Strict VOS order:



d. Strict OVS order:



Note that the abstract structure in (4.51a) for SVO order corresponds with the set of rules in (4.50). For the three orders in (4.51b), (4.51c) and (4.51d), one can imagine a similar set of rules as for SVO in example (4.50), but in a different ordering. Crucial is that the annotations for SUBJ and OBJ are obligatory, and therefore tied to a specific c-structural node. There are two remaining orders, VSO and OSV, in which V and O do not appear adjacent to each other, and therefore do not form a c-structural constituent. For these, a different type of c-structure is required. For these two orders, VSO and OSV, we can also have hierarchical structures which adhere to Bresnan’s principles shown in (4.46), if we assume that V appears in C position in these languages. We therefore require a CP projection.²⁹ A set of rules for VSO order is as follows, assuming that the verbs in question (e.g. finite verbs) are lexically specified to be of category C:

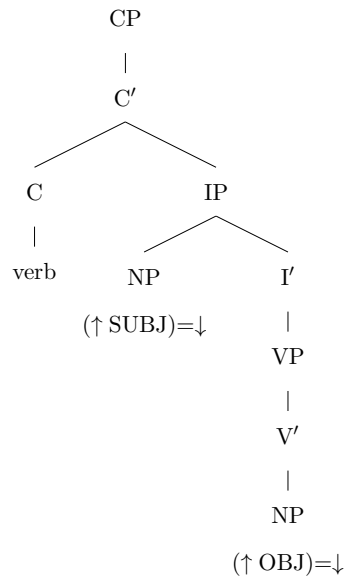
$$\begin{array}{l}
 (4.52) \quad \text{CP} \rightarrow \text{C}' \\
 \qquad \qquad \qquad \uparrow = \downarrow \\
 \text{C}' \rightarrow \text{C} \quad \text{IP} \\
 \qquad \qquad \qquad \uparrow = \downarrow \\
 \text{IP} \rightarrow \quad \text{NP} \quad \text{I}' \\
 \qquad \qquad \qquad (\uparrow \text{SUBJ}) = \downarrow \quad \uparrow = \downarrow
 \end{array}$$

²⁹ Assuming a verb appears in C position and not in V inside the VP position means that the verb is not part of the VP constituent that it is the head of. This has been referred to as ‘head movement’, or more accurately within LFG, ‘variable head positioning’ (Bresnan, 2001; Dalrymple, 2001). This will be discussed in more detail in Section 5.5.2.

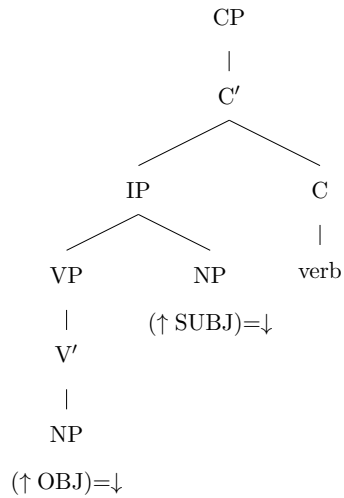
$$\begin{array}{l}
 I' \rightarrow VP \\
 \quad \uparrow = \downarrow \\
 VP \rightarrow \quad NP \\
 \quad (\uparrow OBJ) = \downarrow
 \end{array}$$

The fact that this set of rules adheres to Bresnan's principles means that a headless VP needs to be included in the structure. An abstract structure with partial annotation for VSO order, as well as OSV order (which is similar in structure but requires different ordering), is as follows:

(4.53) a. Strict VSO order (V in C):



b. Strict OSV order (V in C):



These abstract structures thus adhere to Bresnan’s principles, but one can imagine that if we do not assume that the principles apply exceptionlessly, much more is possible in terms of phrase structure configuration. For example, one could propose a set of rules for the order VSO or OSV in which V appears in I position, but which does not adhere to the principles in (4.46).³⁰ An example of this for VSO order is as follows, assuming that the verbs in question (e.g. finite verbs) are lexically specified to be of category I:

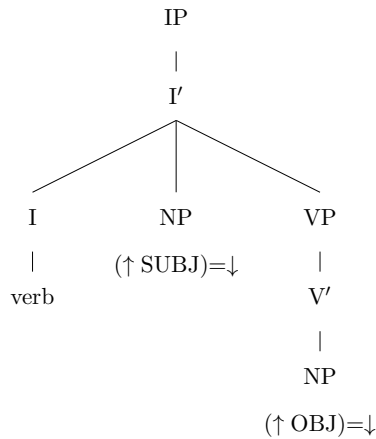
$$\begin{array}{l}
 (4.54) \quad \text{IP} \rightarrow \text{I}' \\
 \qquad \qquad \qquad \uparrow = \downarrow \\
 \text{I}' \rightarrow \text{I} \quad \text{NP} \quad \text{VP} \\
 \qquad \qquad \qquad \uparrow = \downarrow \quad (\uparrow \text{SUBJ}) = \downarrow \quad \uparrow = \downarrow \\
 \text{VP} \rightarrow \text{NP} \\
 \qquad \qquad \qquad (\uparrow \text{OBJ}) = \downarrow
 \end{array}$$

This set of rules only partially adheres to Bresnan’s principles in (4.46): the OBJ appears as the daughter of V’ inside the VP (just as in the abstract structures for all six orders shown in (4.51) and (4.53)). However, the SUBJ does not appear in the specifier of a functional category. If it did, it would appear in the specifier of IP position, which means it would not appear between V and O. This shows that the flat, non-binary structure of the I’ rule in

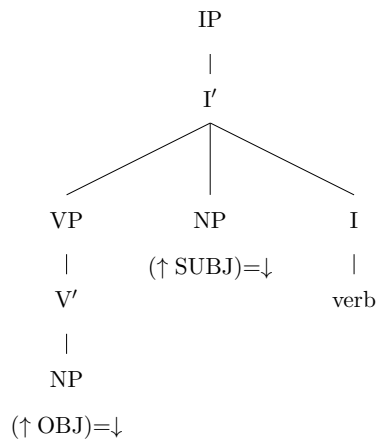
³⁰Like the examples with V in C, examples of V in I show ‘head movement’, or ‘head optionality’.

(4.54) is important in rendering these orders, if we want verbs to appear in I position. An abstract representation with partial annotation of the rules in (4.54) for VSO order is shown in (4.55a), alongside a similar structure for OSV order with V in I in (4.55b):

(4.55) a. Strict VSO order (V in I):



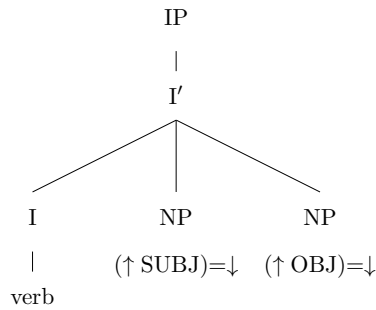
b. Strict OSV order (V in I):



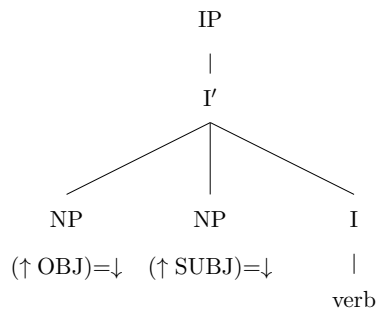
This shows that both orders can in fact be rendered with V in I, if one relaxes Bresnan's principles.

One could also imagine a hypothetical set of structures like the ones in (4.55), but without a VP node (and V' node), with the object NP as a sister to the subject NP:

(4.56) a. Strict VSO order (V in I, no VP):



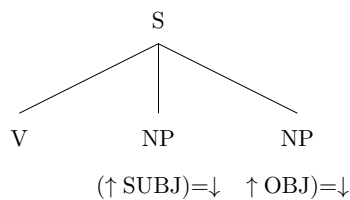
b. Strict OSV order (V in I, no VP):



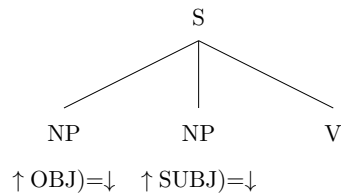
These are possible structures, although they do not adhere to Bresnan's principles at all: the subject does not appear in the specifier of FP (see principle (4.46b)) and the object does not appear as the complement of a lexical category (see principle (4.46d)). Moreover, they do not capture the fact that subject and object appear in a strict relative order to each other (and therefore also goes against the principle in (4.45)).

The extreme alternative to the set of rules which produce the abstract structures in (4.53), (4.55) for VSO and OSV word order is a flat structure (with or without a VP constituent), following the exocentric rule in (4.48). Hypothetical flat structures without VP constituents for strict VSO or OSV word orders could look as follows, with partial annotation:

(4.57) a. Flat, exocentric VSO order:



b. Flat, exocentric OSV order:



These hypothetical flat structures do not follow any of Bresnan’s principles. The flat structures also go against the principle stated in (4.45).

Even though the hypothetical structures in (4.56) and (4.57) with flat ordering of argument functions (and no VP) do not capture strict word order in the way specified by Bresnan’s principles shown in (4.46), they are technically possible for strict VSO and OSV orders (and in fact also for the other strict orders). Remember that the structures presented in this section are hypothetical: actual word order patterns in individual languages will provide the correct structure for these languages. As an example of a (partially flat) structure for a strict word order, recall Kaplan & Zaenen’s (2003) analysis of Dutch cross-serial dependencies discussed in Section 3.2.5. For these cross-serial dependencies they assume a partially flat structure for arguments which actually have set positions in a sentence.³¹ Their analysis relies on strict ordering and a hierarchical structure of verbs, which is used to constrain the order of their arguments via the use of f-precedence. I assume in principle that distributional facts about individual languages can overrule the principle in (4.45), but as I am not concerned with individual languages in this section, I use the principle in (4.45) as a starting point for my more general approach.

Type 1: Constraints on annotations on c-structure nodes

After having shown how different strict word orders can in principle be rendered using Bresnan’s principles (and also without), it is time to abstract away from this, and focus on what all these abstract structures for strict word order languages, and their annotations, have in common. The key is obligatory annotation on c-structure nodes. It is not the exact

³¹Importantly, their approach focuses on embedded clauses, which show different word order than matrix clauses. Different analyses for matrix and embedded clauses may thus be necessary in such a case.

c-structural representation, but the obligatory annotations on the c-structure that ensure that argument functions appear in set positions. For example, going back to the rules for SVO languages in (4.50), here one would have obligatory annotation of specific argument functions. In this case, for example, we could say that the specifier of IP is always annotated with SUBJ and that the complement of V (if present) is always annotated with OBJ (this also works for an SOV word order language). Both of these annotations are instantiations of the partial structures proposed by Bresnan (2001) shown in (4.46) and (4.47) above; (4.47b) shows how subjects appear in specifiers of functional projections (FP) and (4.47d) shows how non-subject argument functions appear as complements of lexical categories. This does not make it immediately clear that the NP should be marked as an object, however, but this fact can be derived independently, e.g. by case-marking or by the subcategorisation frame of the specific verb (or both). We have seen in the previous subsection that the other five strict word orders can also be represented while adhering to Bresnan’s principles.

In terms of annotations for argument functions in a Type 1 language, I assume that at least one AF is annotated obligatorily on a specific node in the tree.³² Under this assumption, the annotation principles for a Type 1 language are more specific than the constraints proposed by Bresnan (2001) shown in (4.46). Bresnan’s principle in (4.46b), stating that specifiers of functional categories host UDF or SUBJ, is not specific about which functional category can host which of the two (UDF or SUBJ) in its specifier. Also, her principle in (4.46d), stating that complements of lexical categories are argument functions, is not specific about either the specific lexical category or the specific argument function. I claim that in a Type 1 language, in addition to a constraint on annotating AFs, there is no node marked with a specific information structure role. To capture these ideas, we can summarise the types of annotations for a Type 1 language as shown in Table 4.2.

³²In principle this would make it possible for a specific constituent to appear in two potential positions, with the strict word order always maintained. For example, the subject could appear either in the specifier of CP or of IP. This adds a level of uncertainty of annotation, but I assume that this would in principle be possible in a Type 1 language.

Table 4.2: Constraints on annotation for a Type 1 language

Argument Functions	Information Structure Roles
Specific (for at least one AF) e.g. (\uparrow SUBJ) = \downarrow	Non-specific (for all ISRs): $\downarrow_{\sigma_i} \in (\uparrow_{\sigma_i}$ ISR)

Table 4.2 signifies that a Type 1 language is defined in terms of a constraint on the annotations of argument functions. I assume that there is at least one obligatory annotation for a specific argument function, tied to a specific node in the structure. For IS roles annotations, there is uncertainty with no node annotation for a specific information structure role.

It appears that English fits into the category of Type 1 languages, as it does not have any c-structure nodes with an obligatory annotation for a *specific* IS role. It does have c-structure nodes with possible annotations for IS roles, but they are not specific. This becomes clear from the English fronting rule shown in (3.22), repeated here:

(4.58) English fronting rule:

$$\begin{array}{l}
 \text{ISR} \equiv \{ \text{TOPIC} \mid \text{FOCUS} \} \\
 \text{IP} \rightarrow \quad \text{UDFP} \quad \text{IP} \\
 \quad \quad (\uparrow \text{UDF}) = \downarrow \quad \uparrow = \downarrow \\
 \quad \quad \downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} \text{ISR}) \\
 (\uparrow \text{UDF}) = (\uparrow \text{UDFPath})
 \end{array}$$

This rule shows that English has a fronted position in which certain types of IS roles may occur, but the annotation for the IS roles is not specific: it ranges over topic and focus. The same is true for *wh*-fronting, despite specifically being a focus element. *Wh*-constituents appear in the specifier of CP, but this is the same position that hosts relative pronouns in relative clauses, which are topic constituents. Following the classification of Type 1 languages in Table 4.2, English thus falls into the Type 1 category, rather than the Type 3 category, which has specific annotations for both AFs and IS roles. This will be discussed in more detail in Section 4.5.2.

4.4.2 Type 2: Discourse configurational languages

Languages of Type 2 are broadly what have been referred to as discourse configurational languages, in which there are specific c-structural positions for specific information structure roles, or more descriptively, in which information structure determines word order. Importantly, in Type 2 languages argument functions do not have specific c-structural correlates.

Characterising Type 2 languages: an example structure

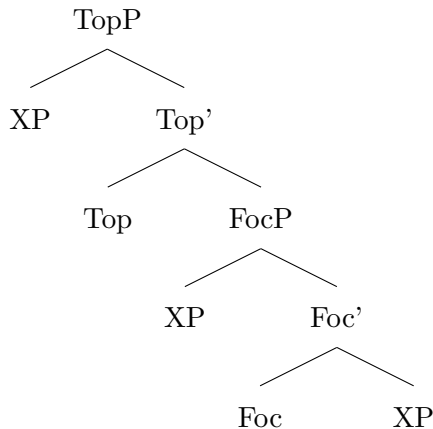
In characterising Type 2 languages, as for Type 1 languages, c-structure rules and annotations are key, specifically how constrained the annotations are. Before going into this in more detail, I will to present a possible, example structure for a language of Type 2. In Section 3.2.3 I made certain assumptions about information structure: I incorporate i-structure into my approach, and assume that unbounded dependencies, often connected to (a) specific information structure role(s), are represented in the f-structure as UDFs. I assume that the IS roles TOPIC and FOCUS often appear as specifiers of XP.³³ Other IS roles do not generally seem to be tied to specific c-structural positions (an exception is discussed by Butt & King (1996, 2000) who propose set structural positions for both COMPLETIVE INFORMATION and BACKGROUND INFORMATION in Hindi/Urdu). For this reason, a large part of the discussion will be centered on topic and focus and their respective structural correlates, as the aim is to see how IS roles play a role in c-structure.

As for Type 1 languages, for Type 2 the aim is to see how set positions are reflected in the structure of a language. As background to this issue, in transformational theories (e.g. Minimalism), topic and focus appear in the SPEC position of TopP and FocP projections respectively (which are different from the constituent structure metacategory abbreviation TopicP as used by Dalrymple (2001)). This is originally known as the cartographic approach,

³³According to Bresnan's principles shown in (4.46) and (4.47), TOPIC and FOCUS appear in specifier position of functional categories, but recall that FOCUS has also been argued to appear in SPEC of VP in some languages, such as Hungarian (Laczkó, 2014a) and Urdu and Turkish as described above (Butt & King, 1996, 2000). In the analysis of Butt & King (1996, 2000), focus appears in specifier position of VP and any postverbal material is BACKGROUND INFORMATION. Also note that in English, we have seen that TOPIC and FOCUS do not appear in a specifier position, but rather are adjoined to IP.

as introduced by Rizzi (1997) and Cinque (1999) within the Principles and Parameters framework. The usual order is topic > focus, yielding a structural analysis of the following kind:

(4.59) Minimalist tree with discourse projections, along the lines of Rizzi (1997):



In this tree structure, the topic and focus constituents appear in the specifiers of TopP and FocP respectively. In a transformational theory, grammatical functions are assigned to these topic and focus constituents by positing movement from a base-generated position in which grammatical functions are assigned. In LFG, this is not necessary because of the local annotations to the f-structure and because the theory eschews movement. Also, in LFG TopP and FocP do not exist as syntactic categories of their own; if they were this would also imply that Top and Foc are functional or lexical categories, which is not the case in LFG. Constituents with a topic or focus role can be of different types of lexical categories (such as NP, VP, AdvP, depending on the particular language). As LFG does not posit TopP and FocP positions but works with annotations instead, we could in fact posit a completely flat structure and still obtain the right f-structure and i-structure. However, I will follow the principle stated in (4.45) and capture any distributional properties in c-structure.

I follow the common assumption in LFG that topic and focus appear in the specifier of XP (or adjoined to XP as is the case in English). This yields a set of rules which build a hierarchical structure. As an illustration of what a Type 2 language might look like, consider the set of hypothetical rules for a Type 2 language in (4.60), with topic preceding focus as is

common cross-linguistically.^{34,35}

$$\begin{array}{l}
 \text{IP} \rightarrow \quad \text{UDFP} \quad \text{I}' \\
 \downarrow \in (\uparrow \text{UDF}) \quad \uparrow = \downarrow \\
 \downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} \text{ TOPIC}) \\
 (\uparrow \text{UDF}) = (\uparrow \text{UDFPath}) \\
 \\
 \text{I}' \rightarrow \quad \text{I} \quad \text{S} \\
 \uparrow = \downarrow \quad \uparrow = \downarrow \\
 \\
 \text{S} \rightarrow \quad \text{NP}^* \quad \text{VP} \quad \text{NP}^* \\
 (\uparrow \text{GF}) = \downarrow \quad \uparrow = \downarrow \quad (\uparrow \text{GF}) = \downarrow \\
 \\
 \text{VP} \rightarrow \quad \text{UDFP} \quad \text{V}' \\
 \downarrow \in (\uparrow \text{UDF}) \quad \uparrow = \downarrow \\
 \downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} \text{ FOCUS}) \\
 (\uparrow \text{UDF}) = (\uparrow \text{UDFPath}) \\
 \\
 \text{V}' \rightarrow \quad \text{V} \\
 \uparrow = \downarrow
 \end{array}$$

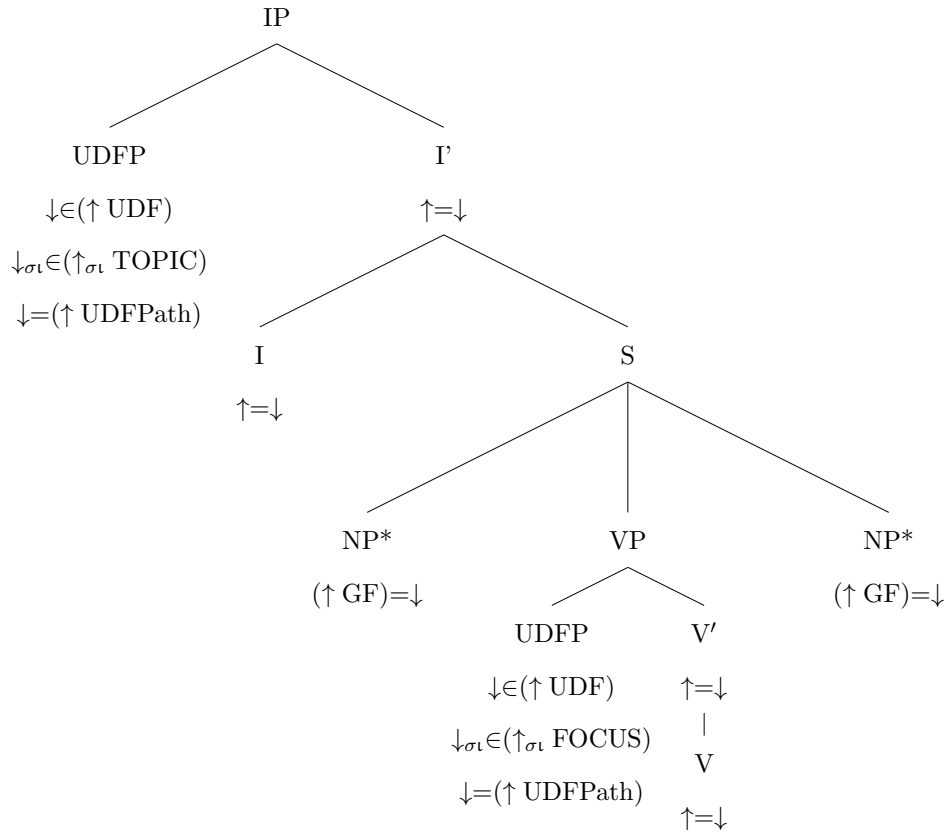
In this hypothetical set of rules, TOPIC appears in specifier of IP (as it commonly does cross-linguistically) and FOCUS appears in the specifier of VP, and both are represented in f-structure by a UDF. Note that this is not exactly in line with Bresnan's endocentric principles: principle (3.31b) states that specifiers of functional categories host the discourse functions UDF or SUBJ; VP is a lexical category, not a functional category. As mentioned, the specifier of VP has been given as the position of focus constituents in some languages; I follow this literature for this illustration of a hypothetical structure. One important reason to do so is that topics commonly appear in the specifier of IP, and I want to show the common topic > focus order. With regards to the S rule, the flat structure consisting of a VP and zero or more NPs on either side (NP* with Kleene star notation) illustrates several

³⁴This is the structure of a simple sentence and does not contain constituents like AdjP, AdvP or CP in the S rule. I have arbitrarily chosen VP under S, rather than V. The set notation for TOPIC and FOCUS allows multiple topics and foci: ones that are not bound to a structural position could be marked by intonation.

³⁵Technically one might not need a UDF in f-structure accompanying the IS role specifications; the motivation behind UDFs in discourse configurational languages is discussed in Section 4.6.

things. Firstly, NPs can appear freely in any order, although TOPIC and FOCUS have a set position. Grammatical functions are freely assigned to the NPs, which becomes clear from the annotation $(\uparrow \text{GF}) = \downarrow$. The reason for positing a VP (with the V' not dominating any argument functions) in this example Type 2 language, is because I follow the assumption that TOPIC and FOCUS appear in the specifier of XP position (which is a looser definition than Bresnan's assumption that they appear in the specifier of FP position). A VP node is thus required in order to have a specifier position to host the immediately preverbal focus, following general X-bar theory. In this I follow approaches such as Butt & King (1996, 2000), who posit a VP node for Hindi/Urdu for this reason, with V' not dominating any argument functions. The justification for VP here is thus different than for the possible example structures for Type 1 languages, where the VP dominates the object function specifically. The set notation for UDF entails that there can be more than one UDF, e.g. one with a topic function and one with focus function. I assume that the rest of the constituents can be marked for an information structure role as well; BACKGROUND INFORMATION and COMPLETIVE INFORMATION are also marked by annotation if they are present in the sentence. Tying these two IS roles to specific nodes is more difficult (Butt & King, 1996, 2000). The rules in (4.60) yield a structure with specific positions for topic and focus, if all nodes are used:

(4.61)



Here the IS roles TOPIC and FOCUS are tied to specific positions via specific annotations, but in the syntax they appear as UDF. For reasons explained, I leave aside the issue of how the constituents under S are connected to IS roles.³⁶ The constituents under S are also annotated for their grammatical function (but without a UDF).

The set of rules in (4.60) provides an example illustration of what a language of Type 2 can look like, and as one can imagine, much more variation is possible. For example, for Warlpiri, Simpson (2007) proposes that TOPIC appears in the specifier of CP, and FOCUS in the specifier of IP. Moreover, some languages which have been discussed as discourse configurational languages have set positions for particular constituents, words or particles. Latin has certain second position clitics, and the Warlpiri auxiliary has a particular position in the left periphery as well; Simpson (2007) assumes this to be in I position. These types of positions will need to be incorporated into the phrase structure of particular languages in some way,

³⁶One approach to this problem would be an OT-LFG one, in which constituents under S are ordered based on OT constraints, e.g. ‘newsworthiness’. I leave this as an option for now.

in accordance with the principle in (4.45). However, the c-structure rules in (4.60) serve well as an example for a purely discourse configurational language, in which only IS roles have set positions in the c-structure.

Type 2: Constraints on annotations on c-structure nodes

Now abstracting away from the example structure in (4.61), let us look at the constraints on annotations. Topic and focus are clear-cut cases, as they are often found in particular structural positions in discourse configurational languages. The annotation for the other two information structure roles is more difficult; as this appears to be a language-specific issue, I will leave aside the specific details of this and concentrate on topic and focus. For argument functions, there is no specific obligatory annotation at all; assignment of AFs is in principle free. We thus have a characterisation of constraints on annotations of the kind shown in Table 4.3.

Table 4.3: Constraints on annotation for a Type 2 language

Argument Functions	Information Structure Roles
Non-specific (for all AFs): (\uparrow AF) = \downarrow	Specific (for at least one ISR) e.g. $\downarrow_{\sigma_i} \in (\uparrow_i$ TOPIC)

In Type 2 languages, there is an annotation for at least one specific information structure role on a specific node. There are no constraints on annotation of argument functions, which is crucial. The constraints on annotations in Table 4.3 are assumed to hold for all Type 2 languages, and the structure in (4.61) is only an example structure that fits these constraints. Actual c-structure constituency in a specific language will have to be determined by constituency tests.

4.4.3 Type 3: Mixed configurational languages

The third type of language to explore is one in which both argument functions and IS roles have specific annotations in c-structure rules. This third type provides a vast array of possibilities, because it combines the possibilities of (obligatory) annotation to both f-structure

(of argument functions) and i-structure. In order to characterise this type of language, I will start by investigating what the boundaries would be for this type.

On the one end of the spectrum of possibilities for Type 3 languages, we can imagine a language of which the word order is mainly determined by argument functions, but with a minor influence of discourse functions on the c-structure. As an example, we might imagine a language which is like English, except that it has specific annotations for specific IS roles, e.g. a designated position for topic. On this ‘grammatically configurational’ end of the spectrum of Type 3 languages we can thus have languages with c-structure rules that are quite heavily constrained in terms of AF annotation (as for example the rules in (4.50) for an exemplar Type 1 language), with the addition of special rules for specific phenomena such as topicalisation (where topicalisation is fronting of a topic constituent specifically).

On the other end of the spectrum we can imagine a language which has fairly set positions for information structure roles, but with some allowance for argument functions to determine word order. One way that this is possible is for the information structure roles to be set in the left periphery, and the order within the S constituent in the right part of the sentence to be determined by argument functions. Only a minor influence of argument functions would be seen if only one position within the S constituent would be set to a particular argument function. We could imagine that, for example, the subject always appears third in the sentence, after topic and focus. This is an example, however, and we need a more concrete way of describing a language of Type 3.

We can definitely establish that a language of Type 3 needs two kinds of rules, namely at least one c-structure rule in which a specific information structure role (whether with UDF or not) has a set position in the sentence, and at least one c-structure rule in which a specific argument function has a set position in the sentence. We can generalise across annotation possibilities for Type 3, which is shown in Table 4.4.

Table 4.4: Constraints on annotations for a Type 3 language

Argument Functions	Information Structure Roles
Specific (for at least one AF) e.g. (\uparrow SUBJ) = \downarrow	Specific (for at least one ISR) e.g. $\downarrow_{\sigma_i} \in (\uparrow_{\sigma_i}$ TOPIC)

In the tables of constraints on annotations for the Type 1 and Type 2 language, we saw that the constraints on annotations for the two groups (argument functions and information structure roles) were different from each other: for one group there is free assignment, and for the other group at least one specific annotation is required. In a Type 3 language, we can say that for each of the two groups, AFs and IS roles, we need at least one specific rule. There is no non-specific annotation for either of the groups, and we can therefore refer to this group as mixed configurational. The set of constraints in Table 4.4 is fairly restricted, but that does mean that the Type 3 group encompasses a wide range of possible variation in terms of obligatory annotations on c-structure rules.

4.4.4 Type 4: Maximally flat structure languages

The final type of language left to discuss is one in which neither argument functions nor information structure roles are tied to specific structural positions. There are no specific syntactic constraints on word order at all. However, there could be other ways of signaling grammatical functions, such as by morphological means, or information structure roles, such as by prosody and intonation. Also, information structure can technically play a role in word ordering in a language of Type 4, although it does not lead to specific annotations/positions. This means that scrambling could be present.³⁷ Without any set positions for specific constituents, positing a flat structure seems plausible: Type 4 languages are maximally flat structure languages.³⁸ I employ the term ‘maximally flat structure languages’ instead of simply ‘flat structure language’, because we could imagine that there is a specific left peripheral

³⁷Technically, argument functions could play a role in a Type 4 languages if they do not lead to specific annotations. An example of this would be if a c-structural node is annotated for being either object or second object. This is not a specific annotation.

³⁸Note that verbs may in fact have set positions, also in Type 4 languages. This specific verb placement (and potentially of other constituents such as the AUX in Warlpiri) seems to often be defined with respect to particular argument function/IS role placement, as described in Section 4.3.2. However, as mentioned, I do not take verb placement into account in this space of possibilities.

position with a non-specific annotation for a range of IS roles or AFs. This would therefore not be a completely flat structure. The c-structure rule for simple sentences only containing verbs and NPs for an example Type 4 language with a completely flat structure could be imagined as follows:

$$\begin{aligned}
 (4.62) \quad S &\rightarrow \{ \quad V \quad | \quad \quad \quad NP \quad \quad \quad \}^* \\
 &\quad \quad \quad \uparrow=\downarrow \quad \quad \quad (\uparrow \text{ GF}) =\downarrow \\
 &\quad \quad \quad \quad \quad \quad \downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} \text{ ISR})
 \end{aligned}$$

There are no constraints on the c-structure whatsoever, and the c-structure in this example set of rules is flat. NPs must bear some grammatical function, and thereby satisfy f-structural constraints, but the annotations themselves are unconstrained. Annotation for IS roles is unconstrained as well. This flat structure resembles structures that have been proposed for Warlpiri (e.g. Simpson (1991)), before proposals taking information structure into account, e.g. Simpson (2007) for Warlpiri. As there are no (specific) constraints on the c-structure for a Type 4 language, we can summarise the constraints as shown in Table 4.5.

Table 4.5: Constraints on annotations for a Type 4 language

Argument Functions	Information Structure Roles
Non-specific (for all AFs): (\uparrow AF) = \downarrow	Non-specific (for all ISRs): $\downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} \text{ ISR})$

Here we say that there is uncertainty for both AF and IS role annotations, as both are non-specific.

4.4.5 Summary and concluding remarks

In the previous sections, I have discussed the four different types of languages that are in principle possible in LFG. An overview of the constraints on annotations in each type of language is presented in Table 4.6.

Table 4.6: Constraints on annotations for the different Types

	Definition	Argument Functions	Information Structure Roles
Type 1	Only AFs	Specific (for at least one AF) e.g. $(\uparrow \text{SUBJ}) = \downarrow$	Non-specific (for all ISRs) $\downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} \text{ISR})$
Type 2	Only ISRs	Non-specific (for all AFs) $(\uparrow \text{AF}) = \downarrow$	Specific (for at least one ISR) e.g. $\downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} \text{TOPIC})$
Type 3	Both AFs and ISRs	Specific (for at least one AF) e.g. $(\uparrow \text{SUBJ}) = \downarrow$	Specific (for at least one ISR) e.g. $\downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} \text{TOPIC})$
Type 4	Neither AFs nor ISRs	Non-specific (for all AFs) $(\uparrow \text{AF}) = \downarrow$	Non-specific (for all ISRs) $\downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} \text{ISR})$

The four different types display a mix of specificity and uncertainty in their annotations. This set of constraints does not capture some subtleties in annotation, however. For example, one could imagine a case in which there is an uncertainty in AF annotation between two different AFs. For example, as mentioned in footnote 37, one particular structural position could be annotated with either OBJ or OBJ_θ (as an example). This is not a specific annotation (as there is a level of uncertainty), but the uncertainty is more constrained than with the annotation $(\uparrow \text{AF}) = \downarrow$.³⁹ These are all subtle details which will need to be worked out for individual languages.

This four-way classification provides a basis for the main goal of this thesis, namely to assess how languages can be classified based on their configurationality. With obligatory annotations for specific positions for specific constituents (assuming the principle in (4.45) stating that set positions should be reflected in c-structure annotations), we can say that there are four different types of languages on the configurationality spectrum, under the assumption that configurationality is dependent on c-structural configuration specifically. In this way I am adhering to the theoretical sense of configurationality. I still assume that there is a full on spectrum of configurationality, as a range of variation is possible within the four subtypes. For example, one language of Type 1 might have more obligatory AF annotations than another language of Type 1. Moreover, one might be able to define subtypes of the four types based on factors other than c-structure, e.g. by means of the existence and extent of scrambling, a

³⁹Likewise, as briefly addressed before, we could have a case where a specific AF can appear in two different structural positions, but not anywhere else. This is also a level of uncertainty, though constrained.

phenomenon which I assume to be separate from configurationality. To give a clearer idea of how the languages discussed in this thesis fall into the different categories just identified, I discuss several of these languages and their status in the configurationality classification in the next section. I believe that this will make the classification somewhat easier to understand.

4.5 Mapping languages onto the space of possibilities

To give an idea of how languages map onto the classification of constraints in Table 4.6, I will briefly assess how the languages discussed in this thesis fit into the four different types. It would be tempting to draw conclusions from this about which of the four types do or do not exist, but one has to be careful with this. I want to avoid the *Substance Seduction*, as described by Kaplan (1987): the tendency of linguists to focus on characterising all and only the possible human languages, and therefore the need to posit substantive constraints and generalisations which are not necessarily true and correct based on the limited data (which might be accidental) at hand. Rather, it is crucial to let the theory make strong predictions about what is possible and what is not. In the configurationality case, the theory predicts that all four types are possible. Ultimately, I want to make a substantive linguistic claim that carves out the space of possible human languages (at least based on the two main factors influencing word order).

With this in mind, I will nonetheless tentatively test two possible generalisations about word order:

1. Every language has at least one rule annotated with a specific argument function.
2. Every language has at least one rule annotated with a specific information structure role.

Testing these two generalisations will aid the process of establishing into what category the languages discussed in this thesis fit. If both generalisations appear to be true, we would expect all languages to be of Type 3, and that both information structure and argument

functions play a role in c-structure configuration. If only generalisation 1 appears to be true, it would appear that there is no such thing as ‘free word order’ in the traditional sense, and that all languages are grammatically configurational to some extent. If only generalisation 2 seems to be true, we might assume that all languages are discourse configurational to some extent, and lacking a specific position for argument functions. The different potential combinations of generalisations thus lead to different predictions about what types of languages are actually attested. Testing these two generalisations will therefore give a better insight into some universal aspects of language, and thereby potentially into the human cognitive language system. The next few sections focus on this.

4.5.1 Generalisation 1: Every language has at least one specific AF rule

In order to see if this potential generalisation is true, essentially we need to see if languages of Type 2 exist. If they do, we can say that this generalisation is false. Type 2 languages have c-structure rules which make specific reference to particular IS roles, but none that make reference to particular AFs. Languages which are possible candidates for this are Hungarian, Warlpiri, and Latin. As far as I am aware, these languages do not have any set positions for argument functions. Let us start with Hungarian, often discussed as a typical discourse configurational language. Kiss (2002) states that in Hungarian, constituents which appear before the verb have a special function such as interrogative phrases or distributive quantifiers. She also explicitly states that “postverbal argument order is not determined by the grammatical functions of arguments” (Kiss, 2002, p. 28). Additionally, she claims that bare nominals must appear preverbally (outside the VP, which is V-initial, in her analysis). None of these observations imply that argument functions play a role in word order. Also from work on Hungarian in LFG, the same observation seems true. Mycock (2006, 2007a,b) and Laczkó (2014a) show that Hungarian word order is topic > focus > verb > other; a similar observation is made by Kiss (2002). The verb may also appear sentence-initially, if it has a focus function itself, and is marked by stress (Puskás, 2000).⁴⁰ Some of this variation is

⁴⁰Methods to establish the discourse function of a verb are discussed by King (1997) and Dalrymple & Nikolaeva (2011).

illustrated here, similar to the Hungarian data presented earlier:

- (4.63) a. [*János*]_{TOPIC} [*be-mutat-t-a* *Mari-t* *Anná-nak*]_{PRED}
 John.NOM VM-introduce-PAST-DEF.3SG Mary-ACC Anna-DAT
 ‘John introduced Mary to Anna.’
- b. [*János*]_{TOPIC} [[*MARI-T*]_{FOCUS} *mutat-t-a* *be*
 John.NOM Mary-ACC introduce-PAST-DEF.3SG VM
Anná-nak]_{PRED}
 Anna-DAT
 ‘John introduced MARY to Anna.’

(Mycock, 2007b, p. 10)

In this example, I have chosen to adopt Mycock’s notation, marking a topic field, followed by a predicate field (containing the verb). Focus constituents appear inside the predicate field. The two sentences in (4.63) have the same truth-conditional meaning, but are different in terms of information structure. In the second example there is a focus constituent, which appears preverbally. Again we see that the verb acts as an anchor, around which constituents are ordered depending on their information structure (with topic > focus preverbally). The post-verbal ordering appears to be influenced by information structure as well, as implied by Mycock (2013). Crucially, ordering does not seem to depend on argument functions in any way. Even relative ordering between preverbal constituents (i.e. when there is more than one constituent preceding the verb) appears to be based on information structure, and not on argument functions. An example of this is a sentence with multiple *wh*-words:

- (4.64) *Ki* *ki-t* *ki-nek* *mutat-ott* *be?*
 who.NOM who-ACC who-DAT introduce-PAST.3SG VM
 ‘Who introduced who to who?’

(Mycock, 2007a, p. 224)

These *wh*-words are all focus constituents by nature, but importantly, there is more than one. According to Mycock (2007a, 2013), the immediately preverbal *wh*-word (*ki-nek*) is what is called the ‘sorting key’, based on work by Kuno (1982) and Kuno & Takami (1993). The sorting key is the *wh*-word that directly answers the main issue that the ‘asker’ wants

answered. It is therefore ‘more’ focused (in information structural terms) than any of the other focus words. Regarding the overall ordering of question words, Mycock (2013) states that their relative ordering is dependent on their individual information structural status, assuming that each of them has a slightly different discourse function. This strongly implies that argument functions do not play a role in relative ordering of question words. Based on this, and on other previous work on Hungarian, I assume that argument functions do not play any role in word order determination in Hungarian. Hungarian is thus a perfect example of a discourse configurational language. The position of topic and focus is preverbal, with the verb serving as an anchor (but as mentioned, the verb itself can also be in focus). It will be interesting to compare whether a similar ordering occurs in languages which are like Hungarian in terms of the way that word order is determined.

In Warlpiri, we see patterns similar to the ones in Hungarian. In Warlpiri, the AUX serves as an anchor, in many cases appearing in second position. However, Simpson (2007) shows that there are at least three constituents possible before the AUX:⁴¹

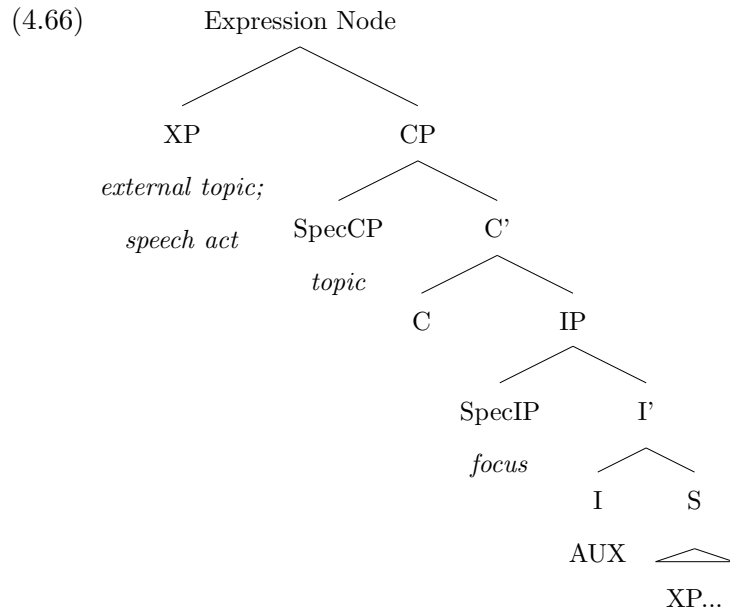
(4.65) Q. *Yuwa nyarrpa-ma-nu-ngku-lu yalumpu=ju?*
 hey what-cause-PAST-2SG.OBJ-3PL.SUBJ there-KN
Nyiyarlu-ngku nya-ngu?
 what-ERG-2SG.OBJ see-PAST
 ‘Oh, what did they do to you there? What happened to you?’

A. *Karinganta ngaju-ju YINYA-PATU-RLU-ju-lu*
 I.say 1SG.OBJ-KN those-mob-ERG-1SG.OBJ-3PL.SUBJ
 TOPIC FOCUS
 NGARRKA-PATU-RLU *jiily-ngarru-rnu mardukuja-ngurlu-kula* -
 man-mob-ERG point-tell-PAST woman-from-it.was
 FOCUS
ngarrka-patu-rlu.
 man-mob-ERG
 ?FOCUS
 ‘I’m telling you that I was fingered by those men there over the woman, by the men.’

(Simpson, 2007, p. 410–411)

⁴¹I have changed the clitic notation from the example given by Simpson (2007), in order to remain consistent in my notation throughout this thesis in not denoting pronominal markers or the AUX as clitics.

In (A), the first constituent is an evidential particle, appearing adjoined to the CP structure. There are two words which both contribute to the FOCUS IS role, and potentially the last word of the sentence (as a repetition of the second FOCUS word) as well. Simpson (2007) proposes the following structure for Warlpiri sentences:



(Simpson, 2007, p. 412)

The root node of this structure is the exocentric ‘Expression Node’ (following King’s (1995), who herself follows Aissen (1992)), which makes it possible to have a “speech act marker” or an external (hanging) topic appear before the CP.⁴² The term ‘external topic’ is from Aissen (1992), who distinguishes between internal and external topics in Mayan. According to Aissen, an external topic is a type of topic that may be coreferent with an argument of the predicate, but is not itself an argument of the predicate. Semantically an external topic identifies a referent in the discourse about which the speaker is going to make an assertion; external topics are necessarily switch (new) topics, not continuing ones. Internal topics according to Aissen (1992) are arguments of the predicate, and they are allowed to be either switch or continuing topics. In my classification I leave out external (hanging) topics, as they are not

⁴²Simpson (2007) states that the following are speech act markers in her definition: the evidential particle *karinganta* (‘I say’) as is present in the answer of example (4.65), *kulanganta* (‘I thought counterfactually’) and *kala* (‘but’).

themselves arguments of the predicate of the sentence that they are part of, and they often appear in a position adjoined to the more central syntactic structure of a sentence.^{43,44}

It is clear that the position of these constituents is triggered by the discourse; grammatical functions do not play a role. As far as I am aware, the ordering after the AUX is also not in any way determined by argument functions. In the structure in (4.66), everything following the AUX is dominated by an S node, which has a flat structure. As there is no indication of the post-AUX order of constituents being determined by argument functions, we can provisionally assume that information structure also plays a role in ordering here (and argument functions not at all). It seems likely that post-AUX constituents form background information. We see a clear parallel between Hungarian and Warlpiri: there is an anchor (the verb in Hungarian, the auxiliary in Warlpiri), with set positions for information structure roles pre-anchor, and presumably some kind of influence of information structure post-anchor (without any set structural positions). These two languages are thus surprisingly similar, even though they have been described in somewhat different terms (i.e. Hungarian as discourse configurational and Warlpiri as non-configurational).

Finally let us look at Latin. There are traditionally two approaches to the analysis of Latin word order: one claiming that Latin has a specific underlying word order, with variation allowed with the use of transformations (in transformational frameworks), and one claiming that Latin has no underlying word order. I will assume the latter, as it best fits the assumptions of LFG. As has been shown before, Latin is a traditional ‘free word order’ language and in terms of grammatical functions, it is not possible to devise an underlying order in terms of S, O and V. Its order is said to be dependent on the discourse, as described by Panhuis (1982), Pinkster (1990), Devine & Stephens (2006) and Ledgeway (2012) among others. As in Hungarian and Warlpiri, topic and focus constituents appear in the left periphery. Examples

⁴³Also, in Warlpiri sentences with external topics, there must be a ‘resumptive’ type of constituent, usually *ngula* (‘that’) in place inside the sentence. This is not the case for internal topics (Legate, 2002).

⁴⁴Note that English fronted topics/foci appears adjoined to IP in their own IP projection. Crucially, however, the topic/focus constituent is an argument or adjunct of the main predicate. Recall example (4.3): *The first part of the movie* *he missed out on*. Without the topic, the sentence *he missed out on* is incomplete.

of topics are given in the following:

(4.67) (Under these beams, between the conduits and the end walls, in the position of the mills, run a beam 1.5 feet square and 23.5 feet long, or two pieces.)

In iis trabeculis trabes, quae insuper
on DEM.ABL [little beams].ABL beams.ACC which.ABL.F.PL above
arbores stipites stant, conlocato...
posts.ACC posts.ACC stand.3PL position.IMP.SG
'On these little beams, put in position the beams which stand above the main posts...'

(Cato, *De Agri Cultura*, 18.6, cf. Devine & Stephens (2006, p. 114), partly transl. by Hooper & Ash (1935))

(4.68) (Make the disk 4 feet in diameter, 6 fingers thick, constructed in sections in the Punic style with dovetailed oak. When you have fitted them together, fasten with pins of dogwood.)

In eum orbem tris catenas indito...
to.ACC DEM.ACC disk.ACC three.ACC crossbars.ACC fit.IMP.SG
'to the disk, fit three crossbars...'

(Cato, *De Agri Cultura*, 18.9, cf. Devine & Stephens (2006, p. 114), partly transl. by Hooper & Ash (1935))

These are examples of topics that link with the previous discourse, and they occur very frequently in Latin. In (4.67), the *trabeculis* ('little beams') have been mentioned in the previous part of the text, and in (4.68) the *orbem* ('disk') has been mentioned in the previous sentence. There are also clear examples of focus in the left periphery:

(4.69) (Recipe for *globi*: Mix the cheese and spelt in the same way, sufficient to make the number desired.)

IN AHENUM CALDUM *unguen indito*.
in [copper vessel].ACC hot.ACC grease drain.2SG.IMP.FUT
'Pour lard into a hot copper vessel.

(Cato, *De Agri Cultura*, 79, cf. Devine & Stephens (2006, p. 114), transl. by Hooper & Ash (1935))

(4.70) NON VITAM LIBERUM SED MORTIS CELERITATEM *pretio*
not life.ACC children.GEN but death.GEN swiftness.ACC price.ABL
redimere cogebantur parentes.
purchase.INF compell.3PL.IMP.F.PASS parents.NOM
'Parents were compelled to purchase for their children by bribery not life, but a speedy death.'

(Cicero, *In Verrem*, 2.5.119, cf. Devine & Stephens (2006, p. 229), transl. by Greenwood (1935))

In example (4.69), the initial constituent is in focus, and in (4.70) there is a clear example of contrastive focus, also appearing clause-initially. There is no clear indication in Latin that argument functions play a role in Latin word order, other than the natural link between topic and subject constituents. This puts Latin in the same category as Warlpiri and Hungarian.

In conclusion, it appears that there are in fact languages in which argument functions play no role whatsoever in word ordering, and word order is solely determined by information structure roles. In these languages there are therefore no obligatory annotations for specific AFs: this shows that Type 2 languages occur. Therefore, the potential generalisation that every language has at least one c-structure rule which is annotated with a specific argument function (AF) is not true. Moreover, the overview of languages in this section reinforces my claim that traditionally classified non-configurational languages and traditionally classified discourse configurational languages belong to the same class of languages (in terms of their configurationality).

4.5.2 Generalisation 2: Every language has at least one specific IS role annotated rule

In order to test the potential generalisation that every language has a c-structure rule with a node obligatorily annotated with a specific IS role, we must determine whether a language of Type 1, in which only argument functions play a role, exists. As stated in the section on Type 1 languages above, English appears to fall in the Type 1 category. The same thing could potentially be said about other languages with strict word order in argument functions, e.g. other Germanic languages such as Dutch and Swedish, and also possibly Mandarin Chinese, which will be evaluated in this section. The English fronting c-structure rule from (3.22) is repeated here:

(4.71) English fronting rule:

$$\begin{array}{l}
 \text{ISR} \equiv \{ \text{TOPIC} \mid \text{FOCUS} \} \\
 \text{IP} \rightarrow \quad \quad \quad \text{UDFP} \quad \quad \quad \text{IP} \\
 \quad \quad \quad \quad \quad \quad (\uparrow \text{UDF}) = \downarrow \quad \quad \quad \uparrow = \downarrow \\
 \quad \quad \quad \quad \quad \quad \downarrow_{\sigma_1} \in (\uparrow_{\sigma_1} \text{ISR}) \\
 \quad \quad \quad \quad \quad \quad (\uparrow \text{UDF}) = (\uparrow \text{UDFPath})
 \end{array}$$

As argued above, the annotation for the position adjoined to IP is not unique to one specific IS role: it ranges over topic and focus. A similar point can be made about the position that *wh*-constituents and relative pronouns appear in. Consider the following examples:

(4.72) English constituent question formation:

WHO did John see?

(4.73) English relative clause formation:

The man, who John saw, was very tall.

The *wh*-word (*who*) in (4.72) has a focus function and the relative pronoun (*who*) in (4.73) has a topic function. Both *wh*-word and relative pronoun are assumed to appear in the specifier of CP position. One can posit one rule for CP in English, which is as follows:⁴⁵

⁴⁵In constituent question formation, the CP represents the sentence as a whole, e.g. the whole sentence in

$$\begin{array}{l}
(4.74) \text{ ISR} \equiv \{\text{TOPIC} \mid \text{FOCUS}\} \\
\text{CP} \rightarrow \quad \text{UDFP} \quad \text{C}' \\
\quad \quad \quad (\uparrow \text{UDF}) = \downarrow \quad \uparrow = \downarrow \\
\quad \quad \quad \downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} \text{ISR}) \\
\quad \quad \quad (\uparrow \text{UDF}) = (\uparrow \text{UDFPath})
\end{array}$$

In the case of *wh*-fronting to SPEC of CP, the constituent bears a focus role, and in the case of relative pronouns (and potentially accompanying constituents, in for example the sentence *the man whose book I read*), the constituent will bear a topic role. This shows that English, although it does have some fronted positions for certain elements bearing some kind of information structure role, does not have any obligatory annotations for specific IS roles, and it thus falls into the Type 1 category.

Similar rules to English fronting exist in Dutch and Swedish, as illustrated by the following examples:

(4.75) a. Dutch topic fronting:

Q. *Heb jij Oorlog en Vrede gelezen?*
 have.2SG you War and Peace read.PTPC
 ‘Have you read War and Peace?’

A. *Nee, dat boek heb ik niet gelezen.*
 no that book have.1SG I not read.PTPC
 ‘No, that book I have not read.’

b. Less marked (acceptable in more contexts): *Ik heb dat boek niet gelezen.*

(4.76) a. Dutch focus fronting:

Q. *Welk boek heb jij gelezen?*
 which book have.2SG you read.PTPC
 ‘Which book did you read?’

A. *OORLOG EN VREDE heb ik gelezen.*
 War and Peace have.1SG I read.PTPC
 ‘War and Peace I read.’

example (4.72), and in relative clause formation, the CP represents the relative clause only, e.g. *who John saw* in example (4.73).

b. Less marked (acceptable in more contexts): *Ik heb Oorlog en Vrede gelezen.*

(4.77) a. Swedish fronting:

Några pengar gav Eva förmodligen inte Oscar.
any money give.PAST Eva presumably not Oscar
'Not any money Eva presumably gave Oscar.'

b. Less marked: *Eva gav förmodligen inte Oscar några pengar.*

(Börjars *et al.* , 2003, p. 44)

Dutch word order in matrix clauses is SVO, although Dutch is assumed to be an SOV language typologically, based on data from subordinate clauses, which will not be discussed here. In LFG this simply means that the matrix SVO and subordinate SOV have different structures, without being derived from each other. Swedish word order is assumed to be SVO, although a great deal of variation is allowed, as briefly illustrated in Chapter 2; also see Börjars *et al.* (2003). In the two Dutch examples, there is fronting of a topic or focus constituent (the object of the sentence) to the position immediately preceding the finite verb. Importantly, both topic and focus may appear in the same position. In the Swedish example the object of the verb is also fronted and appears in the position immediately preceding the finite verb. Börjars *et al.* (2003) claim that this position may host both topic and focus constituents (as well as the subject of the sentence), showing that also in Swedish, this position is not unique for a specific IS role. I thus assume similar rules for fronting in Dutch and Swedish as the one for English in (4.71).

Dutch and Swedish also have *wh*-fronting and relative clause formation. Consider the following examples from Dutch:

(4.78) Dutch *wh*-fronting:

WIE zag jij?
who saw.2SG you.SG.NOM
'Who do you see?'

(4.79) Dutch relative clause formation:

De man die ik gisteren zag.
the man who I yesterday saw.1SG
'The man who I saw yesterday.'

The fronted *wh*-element in (4.78) has a focus function and the relative pronoun in (4.79) has a topic function. Both are assumed to appear in the same position: specifier of CP (following Van der Beek (2003) who assumes that *die* ('who') in Dutch is a relative pronoun with topic function).⁴⁶ I thus assume that Dutch has a CP rule similar to English, and that there is no specific annotation on the specifier of CP. For Swedish the situation is different, because of the nature of relative clause formation. Consider the following examples:

(4.80) Swedish *wh*-fronting:

VEM kysste jag inte?
who kissed I not
'Who did I not kiss?'

(Sells, 2001, p. 3)

(4.81) Swedish relative clause formation:

Jag känner en man som säljer dem.
I know a man that sells them
'I know a man that sells them.'

(Engdahl, 1997)

The Swedish *wh*-sentence in (4.80) is similar to the Dutch one in (4.78), but the relative clause example in (4.81) is different, because *som* is a complementiser (like English *that*) and not a relative pronoun (Engdahl, 1997). It therefore appears in C position rather than in specifier

⁴⁶We can assume that *die* is a relative pronoun and not a complementiser (such as English *that* in relative clauses) because *die* inflects based on the gender of the noun that it relativises.

of CP position in Swedish. Unlike in English, in Swedish there is not the option of having both types of relative clause formation with either a relative pronoun or a complementiser. In Swedish, it thus appears that the SPEC of CP position has an obligatory annotation for a specific IS role, namely FOCUS (in *wh*-questions).

Now I briefly turn to an unrelated language, Mandarin Chinese, discussed in Section 4.2.1, which discussed strict word order languages. Mandarin Chinese has been labelled a topic prominent language (Li & Thompson, 1989). As shown in Section 4.2.1, Mandarin Chinese has SVO word order. Fronting is possible, with a specific topic function:

(4.82) a. *Shu John dou du le.*
 books John all read ASP
 ‘The books, John read (them all).’

b. *John shu dou du le.*
 John books all read ASP
 ‘John read all the books.’

(LaPolla, 1998, p. 2)

In (4.82a) there is fronting of the object to sentence-initial position, and in (4.82b) there is fronting to a position immediately following the subject. In both cases, the IS role is assumed to be topic (LaPolla, 1998).⁴⁷ This is reinforced by Badan & Del Gobbo (2011), who argue that initial position in Chinese is exclusively topic, unless focus morphology is used, i.e. *lian*-focus (*even*-focus):⁴⁸

(4.83) *Lian zhe ben shu Zhangsan dou/ye mai le.*
 even this.CL book Zhangsan all/also buy PERF
 ‘Even this book, Zhangsan also bought.’

(Badan & Del Gobbo, 2011, p.65)

⁴⁷Alison Biggs (p.c.) points out that the construction in (4.82b) is somewhat different from the one in (4.82a). The construction of type (4.82b) is discussed in Shyu (2014); most commonly the role of the fronted constituent *shu* (‘books’) has been described as topic, although sometimes also as contrastive or emphatic, in different terminological traditions.

⁴⁸Mandarin Chinese is a *wh*-in-situ languages and therefore constituent questions do not show fronting.

Badan & Del Gobbo (2011) claim that *lian* (literally meaning ‘including’) is optional in this focus construction. The presence of one of the two words *dou* or *ye* is obligatory in this construction (even if *lian* is absent); *dou* and *ye* are in complementary distribution. The question is whether in Mandarin Chinese there is a phrase structure rule that contains a node annotated for a specific IS role. Most work on Mandarin phrase structure has been done in frameworks other than LFG, often making use of the cartographic approach, e.g. Badan & Del Gobbo (2011) and Shyu (2014). Topics and foci are represented in TopP and FocP structures in these approaches; I do not make use of these projections. If we assume that the focus construction in (4.83) is lexically specified for having a FOCUS information structure role, then we might be able to say that in Mandarin Chinese, there is a c-structure rule with a specific TOPIC function, which can be overruled by FOCUS with the right lexical specification.

We can draw a few conclusions from the discussion in this section. First of all, there are languages which are said to have relatively strict ordering of argument functions that have c-structure rules with specific annotations for specific IS roles (e.g. potentially Swedish and Mandarin Chinese). Secondly, and crucial to the issue at hand, there do appear to be languages that do not have even one rule with specific annotations for specific IS roles, namely English and Dutch. This implies that languages of Type 1 exist, and therefore we can say that the generalisation that every language has at least one rule annotated for a specific information structure role is not true. Also, assuming that Swedish and Mandarin Chinese have c-structure rules with specific annotations for both specific AFs and IS roles, we can see that they are of the kind that fall into Type 3 of the classification of languages.

4.5.3 Generalisations and observations

Based on data discussed so far, it does not appear that either of the potential generalisations brought forward in the previous section is true: not every language has at least one rule annotated with a specific AF and not every language has at least one rule annotated with a specific IS role. However, the English and Dutch data show that all types of fronting in these

languages (whether of non-*wh*-constituents, *wh*-constituents or relative constituents) have one thing in common: they involve rules which are annotated with a +PROM information structure role. The subdivision of IS roles into binary values is discussed by Butt & King (1996) Choi (1999) and Mycock (2013) among others. It can be represented in the way shown in Table 4.7 (Butt & King, 1996).

Table 4.7: The division of IS roles into binary features

	[+PROM]	[-PROM]
[+NEW]	FOCUS	COMPLETIVE INFORMATION
[-NEW]	TOPIC	BACKGROUND INFORMATION

Table 4.7 shows that TOPIC and FOCUS appear to form a natural class, and even if certain rules do not make reference to one of them specifically, they make reference to the two as a group. This has no influence on the four-way classification of languages in the way that it is currently defined, but it is an interesting point in the current context. We can therefore posit the following tentative generalisation, based on the data seen so far:

(4.84) **The Prominence Generalisation:**

Every language has at least one rule annotated with an obligatory +PROM feature.

A corollary of this generalisation is that in all languages information structure plays a role in word order determination. The same thing cannot be said about annotations for argument functions. This means that there appears to be at least one language universal when it comes to word ordering principles. This is interesting, and the question is what implications this has about the language faculty. This generalisation is especially remarkable considering the fact that information structure can actually be expressed in different ways as well, namely by intonation and prosody.⁴⁹ There is something universal about having prominent constituents appearing in the (left) periphery of a sentence.

The generalisation posited in (4.84) does not have a direct bearing on the classification I propose if we assume that the four distinct information structure roles are the key players

⁴⁹This way of expressing information structure is discussed in more detail (within the LFG framework) by Mycock & Lowe (2013).

on the i-structure side of the classification. However, it should be noted explicitly that if one does choose to take features into account rather than fully specified information structure roles, the classification will look very different. Take for example the classification of a Type 3 language. The constraint stated on information structure for this Type is that there is at least one c-structure node (in a c-structure rule) with a specific annotation for a particular IS role. Above I have shown that this appears to be the case for Mandarin Chinese and for Swedish (in which there is also at least one specific annotation for a particular argument function), but that this is not the case for English. In my classification English falls into the Type 1 category, lacking a specific annotation for a particular IS role. This is because TOPIC and FOCUS, when realised syntactically, appear in the same positions. If, however, one uses a feature system, one could state a constraint of the kind ‘there is at least one c-structure node with a specific annotation for a particular IS feature’ for a Type 3 language. This way TOPIC and FOCUS can both be subsumed by the value +PROM, and it means that English actually falls into the Type 3 category rather than the Type 1 category. Considering the generalisation in (4.84) this might be a more desirable outcome, as it better reflects the fact that in English, word order can be used to express information structure roles/features. The constraint ‘there is at least one c-structure node with a specific annotation for a particular IS feature’ would be a general constraint, and it in itself does not capture the fact that +PROM as a feature value appears to have a special status, if we assume that only the Prominence Generalisation in (4.84) can be posited. One would want to incorporate this special status of the +PROM feature value into a classification based on IS features. I leave a classification based on IS features open for further research, and note here that it appears to have the potential to better capture certain intuitions, such as the fact that English has information structure induced word order variation to some extent (e.g. in its fronting construction), which is not captured by its status as a Type 1 language in my classification.

Returning to the classification of languages that I assume which relies on information structure roles (and not features), we can fill in which types of languages actually occur based on the discussion in this section. The outcome is shown in Table 4.8.

Table 4.8: The actual occurrence of LFG's word order types

Type	Influencing Factors on Word Order	Does this type occur?
1.	Only argument functions (AF)	Yes
2.	Only information structure roles (ISR)	Yes
3.	Both AFs and IS roles	Yes
4.	Neither AFs nor IS roles	No?

From the above discussion, it appears that languages of Type 1, Type 2 and Type 3 exist. I have not found an example of a Type 4 language. Based on cross-linguistic data, languages of Type 4 seem unlikely, but that does not mean it is not a theoretical possibility.⁵⁰

The discussion has for the most part focused on the left periphery, but there are also instances of information structure roles appearing in the right periphery in some languages. For example, there are examples of rightward displacement such as the following, from Hungarian and Dutch:

(4.85) Hungarian right periphery focus:⁵¹

A lányok nyerték meg tegnap A KAJAKVERSENYT, *a fiúk pedig* A
the girls won VM yesterday the kayak contest the boys and the
KENUVERSENYT.
canoe contest
‘It was the girls who won the kayak contest yesterday, and the boys who won the
canoe contest.’

(Gazdik, 2010, p. 65)

⁵⁰We may speculate that Type 4 languages would be very unstable diachronically; it might be natural for them to ‘turn into’ a language of one of the other categories.

⁵¹In this example, the coordinator *pedig* (‘and’) appears after the first word of the second clause that it is coordinating. *Pedig* is a coordinator that is ‘right-shifted’ (Kenesei *et al.*, 1998). This implies that it might be a clitic, in a similar way as the Latin word *-que* (‘and’) is an enclitic, which is also to be interpreted before the word that it attaches to.

(4.86) Dutch right periphery displacement:⁵²

a. *Leg neer **dat boekje!***
put.IMP down that booklet
'Put that booklet down!'

b. Unmarked order:

Leg dat boekje neer!
put.IMP that booklet down

(Den Dikken, 1992)

In the Hungarian example there is a focus element in the right periphery, and in the Dutch example there is a displaced element (marked in bold) which could be either topic or focus, depending on the context. This shows that certain IS roles can also appear in the right periphery, as they do in the left periphery. For individual languages, examples like these need to be incorporated into an analysis. For the current discussion it is mainly important whether the annotation is specific or not. I will not provide an analysis of right periphery displacement in this thesis.

4.6 Unbounded dependencies

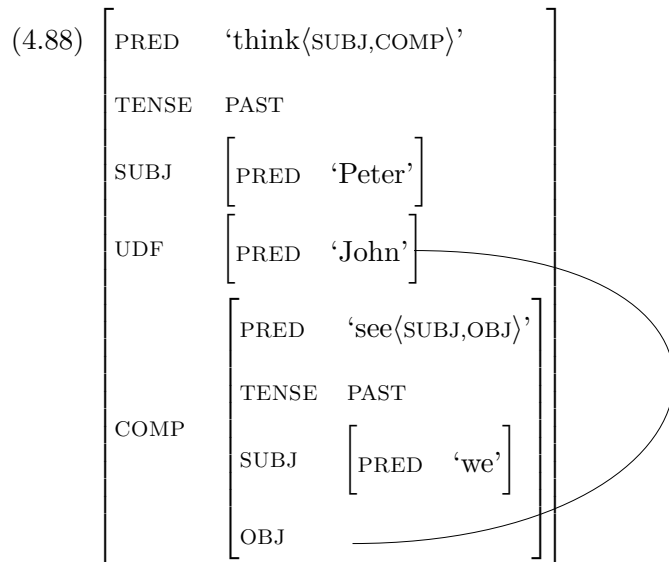
In this section I discuss the role that unbounded dependency functions (UDFs) play in the classification of languages in terms of their configurationality. The reason for addressing this is because it seems somewhat counterintuitive at first glance to have a UDF (marking a constituent fronted due to information structural reasons) in discourse configurational (Type 2) languages. In these languages, one cannot really speak of fronting triggered by information structure, as word order is standardly determined by the discourse.

As mentioned, UDFs were introduced on the one hand to ensure that information structure is not represented inside the f-structure but on its own level of representation (i-structure),

⁵²A context one might imagine for this type of example is one in which a parent is telling a child not to pick anything up, and then the child does it anyway. This example represents the parent's reaction to the child's action.

and on the other hand to conflate the grammaticised topic and focus functions, as they appear in similar positions in some cases (but different information structural contexts). UDFs have been used in the analysis of unbounded dependencies in constructions such as fronting (in English and other languages). This ensures that the fronted element receives a grammatical function, as well as an information structure role. The UDF and grammatical function have functional equality in the f-structure; they have the same f-structure. This is signified by a line connecting the two, which is illustrated in (4.88) for example (4.87):

(4.87) John, Peter thought we saw.



This example involves the crossing of a clausal boundary. A similar analysis of the type in (4.88) involving a UDF is assumed for relative clause formation and constituent question formation, constructions in which an element appears in a fronted position. In a language like English, there are specific c-structure rules for fronting, relative clause formation and constituent question formation, as shown in the previous section.

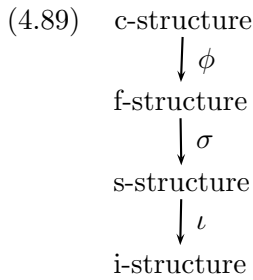
The following sections investigate to what extent UDFs can be used to account for word order variation and whether their use is connected to configurationality. In a language like English it appears straight-forward to posit a UDF for cases of fronting, but in a discourse configurational language (a language of Type 2) this appears at first glance more complicated.

Particularly relevant is the distinction between fronting within clausal boundaries and fronting across clausal boundaries. The reason for this is that, as just mentioned, in discourse configurational languages one cannot really speak of fronting within clause boundaries triggered by information structure (as for example in English), because word order is standardly determined by the discourse. In this case there is no long distance dependency. The situation is potentially different when fronting leads to the crossing of a clausal boundary.⁵³ For this reason, I investigate the argumentation behind having a UDF in f-structure. Ultimately, I show that having a UDF in f-structure is dependent on the existence of long distance dependencies in a language.

4.6.1 A UDF in f-structure

This section presents a range of possible arguments for and against having a UDF in f-structure, before showing how the use of UDF captures certain generalisations in Section 4.6.2. I start by considering UDFs which are resolved within clausal boundaries. Firstly, assuming that the UDF ‘represents’ a displaced element in f-structure, at first glance it appears that we need a UDF in order to have the appropriate semantic analysis for the constituent. Through functional equality the UDF is connected to a grammatical function. This functional equality is needed to achieve the right semantics and information structure specification, assuming a parallel architecture. Recall that I assume the following architecture, proposed by Dalrymple & Nikolaeva (2011):

⁵³King (1995) proposes to have grammaticalised TOP and (Q-)FOC appear in the f-structure for Russian, a language that she analyses as discourse configurational. She makes use of a functional uncertainty path to signal that unbounded dependencies are possible, and shows that there are instances of fronting across clausal boundaries. This shows that having an f-structure attribute for unbounded dependencies (TOP and (Q-)FOC in her case) in discourse configurational language has been proposed before.



(cf. Dalrymple & Nikolaeva (2011, p. 90))

In this architecture, there is no direct link between c-structure and i-structure/s-structure: information flow is via the f-structure. It seems that in a case of fronting, we would need a UDF, because a grammatical function such as object (which it might be linked to) does not standardly carry a specific information structure role.

Although this might appear problematic at first glance, and it is true that an architecture as in (4.89) is necessary to give a full semantic analysis, there is actually no need to posit a separate f-structure attribute for the ‘displaced’ element. With the right annotations on c-structure, combined with a specific information structural context, we can ensure that we reach the correct semantic analysis without positing a UDF in f-structure. This implies that we do not need a UDF in the ‘simple’ case where there is ‘displacement’ inside a clause boundary. Going back to the rule for fronting which has been illustrated previously, we could in principle imagine a rule of the following kind.⁵⁴

$$\begin{array}{l}
(4.90) \text{ ISR} \equiv \{ \text{TOPIC} \mid \text{FOCUS} \} \\
\text{IP} \rightarrow \quad \text{UDFP} \quad \text{IP} \\
(\uparrow \text{UDFPPath}) = \downarrow \quad \uparrow = \downarrow \\
\downarrow_{\sigma_l} \in (\uparrow_{\sigma_l} \text{ISR})
\end{array}$$

In this case we do not have a UDF, but we do have a metacategory UDFP, ranging over the possible XPs that can appear fronted. We also have an annotation for the GF of this con-

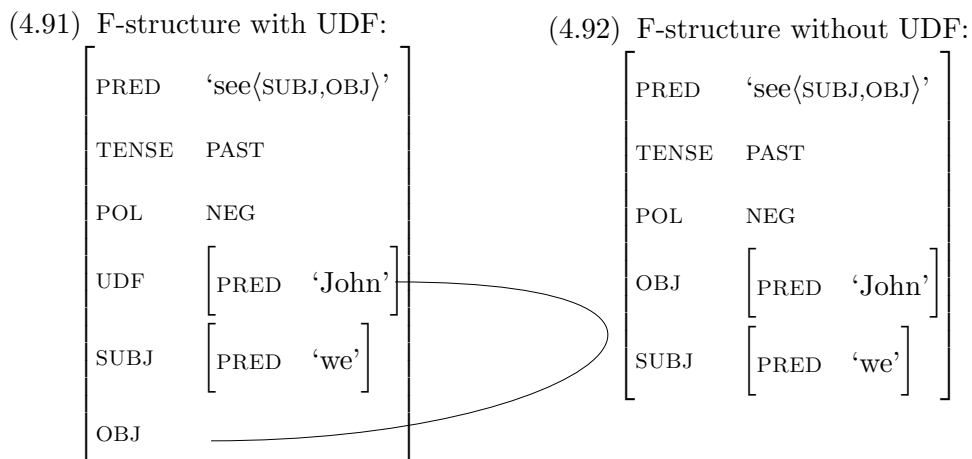
⁵⁴One argument in favour of a UDF in f-structure is that it simplifies expressing the constraints on what may appear as a UDF. The rule in (4.90) illustrates that we do not actually need an annotation $(\uparrow \text{UDF}) = \downarrow$ to f-structure, but that a metacategory UDFP and a specification of $(\uparrow \text{UDFPPath}) = \downarrow$ take care of the constraints on what may appear as a UDF, and what GF it may be linked to.

stituent, signified by UDFPath.⁵⁵ The final annotation on UDFP shows that the information about IS roles is annotated to i-structure via s-structure.⁵⁶ Note that in this IP rule, there are three levels of uncertainty, as UDFP, UDFPath and ISR are all metacategories. This type of analysis is thus valid for fronting within clausal boundaries, but actually the same analysis can also account for the case of fronting crossing clausal boundaries, because UDFPath in (4.90) can be specified in such a way to also cover cases of long distance dependencies, by the use of functional uncertainty. However, in the case of fronting across clausal boundaries it does not give rise to structure-sharing between a UDF and GF of some predicate in the sentence: the constituent adjoined to IP maps only to the f-structure of a GF of some predicate in the sentence. The f-structure representation therefore does not involve linking two f-structures, as for example shown in (4.88). Being able to posit a rule like (4.90) thus implies that for both cases of fronting inside clausal boundaries and fronting across clausal boundaries, there is technically no need to posit a UDF f-structural attribute.

Moreover, we do not actually need a UDF to satisfy f-structure constraints. Recall the f-structure shown in (3.27) for example (3.21) (*John we didn't see*); it is repeated in (4.91). Example (4.92) shows the f-structure for the same example, but under the assumption that the rule in (4.90) without UDF applies:

⁵⁵Eliminating the UDF itself, but still maintaining the terms UDFP and UDFPath might be a bit confusing; we might want to think of using different terms.

⁵⁶Even though there is a mapping to s-structure, it is unclear how a rule like (4.90) would allow for a general statement of the mapping to semantics for all cases of fronting, whether it occurs within a clause or crossing a clausal boundary. This is a compelling argument in favour of a UDF across the board, as we will see.



The f-structure in (4.91) itself is complete and coherent without the UDF, which is further illustrated by the f-structure in (4.92). From an f-structure point of view, we do not need the UDF. Note that the same is true for fronting across clausal boundaries.

One can also appeal to other arguments for UDF, other than those relating to information structure roles or f-structure constraints. As suggested by Mary Dalrymple (p.c.), one could look at phenomena such as crossover and anaphoric binding. Consider the following examples, illustrating weak crossover in (4.93b):

- (4.93) a. His_i mother likes Bill_i.
 b. *Who_i does his_i mother like?

The first sentence is somewhat acceptable, whereas the second sentence is completely unacceptable; it is a weak crossover violation. One could explain the difference in grammaticality by the presence of a UDF in f-structure, by positing a constraint stating that the UDF may not act as an antecedent to the pronoun. This is a way of explaining the difference between the two sentences, as the f-structures of the two sentences are otherwise very similar. However, Dalrymple *et al.* (2001) have shown that one can account for the ungrammaticality of (4.93b) by a violation of their concept of *Syntactic Prominence*.⁵⁷ Dalrymple *et al.* (2001) assume

⁵⁷The definition of *Syntactic Prominence* is as follows: *An operator O is more prominent than a pronoun P if and only if CoargOp is at least as high as CoargPro on the functional hierarchy. CoargOp and CoargPro are coargument f-structures such that CoargOp contains the operator O and CoargPro contains the pronoun P* (Dalrymple *et al.* , 2001).

that topic and focus appear inside the f-structure as grammaticised discourse functions, but their analysis of sentences like (4.93b) does not take this f-structure presence into account. Important instead is the syntactic rank of the DP and its coreferring pronoun (*Syntactic Prominence*), and their f-precedence in relation to each other (*Linear Prominence*).⁵⁸ This shows that the examples of weak crossover can be accounted for without specific reference to an ‘extra’ attribute in the f-structure such as TOP or FOC, or UDF by extension.⁵⁹ Again, these arguments also apply for cases of cross-clausal fronting.

One reason not to assume a UDF in f-structure is if we assume that rather than having a long distance dependency, we have an actual discontinuity between embedded verb and object (from the same VP, in languages that are said to have a VP). Discontinuous expressions will be discussed in detail in the following chapter. I do not want to assume a discontinuity in the case of a language like English, however, as I assume that an actual discontinuous expression represents something different than the type discussed here in fronting.

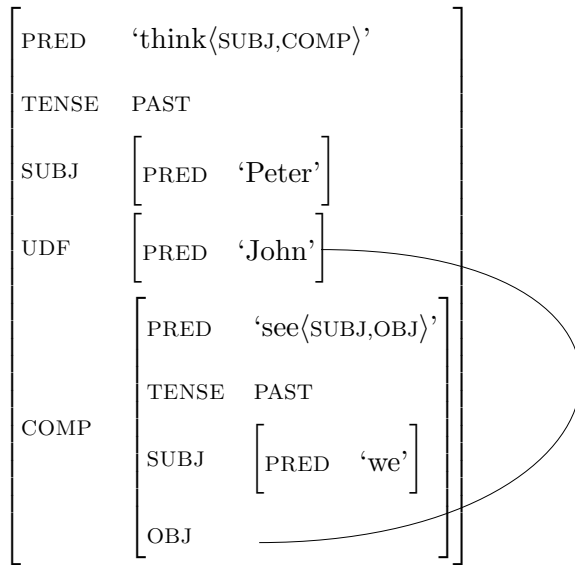
Now turning explicitly to fronting across clausal boundaries (although we have seen that the argumentation above applies to this case as well), we can see that this type of fronting is similar to within-clause fronting in some ways, with the difference that fronting across clausal boundaries renders truly long distance dependencies. An example from English was shown in (4.88), repeated here:

(4.94) John, Peter thought we saw.

⁵⁸The definition of *Linear Prominence* is as follows: *An operator O is more prominent than a pronoun P if and only if CoargOp f-precedes P.*

⁵⁹This idea is worked out further in LFG by Nadathur (2013); she argues in favour of a direct link between the pronoun and its subcategoriser with the use of the Direct Association Hypothesis (Pickering & Barry, 1991).

(4.95) F-structure for example (4.94):



This f-structure is different from the one in the previous section illustrating fronting within the same clause. There is a dependency between two different clauses, and an instance of structure-sharing which appears very similar to raising constructions, as noted by Alsina (2008). This type of long distance fronting is even more like raising than the example of ‘simple’ fronting (within a clausal boundary) discussed in the previous section, as a raising construction also involves a dependency crossing a clausal boundary.

A possible argument for the existence of UDFs specifically in sentences with long distance dependencies is anaphoric binding. Note the difference between the following two sentences:

- (4.96) a. Which pictures of himself_{*i*} did Bill_{*i*} say you took?
 b. *Bill_{*i*} said that you took those pictures of himself_{*i*}.

One could attribute the difference between two sentences to the presence of a UDF, if we assume that the reflexive pronoun and its antecedent must be in the same clause. This is true in (4.96a) if we posit a UDF, but not in (4.96b). As suggested by Mary Dalrymple (p.c.), however, this difference could actually be attributed to the semantics of picture noun reflexives. It might have something to do with logophoricity and point of view, although more work would need to be done on this.

This brief discussion shows that one does not technically need a UDF in f-structure to account for both fronting within a clausal boundary and fronting across a clausal boundary (actual long distance dependencies). The observation that fronting within clausal boundaries might not motivate the presence a UDF in f-structure seems especially crucial for discourse configurational languages, in which one cannot really speak about ‘fronting’ inside clauses (triggered by information structure), as the unmarked word order is discourse dependent. Recall the Hungarian data, in which there are set topic and focus positions before the verb. If we want to have an analysis for within-clause fronting in discourse configurational languages along the lines of Alsina (2008, 2014) and Asudeh (2011, 2012), then we would nearly always have a UDF in f-structure (or two in the case of both topic and focus appearing preverbally).⁶⁰ This does not really seem to capture the fact that in discourse configurational languages, unmarked word order is determined by information structure. At the same time, there are good reasons to posit a UDF even in cases like this; this will be shown in the next section.

4.6.2 UDF capturing generalisations

I have shown that having a UDF in f-structure is not technically necessary to account for (at least certain types of) fronting. There is, however, one very good reason to posit a UDF in f-structure, both for within-clause fronting and cross-clausal fronting, namely to capture certain generalisations. First of all, a UDF provides a neat way to signal in the f-structure that there is a dependency of some kind. In the case of long distance dependencies specifically, a UDF captures the fact that a clausal boundary is being crossed and that there is a dependency between a higher and a lower clause within the f-structure. This is not captured by a rule of the type shown in (4.90), which shows the constraints on the dependency but does not capture f-structurally that there is a (potential) crossing of a boundary in f-structure; there is no structure-sharing. Moreover, not having a UDF would render the c-structure rules rather messy and unclear. I therefore assume that it is desirable to have a UDF in f-structure to capture long distance dependencies.

⁶⁰I employ the term fronting here, although note that this term is somewhat odd in relation to discourse configurational languages, in which we cannot really speak about fronting within the same clause. However, it provides a good shorthand for the phenomenon at this stage.

This assumption can be extended to within-clause fronting (in which there is no long distance dependency, and no clausal boundary is crossed), because a UDF for both within-clause fronting and cross-clausal fronting provides a neat way to capture that the two types of fronting are very similar. Positing a UDF for both types of left peripheral placement gives a straightforward uniform characterisation in the form of a functional uncertainty path for UDF:

$$(4.97) \ (\uparrow \text{UDF}) = (\uparrow \text{COMP}^* \text{GF})$$

(Asudeh, 2012, p. 72)

This is only a very simple path, and it does not account for (for example) English fronting data (for the exact UDFPath for the English data, see Asudeh (2012, p. 72), an adaptation of Dalrymple (2001, p. 396)). It does, however, illustrate the functional uncertainty which is present in potential UDFPaths. UDFPath here accounts for all outcomes of COMP* GF, whether the fronting is not crossing any clausal boundaries (GF), crossing one boundary (COMP GF) or several (e.g. COMP COMP COMP GF). If we assume that this type of functional uncertainty path applies for all types of fronting (whether within a clause or crossing a clause), we only need one path specification. This type of path thus captures the *unboundedness* of the dependency, as the term itself implies. The term *unbounded dependency* thus better captures the phenomenon than the term *long distance dependency*, as the latter does not encompass ‘simple’ fronting within the same clause. As mentioned, technically the functional uncertainty in (4.97) could also be captured in a rule as in (4.90) without an actual f-structure UDF but with a UDFPath specification, but having a UDF provides a somewhat neater way to express these constraints.

If we were to assume that a UDF only occurs in cross-clausal cases of fronting (only for real long distance dependencies), we would need two separate specifications: one for the long distance case with UDF and one for the within-clause fronting case, without UDF. This could look something like this:

(4.98) Fronting across a clausal boundary:

$$\begin{array}{ccc} \text{IP} & \rightarrow & \text{UDFP} \quad \text{I}' \\ & & (\uparrow \text{UDF}) = \downarrow \quad \uparrow = \downarrow \\ & & (\uparrow \text{UDF}) = (\uparrow \text{COMP}^+ \text{GF}) \end{array}$$

(4.99) Fronting within a clausal boundary:

$$\begin{array}{ccc} \text{IP} & \rightarrow & \text{SFP} \quad \text{I}' \\ & & (\uparrow \text{GF}) = \downarrow \end{array}$$

This is not a set of rules for a particular language, but rather an example of what such rules might look like. The specification of UDFPath is different per language. In (4.99) I have chosen the constituent structure metacategory abbreviation SFP, which stands for ‘Simple Fronting Phrase’, to distinguish it from UDFP in the long distance fronting rule in (4.98). It is clear that the rule in (4.99) for simple fronting is much more straightforward than the cross-clausal fronting in (4.98). However, there are now two separate rules for what appear to be two different instantiations of the same phenomenon. The two rules fail to capture the unboundedness of fronting as a unified phenomenon. Moreover, if it is the case that the values of the metacategory UDFP in (4.98) and the metacategory SFP in (4.99) are the same (which they are, for example, in English), then this is another strong argument to only posit one single rule to capture these constraints.

Another important reason for positing a UDF in f-structure, for both types of fronting, is to capture semantic generalisations. As hinted at earlier, having a UDF provides a general statement of the mapping to semantics for all cases, which is desirable. I will not go into the details of the semantic analysis here.

Based on these arguments, I assume a UDF in f-structure, and I only posit one rule to account for both within-clause fronting and cross-clausal fronting. Therefore, I posit a UDF across the board for languages which allow both types of fronting, capturing the unboundedness of the construction. In this I follow Alsina (2008, 2014) and Asudeh (2011, 2012). It might appear that the presence of a UDF (or the more traditional grammaticalised TOPIC

and FOCUS) across the board has been assumed implicitly in the literature, but I believe it needs to be made explicit due to the nature of discourse configurational languages (languages of Type 2). For languages which allow for unbounded dependencies, I posit a UDF in all cases. In a language like English this is fairly straightforward: there is a UDF in all cases of fronting, whether it is within the same clause or crossing a clausal boundary. Note that in English, the fronting rule is a separate rule from the general rule which allows for SVO word order in discourse neutral sentences. In discourse configurational languages that allow long distance dependencies, I will also posit a UDF in all cases. This is line with King (1995), who posits a grammaticalised discourse function for the unbounded dependencies attested in Russian, a language analysed as discourse configurational. The condition that a language allows long distance dependencies is crucial: without this there is no unbounded dependency and therefore no UDF. As I will briefly illustrate later, it seems that the discourse configurational languages I have considered in this thesis all have long distance dependencies of some kind.

So far I have mainly addressed the case in which a language allows both within-clause fronting and cross-clausal fronting. However, there appear to be languages in which fronting is clause-bounded. One case of this is Tsez, a Northeast Caucasian language (Polinsky & Potsdam, 2001). Polinsky & Potsdam (2001) show that fronting of topics is possible in Tsez, but that it is strictly clause-bounded; long distance fronting is not acceptable. This is shown by the following examples:⁶¹

- (4.100) a. *Iškolaɣor uʒ-ā k'et'u begirsi.*
to.school boy-ERG cat.ABS sent
‘To school, the boy sent the cat.’

⁶¹Tsez also has morphological means of marking topic, but the strategy used in example (4.100) does not involve any special marking. Focus may be marked morphologically but it is not fronted; fronting is reserved for topic constituents (Polinsky & Potsdam, 2001).

- b. **İskola*ğor *kid* [*už-ā* *k'et'u* *begā-ru-ki*] *boži*zi
to.school.TOP girl.ABS boy-ERG cat.ABS send-PSTPRT-NMLZ believe
yoq-xo
be-PRES
‘To school, the girl believes that the boy sent the cat.’

(Polinsky & Potsdam, 2001, p. 599)

Example (4.100a) shows a case of within-clause fronting, which is grammatical. Example (4.100b) shows that fronting that crosses a clausal boundary is not grammatical, however. This shows that fronting is not unbounded in all languages, and that having a UDF in f-structure along with a path of the general form as shown in (4.97) is not necessary for all languages. We have seen that the motivation behind having a UDF for within-clause fronting only is not very strong, and I therefore propose the following type of fronting rule for a language such as Tsez:

$$\begin{array}{l}
 \text{XP} \rightarrow \text{SFP} \quad \text{X}' \\
 (4.101) \quad (\uparrow \text{GF}) = \downarrow \quad \uparrow = \downarrow \\
 \downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} \text{ TOPIC})
 \end{array}$$

The c-structure metacategory abbreviation SFP ranges over the possible types of XPs that may appear in topic position. I analyse the topic constituent as appearing in a specifier position, without specifying the exact XP. The annotation for GF is unspecified (although this might be restricted in individual languages). Importantly, the annotation for topic is obligatory. For a language which allows for both topic and focus in the same specifier position there would be a $\downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} \text{ ISR})$ annotation, with $\text{ISR} \equiv \{\text{TOPIC} \mid \text{FOCUS}\}$. This shows a clear distinction between languages that employ unbounded dependencies and ones that do not: for the former I posit a UDF with UDFPath, for the latter I posit a simple obligatory annotation to i-structure for the specific IS role(s).

4.6.3 An illustration of unboundedness

It appears to be more common for languages to have unbounded dependencies than not, and this will be illustrated in this section, showing fronting data from several of the languages

discussed in this thesis, on both ends of the configurationality spectrum. The aim of this is to see the range of data that is covered by positing a UDF for languages with local and long-distance fronting. In the group of languages which have strict ordering of argument functions, both types of fronting seem to be allowed. We have seen that this is true for English, but it is also true for Mandarin Chinese and Yoruba. Consider the following examples from Mandarin Chinese:⁶²

(4.102) a. Unmarked SVO word order:

Wo chi shuiguo le.
 I eat fruit LE
 'I ate the fruit.'

b. Simple fronting:

Shuiguo wo chi le.
 fruit I eat LE
 'The fruit, I ate.'

c. Long distance fronting:

Shuiguo wo zhidao ta yijing chi le.
 fruit I know he already eat LE
 'Fruit, I know he already ate.'

(Ji, 1996, p. 10–11)

Clearly, as in English, in Mandarin Chinese fronting is not clause-bounded. Therefore we can also posit a UDF with a functional uncertainty path for Mandarin Chinese. As for *wh*-questions, Mandarin Chinese has *wh*-in-situ *wh*-words; therefore there is no fronting here.

Now turning to Yoruba, here one also finds cross-clausal dependencies, for example in the following *wh*-constructions:⁶³

⁶²The word *le* (marked LE) marks perfectivity and/or inchoativity. According to Ji (1996) it is unclear which of the two *le* is marking here, but this is not relevant to the discussion at hand.

⁶³The word *lo* in (4.103) is a contracted form of *ni o*, with *ni* = FOC and *o* = 2SG (Bisang & Sonaiya, 2000).

(4.103) Simple *wh*-fronting:

Kí lo rà?
what FOC.2SG buy
'What did you buy?'

(Bisang & Sonaiya, 2000, p.179)

(4.104) Long distance *wh*-fronting:

- a. *Ta ni o rò pé ó ra kínì?*
who FOC you think that 3SG buy what
'Who do you think bought what?'
- b. *Kí ni o rò pé taní rà?*
what FOC you think that who buy
'What do you think that who bought?'

(Adesola, 2006, p. 309)

Notice that in both of the examples in (4.104), there are two *wh*-words: one is fronted and the other one remains in situ, implying there is only one left peripheral position for fronted elements, like in English. These examples also show that in Yoruba, fronting from an embedded clause is allowed as well as fronting within a clause, and so for Yoruba we can also posit a UDF. In the Mandarin Chinese and Yoruba examples which involve a long distance dependency shown in (4.102c) and (4.104) respectively, the path of the unbounded dependency has length two: (\uparrow COMP GF). Within-clause fronting, shown in (4.102b) and (4.103) yields a UDFPath of length one.

As for discourse configurational languages, languages of Type 2, it appears that here too unbounded dependencies are present in at least some languages. In Hungarian, Japanese and Latin one can find long distance dependencies between matrix and subordinate clauses. The case for Warlpiri is more complicated, as it has been claimed that Warlpiri does not allow for subordination; rather it has been said to employ 'adjoined relative clauses' (Hale,

Here the *wh*-word remains in situ, but every clause (whether it is the matrix clause or another embedded clause) has an instantiation of the word *mi*- ('what'), to extend the scope of the main *wh*-word. This thus automatically yields a wide scope reading, and is an alternative to the type of 'normal' fronting example in (4.105) (Mycock, 2006). The scope marking construction is a way to ensure that the LDD is signalled throughout the sentence, and the normal fronting construction lacks this property.

Apart from *wh*-fronting, LDDs also appear to exist in non-*wh*-fronting constructions in Hungarian:

- (4.107) a. *János Juliskát hallottam hogy elveszi feleségül.*
 John.NOM Julie.ACC hear.PAST.1SG that take.3SG as.wife
 'Julie, I heard John will marry.'
- b. *Marival megmondtam hogy nem engedem hogy rosszul bánjanak.*
 Mary.with say.PAST.1SG that not allow.1SG that badly behave.3PL
 'Mary, I have said that I do not allow that they treat badly.'

(Kiss, 1995c, p. 224–227)

Note that in (4.107a), both the subject and the object of the subordinate clause are fronted. In (4.107a) the LDD has length two, in (4.107b) it has length three.

In Japanese one finds LDD cases of fronting. In (4.108) there are examples of fronting with no boundary crossing (with a path of length one, in 4.108a)) and with crossing one clausal boundary (with a path of length two in 4.108b)):

- (4.108) a. *Sono hon-o Taroo-ga katta (koto).*
 that book-ACC Taro-NOM bought fact
 'That book, Taro bought.'
- b. *Sono hon-o Hanako-ga Taroo-ga katta to omotteiru (koto).*
 that book-ACC Hanako-ga Taro-NOM bought COMP think fact
 'That book, Hanako thinks that Taro bought.'

(Saito, 1992, p. 69)

Interestingly, Kempson & Kiaer (2010) claim that Japanese LDD fronting is of borderline status (unlike Korean, in their comparison of the two languages). This statement, plus the apparent lack of examples of fronting crossing more than one clausal boundary, suggests that fronting in Japanese is in fact relatively constrained. Again, this could be due to processing constraints. However, the example in (4.108b) implies that LDD fronting is not in principle ruled out. As for *wh*-questions, Japanese is a *wh*-in-situ language, so there are no instances of LDDs for constituent questions.

Turning to Latin, also here one can find cases of LDDs, both in cases of fronting from *wh*-question embedded clauses or from declarative embedded clauses.

(4.109) (If bedding runs short, gather oak leaves and use them for bedding down sheep and cattle.)

STERCILINUM MAGNUM *stude* *ut* *habeas*.
 dung.hill.ACC large.ACC ensure.2SG.IMP that have.2SG
 ‘See that you have a large dung hill...’

(Cato, *De Agri Cultura* 5.8, transl. by Hooper & Ash (1935))

(4.110) (Redeeming the promise I made as I took my leave of you to write you all the news of Rome in the fullest detail, I have been at pains to find a person to cover the whole ground so meticulously that I am afraid you may find the result too wordy.)

Tametsi tu scio quam sis curiosus
 however you.SG.NOM know.1SG how be.2SG.SUBJ curious.SG.NOM
 ‘However, I know how curious you are...’

(Caelius at Cicero, *Fam* 8.1.1, cf. Sayeed (2005, p. 97), transl. by Shackleton Bailey (2001))

In (4.109), there is a fronted focus constituent and in (4.110) there is a fronted contrastive topic. In both cases, the fronted constituents play a role in the subordinate clause, but they

appear in the main clause. This shows that long distance dependencies are indeed possible in Latin. Latin also displays a phenomenon which on the surface appears to be similar to LDD, described in detail by Danckaert (2012):

- (4.111) a. *Eum cum videro, Arpinum pergam.*
 him.ACC when see.1SG.FUT.PERF Arpinum.ACC proceed.1SG.FUT
 ‘When I have seen him, I will move on to Arpinum.’

(Cic. *Att.* 9.15.1)

- b. *Conloqui videbamur in Tusculano cum essem.*
 talk.INF seem.1PL.IMPF in Tusculan.ABL when be.1SG.IMPF.SUBJ
 ‘We seemed to be discussing, when I was in the Tusculan estate.’

(Cic. *Att.* 13.18)

(cf. Danckaert (2012, p. 2))

In both of these examples, there is a constituent that immediately precedes the subordinator of the subordinate clause that it is part of. In (4.111a) this is the object of the subordinate clause and in (4.111b) it is the PP *in Tusculano*, which appears to be the complement of the verb *essem*, because leaving it out would render the sentence incomplete. Rather than analysing examples like this as long distance dependencies, Danckaert (2012) analyses both fronted constituents to be part of the extended left periphery of the subordinate clause. I do not take examples like these into account.

This discussion of long distance dependencies in discourse configurational languages is concluded with Warlpiri. Warlpiri is left until the end because the status of subordination in Warlpiri has been debated. Hale (1976) claims that Warlpiri does not have embedded clauses (Hale, 1976). Rather, he claims, it has a type of ‘adjoined relative clause’:^{65,66}

⁶⁵Note that there are two interpretations of this sentence: Hale’s *NP-relative interpretation* (representing with a relative clause in the translation) and Hale’s *T-relative interpretation*, a type of temporal adjunct interpretation (Hale, 1976). The NP-relative interpretation is only available if the two clauses share the same argument, and the T-relative interpretation is only available if the two clauses share the same time reference.

⁶⁶According to Legate (2009), Hale (1976) does not consider adjoined relative clauses with speech verbs as the matrix verb. Further literature does not address this issue either, with the exception of Hale (1994), which merely states that they are adjoined, but without providing any further discussion.

(4.112) *Ngajulu-rlu rna yankirri pantu-rnu kuja-lpa ngapa*
 I-ERG AUX emu.ABS spear-PAST COMP-AUX water.ABS

nga-rnu.

drink-PAST

‘I speared the emu which was/while it was drinking water.’

(Hale, 1976, p. 78)

The main reason that Hale (1976) does not analyse this as involving embedding seems to be that the ‘adjoined relative clause’ always has to appear at the edge of the matrix clause and never ‘embedded’ in the middle, and it is typically separated from the main clause by an intonational pause. The terminology is crucial here: Hale appears to use the term *embedded* referring to linear position, not subordination. In the most general sense of the word, the ‘adjoined relative clause’ in (4.112) is subordinate: it modifies (a constituent of) the matrix clause and it forms its own finite clause, including AUX. It appears that especially in the case of the relative clause interpretation, it is a modifier of a nominal constituent; in example (4.112) this is *yankirri* (‘emu’). In the temporal interpretation this does not have to be the case necessarily, as illustrated by the following example, where the two clauses do not share the same argument:

(4.113) *Ngajulu-rlu lparna karli jarntu-rnu kuja-mpa ya-nu-rnu*
 I-ERG AUX boomerang trim-PAST COMP-AUX walk-PAST-hither

nyuntu

you

‘I was trimming a boomerang when you came up.’

(Hale, 1976, p. 79)

In this example only the temporal interpretation is acceptable, and the subordinate clause is clearly an adverbial clause modifying the predicate of the matrix clause rather than modifying an argument of the predicate.

Warlpiri not only has finite subordinate clauses of the kind illustrated above, but also ‘adjoined infinitive clauses’ (Hale, 1976). An example which is very similar in meaning to the temporal interpretation of (4.112) is the following:

(4.114) *Ngajulu-rlu rna yankirri pantu-rnu, ngapa nga-ninyja-kurra.*
 I-ERG AUX emu spear-PAST water.ABS drink-INF-COMP
 ‘I speared the emu while (it was) drinking water.’

(Hale, 1976, p. 81)

These types of infinitive clauses differ from the finite ones in two respects. Firstly, they can only have a temporal interpretation (even if the two sentences share the same argument), and they do not necessarily have to appear ‘adjoined’ in linear terms: they can appear immediately adjacent to their head noun inside the sentence.

Much more can be said about these subordinate clauses, but I will now turn to the relevant issue at hand, namely the existence of unbounded dependencies. I have not found any examples of the finite subordinate construction (‘adjoined relative clause’) in which a constituent is fronted across a clausal boundary. I have, however, found one instance of a cross-clausal fronted argument in an example of an infinitive subordinate clause (‘adjoined infinitive clause’):

(4.115) *Kuyu-ku wati ya-nu wirlinyi pi-nja-ku.*
 game-PURP.C man go-PAST daytrip kill-INF-PURP.C
 ‘The man went hunting to kill game.’

(Hale *et al.* , 1995, p. 1444)

Here we have a matrix clause and a subordinate purpose clause: the reason for going hunting is to kill game. This is marked by the specific complementiser used in this sentence, *-ku*, glossed as PURP.C. We see that the object of the subordinate clause (*kuyu*, ‘game’) is fronted to sentence-initial position. Interestingly, the object is marked with the complementiser as well, showing that it semantically belongs inside the subordinate clause. This parallels morphological marking of discontinuous expressions in Warlpiri: in a discontinuous expression all subparts are marked for case, unlike its contiguous counterparts in most of the literature.⁶⁷

⁶⁷This is contradicted by elicitation done by Margit Bowler (p.c.) in 2013. She claims that at the time of her elicitation, speakers case-mark only one word of a (contiguous) constituent, and that this was independent of the age of the speakers. This is different from the observation that have been made in the literature that in Warlpiri case is only marked once on a constituent consisting of more than one word; see for example Hale *et al.* (1995).

In (4.115) we thus have a case of fronting across a clausal boundary, if we assume that the purpose clause is in fact a subordinate clause.

This overview shows that despite the range of possibilities in subordination briefly touched upon, it appears that all languages discussed in this thesis have some type of cross-clausal fronting. The only exception to this is Tsez, which was briefly addressed in Section 4.6.2. The existence of a language like this shows that not all languages have unbounded dependencies, but the discussion in this section has in fact shown that unbounded dependencies are common cross-linguistically. They are found both in relatively grammatically configurational languages (and mixed configurational languages) and in discourse configurational languages. There are language-specific constraints on what type of constituent may be fronted, how many clause boundaries the fronted constituent may cross, and there are cross-linguistic differences between *wh*-fronting and non-*wh*-fronting. The distance over which a constituent may be fronted is very likely to be constrained by processing; fronted constituents from deeply embedded clauses are difficult to process, as shown by Gibson (1998) and Hawkins (1994, 2004). Assuming processing to play a role, one would expect the same constraints for all languages. I will not discuss in detail how exactly processing constraints play a role in the individual languages, but I do in principle assume that they play a role in constraining fronting.

4.6.4 Implications

With these observations and assumptions laid out, I posit a UDF for all cases where fronting is allowed across clausal boundaries (with a UDFPath of length two or more), assuming that it is processing that imposes constraints on the extent of embedding rather than the syntax. This is in effect a hypothesis that is falsified if a language is found which provides evidence that there is a distinction between, for example, a UDFPath of length two and a UDFPath of length three (note that both are cases of LDD). It is much cleaner to assume that there is only one simple rule, and there is no clear-cut evidence that a distinction like this is present in any of the languages discussed in this thesis. For languages such as Tsez, which do not appear to have any long distance dependencies but in which fronting is clause-bounded, I do

not posit a UDF.

Importantly, independent of the existence of a UDF in all languages in which there are long distance dependencies, there is a clear difference between relatively grammatically configurational languages (and potentially mixed configurational languages) and discourse configurational languages. In languages like English, Yoruba, and Mandarin Chinese, for most sentences a c-structure rule applies that allows for SVO word order; these rules do not incorporate a UDF. In the clearly marked cases where a constituent is fronted, there is a separate c-structure rule, which incorporates a UDF. Example (3.22) for English fronting is repeated here, with some elaboration:

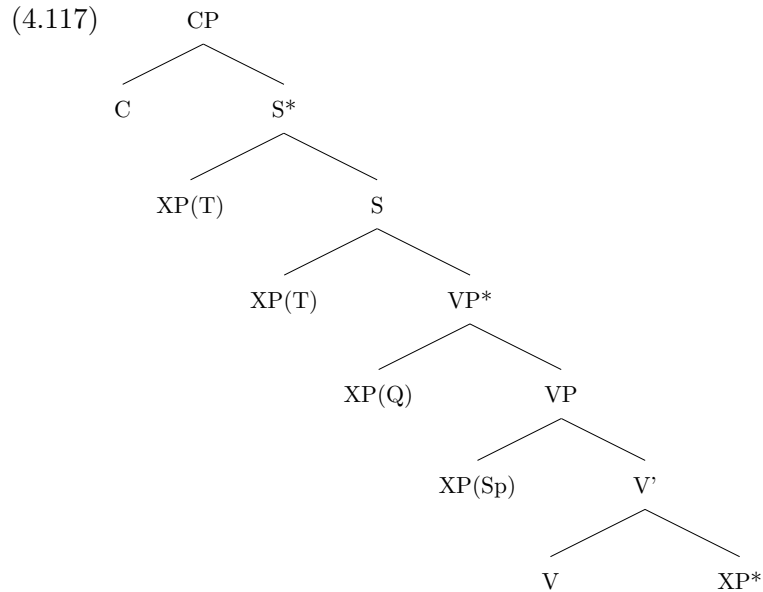
(4.116) $ISR \equiv \{TOPIC \mid FOCUS\}$

$$\begin{array}{l}
 IP \rightarrow \quad \quad UDFP \quad \quad IP \\
 \quad \quad \quad (\uparrow UDF) = \downarrow \quad \quad \uparrow = \downarrow \\
 \quad \quad \quad \downarrow_{\sigma_i} \in (\uparrow_{\sigma_i} ISR) \\
 \quad \quad \quad (\uparrow UDF) = (\uparrow UDFPath) \\
 IP \rightarrow \quad \quad DP \quad \quad I' \\
 \quad \quad \quad (\uparrow SUBJ) = \downarrow \quad \uparrow = \downarrow \\
 I' \rightarrow \quad \quad I \quad \quad VP \\
 \quad \quad \quad \uparrow = \downarrow \quad \uparrow = \downarrow
 \end{array}$$

In sentences with no fronting, the second and third rule from (4.116) apply, and in cases of fronting the first rule in (4.116) applies as well. In a grammatically configurational language which has V2 word order, the rules would be similar, with the exception that subjects and fronted elements occupy the same position before the finite verb. In these languages there is therefore only one IP rule, where subject or any fronted constituent are in the specifier of IP.

In discourse configurational languages, the situation for c-structure rules is somewhat different. For discourse configurational languages which make use of long distance dependencies, I posit a UDF across the board, including in simple sentences without embedded clauses. As an

illustration of this, we can look at Hungarian. For Hungarian I assume the structure proposed by Laczkó (2014a, p. 337):⁶⁸



As one can see, Hungarian has a fairly elaborate left periphery in Laczkó’s analysis. Here ‘T’ stands for topic or sentential adverb, ‘Q’ stands for quantifier or *wh*-word, and ‘Sp’ stands for focus, *wh*-word, or verbal modifier (VM). The Kleene star marked S (S*) and VP (VP*) make multiple left-adjunction possible; the Kleene star notation (as explained briefly in Chapter 2) means that there can be zero or more of S and zero or more of VP in the structure of Hungarian sentences. Laczkó (2014a) claims that there is clear evidence for a CP in Hungarian, as Hungarian has complementisers which introduce complementiser clauses, but also that it is reasonable to assume that relative clauses are CPs with the relative pronoun in specifier of CP position (see Kenesei (1992)), and S as the complement of the C head. Laczkó argues that there is no empirical evidence for an IP node in Hungarian, as one would expect the specifier of IP to host either subject constituents or constituents with a specific topic and/or focus function. He argues that neither appears in this position in Hungarian, which is the position that would immediately precede constituents that could in principle serve as the head of IP, namely certain types of auxiliaries.

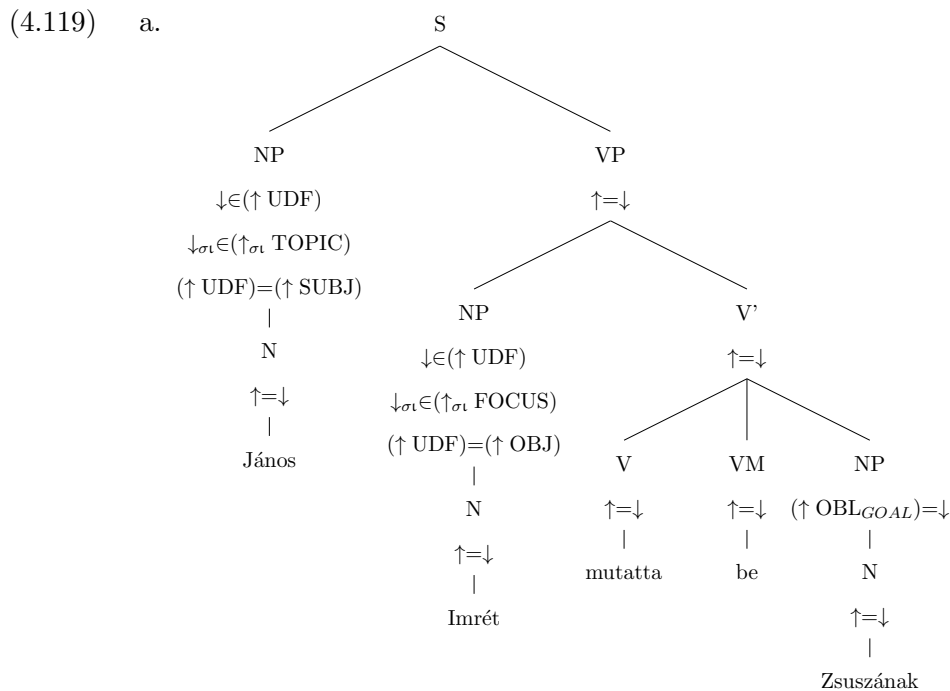
⁶⁸For reasons of clarity, I show an abstract structure here instead of c-structure rules, following Laczkó (2014a).

To see what the structure in (4.117) looks like for actual examples including UDF, we can consider the following two examples, one of a main clause standing on its own and one long distance example, repeated from (4.20a) and (4.107a) respectively:

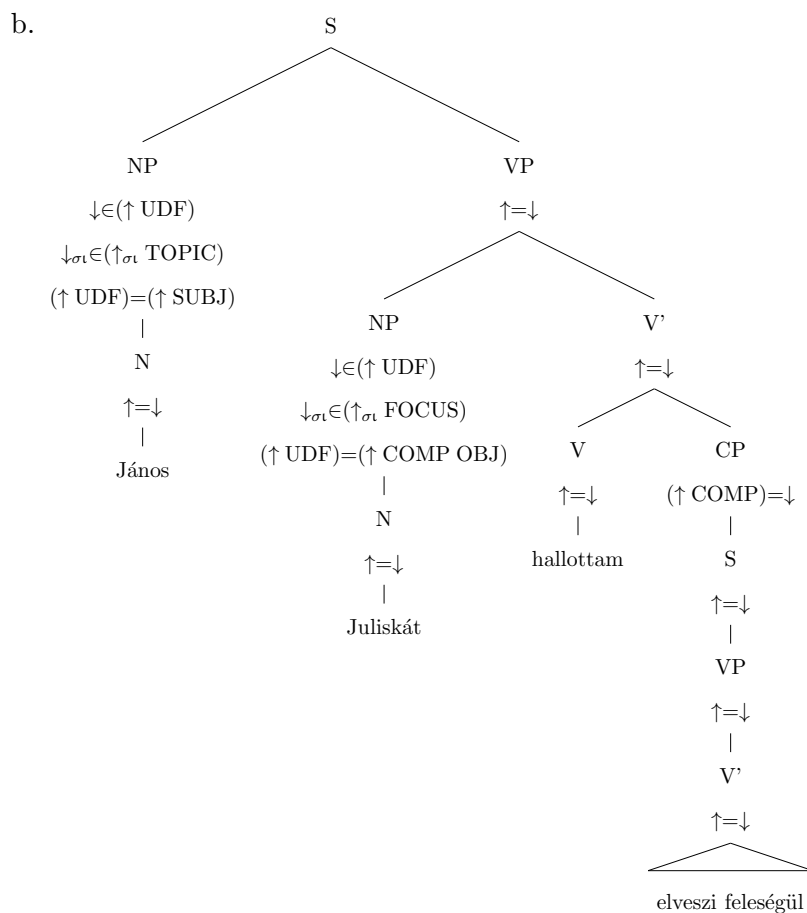
- (4.118) a. *János* IMRÉT *mutatta* *be* *Zsuzának*.
 John.NOM Imre.ACC introduce.PAST VM Susan.DAT
 TOPIC FOCUS
 ‘Imre, John introduced to Susan.’

- b. *János* JULISKÁT *hallottam* *hogy elveszi feleségül*.
 John.NOM Julie.ACC hear.PAST.1SG that take.3SG as.wife
 TOPIC FOCUS
 ‘Julie, I heard John will marry.’

The corresponding c-structures are the following:⁶⁹



⁶⁹Note that the value of the UDF attribute is in a set in Hungarian, as more than one UDF can appear: one TOPIC and one FOCUS.



This shows that the structure for examples with UDFPath of length one and length two are very similar. One could posit the following c-structure rules to incorporate TOPIC and FOCUS information structure roles:

$$\begin{array}{lcl}
 \text{S} & \rightarrow & \text{NP} \quad \text{VP} \\
 & & \downarrow \in (\uparrow \text{UDF}) \quad \uparrow = \downarrow \\
 (4.120) & & \downarrow \sigma_i \in (\uparrow \sigma_i \text{ TOPIC}) \\
 & & (\uparrow \text{UDF}) = (\uparrow \text{UDFPath}) \\
 \text{VP} & \rightarrow & \text{NP} \quad \text{V}' \\
 & & \downarrow \in (\uparrow \text{UDF}) \quad \uparrow = \downarrow \\
 & & \downarrow \sigma_i \in (\uparrow \sigma_i \text{ FOCUS}) \\
 & & (\uparrow \text{UDF}) = (\uparrow \text{UDFPath})
 \end{array}$$

The assumption is that the UDFPaths for both TOPIC and FOCUS are fairly unrestricted,

to reflect the freedom of grammatical function assignment. As shown by the structure that I assume in (4.117), V' has a flat structure, with the verb appearing initially. NPs dominated by V' are assumed to have the specification $(\uparrow \text{GF}) = \downarrow$.

This shows that both relatively grammatically configurational languages, language of Type 1 (or mixed configurational languages, languages of Type 3), and discourse configurational languages, language of Type 2, have similar c-structure rules to incorporate information structure roles tied to specific structural positions. The main difference between the languages is thus in the presence or absence of rules that include specific annotations for argument functions, as shown in Sections 4.4 and 4.5. Hypothesising that UDFs might only be present in relatively grammatically configurational languages and not in discourse configurational languages is not correct, based on the arguments shown in this section, and this means that the presence of a UDF cannot be used to distinguish languages in terms of their configurationality. This leads me to conclude that the main way to distinguish languages in terms of their configurationality is by constraints on annotations, by means of the classification presented in Section 4.4.

4.7 Conclusion and implications for configurationality

This chapter has presented a wide range of data from different languages, showing that there is a large degree of word order variation possible in the world's languages. This builds on the data shown in Chapter 2. I have clarified some of the terminology used in describing word order variation, namely the difference between the terms 'non-configurational', 'discourse configurational' and 'scrambling'. In theoretical terms, a discourse configurational language is a language with an elaborated left periphery structure dependent on the discourse, i.e. on information structure roles. I have shown that some languages that have labelled as non-configurational actually have a discourse configurational structure. Therefore I apply the term discourse configurational to these languages as well.⁷⁰ I assume that scrambling is any kind of information structure induced word order variation that does not result in discourse

⁷⁰It could be the case that actual strictly non-configurational languages (subsumed in the Type 4 category of 'maximally' flat structure languages) exist, but I have not found an example of this.

configurationality, i.e. in obligatory annotations for specific IS roles.

Furthermore, this chapter sets out a space of possibilities for word order types, based on two main factors that play a role in word order: annotations for argument functions and information structure roles. I have shown that there are four different types of languages based on how annotations for AFs and IS roles on c-structure rules are constrained. Type 1 languages, truly (grammatically) configurational languages, have at least one specific annotation for an argument function, and no restrictions on information structure role specification. Type 2 languages, truly discourse configurational languages, have a specific specification for at least one information structure role, and no restrictions on argument function specification. Type 3 languages show a mixture of both Type 1 and Type 2 constraints, in having a specific annotation for at least one argument function and a specific annotation for at least one information structure role. Type 4 languages are maximally flat structure languages in not having any constraints on annotations for either argument functions or information structure roles. My main goal in giving this classification is to set out a space of possibilities in how languages are structured. However, I also discussed which of the types are actually attested in the data discussed in this thesis, to give a better idea of what the classification constitutes. Based on this data, I conclude that Type 1, Type 2 and Type 3 languages are attested, but Type 4 is not. This does not mean that Type 4 languages are not possible or do not exist; they are simply not attested in the languages that are discussed in this thesis.

I assume UDFs for a range of different languages, both for languages that fit into the Type 2 category and also for languages that fit into the Type 1 and Type 3 categories. Crucial is the existence of fronting (or generally, displacement) across clausal boundaries: for this I posit a UDF, following Alsina (2008, 2014) and Asudeh (2011, 2012). For a language such as Tsez, which has been shown not to allow fronting across clausal boundaries, I do not assume a UDF for fronting. Importantly, this shows that UDF cannot be used to distinguish different types of languages in terms of their configurationality; rather, I assume that constraints on annotations as described in the space of possibilities are key in this.

This shows that configurationality can be understood in terms of constraints on annotations, and I have given a way to characterise this. Recall that in principle, I assume a spectrum of configurationality. The space of possibilities shown in Section 4.4 provides a four-way distinction between languages. Within the four types, different degrees of obligatory annotation are possible; for example one language might have only one set position for a specific argument function and another might have two or three. Gradation is thus possible within each of the four types. Moreover, I assume that within these four types, there are subtypes which are dependent on factors other than constraints on annotations. For example, both English and Dutch are Type 1 languages, but word order in Dutch is freer than in English. This becomes evident from scrambling possibilities in Dutch, which I assume not to be relevant to the space of possibilities, as they do not result in set structural positions for information structure roles. Also, the discussion to follow in Chapter 5 on discontinuous expressions and potentially the discussion in Chapter 6 on subject-object asymmetries will show that in order to characterise subtypes of the four different types, one can appeal to other factors, e.g. the existence of discontinuous expressions. However, the four-way distinction provides a good starting point for this, and shows that if we assume that configurationality is defined in terms of actual c-structure configuration, then this four-way distinction provides a useful way of characterising languages in terms of their configurationality.

Chapter 5

Discontinuous Expressions

5.1 Introduction

Besides free word order, another characteristic that has been attributed to traditionally defined non-configurational languages is the occurrence of discontinuous expressions, sometimes also referred to as discontinuous constituents. Hale (1983), who employs the term ‘expressions’ rather than ‘constituents’, discusses Warlpiri discontinuous nominal expressions in which two nominals, one with a noun-like function and one with an adjective-like function, form one semantic unit but are separated in phrase structure. Warlpiri has been said to only have N, V and PV (preverb) lexical categories (Hale, 1983; Hale *et al.*, 1995; Simpson, 1991). For this reason, adjective-like words are assumed to be of the category N, meaning that discontinuous expressions exist of two (or in principle more) nominals. Hale gives the following examples, with the discontinuous parts in bold:¹

(5.1) a. Discontinuous nominal:

Wawirri *kapi-rna* *panti-rni* **yalumpu.**
kangaroo AUX spear-NPAST that
‘I will spear that kangaroo.’

¹In Warlpiri, the absence of case on the final word of a constituent implies absolutive case. It is not marked here, as individual non-case-marked nouns can technically also receive a different case if they are part of a larger constituent; this will be shown later.

b. Contiguous nominal:

Wawirri yalumpu kapi-rna panti-rni.
kangaroo that AUX spear-NPAST
'I will spear that kangaroo.'

(Hale, 1983, p. 6)

In (5.1a), *wawirri* ('kangaroo') is separated from *yalumpu* ('that'). Similar types of discontinuous expressions appear in a number of other Australian languages (among others Jiwarli, Kalkatungu and Wambaya), in Latin and Ancient Greek, and in some Slavic languages such as varieties of Serbo-Croat-Bosnian (SCB), Polish and Russian. However, these languages do not necessarily have the same inventory of lexical categories as Warlpiri, thus a discontinuous expression may also consist of an adjective and a noun, or a determiner and a noun. The key characteristic of discontinuous expressions is that there are two or more parts which form a semantic unit and which are not adjacent to each other in phrase structure.

Discontinuous expressions are interesting because apart from being allowed in certain discourse configurational languages (but not all), they raise a problem for phrase structure constituency. This chapter gives an overview of the types of discontinuity attested and different works in which discontinuity has been addressed. Section 5.2 discusses the different types of discontinuity found cross-linguistically in order to give an overview of the data. Section 5.3 presents a discussion of the type of discontinuous nominal constituent which has been claimed to be a characteristic of non-configurational languages by Hale (1983). Section 5.4 illustrates some of the ways in which discontinuity has been formally defined, and includes a proposal for a formal definition in LFG. Section 5.5 discusses the way in which discontinuous expressions have been analysed in different languages, along with a discussion of the impact of the formal definition from the previous section. Section 5.6 ties together some of the points made in this chapter, in an attempt to show how discontinuity is connected to discourse configurationality (or more traditionally, non-configurationality). The chapter concludes in Section 5.7.

5.2 Types of discontinuity

Cross-linguistically, various types of discontinuity are attested. As mentioned, the type of discontinuity that I am interested in in this chapter is that of discontinuous nominal expressions, in which a determiner or adjective (or adjective-like nominal) is separated from a noun, as this is the type of discontinuity often attributed to discourse (non-configurational) languages. For completeness, I will begin by discussing some of the other kinds of discontinuity. Discontinuity is not only attested with nominals, but also with verbs. An example of this is phrasal verbs (in English, and other languages):

(5.2) a. Discontinuous phrasal verb:

I will **switch** the light **off**.

b. Contiguous phrasal verb:

I will **switch off** the light.

In (5.2a), the main verb *switch* is separated from the verbal particle *off*. Example (5.2b) shows that this split is not obligatory.² A similar type of discontinuity also exists in German (Lüdeling, 2001), Dutch (Booij, 2002) and Swedish (Toivonen, 2003):

(5.3) German:

a. *Er gab den Kampf auf.*
he gave the.ACC fight up
'He gave up the fight.'

b. *Er wird den Kampf aufgeben.*
he will the.ACC fight give up
'He will give up the fight.'

(Forst *et al.* , 2010, p. 229)

²The exception to this seems to be pronominal objects: one can say *I will switch it off* but generally not **I will switch off it*. However, Toivonen (2003) argues, following Neeleman (2002), that this is not a syntactic generalisation, but that pronominal placement in this case is governed by pragmatics.

(5.4) Dutch:

- a. *Hij gaf de strijd op.*
he gave the fight up
'He gave up the fight.'
- b. *Hij zal de strijd opgeven.*
he will the fight give up
'He will give up the fight.'

(5.5) Swedish:

Sofia kastar ofta bort saker.
Sofia throws often away things
'Sofia often throws things away.'

(Toivonen, 2003, p. 11)

In the German and Dutch examples in (5.3) and (5.4), the verbs are separable verbs: these consist of a prefix and a main verb (often spelled as one word), which are separable in certain situations. This is in some ways unlike the English phrasal verbs, as verbs like *switch off* are taken to be two different words. Also, in English the verb and particle always appear in the same order whether they are separated or not (verb > particle), but as one can see from the above examples, in German and Dutch the verb precedes the particle when separated, but vice versa when together. In Swedish, generally the particle follows the head verb, as shown in (5.5).³ In this example, the verb and its particle are separated by an adverb. They may not be separated by the object of the sentence, as the particle always precedes the object (and so does the finite verb in this V2 language) (Toivonen, 2003). Forst *et al.* (2010) argue for a uniform treatment for English phrasal verbs and German separable verbs, as well as for Hungarian separable verbs, referring to all of these as particle verbs.⁴ For the purpose of the

³The exception to this is morphologically derived words, such as past participles, e.g. *utlånada* ('lent out'), in which the particle precedes the main verb.

⁴I have left Hungarian separable verbs out of this discussion, as they do not appear to create discontinuities; whether separated or not, the two different elements appear adjacent to each other in the examples provided in Forst *et al.* (2010). When together the verb and particle form one word with the particle preceding the word, and when separated they form separate words with the particle immediately following the verb.

current discussion, the important characteristic of these types of verbs in English, German and Dutch is that they are allowed to be discontinuous.

Discontinuity of nominal phrases may occur with relative clauses in some languages, in constructions that have been said to involve ‘extraposition’ of the relative clauses:

(5.6) a. Discontinuous DP:

Men entered **who were wearing black suits**.

b. Contiguous DP:

Men who were wearing black suits entered.

(Ojeda, 2006, p. 624)

In (5.6a) the head noun *men* is separated from its relative clause, *who were wearing black suits*. This type of discontinuity is not unique to English. It is attested in German and Dutch as well:

(5.7) a. German:

Er hatte dem Versprechen vertraut, dass sie kommen
he had the.DAT promise believe.PTPC that she come.INF
würde.
would
‘He believed in the promise that she would come.’

(Kiss, 2005, p. 282)

b. Dutch:

Hij is de belofte nagekomen, dat hij vanaf nu op tijd zou
he AUX the promise keep.PTPC that he from now on time would
komen.
come.INF
‘He has kept the promise that he would be on time from now on.’

In both of these sentences, the head noun is separated from its relative clause by a past participle. The alternative structures in which the relative clause immediately follows the

head noun and the verb appears sentence-finally are also grammatical. The conditions in which one or the other variety may occur appear to be semantic, at least in German, according to Kiss (2005), and are not relevant to the present discussion. The discontinuity triggered by separable particles and relative clause extraposition can even be combined to create two discontinuities. An example of this with the Dutch verb *nakomen* ('to keep (a promise)') is the following, with the discontinuous DP in bold and the discontinuous separable verb underlined:

- (5.8) *Hij komt de **belofte** na, dat hij vanaf nu op tijd zal komen.*
 he keep.3SG the promise PART that he from now on time will
 come.INF
 'He is keeping the promise that he will be on time from now on.'

The motivation for the extraposition of relative clauses might be two-fold: triggered by focus (Rochemont & Culicover, 1990; Takami, 1999) and/or by weight of the relative clause compared to the verb (Hawkins, 2004; Wasow, 2002). I will leave aside this issue for now.

Similarly to extraposition of relative clauses, a split between a head noun and its modifying prepositional phrase is attested in certain languages:⁵

- (5.9) a. English:

A number of stories soon appeared **about Watergate**.

(Kirkwood, 1977, p. 55)

- b. German:

*Über den Urlaub habe ich noch **keine Nachricht** empfangen.*
 about the holiday have I yet no message receive.PTPC

'About the vacation I have not received a message yet.'

The English and German examples, as well as in fact the English translation of the German sentence, show that PPs may be separated from the rest of the DP, in either preposed or postposed position.

⁵Discontinuous DPs in German of the kind in (5.9b) are described in detail by De Kuthy (2002).

Discontinuity may also arise when parentheticals intervene, in this case in a VP:

(5.10) John talked, of course, about politics.

(McCawley, 1982, p. 95)

If we assume that *of course* in (5.10) is in fact part of the constituent structure of the sentence, and not simply an interjection of some sort, the VP appears to be discontinuous. Like the other instances of discontinuity illustrated earlier this section, this is an issue for the phrase structure. I have mentioned that the main type of discontinuous expression which is directly relevant to the discussion of configurationality seems to be one in which the determiner or adjective (or adjective-like nominal) is separated from the noun. This type of discontinuity is generally not attested in languages on the configurational end of the spectrum, but with parentheticals intervening it does seem to be possible to some extent. Consider the following example from English:

(5.11) I have a, what do you call it, thing which you can track your position with.

This does not seem like a real discontinuity, however, due to the nature of the phrase *what do you call it*: this is something that is added in spoken discourse, as a type of filler at a point in time when the speaker has forgotten the definition of something. It is prosodically marked by a pause before and after the phrase, marked here by the commas. For this reason, I will not assume that cases like this in English are actual cases of discontinuity.

5.3 Discontinuous nominal phrases

This section investigates discontinuous nominal expressions of the kind discussed by Hale (1983), in several different languages. The purpose of this is two-fold: firstly to give an overview of the phenomenon, and secondly to show what discontinuous nominal phrases have in common, and how they differ, cross-linguistically. The type of nominal discontinuity discussed in this section is somewhat different than the type allowed in English and German, discussed in the previous section. In the examples discussed in the previous section, a relative

clause or a prepositional phrase is separated from the head noun, and the position in which the ‘extraposed’ relative clause or PP may appear in is restricted. The examples discussed in this section are ones in which adjectives or determiners are separated from a noun, and the positions in which the two (or more) parts may appear are much less restricted. Section 5.3.1 discusses nominal discontinuity in Warlpiri and Jiwarli, two Australian languages of the Pama-Nyungan family. Section 5.3.2 discusses discontinuous nominal expressions in Latin, and Section 5.3.3 discusses this phenomenon in two Slavic languages: New-Shtokavian (a variety of Serbo-Croat-Bosnian) and Russian. This is followed by a brief discussion of different types of nominal discontinuity in Section 5.3.4.

5.3.1 Australian languages

Warlpiri

Recall that Warlpiri has been claimed to only have N and V (and PV, Preverb) lexical categories (Hale, 1983; Hale *et al.*, 1995; Simpson, 1991): the categories A and P are not present. The nominal category encompasses a range of different functions: substantives, pronouns, indefinite determiners, attributives and more (Hale *et al.*, 1995).⁶ This means that words which might seem like adjectives in translation are in fact analysed as nominals with an attributive function. Discontinuity of nominal expressions is therefore discontinuity between two different nominals, which together form a semantic constituent.

Discontinuity of nominal expressions is well-described for Warlpiri (Hale (1983), Simpson (1991), Legate (2002) among others). Repeated here is example (5.1):

(5.12) a. Discontinuous nominal:

Wawirri kapi-rna panti-rni yalumpu.
 kangaroo AUX spear-NPAST that
 ‘I will spear that kangaroo’.

⁶The ‘substantive’ use of the N category in Warlpiri marks what is most commonly assumed to be an N cross-linguistically: names of people, objects, places, actions, ideas etc.

b. Contiguous nominal:

Wawirri yalumpu kapi-rna panti-rni.
kangaroo that AUX spear-NPAST
'I will spear that kangaroo'.

(Hale, 1983, p. 6)

As mentioned, the absence of case-marking on *wawirri* ('kangaroo') and *yalumpu* ('that') implies that it is absolutive, forcing the object reading. An example which clearly shows the use of case-marking in discontinuous expressions, as well as an example of discontinuity between a nominal with substantive use and a nominal with attributive use (translated as a noun and an adjective respectively), is given in (5.13):⁷

(5.13) Discontinuous expression:

Kurdu-jarra-rlu ka-pala maliki wajili-pi-nyi wita-jarra-rlu.
child-DU-ERG PRES-3DU.SUBJ dog chase-VR-NPST small-DU-ERG

a. Merged: 'Two small children are chasing the dog.'

b. Unmerged: 'Two children are chasing the dog and they are small.'

(Simpson, 1991, p. 257)

(5.14) Contiguous expression:

Kurdu wita-jarra-rlu ka-pala maliki wajili-pi-nyi
child small-DU-ERG PRES-3DU.SUBJ dog chase-VR-NPAST
'The two small children are chasing the dog.'

(Simpson, 1991, p. 258)

⁷Hale (1981) notes that in a sentence like (5.13), any ordering of the subject head, the subject modifier(s), the verb and object are possible, as long as the AUX appears in second position. It has been shown that in fact the AUX does not have to appear in second position, but it does appear in a fixed structural position.

The example in (5.13) has two readings: one in which the two nominals marked with ergative case are interpreted as one semantic unit (the ‘merged’ reading), and one in which the two nominals form two different units (the ‘unmerged’ reading) (Hale, 1981; Nash, 1986; Simpson, 1991); this is reflected in the translation. The first interpretation is called ‘merged’ because it is equivalent to the interpretation of the contiguous example in (5.14). The merged reading illustrates restrictive modification, and possibly some types of non-restrictive modification as well (Simpson, 1991). The unmerged reading, according to Simpson (1991), covers non-restrictive attribution of properties (such as *the philosophical Greeks*), apposition (*my friend, Mr Leakey*), secondary predication (*they want him alive*), as well as some other types.

Other than the difference in interpretation, we see that the discontinuous expression in (5.13) illustrates a different case-marking pattern than the contiguous one in (5.14). In (5.13) both parts of the discontinuous expressions are case-marked, with ergative case in this case. In (5.14) only the last part of the expression is case-marked with ergative case (*wita-jarra-rlu*), the first part is unmarked (*kurdu*, as opposed to the marked version *kurdu-jarra-rlu*).⁸ Note that number is also only marked once in the contiguous case, but twice in the discontinuous expression. The fact that in a contiguous expression case is only marked once, on the right part of the expression, is evidence that it forms a constituent in phrase structure (Hale *et al.* , 1995).⁹ Another argument is the fact that as a whole, the contiguous expression occurs before the AUX in Warlpiri, as illustrated in (5.14). This is not the case for discontinuous expressions, adding to the evidence that they do not in fact form one phrase structural constituent. A further analysis of this, as well as the two different interpretations of a sentence such as (5.13), will follow in Section 5.5.1.

⁸In principle a lack of case-marking on the final word of a constituent implies absolutive case in Warlpiri. However, the lack of case-marking on *kurdu* (‘child’) in (5.3) does not signal absolutive case, as it is not the last word of the constituent.

⁹As mentioned, Margit Bowler (p.c.) found that at the time of her elicitation in 2013, speakers (of all ages) mark all subphrases with case.

Jiwarli

Another language displaying nominal discontinuity, of the same language family as Warlpiri (Pama-Nyungan, although not closely related within this family), is Jiwarli. Jiwarli ceased to be spoken in 1986, when its last speaker died (Austin & Bresnan, 1996). It is very similar to Warlpiri in many ways, with null anaphora, word order determined by information structure, split ergativity, as well as a lack of adjective and preposition lexical categories (Austin & Bresnan, 1996; Austin, 2001).¹⁰ However, it does not have an AUX-type constituent. Discontinuous nominal phrases are found in Jiwarli:

- (5.15) a. *Kutharra-rru ngunha ngurnta-inha jiluru.*
two.ABS-now that.ABS lie-PRES egg.ABS
'Now those two eggs are lying (there).'
- b. *Karla wantha-nma-rni jarnpa juma.*
fire.ABS give-IMP-hence light.ABS small.ABS
'Give me a small fire light.'

(Austin & Bresnan, 1996, p. 246)

Assuming that Jiwarli only has N and V lexical categories, in example (5.15a) one can see that the two nominals *kutharra* ('two') and *ngunha* ('that') are separated from the nominal *jiluru* ('egg'), by the main verb of the sentence. The same occurs in (5.15b). Notice that there is a difference from Warlpiri (at least as described by Hale *et al.* (1995) and others): two adjacent nominals which are part of the same expressions are both case-marked. This becomes further evident from examples where there is no discontinuity:

- (5.16) *Piji-nha mantharta-nha wanka-rla-rninyja ngulu-pa martaru-lu.*
many-ACC man-ACC live-make-PAST that.ERG-SP gum-ERG
'That gum has cured many people.'

(Austin & Bresnan, 1996, p. 245)

¹⁰Split ergativity manifests itself in Warlpiri and Jiwarli via syncretism according to the animacy of the marked nominal. The first person singular pronoun, and optionally the second person singular pronoun, follow the nominative/accusative pattern (syncretism of subjects of transitive verbs, A, and intransitive verbs, S). Inanimate nominals and demonstratives follow the ergative/absolute pattern (syncretism of subjects of intransitives and objects of transitives, O). All other nominals have three different types of case-marking for A (ergative), S (absolute) and O (accusative) (Austin, 1995, 2001).

Both the subject and object in (5.16) consist of two nominals, and each individual nominal is marked for case. This type of case-marking, along with the lack of an anchor such as AUX in Warlpiri, makes it more difficult to determine phrase structural constituency.

5.3.2 Latin

In Latin, discontinuous nominal phrases are relatively common. According to Spevak (2010), 13% of nominal phrases in the works of Caesar are discontinuous, 24% in Cicero and 4% in Sallust; on average across the three authors this is 12%. Pinkster (2005) claims that Pliny the Elder, who wrote his works approximately a century later than the previous three authors, uses discontinuous nominal expressions about 12 % of the time, a percentage similar to Caesar. This shows that there is variety present across different authors. In general, variety is also attested across different periods: Herman (1985, 2003) shows that there is a decrease in the frequency of discontinuity in Latin over time overall.

Discontinuity in Latin is possible between a noun and a determiner or an adjective:¹¹

- (5.17) ...*a qua ego nullum confiteor aetatis meae*
 from+ABL which.ABL I.NOM no.ACC admit.1SG lifetime.GEN my.GEN
tempus abhorruisse...
 time.ACC deter.INF.PASS
 ‘... of which I admit that at no point in my lifetime I have been deterred...’

(Cic. *Arch.* 1)

- (5.18) *Hae permanserunt aquae dies complures.*
 these.NOM last.3PL.PERF floods.NOM days.ACC several.ACC
 ‘These floods lasted for several days.’

(Caes. *Civ.* 1.50.1, via Spevak (2010, p. 24))

- (5.19) *Super limen autem cavea pendebat aurea...*
 over doorway.ACC but cage.F.NOM hang.IMP.F.3SG golden.F.NOM
 ‘But in the doorway hung a golden cage...’

(Petr. *Sat.* 28, via Bolkestein (2001, p. 254))

¹¹Latin does not have any articles, but it does have demonstratives and quantifiers.

In (5.17), the quantifier *nullum* ('no') is separated from the noun *tempus* ('time'), by the finite verb in the sentence (and the genitive *aetatis meae*, 'of my lifetime', which is part of the nominal expression that is discontinuous). The discontinuous parts have the same case. In (5.18), there is discontinuity between a demonstrative (*hae*, 'these') and a noun (*aquae* 'floods'). The intervening element is the finite verb. In (5.19), the noun *cavea* 'cage' and the adjective *aurea*, 'golden' are separated, again by an intervening finite verb. The intervening element may be something other than a verb, such as an argument:

(5.20) *ternis* *expeditionem* *eam* *mensibus* *confici*
 three.ABL expedition.ACC this.ACC months.ABL accomplish.INF.PASS
 'that this expedition was accomplished in three months'

(Plin. *Nat.* 7.26, via Bolkestein (2001, p. 254))

Here the adjunct *ternis...mensibus* ('three months') is discontinuous, with the subject of the subordinate clause intervening.¹²

5.3.3 Slavic languages

Certain Slavic languages are also said to have discontinuous nominal expressions. This is the case for Serbo-Croat-Bosnian (SCB) (Wilder & Cavar, 1994; Cavar & Seiss, 2011), Russian (Sekerina, 1997, 1999) and Polish (Siewierska, 1984).

New-Shtokavian

Cavar & Seiss (2011) describe discontinuity in New-Shtokavian, a dialect of SCB spoken in Croatia. This is an interesting case, as it involves clitics, and is therefore often analysed either as a purely phonological phenomenon (Radanović-Kocić, 1988, 1996) or as a mixed phonological-syntactic phenomenon as proposed by Schütze (1994) and Halpern (1995), citing work by Zec & Inkelas (1990). Cavar & Seiss (2011) take a fully syntactic approach, following Cavar & Wilder (1992) and Progovac (1996). The reason for this will become clear imminently. Firstly, here are some examples of the discontinuous data:

¹²Example (5.20) contains a so-called *Accusativus cum Infinitivo*-construction (*AcI*) in which a complement clause is formed by a subject in accusative case and verb in infinitive form. As one can see, it is translated with the accusative phrase being the subject and the verb in finite form in English.

(5.21) a. Contiguous constituent:

Novi auti su stigli u skladište.
new cars be.3PL arrive.PTCP in storage
'New cars arrived at the storage.'

b. Discontinuous expression 1:

Novi su auti stigli u skladište.
new be.3PL cars arrive.PTCP in storage
'New cars arrived at the storage.'

c. Discontinuous expression 2:

Novi su danas auti stigli u skladište.
new be.3PL today cars arrive.PTCP in storage
'New cars arrived at the storage today.'

(Cavar & Seiss, 2011, p. 132–133, 137)

Example (5.21a) shows the constituent *novi auti* ('new cars') appearing sentence-initially, with the clitic *su* ('be.3PL') attached to it. The two latter examples display discontinuity of the subject: in (5.21b) the clitic intervenes between the adjective *novi* and the noun *auti*. Some might not call this true discontinuity (but Cavar & Seiss (2011) do analyse it as such), as it is a clitic and not a full phonological word intervening (despite the fact that example (5.21a) without discontinuity is possible). Example (5.21c) shows that full phonological words may also intervene: a clausal adjunct in this case.

The clitic intervening in (5.21b) and (5.21c) is an auxiliary, but pronominal clitics are also found in this dialect; both are referred to as 'clausal clitics'. Cavar & Seiss (2011) show that these clausal clitics appear obligatorily either after a clause-initial syntactic constituent, as in (5.21a), or after the first phonological word, as in (5.21b) and (5.21c). Importantly, they note that the two types of sentences have a different information structure, and claim that this is reflected in the syntactic structure. In a sentence like (5.21a), the first constituent consists of two words, assigned one information structure role as a whole, either topic or contrastive

focus.¹³ In (5.21b) the first word forms a constituent by itself and is assigned its own IS role: contrastive focus. Cavar & Seiss (2011) note that the first part of a discontinuous expression always has a focus function, and that it always has to be prosodically stressed. In general then, the clausal clitic attaches to the first constituent of the sentence and sentences (5.21b) and (5.21c) are both examples of discontinuous expressions.

Discontinuity between a determiner and a noun is also possible:

- (5.22) a. *Taj je čovjek nazvao.*
 this be.3SG man call.PTCP
 ‘This man called.’
- b. *Taj je danas čovjek nazvao.*
 this be.3SG today man call.PTCP
 ‘This man called today.’

(Cavar & Seiss, 2011, p. 137)

In interrogative contexts, syntactic discontinuity is particularly free, and not restricted to being split by clitics or clausal adjuncts:

- (5.23) a. *Kakav je Ivan kupio auto?*
 what kind of be.3SG Ivan buy.PTCP car
 ‘What kind of car did Ivan buy?’
- b. *Kakav je Ivan auto kupio?*
 what kind of be.3SG Ivan car buy.PTCP
 ‘What kind of car did Ivan buy?’

(Cavar & Seiss, 2011, p. 137)

In example (5.23a), the *wh*-word *kakav* (‘what kind of’) is separated from the noun *auto* (‘car’) by a clitic, subject noun and a participle verb. Example (5.23b) shows a variation of this with the participle following *auto*. This type of discontinuity seems rather clearly to be triggered by information structure, resulting in the word with focus IS role (the *wh*-word)

¹³In the feature account of IS roles by Choi (1999), topic and contrastive focus are both +PROM (prominent) information, so the grouping of these two is natural in this sense, as discussed in Chapter 4.

appearing in sentence-initial position. This type of discontinuity is actually fairly common cross-linguistically (in Slavic and non-Slavic languages) (Fanselow & Cavar, 2001, 2002), and is also found in languages which are not usually assumed to have discontinuous nominal expressions, for example French (Obenauer, 1976). An example from French is shown in (5.24):¹⁴

- (5.24) *Combien* *as-tu* *rencontré* *de ministres* *chez Jean-Charles?*
 how much have.2SG-you.2SG meet.PTPC of ministers at Jean-Charles
 ‘How many ministers did you meet at Jean-Charles’ house?’

(cf. Obenauer (1976, p. 4))

Cavar & Seiss (2011) show that the same type of discontinuity with *wh*-phrases is possible within objects of PPs:

- (5.25) *U kakvom* *je* *Ivan živio* *gradu?*
 in what kind of be.3SG Ivan live.PTCP city
 ‘In what kind of city did Ivan live?’

(Cavar & Seiss, 2011, p. 137)

Here the preposition and part of its object (the *wh*-word) appear together clause-initially, and the other part of the prepositional object, *gradu* (‘city’), appears clause-finally, separated from the rest of the PP by a clitic, the subject nominal and a participle. Cavar & Seiss (2011) note that the linear order preposition > object has to be maintained in this type of discontinuity, and examples in the other order are not acceptable.¹⁵ Prepositions are not allowed to stand by themselves, with no part of their object adjacent, as shown by the following examples:

- (5.26) a. **U Ivan nekom gradu živi.*
 in Ivan some city live.3SG
 ‘Ivan lives in some city.’

¹⁴The French quantifier *combien* on its own means ‘how much’, and in combination with *de* (‘of’) it means ‘how many’.

¹⁵A language like Latin, which has similar discontinuity in prepositional phrases, to be fully discussed in a later section, does not have this linear order requirement. Even in a phrase like *magna cum laude* (great.ABL with honour.ABL, ‘with great honour’), part of the object of the prepositional phrase appears before the preposition.

- b. **U* je *nekom gradu* Ivan živio.
 in be.3SG some city Ivan live.PTCP
 ‘Ivan lived in some city.’

(Cavar & Seiss, 2011, p. 138)

The preposition may not appear on its own without its object, even in an example like (5.26b) where it is only a clitic that intervenes. This is true even in cases where the preposition is bi-moraic and stressed, in other words, clearly an independent phonological word. This piece of data from New-Shtokavian is interesting, as it corresponds to a constraint in Latin, stating that a preposition may not be separated from its object (but an object may be discontinuous itself); this will be discussed in more detail in Section 5.5.2.

Russian

Discontinuous nominal expressions occur in Russian in two particular registers: the language of Russian literature and colloquial, spoken Russian (Sekerina, 1999). Here are some examples:¹⁶

- (5.27) a. Discontinuous expression:

Šumnuju kupili naši sosedī sobaku.
 loud.ACC bought our neighbours.NOM dog.ACC
 ‘Our neighbours bought a loud dog.’

- b. Contiguous expression:

Naši sosedī kupili šumnuju sobaku.
 our neighbours.NOM bought loud.ACC dog.ACC
 ‘Our neighbours bought a loud dog.’

(Sekerina, 1999, p. 270)

¹⁶Note that different orders of (5.27b) are allowed, as Russian is considered to be a discourse configurational language (Sekerina, 1999).

(5.28) *I k polosatym bežit on tigrjatam...*
 and to striped.DAT runs he [tiger cubs].DAT
 ‘And he is running to the striped tiger cubs...’

(Kornej Čukovskij, *Doktor Ajbolit*, via Sekerina (1999))

In (5.27a) there is discontinuity between the adjective *šumnuju* (‘loud’) and the noun *sobaku* (‘dog’), both in accusative case. Example (5.28), an example from literary Russian, displays discontinuity of a prepositional object. As in similar examples in New-Shtokavian in the previous section, here there is discontinuity between the two parts of the prepositional object, but the preposition does not stand on its own.

5.3.4 Different types of nominal discontinuity and discussion

According to Siewierska (1988), in both Russian and Polish, discontinuous nominal phrases occur in impromptu speech and in literary prose. The type of discontinuity we have seen in Latin is from a literary register as well, and Gil (1983) claims that nominal discontinuity also appears in colloquial Hebrew. Siewierska (1988) points out that discontinuity in all of these languages is a constrained and marked phenomenon. She contrasts this with the type of nominal discontinuity attested in Australian languages. According to Siewierska, in Russian, Polish, Latin and Hebrew, there are good reasons to posit NPs, PPs and APs. For some Australian languages, however, there have been proposals that there is no such thing as a phrase, and that a sentence consists of a set of unordered words, not grouped in phrases. This has been proposed by Nash (1980) and Hale (1981) for Warlpiri, and represented by the W-star proposal by Hale (1981), addressed in Chapter 2. This proposal assumes that the following rule accounts for Warlpiri phrase structure: $E \rightarrow W^*$, where W^* is a string of words of arbitrary length.¹⁷

A few things need to be said about the W-star proposal. First of all, as mentioned, in Warlpiri there are in fact two reasons to assume that there is such a thing as a nominal

¹⁷IRecall from Chapter 2 that later works propose more elaborate rules for Warlpiri. This will become even clearer when proposals for Warlpiri c-structure are discussed in Chapter 6.

constituent, and that the structure is not simply a string of words. The first reason is the positioning of the AUX, which can follow two nominals mapping to the same f-structure, implying that they are one constituent. Secondly, the case-marking in Warlpiri, as shown, is such that only the final nominal in a contiguous expression is case-marked: this also implies that nominal constituents exist. This is not attested in other Australian languages, such as Jiwari as shown above, or in Kalkatungu or Wambaya. Therefore, even if there are no APs or PPs in Warlpiri (the first because adjective-like elements are assumed to be of nominal nature in Warlpiri, and the latter because there are no prepositions in Warlpiri), there does appear to be some kind of nominal constituent. Following Simpson (1991) this can be expressed by N' , the Warlpiri equivalent of a nominal constituent, which will be discussed in detail in Section 5.5.1).¹⁸ However, it is less clear whether this type of constituent also exists in languages like Jiwari or Kalkatungu, which do not have the same type of constituency evidence as Warlpiri, and might be closer to a truly W-star language. This shows that one cannot simply group Australian languages together in terms of their type of discontinuity.¹⁹

Returning to Siewierska's (1988) claims: she states that in Latin, Russian, Polish, etc. discontinuity is very marked, while in certain Australian languages (though not all) discontinuity is a very common phenomenon. For Latin this has been measured (and it is fairly low, 12% across three different authors, see Section 5.3.2), and for the other languages a similar quantitative approach to discontinuity would be desirable. I leave aside the issue of the extent of use of discontinuity and the potential for different types of discontinuity.

¹⁸The N' constituent in Warlpiri can dominate one or more Ns.

¹⁹Warlpiri, Jiwari and Kalkatungu are all languages of the large Pama-Nyungan language family, but discontinuity is not restricted to this family. Wambaya, which is a Non-Pama-Nyungan language, also has discontinuous expressions (Nordlinger, 1998b). Wambaya, like Warlpiri, has a second position (type) auxiliary element, which can follow a head nominal and its modifiers, implying that there is some kind of nominal constituent in Wambaya as well (Nordlinger & Bresnan, 1996).

5.4 Formal definitions

5.4.1 Previous work

The starting point in providing a formal definition for discontinuity is the definition of discontinuous constituents by Ojeda (2006).²⁰ Ojeda (2006) starts his discussion of discontinuity with the following definition:

(5.29) **Definition 1 of discontinuity:**

Let A , B , C , D be four constituents of some word or phrase.

A is said to be *discontinuous* iff (i) B is a constituent of A , (ii) C is a constituent of A , (iii) D is *not* a constituent of A , and (iv) D is linearly ordered between B and C .

(Ojeda, 2006, p. 624)

The relation ‘is a constituent of’ could be interpreted to mean that B and C are part of the same semantic constituent. Positing that they form a constituent in phrase structure is more problematic, as will be explained shortly. In LFG terms, one can say that B and C are part of the same f-structure, equal to or contained within A ’s f-structure. D is thus locally an unrelated element. A is discontinuous if its subparts (in this case B and C) are not adjacent in phrase structure (with D intervening).

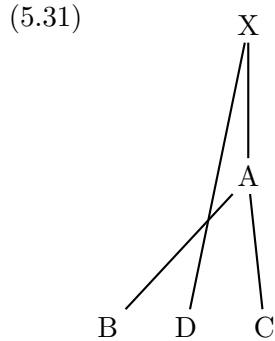
This definition presupposes a syntactic structure with crossing branches, as the discontinuous constituent is in fact described as a constituent in (5.29). I assume the following definition of constituency:

(5.30) A **constituent** is a set of terminal nodes exhaustively dominated by a particular node.

(Carnie, 2012, p. 123)

²⁰The definition discussed in this section refers to discontinuous *constituents* rather than *expressions*; so far I have only talked about discontinuous expressions. They are not the same thing, and as will become clear imminently, the term *expression* is more accurate than the term *constituent*. However, a large part of the literature talks about constituents, therefore this term needs to be discussed.

This definition, along with the definition of discontinuity in (5.29) gives a structure such as the following:



This is an example: other possibilities exist, as the definition in (5.29) does not make any predictions about the constituency of *D*. The important thing is that *D* intervenes between *B* and *C*, and that it is not dominated by the same node.

One has to be careful with positing crossing branches, however. According to Radford (1988), crossing branches are undesirable, as allowing for them makes wrong predictions about cross-linguistic phrase structure. If we allow for crossing branches, then the set of possible phrase structures is much larger than if we do not allow for crossing branches. Crossing branches also allow for phrase structures that are most likely not attested; they overgenerate structures and do not constrain phrase structure. In order to constrain phrase structure cross-linguistically, syntacticians have commonly assumed that crossing branches are ruled out. As defined in Wall (1972), two conditions prohibit crossing branches: the *Exclusivity Condition* and the *Nontangling Condition*. The Exclusivity Condition requires that every two nodes of a tree are ordered in such a way that they are in a relation of either dominance or precedence to each other (but never both). The Nontangling Condition states that if some node in a tree precedes another node, then all the nodes dominated by the former must precede all nodes dominated by the latter (Ojeda, 2006).²¹ Together these two rule out crossing branches. Another way of stating this more simply is by saying that phrase structures are subject to a *No Crossing Branches Constraint*, as for example defined by Radford (1988) (a similar constraint is proposed by Van Valin (2001)):

²¹For a formal mathematical description of these conditions, see Wall (1972) or Partee *et al.* (1990, p. 442).

(5.32) **No Crossing Branches Constraint:**

If one node X precedes another node Y , then X and all descendants of X must precede Y and all descendants of Y (A is a *descendant* of B iff A is dominated by B)
(Radford, 1988, p. 121)

This discussion makes clear that in frameworks that only rely on phrase structure as a grammatical representation, discontinuous constituents and the conditions explained in the previous paragraph which prohibit crossing branches, are in fact incompatible. This problem is solved in the literature by appealing to work originating with Postal (1964), claiming that any analysis involving discontinuous constituents should be replaced by an account only appealing to contiguous constituents. This assumption led to a different definition of discontinuous constituents:

(5.33) **Definition 2 of discontinuity:**

Let A, B, C, D be four constituents of some word or phrase.

Let B, C, D be three constituents of A .

Let B, D, C occur in that linear order.

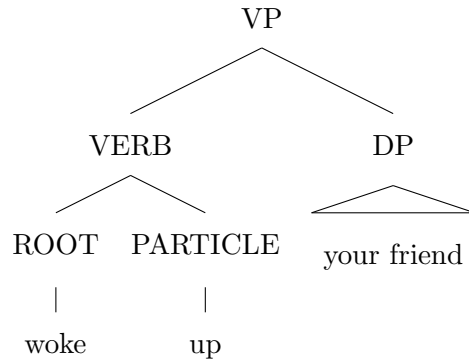
A is discontinuous iff:

A is derived transformationally from a constituent A' such that (i) B is a constituent of A' , (ii) C is a constituent of A' , (iii) B precedes C under A' , and (iv) D is not a constituent of A' .

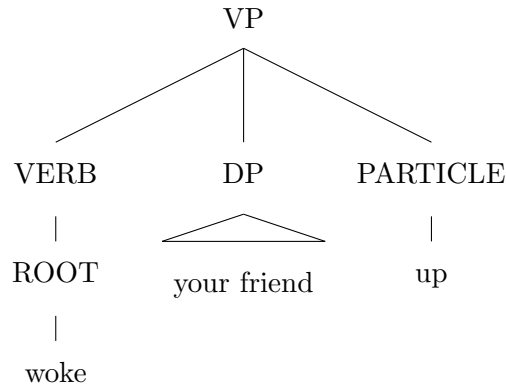
(Postal (1964, p. 67) via Ojeda (2006, p. 625))

Following Ojeda's reasoning, we can explain Postal's definition of discontinuous constituents in (5.33) with the use of the following trees:

(5.34) a.



b.



(Ojeda, 2006, p. 624–625)

It is clear that these trees are related to each other in some way. Following the definition in (5.33), we could say that in (5.34b), *A* is *VP*, *B* is *VERB*, *D* is *DP*, *C* is *PARTICLE*, and we could assume that the *VP* in (5.34b), *A*, is derived transformationally from the *VP* in (5.34a), which is *A'*.²²

This illustration shows that the definition of discontinuity in (5.33) is only possible with the use of transformations in the phrase structure in which one structure is derived from the other. Under this definition, there are no real discontinuous constituents (and thereby also no crossing branches). This contrasts with the definition of (5.29), which posits truly discontinuous constituents, but with the consequence of having crossing branches. I assume along with Radford (1988) that crossing branches are undesirable, following standard practice in syntactic theory. This calls into question the status of discontinuous ‘constituents’

²²Note that this definition and explanation by Postal (1964) means that in (5.34a), the *DP* is *not* a constituent of *VP*.

as actual constituents. Following the definition of constituent in (5.30), the assumption that branches may not cross, as well as my assumption that transformations are not allowed to change tree structure, the conclusion one comes to is that discontinuous constituents are not real constituents in phrase structure. Rather, I will refer to them as discontinuous expressions, as this term makes less strong assumptions about phrase structure. In this I follow Hale (1983) and Simpson (1991), who refer to discontinuous expressions in Warlpiri (rather than constituents). The two parts of a discontinuous expression form a semantic unit, but are not grouped together in phrase structure. In the next section I propose a definition of discontinuous expressions in LFG, which overcomes some of the problems discussed in this section.

5.4.2 Discontinuity in LFG

LFG, with its Correspondence Architecture, is able to separate the phrase structural configuration of the discontinuous expression from its grammatical function and semantic content. LFG is thus able to capture the fact that a discontinuous expression contributes the same functional information, as well as semantic information, as a contiguous constituent, but without positing the same phrase structure for both. The key to representing discontinuity is thus in the c- to f-structure mapping. I define discontinuous expression in the following way:

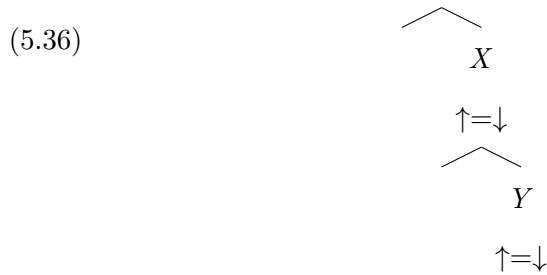
(5.35) **Discontinuous expressions:**

Given two c-structure constituents X and Y , $X \neq Y$,

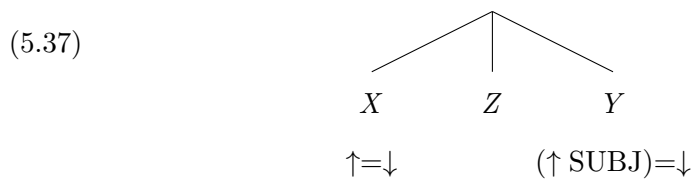
$\{X, Y\}$ form a discontinuous expression iff:

- i. Neither X nor Y dominate the other; and
- ii. X and Y map to the same f-structure; and
- iii. The yield of X is not string adjacent to the yield of Y ; and
- iv. The constituent(s) that intervene(s) between X and Y do not map to the same f-structure as X and Y ; and
- v. Both X and Y are non-projecting nodes.

There are thus five conditions on discontinuity. Condition (i) rules out the following structure as being discontinuous:



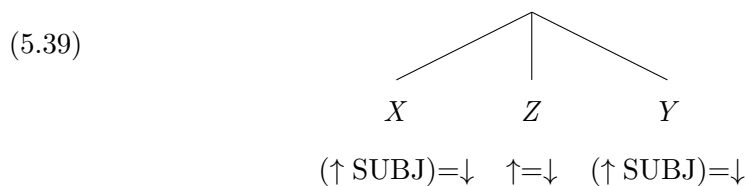
In this structure X and Y map to the same f-structure, but X dominates Y : this structure is thus ruled out by condition (i). Here is an illustration of how condition (ii) constrains discontinuity, first of a structure that is *not* a discontinuous expression:



In this structure the yield of X is not string adjacent to the yield of Y (or in other words, the edges of X and Y do not coincide), but they do not map to the same f-structure, so this is not a discontinuous expression. Condition (iii) speaks for itself, as we need something to intervene to have discontinuity:

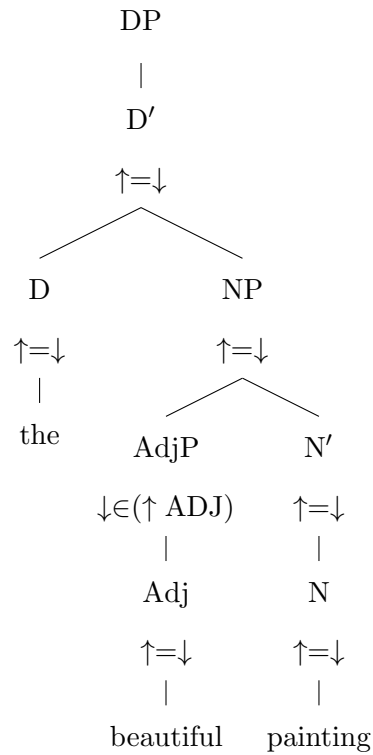


For obvious reasons, this is not a discontinuous structure. An example of a discontinuous structure is the following, satisfying condition (iv) as well:



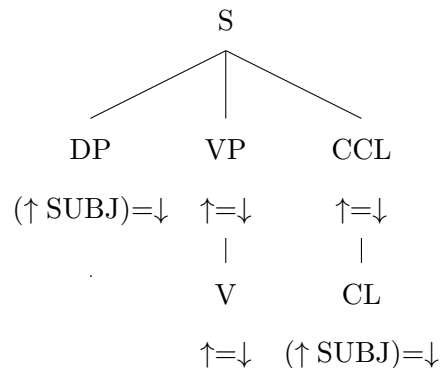
Here X and Y fulfill the first four conditions listed in (5.35). Condition (v) is necessary to account for examples such as the following:

(5.40)



The relation between D and N' (and D and N) fulfill conditions (i)-(iv), but we would not want to classify this relation as discontinuous: a modifier of the constituent as a whole intervenes, not an 'alien' element. Condition (v) is posited to prevent this: two parts of a discontinuous expression must be non-projecting nodes. A non-projecting node is a node which does not project a maximal projection, i.e. a non-projecting word X^0 (as for example proposed by Toivonen (2003) in her analysis of Swedish particles) or a maximal projection itself, i.e. XP. The final condition also has consequences for the treatment of clitics. Consider the following schematic example, following the analysis of clitics and clitic clusters by Bögel *et al.* (2010):

(5.41)



In Bögel *et al.*'s (2010) analysis, CCL stands for 'clausally-scoped clitic cluster', and its clausal-level functional scope is shown by the annotation $\uparrow=\downarrow$ (one could also imagine a structure in which there is no CCL level and CL is an immediate daughter of S). Based on conditions (i)-(iv), one would expect that the overt subject and the subject clitic (attached to the verb phonologically) form a discontinuous expression. Condition (v) also does not seem to rule out discontinuity, as it seems that CL is a non-projecting category, assuming that CL does not project a CCL. Considering that a CCL can contain multiple CLs, this seems like a valid assumption. It is thus a consequence of the definition of discontinuity in (5.35) that the DP and CL form a discontinuous expression in this example. I leave this issue open.

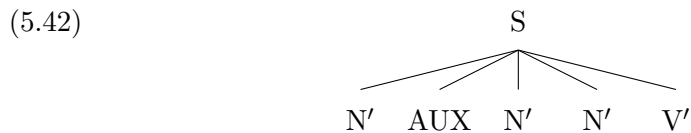
We now have a formal definition of discontinuous expressions. It captures the fact that two or more parts of a discontinuous expression are separated in c-structure, but that they correspond to the same f-structure. This leads to discontinuous expressions having the same semantic interpretation as contiguous expressions, via f- to s-structure mapping. LFG thus provides a neat way of avoiding crossing branches, while ensuring that discontinuous and contiguous expressions receive the same semantic interpretation. This is made possible by the use of annotations to signal c- to f-structure mappings. Importantly, discontinuous expressions do not actually form a single c-structural constituent, based on the definition in (5.30). They are, however, semantic units in some way, and they also correspond to the same functional structure. However, c-structure constituency is determined by other factors such as constituency tests, and discontinuous expressions fail these tests, simply because the different parts are not string adjacent.

5.5 Analysis of discontinuity in LFG

5.5.1 Warlpiri

Building on the discussion of Warlpiri discontinuity in Section 5.3.1, this section focuses on the analysis of Warlpiri discontinuity in LFG, by Simpson (1991). With regards to overall Warlpiri c-structure, in previous work different phrase structures have been proposed for

Warlpiri by different researchers, some of which have been discussed Chapter 2 and some of which will be discussed in more detail in Chapter 6, the chapter focusing on binding in Warlpiri. There are proposals from constraint-based theories (Simpson (1991, 2007) and Austin & Bresnan (1996) in LFG (Donohue & Sag, 1999) in HPSG, from the Minimalist Program (Legate, 2002), as well as those not tied to a specific framework (Hale (1983) and his dual structure approach, the Pronominal Argument Hypothesis (Jelinek, 1984; Baker, 1996a) and Secondary Predicate Approach (Speas, 1990; Baker, 2001)). In this section I present the analysis of Warlpiri discontinuous expressions by Simpson (1991). The flat structure that Simpson (1991) proposes for Warlpiri sentences is as follows:



In this example structure the only thing that is set is the obligatory position of the auxiliary (AUX), if present, in a fixed position in the initial part of the sentence.²³ Grammatical functions (GFs) are assigned freely to the nominal constituents. I believe that in general, a more hierarchical structure as she proposes in Simpson (2007) more accurately captures certain word order facts, but for an account of discontinuity this does not make a difference, as shown by the definition of discontinuity I provide in (5.35).²⁴ In this section I present Simpson's (1991) analysis of Warlpiri discontinuity, therefore I do this by means of the flat structure she proposes in (5.42).

As we have seen, Warlpiri only has N and V (and PV) lexical categories. Simpson proposes that an expansion of N, N', is needed to account for sequences of nominals. Unlike a DP or an NP in a language like English, the N' projection has a flat structure with any number of Ns as its daughters.²⁵ Note that N' in Warlpiri is a non-projecting node. According to Simpson

²³This is an example to illustrate the type of structure we are talking about, rather than being either the structure of a specific example, or a more abstract structure representing Warlpiri c-structure rules. Simpson (1991) provides more in-depth discussion of the exact c-structure rules assumed in this approach.

²⁴Crucially, in both types of structure (hierarchical and flat), there is free assignment of grammatical functions.

²⁵Nordlinger (1998a) notes that there are a few problems with the flat structure for nominal constituents proposed by Simpson (1991). She argues that firstly, it is not compatible with any type of X-bar theory, and

(1991), a constituent consisting of more than one nominal, which has been shown to appear before the AUX as a whole in some of the examples illustrated above, is thus a single N' node, with however many daughters as there are nominals. An N' can also dominate a single N, if the constituent consists of one nominal only. A discontinuous expression consists of multiple N's. This is illustrated in the c-structure in (5.44), for the merged interpretation of example (5.43). I also adopt Simpson's (1991) use of V' to denote a maximal verbal projection. I discuss the merged interpretation before discussing the unmerged interpretation, as I assume the former to be a case of discontinuity, but the latter one not.²⁶

(5.43) *Kurdu-ngku ka wajili-pi-nyi wita-ngku.*
 child-ERG PRES chase-VR-PRES small-ERG

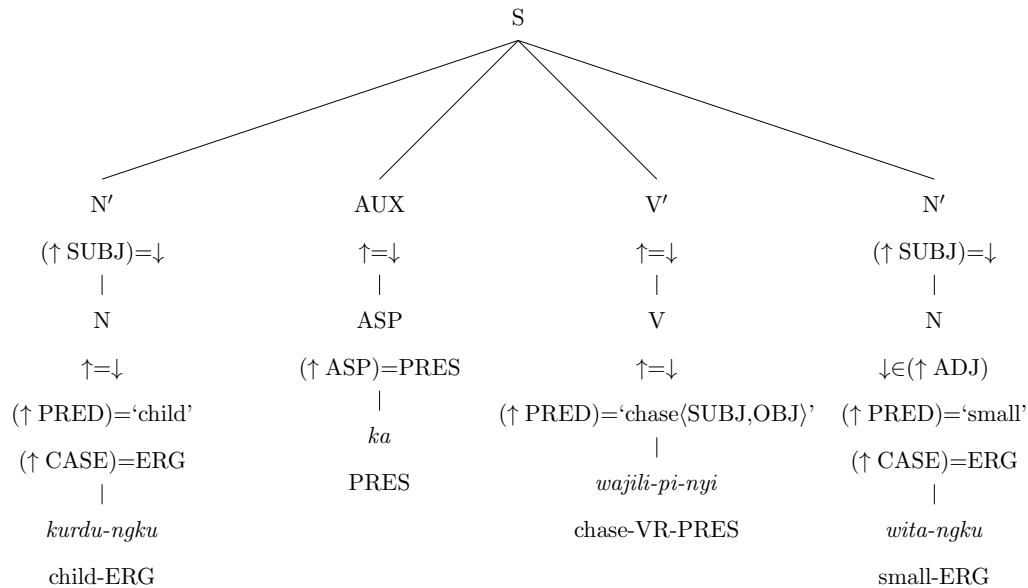
- a. Merged: 'The small child is chasing it.'
- b. Unmerged: 'The child is chasing it and it (the child) is small.'

(Simpson, 1991, p. 282)

secondly it does not extend to other Australian languages. Rather she proposes that Warlpiri has the same nominal structure as the one she proposes generally for Australian languages, namely a structure in which each N is dominated by its own N'; these N's are then allowed to group into larger nominal constituents by positing additional levels of N'. For more details, see her work.

²⁶Under the assumption that both *kurdu-ngku* ('child') and *wita-ngku* ('small') are nominals, one could argue that instead of *wita-ngku* modifying *kurdu-ngku*, modification could happen the other way around, with an interpretation of example (5.43) along the lines of 'The child-like small thing is chasing it' (as a merged interpretation). In her discussion of discontinuous expressions, Simpson (1991) simply assumes that it is *wita-ngku* ('small') that modifies *kurdu-ngku* ('child'), without going into a discussion on why this is the case. It does not appear to be the case that in principle, it is always the second part of the discontinuous expression that is the modifier of the first part. The reason to assume this is Simpson's (1991) postulation of a flat c-structure for Warlpiri, in which grammatical functions are assigned freely to the N' constituents, which does not encode any linear precedence constraints (other than the position of the AUX).

(5.44) C-structure for (5.43), merged interpretation:



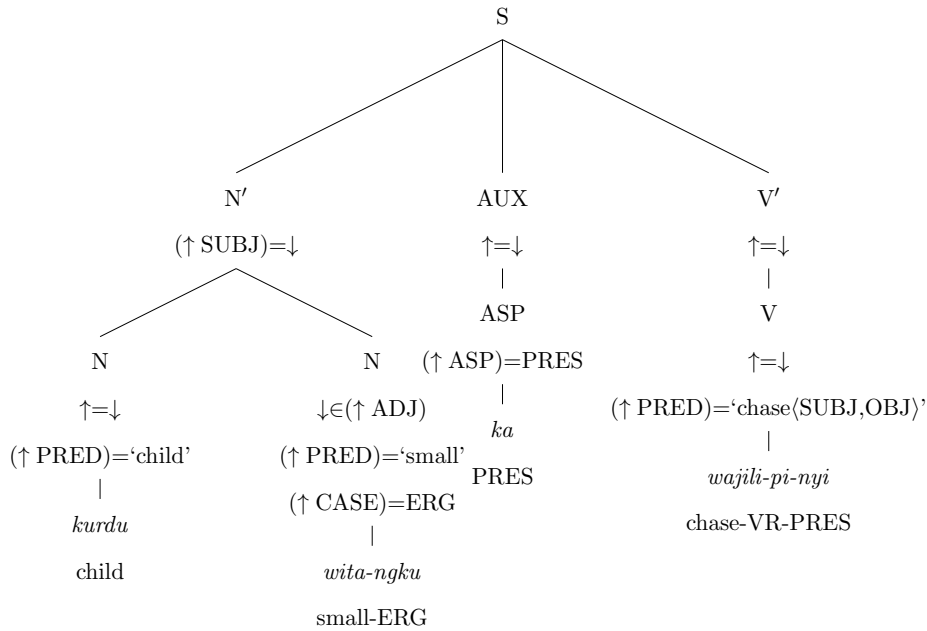
(cf. Simpson (1991, p. 283))

The two parts of the discontinuous expression are both N, and both dominated by an N' node. Both N' constituents have the same annotation, $(\uparrow \text{SUBJ}) = \downarrow$ in this case, and crucially, \uparrow refers to the same f-structure in both cases. The merged interpretation thus falls under the definition of discontinuous expressions as shown in (5.35) in Section 5.4.2: both parts map to the same f-structure.²⁷ I will show later that this is not the case for the unmerged interpretation. Note that if the nominal with substantive use and the adjunct (attributive use) appear adjacent to each other, preceding the AUX, then there is only one N' constituent, only marked for case once (at least in most of the Warlpiri data in the literature). This type of constituent has a merged interpretation:

²⁷Note that the fact that *kurdu-ngku* ('child') and *wita-ngku* ('small') in (5.44) map to the same f-structure is dependent on the annotations. Both parts of the discontinuous expression have the annotation $(\uparrow \text{SUBJ}) = \downarrow$, thus mapping to the same f-structure. However, one could imagine a situation in which the second N', *wita-ngku* ('small'), bears the annotation $\downarrow \in (\uparrow \text{SUBJ ADJ})$ (and the N node would bear the $\uparrow = \downarrow$ annotation). This would give the same overall f-structure for the sentence, but it would mean that the two N's do not map to the same f-structure: the first maps to the f-structure of the SUBJ, the second to the f-structure of the ADJ of the SUBJ. However, I follow Simpson's (1991)'s account, which assumes structures such as in (5.44), with the annotations as shown. Under her assumptions, the two parts of a discontinuous expression map to the same f-structure.

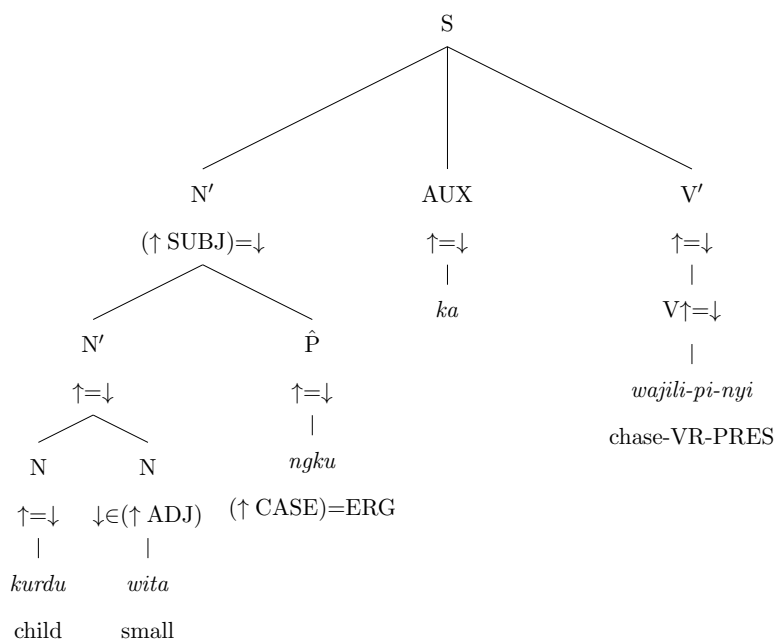
- (5.45) *Kurdu wita-ngku ka wajili-pi-nyi*
 child small-ERG PRES chase-VR-PRES
 ‘The small child is chasing it.’

(5.46) C-structure for (5.45):



In this particular structure, the second element of the first nominal (*wita-ngku*, ‘small’) is case-marked as ergative: it is not so clear how this case would be projected up to N' , so that the whole phrase receives ergative case. In the current analysis, only the modifier of the head of the N' has case. Alternative to the structure in (5.46) following Simpson (1991), one could imagine a structure in which the case-marker *-ngku* is a non-projecting category and forms its own node, following Spencer (2005) and Otaguro (2006). In this type of analysis, there would be an extra node for the case clitic (in a simplified tree):

(5.47)

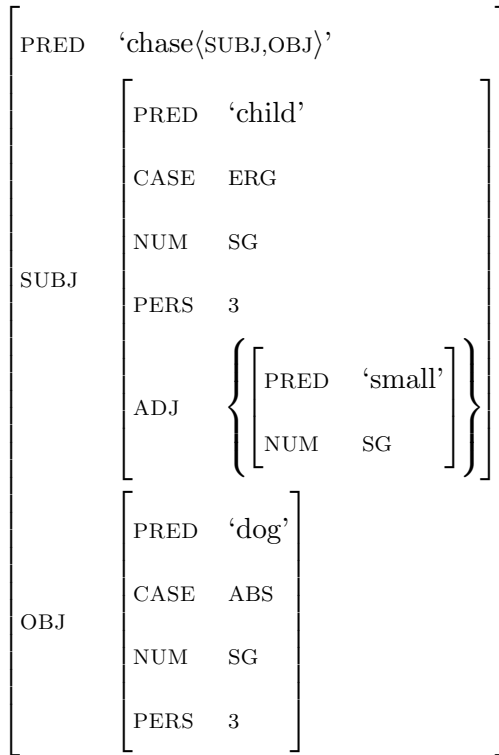


In this tree, following the analysis of case-markers as non-projecting postpositions by Spencer (2005) and Otoguro (2006), the non-projecting postposition provides the case for the whole (highest) N'. Via c- to f-structure mapping, the ergative case ends up being specified for the head of the N' (but not for the modifier which is in the adjunct set). Having case specified for the head but not the modifier, rather than the other way around, seems more desirable. I therefore assume the structure in (5.47), although I still make reference to Simpson's (1991) analysis in places in the remainder of this chapter.

Importantly, both the merged interpretation of (5.43) and example (5.45) are subsumed by the same f-structure, which is as follows (Bresnan, 1982; Simpson & Bresnan, 1983; Simpson, 1991):²⁸

²⁸The only difference between the merged interpretation of (5.43) and example (5.45) is the case specification for the modifier (assuming an analysis with case appearing as a non-projecting postposition): the former has ergative case specification in the f-structure of the modifier, but the latter does not. I leave this specification out completely in the structure in (5.48) for this reason; it subsumes the f-structures of both examples.

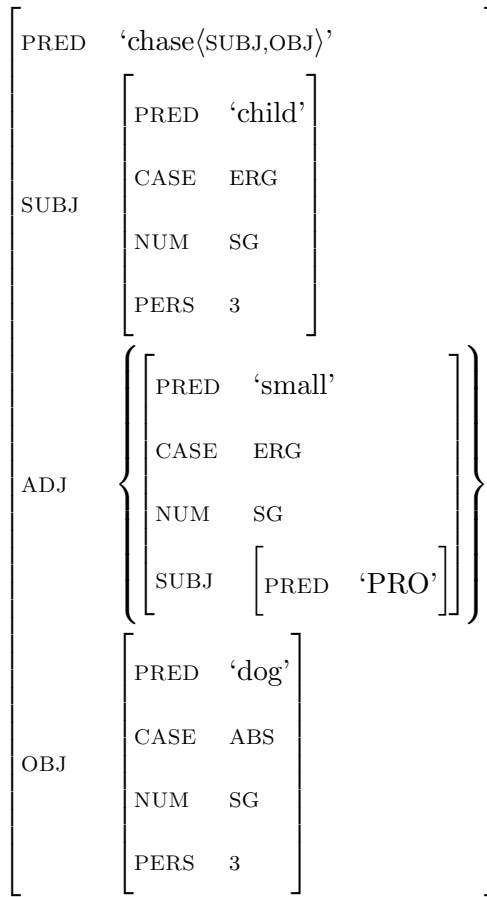
(5.48) F-structure for the merged interpretation of (5.43):



In (5.48) the adjunct appears inside the f-structure of the subject: they are part of the same f-structural constituent. The fact that the f-structure for the contiguous case and the merged interpretation of the discontinuous case are largely the same (other than the case-marking specification) means that they will receive the same semantic analysis, via the f- to s-structure mapping (which is not described here). The difference between the two appears to be information structural, a discussion of which lies beyond the scope of this chapter.

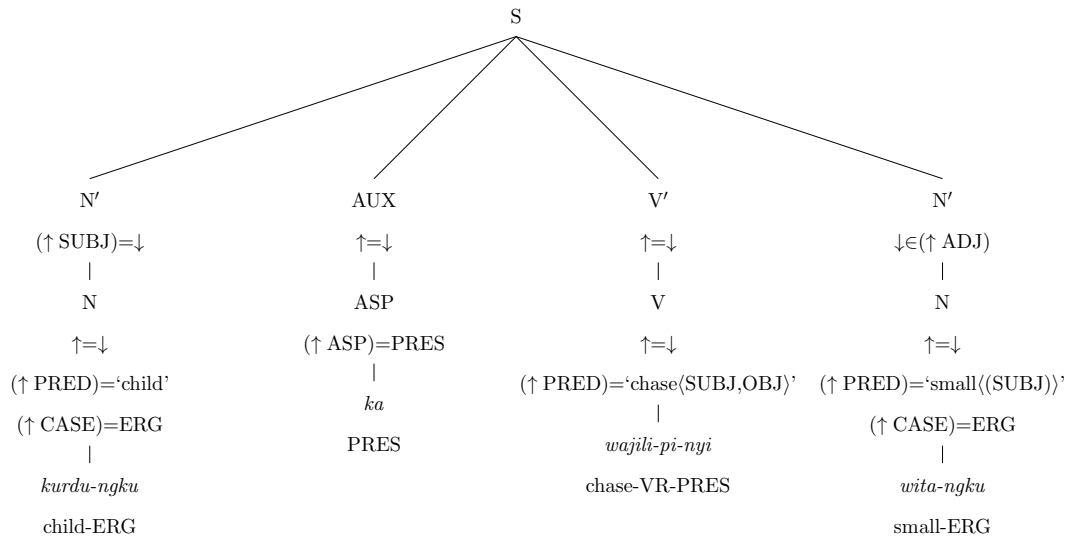
Simpson (1991) distinguishes the unmerged interpretation from the merged one by providing a different type of f-structure. The adjunct, instead of appearing as an ADJ inside the f-structure of a nominal (the subject in the case of the example just presented), appears as an ADJ on the clausal level. The f-structure of the unmerged interpretation of (5.43) is as follows:

(5.49) F-structure for the unmerged interpretation of (5.13):



As Simpson (1991) suggests, the ADJ appears outside the SUBJ f-structure, and the subject of the ADJ is identified as a PRO-form (this is reflected in the translation of this reading, *The child is chasing the dog and it (the child) is small*). Unlike the f-structure, the c-structure for this unmerged interpretation is the same as for the unmerged interpretation, but the annotations are different:

(5.50) C-structure for (5.43), unmerged interpretation:



(Simplified version of Simpson (1991, p. 283))

Compare this to the structure in (5.44) for the merged interpretation. Note that according to the definition of discontinuous expressions in (5.35), the two parts meaning ‘child’ and ‘small’ in (5.50) are not a discontinuous expression, because they do not map to the same f-structure; they form separate f-structures. The second N', *wita-ngku* (‘small’) in (5.50) is now a sentential adjunct. This is different for the merged reading, as shown in (5.44). Therefore I only take the merged interpretation into account as a case of real discontinuity.

5.5.2 Latin

Snijders (2012b) provides an LFG analysis of constraints on discontinuity in Latin, and follows Simpson’s (1991) treatment of discontinuous expressions, by analysing the multiple elements of a discontinuous expressions as mapping to the same f-structure, in line with the definition of discontinuity in Section 5.4.2.²⁹ The LFG analysis of these constraints is discussed here for several reasons. Firstly, it shows that discontinuity is not unconstrained, and illustrates a way of dealing with constraints on the c-structure. Secondly, it addresses a constraint on PPs that seems valid for other languages as well. Finally and importantly,

²⁹Snijders (2012b) builds on Snijders (2012a), which in turn is the basis for the discussion in this section.

it discusses head optionality, which I deem to be crucial in the discussion of discontinuous expressions.

Snijders's (2012b) work on constraints is based on findings by Bolkestein (2001), who discusses tendencies and absolute constraints on discontinuity in Latin. According to Bolkestein there are three absolute constraints on Latin discontinuity, which are not dependent on time period or author (per time period and author there are other constraints, which will not be discussed here).³⁰ Two of them are addressed here, which are as follows (Bolkestein, 2001):^{31,32}

- (5.51) 1. No discontinuity between a preposition and the nominal phrase it governs (yet the nominal phrase may be internally discontinuous, meaning that part of the expression may be separated from the preposition).
2. No discontinuous adjunct genitive phrases on the nominal level.³³

Snijders (2012b) provides an LFG analysis for these constraints; the key is in the obligatoriness of nodes and in constraints on annotations on c-structure rules.

Before discussing the analysis of these two constraints in more detail, I note that Snijders (2012b) assumes a flat c-structure for Latin, following the analysis for Warlpiri by Simpson (1991). As discussed in Chapter 4, it is very likely that Latin has a more articulated left periphery, especially if we assume that it is a Type 2 language. For an analysis of discontinuity, the type of c-structure should not make any difference, as the definition of discontinuity

³⁰To arrive at her constraints, Bolkestein (2001) looks at 59 examples of discontinuous nominal expressions from one of the speeches by Cicero (*Pro Murena*) and a few of his letters, and at 83 examples in the later works of Pliny the Elder and Petronius. Bolkestein found that the constraints on discontinuous expressions in Cicero are different than those in Pliny the Elder and Petronius, but this might be due to time period, style of writing, or sample size.

³¹The third constraint states that 'adjuncts may not be discontinuous if the intervening element itself is an adjunct'. Snijders (2012b) shows that this is problematic for LFG, due to the fact that adjuncts are not unique grammatical functions in LFG. The subparts of a discontinuous expressions need to map to the same f-structure, but there appears no way of constraining this for adjuncts which end up in a set.

³²I have chosen to refer to 'nominal phrases' here, as the term noun phrase (or NP) makes assumptions about internal structure, i.e. that it adheres to X-bar theory.

³³Discontinuous genitive phrases which are arguments of a nominal head are very rare, but possible (Bolkestein, 2001).

largely relies on linear order and f-structure mappings, not on structural configuration (with the exception that a mother and daughter cannot form a discontinuous expression, and discontinuity only applies to non-projecting nodes). An initial attempt at a flat structure for Latin, and a ‘working structure’ for now, is the following:³⁴

(5.52) Provisional S-rule for Latin:

$$S \rightarrow \{ V \mid N' \mid PP \}^*$$

$$\uparrow=\downarrow \quad (\uparrow \text{GF})=\downarrow \quad (\uparrow \{ \text{OBL}_\theta | \text{ADJ} \in \})=\downarrow$$

(5.53) $\text{GF} \equiv \{ \text{SUBJ} \mid \text{OBJ} \mid \text{OBJ}_\theta \mid \text{OBL}_\theta \mid \text{ADJ} \in \}$

The metacategory for the rule in (5.52) is shown in (5.53). Rule (5.52) allows a flat structure, which may include any number of verbs, prepositional phrases and nominal constituents (N'). I assume that nominal constituents in Latin have a flat structure, and I use the notation N' to denote this, following Simpson’s (1991) analysis of flat nominal constituents in Warlpiri. I want to avoid confusion with the term NP, which is assumed to adhere to X-bar theory. Importantly, N' is a non-projecting category. The constituents in (5.52) may be ordered in any way, and the Kleene star notation shows that there may be zero or more of each of the constituents. PPs can either have an OBL_θ grammatical function, or be an adjunct. N' s can have a range of grammatical functions.

First constraint: analysis of discontinuous PPs

As discussed in Snijders (2012b), the first constraint states that a preposition may not be completely separated from its object. Note that this constraint appears to be operative in other languages as well, as shown in the data from New-Shtokavian and Russian in Section 5.3.3. This is strong evidence in favour of a PP constituent in these languages. This constraint challenges LFG’s concept of Economy of Expression. Recall the definition of Economy of Expression, repeated from (3.4):

³⁴For simplicity, I have left out potential adverbs, auxiliaries, and the grammatical functions COMP and XCOMP.

(5.54) **Economy of Expression:**

All syntactic phrase structure nodes are optional and are not used unless required by independent principles (completeness, coherence, semantic expressivity).

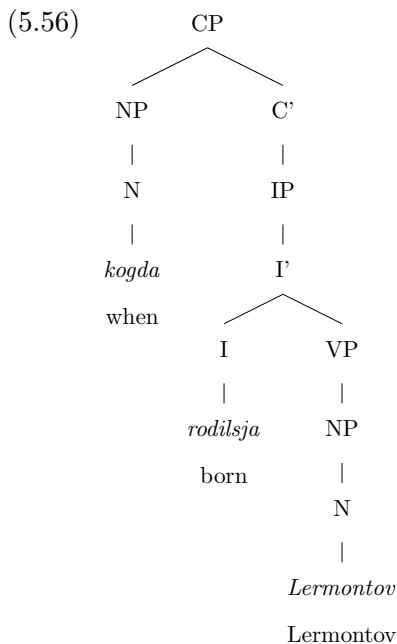
(Bresnan, 2001, p. 91)

This principle makes all nodes, complements and heads, optional, giving the c-structure a great degree of freedom.

Economy of Expression works well for many cases which are problematic for transformational theories, for example when a maximal XP phrase does not dominate a corresponding X head.³⁵ This has been referred to as ‘head movement’, or, within LFG, ‘variable head positioning’ (Bresnan, 2001; Dalrymple, 2001), as briefly described in Section 4.4.1. An example of this is the following from Russian:

(5.55) *Kogda rodilsja Lermontov?*
when born Lermontov
‘When was Lermontov born?’

(King, 1995, p. 172)



³⁵In transformational theories, an X head always has to project an XP category, and vice versa an XP category always has to contain an X head.

In this example the VP does not dominate a V; the VP is ‘headless’ (locally). Instead the verb occurs in I position. The verb is not where one might expect it to be according to strict headedness principles in X-bar theory, but it is present in c-structure, hence the term ‘variable head positioning’. The head of the VP which is positioned in I is a so-called ‘extended’ head (Bresnan, 2001). The concept ‘extended head’ was introduced to ensure that X-bar theory and its principle of endocentricity are retained: by assuming extended heads, every category has a head which determines its properties.³⁶ The definition of external heads is as follows:

(5.57) **Extended heads:**

X is an extended head of *Y* if either (1) *X* is the *X'* categorial head of *Y* (the traditional case), or (2) *Y* lacks a categorial head but *X* is the closest element higher up in the tree that functions like the f-structure head of *Y*.

(Bresnan, 2001, p. 132)

Example (5.55) clearly falls under the second part of the definition. With a slightly modified definition of endocentricity, stating that endocentricity implies that every lexical category has an extended head (Bresnan, 2001, p.133), we can see that endocentricity and X-bar theory can be maintained, and can account for constructions like the one in (5.55). Economy of Expression takes care of the fact that the VP lacks a (local) head, without positing an empty node.³⁷

However, Economy of Expression makes incorrect predictions about discontinuity. Optionality of nodes implies that discontinuity is allowed in an unconstrained fashion. This is a problem in general (and for all languages), and it is specifically a problem for the PP constraint in Latin (and the other languages which appear to have the same constraint), as there is no way to make sure that the preposition appears adjacent to its object. The f-structure constraint of Completeness can account for the fact that a preposition has an object somewhere, but it does not say anything about the position of this object in c-structure. As long

³⁶Endocentricity is not universal, as shown by the existence of exocentric S in some languages.

³⁷Alternatives to X-bar theory have also been proposed to account for this type of data within the LFG framework, e.g. by Zaenen & Kaplan (1995).

as the object is annotated in the right way, Completeness will not be violated.

The way this is solved in Snijders (2012b) is to posit that it is possible to mark exceptions to Economy of Expression. This can be achieved by introducing a new notation to mark obligatoriness of nodes. I choose the notation $\langle X \rangle$ with angle brackets to show this obligatoriness. The PP rule for Latin then looks as follows:³⁸

$$(5.58) \quad \text{PP} \rightarrow \text{P} \ , \ \langle \text{N}' \rangle \\ \uparrow=\downarrow \quad (\uparrow \text{OBJ}) =\downarrow$$

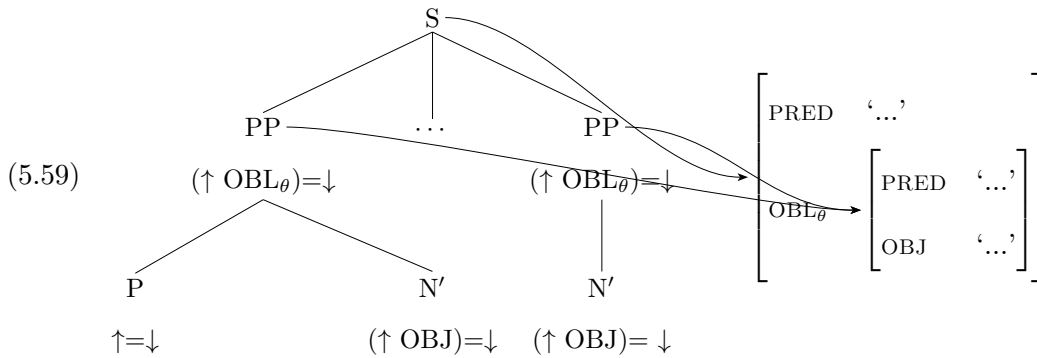
In this PP rule for Latin, the N' is obligatory, but the P is not, to allow for discontinuity.

Importantly, in Latin the P may in principle appear either before or after its complement: Latin has predominantly prepositions, but it also has two postpositions (*causa*, ‘because of, due to’ and *gratia*, ‘thanks to’). This is represented by the Shuffle operator (comma) in the PP rule in (5.58). The Shuffle operator ensures that the nodes appearing before and after it can appear in any order relative to each other. Unfortunately Bolkestein (2001) and Spevak (2010) do not discuss any postpositions in relation to discontinuous expressions; they only discuss prepositional phrases. Therefore it is uncertain whether they are subject to the same constraint. To keep the option open of discontinuous objects of both prepositional and postpositional phrases, the rule in (5.58) is assumed to only make predictions about adjacency, not about linear order.

A discontinuous PP can consist of two (or potentially even more) PPs, one of which contains a P (and obligatorily adjacent N' annotated as its OBJ), the other(s) of which are headless. This means that all parts of the prepositional semantic unit can be annotated to map to the same f-structure, for example $(\uparrow\text{OBL}_\theta) = \downarrow$.³⁹ A schematic illustration of this is as follows:

³⁸The notation with angle brackets, $\langle X \rangle$, looks similar to the notation with round brackets, (X) , which shows optionality, but the two express opposite relations. An alternative to the rule in (5.58) is to make the P optional (with round bracket notation) and not mark the N' . I prefer the rule in (5.58) over the alternative, as I assume that in principle nodes are optional, in line with the other c-structure rules shown in this thesis. This makes the notation less messy. Moreover, it makes the exception to EoE explicit, which seems especially important in a language that has fairly few restrictions on word order.

³⁹The alternative is to assume that a discontinuous prepositional phrase consists of one PP only, with an obligatory P head, and to have any other part of the discontinuous expression appearing as a N' annotated as



Both PPs map to the OBL_θ f-structure.

The claim that one can posit exceptions to Economy of Expression can extend to the analysis of other linguistic phenomena which are problematic for Economy of Expression. An example of this is clitic doubling in varieties of Spanish, as discussed by Bresnan (2001, p. 147-148), and shown in (5.60c):⁴⁰

- (5.60) a. *Juan vió a Pedro.*
 Juan saw P Pedro
 ‘Juan saw Pedro.’
- b. *Juan lo vió.*
 Juan CLITIC.ACC.SG saw
 ‘Juan saw him.’
- c. *Juan lo vió a Pedro.*
 Juan CLITIC.ACC.SG saw P Pedro
 ‘Juan saw Pedro.’

(Bresnan, 2001, p. 330-332)

Example (5.60a) shows a sentence with a prepositional object, example (5.60b) shows a sentence with a clitic object, and example (5.60c) shows a sentence where both are present.

being the object of the PP. For example, the PP could be annotated with $(\uparrow OBL_\theta)=\downarrow$, and an N' , separated from the PP in phrase structure, could be annotated with $(\uparrow OBL_\theta OBJ)=\downarrow$. This would require a revision of the PP rule in (5.58). One reason to choose this approach is to make sure there are no PPs that do not contain P heads. However, in LFG this is not problematic. I choose the approach with multiple PPs as it provides a cleaner, more straightforward account of the data. Moreover, a PP and an N' with the annotations just described would not in fact map to the same f-structure, and therefore not form a discontinuous expression according to the definition in (5.35).

⁴⁰In Spanish, the verb *ver*, ‘to see’, requires a prepositional object with the preposition *a* if the object is animate.

The clitic (assuming it forms its own c-structure node) and the prepositional object cannot both contribute a PRED value for the OBJ of the verb, so under Economy of Expression, one would expect the clitic object to be pruned away, unless one assumes that somehow the clitic contributes its own degree of semantic expressivity. I assume that marked exceptions to Economy of Expression could in principle be used to take care of a case like this, but I leave the details of this open for further research.

Second constraint: no genitive adjuncts on nominal level

The second constraint found by Bolkestein (2001) states that adjunct genitive phrases on the nominal level (as modifiers of a nominal head) are not allowed to be discontinuous. The way to analyse a constraint like this is to annotate the c-structure rule in the right way. One could envision a rule for the N' constituent as shown in (5.61):

$$(5.61) \quad N' \rightarrow \text{Head} / \text{Nonhead}$$

$$(5.62) \quad \text{GF} \equiv \{ \text{OBL}_\theta \mid \text{ADJ} \in \}$$

$$(5.63) \quad \text{Nonhead} \equiv \{ \text{D} \mid \text{A} \mid \text{PP} \mid \text{N}' \}^*$$

$$\uparrow=\downarrow \quad \downarrow \in (\uparrow \text{ADJ}) \quad (\uparrow \text{GF}) = \downarrow \quad (\uparrow \text{GF}) = \downarrow$$

$$(5.64) \quad \text{Head} \equiv \{ \text{N} \mid \varepsilon \mid \varepsilon \}$$

$$\uparrow=\downarrow \quad (\uparrow \text{PRED}) = \text{'PRO'} \quad \sim [(\text{ADJ} \in \uparrow)$$

$$\quad (\uparrow \text{CASE}) = \text{GEN}]$$

In the rule in (5.61), the head and nonheads (which also includes the potential c-structure cohead D, which does not contribute its own PRED value) are separated for clarity. Nonhead and Head are metacategories, and are specified in (5.63) and (5.64) respectively. In (5.61), the Ignore operator (the forward slash) is used to signal that any number of Nonheads may appear preceding or following the Head (Dalrymple, 2001).⁴¹ In the specification of the metacategory

⁴¹The Ignore operator in $XP \rightarrow X1 X2 X3 / \text{Cat}$ is a simpler way to express the following regular expression: $XP \rightarrow \text{Cat}^* X1 \text{Cat}^* X2 \text{Cat}^* X3 \text{Cat}^*$. The Ignore operator thus lets XP expand into X1 X2 X3 (in that order), ignoring occurrences of Cat (Dalrymple, 2001). The Kleene star in the regular expression shows that we technically do not need a Kleene star in the rule in (5.63); I am retaining it here for clarity, however.

Nonhead in (5.63), the Kleene star shows that there may be any number of Ds, As, PPs or N's on the nominal level, and these may appear in any order. In the specification of Head in (5.64) the lack of Kleene star shows that the presence of one of the three options is obligatory. Two of the three options have an 'empty' element ε in c-structure. Importantly, the ε is an abbreviation, and does not license an empty category.

In the case of the first option for Head, N is present, the N' contains a noun and possibly Ds, As, PPs or other N's (for example genitive arguments on the nominal level). When this N head appears inside the overarching N' constituent, discontinuity is not allowed, since a head (with a PRED value, provided by N) can appear only in an f-structure nominal constituent. The reason for this is that a PRED value for a nominal constituent (in f-structure) can only be specified once (in discontinuous nominal constituents, all separated parts will be dominated by an N', but there can be only one N head specifying the PRED).

The second option, ε with annotation (\uparrow PRED)='PRO', takes care of the case in which the nominal phrase consists of a bare determiner or a bare adjective, which is not uncommon in Latin. The epsilon here is thus a dummy N head with a pronominal semantics. The fact that the head provides a PRED value ensures that there is no discontinuity. These two options thus disallow discontinuity.

The last option, the empty epsilon not specified for PRED and specified for not being both an adjunct and having genitive case, allows for discontinuity in cases other than genitive adjuncts. The reason for this is that the N' constituent requires a PRED value for its head (the D is also a head, but contributes a SPEC value, not a PRED value), but the PRED is not specified by ε . The annotation on this ε , namely that it is a nominal which is not both an adjunct and has genitive case, allows discontinuity except for genitive adjuncts modifying nominals. In other words, when the last option out of the three is chosen, discontinuity is allowed, and this shows how head optionality is crucial in (at least some types of) discontinuity. With the last option, there is no head and no PRED value. Choosing the last option allows

a situation in which an N' constituent only consists of an adjective, which is not modifying anything locally. The PRED value of its f-structural head will be contributed by another N' that is separated from it in c-structure (but crucially has the same case-marking). This rule thus neatly ensures that discontinuity is only allowed for a very specific group of nominal phrases. This rule for N' in Latin thus provides an illustration of how one type of method of analysing constraints on discontinuous expressions.

5.5.3 Slavic discontinuity and clitics

The data from New-Shtokavian presented in Section 5.3.3 by Cavar & Seiss (2011) shows that discontinuity exists in this dialect of SCB, both with only a clitic intervening, and with a clitic and an adjunct intervening. This section discusses their analysis. Example (5.21) and (5.23) with fronted *wh*-words are repeated here:

(5.65) a. Contiguous constituent:

Novi auti su stigli u skladište.
 new cars be.3PL arrive.PTCP in storage
 'New cars arrived at the storage.'

b. Discontinuous expression 1:

Novi su auti stigli u skladište.
 new be.3PL cars arrive.PTCP in storage
 'New cars arrived at the storage.'

c. Discontinuous expression 2:

Novi su danas auti stigli u skladište.
 new be.3PL today cars arrive.PTCP in storage
 'New cars arrived at the storage today.'

(Cavar & Seiss, 2011, p. 132–133, 137)

(5.66) a. *Kakav je Ivan kupio auto?*
 what kind of be.3SG Ivan buy.PTCP car
 'What kind of car did Ivan buy?'

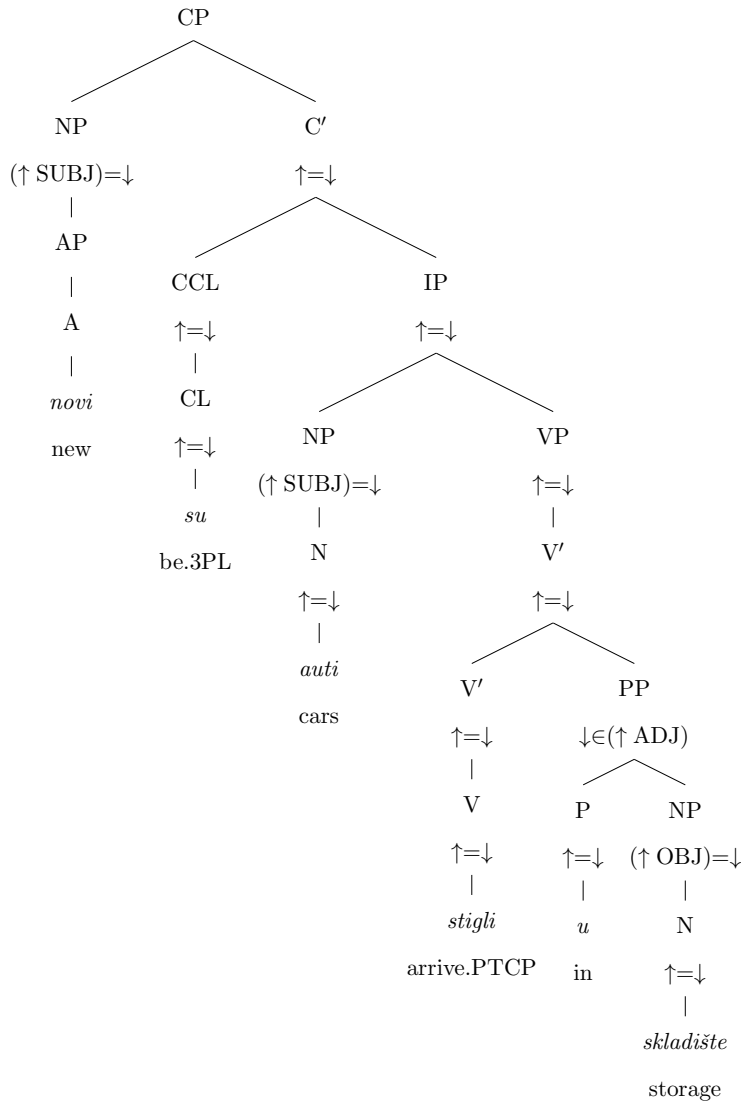
- b. *Kakav je Ivan auto kupio?*
 what kind of be.3SG Ivan car buy.PTCP
 ‘What kind of car did Ivan buy?’

(Cavar & Seiss, 2011, p. 137)

As described in Section 5.3.3, Cavar & Seiss (2011) show that discontinuous expressions have a different information structure than contiguous constituents. In their analysis this is reflected in the syntax: they claim that a clitic follows the first constituent in the sentence, and this first constituent receives the IS role of topic or contrastive focus (both +PROM); in the case of a discontinuous expression the first constituent may only have contrastive focus function. In example (5.65a), *novi* (‘new’) and *auti* (‘cars’) thus form a c-structure constituent, but in (5.65b) and (5.65c) they are separate constituents. This is in accordance with the assumptions about discontinuity in this chapter. They also state their assumption that the two parts of the discontinuous expression unite in f-structure. The way that this is achieved in their account is to have the noun contribute the PRED value for the discontinuous expression, and have a headless NP for the adjective/demonstrative that it is discontinuous with. This adjective/demonstrative does not provide its own PRED for the full NP (an adjective does have a PRED value for the adjective itself), thereby avoiding PRED clash. Normally, a nominalised adjective would have a PRED = ‘PRO’ value for the full NP, but this is lacking in a discontinuous expression of this kind.

An important question is what the consequence of the formal definition of discontinuity presented in (5.35) in Section 5.4.2 is for discontinuity caused by clitics. This is thus especially relevant for an example such as (5.65b), in which only a clitic intervenes. Cavar & Seiss (2011) analyse clitics following Bögel *et al.* (2010). This results in the following structure for example (5.65b), following Cavar & Seiss’s (2011) general analysis of New-shrokanian c-structure:

(5.67) C-structure for (5.65b):



According to the five conditions on discontinuity proposed in (5.35), the subject in this example is discontinuous: the two NPs map to the same f-structure, they are non-projecting nodes, and the intervening element maps to a different f-structure. Assigning separate nodes to clitics (or clitic clusters) thus entails that clitics may intervene in discontinuous expressions. An analysis where clitics are part of the word they attach to syntactically would not label the example in (5.65b) as discontinuous. Clitics can thus create real discontinuity under my assumptions.

Russian, which due to space constraints cannot be discussed in full detail, seems at first glance to be similar to New-Shtokavian in terms of its discontinuity. In the Russian data seen in Section 5.3.3, one of the elements of a discontinuous expression is fronted to initial position, appearing before the finite verb, while the other part appears towards the end of the sentence. The discontinuous data from (5.27) is repeated here:

(5.68) a. Discontinuous expression:

Šumnuju kupili naši sosedī sobaku.
 loud.ACC bought our neighbours.NOM dog.ACC
 ‘Our neighbours bought a loud dog.’

b. Contiguous expression:

Naši sosedī kupili šumnuju sobaku.
 our neighbours.NOM bought loud.ACC dog.ACC
 ‘Our neighbours bought a loud dog.’

(Sekerina, 1999, p. 270)

Here the verb seems to act as an anchor, just like the clitic in the New-Shtokavian data. According to King (1995), the constituent appearing before this finite verb (in I) receives a topic or focus function. It therefore seems that the difference between (5.68a) and (5.68b) is similar to that posited by Cavar & Seiss (2011) (but less constrained in terms of what can intervene), although one would need to do a more in-depth investigation into the information structure of discontinuous expressions in Russian in order to firmly establish this. It does, however, seem plausible that an analysis of discontinuity like the one provided by Cavar & Seiss (2011) for New-Shtokavian can be extended to Russian.

5.5.4 Germanic discontinuous nominal expressions

It has been established that the ‘classic’ examples of discontinuity in Latin and Warlpiri conform to my LFG definition of discontinuity, as well as discontinuity caused by clitics, as for example in New-Shtokavian. As discussed in Section 5.2, there are also other types of

discontinuity, namely those attested in English and Dutch. The question remains whether these types of discontinuities fit into the definition proposed above. The following are examples of the two kinds of nominal discontinuity attested in English (as well as in Dutch and German):

(5.69) a. Relative clause extraposition:

The man entered **who I met yesterday**.

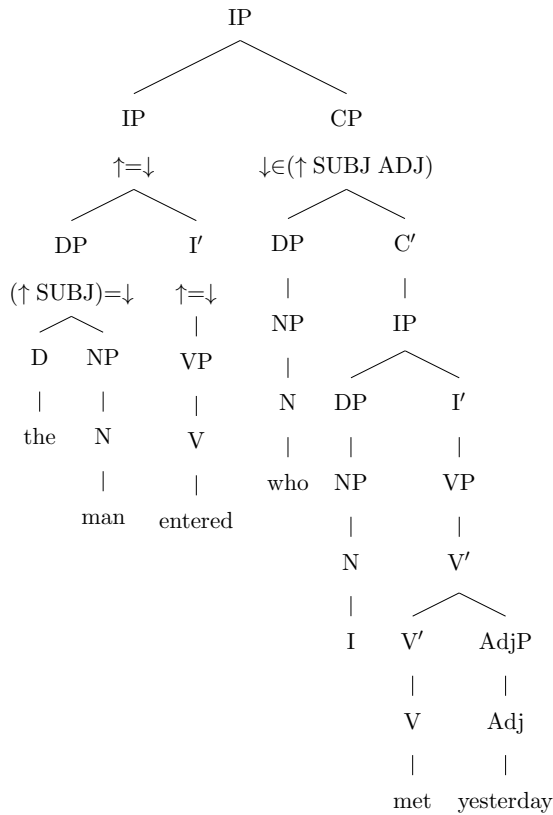
b. DP-PP separation:

Some books were written **about this topic**.

In (5.69a), the two parts that are separated are a DP (*the man*) and a CP (*who I met yesterday*). In (5.69b) the separation is between an DP and a PP. All of these are non-projecting nodes, satisfying condition (v) of the definition of discontinuity, stating that all parts of a discontinuous expression must be non-projecting nodes.

I propose the following analysis for relative clause extraposition, with a CP extraposed after DP and VP, here shown with partial annotation (only for the main three constituents):

(5.70) C-structure for (5.69a):

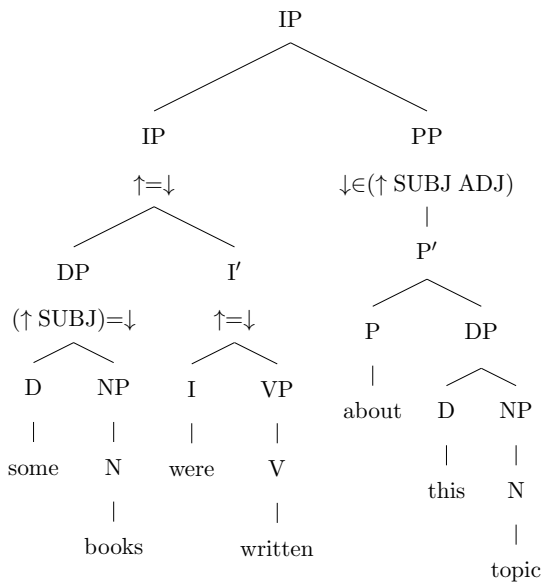


The CP is a daughter of the root node (IP) and is adjoined to the IP which constitutes *The man entered*. The extraposed CP does not appear inside the VP: it fails a number of constituency tests, e.g. one cannot say **entered who I met yesterday, the man did* (VP-preposing test, discussed in Van Valin (2001, p. 113)). This shows that in example (5.69a) the V and the CP are not part of the same constituent. Therefore I propose an analysis in which the CP is adjoined to the IP clause. Looking at the partial annotations, we can see that DP and CP do not map to the same f-structure: the DP maps to the SUBJ structure, and the CP maps to the ADJ set inside the SUBJ. This shows that this structure fails condition (ii). This means that this type of example does not adhere to the LFG definition of discontinuity. We could devise a structure in which the structure in (5.70) does fulfill condition (ii), namely by letting the CP be dominated by another DP, which is annotated with $(\uparrow \text{SUBJ}) = \downarrow$. However, I do not make this assumption, as it goes against common assumptions about English c-structure. Specifically, a phrase such as *who I met yesterday* is assumed to be a CP in English commonly,

not a DP. Syntactically there is no reason to introduce a DP node dominating the CP here. Moreover, having a c-structure such as the one in (5.70) provides a neat way to distinguish the type of discontinuity attested in a language like Warlpiri and a language like English. English-type discontinuity is restricted to only a number of constructions, and the position that the fronted or extraposed constituent can move to is also very restricted. Warlpiri-type discontinuity is not restricted in the same way, and structure (and annotations) is one way to flag this.

The same issue arises with the examples in (5.69b), in which a DP and PP are separated but form a semantic constituent. For this I propose a c-structure analogous to the one for relative clause extraposition:

(5.71) C-structure for (5.69b):



This structure, again with partial annotations, is very similar to (5.70) in terms of its annotations. The DP and PP do not map to the same f-structure. One could let them map to the same f-structure, by positing an extra DP to dominate PP, but as for the previous example, it goes against assumptions about English c-structure: *about this topic* is a PP, not a DP, and there is no good syntactic reason to introduce a DP dominating the PP here. Also, having a structure as in (5.71) (with its annotations) again provides a way to mark English-type

discontinuity as different from Warlpiri-type discontinuity. This example (with its current structure and annotations) thus also does not adhere to the LFG definition shown in Section 5.4.2. The extraposition constructions involving relative clauses and DP-PP separation in Dutch and German are similar to the English examples, so I assume that similar analyses can be posited for the constructions in these languages.

This shows that a consequence of my definition of discontinuity is that the type of nominal discontinuity attested in languages like English, Dutch and German do not fall under the same category as the type of discontinuity attested in Latin, Warlpiri and certain Slavic languages. The definition thus draws a clear line between discontinuity of the type associated with non-configurational (discourse configurational) languages, which I assume to be ‘true’ discontinuity, and of the type attested in languages on the grammatically configurational end of the spectrum. I will refer to the latter type as ‘restricted XP separation’ to signal that this type of separation (whether fronted or extraposed) is restricted to only a number of constructions, and moreover, that the position that the fronted or extraposed constituent can move to is also restricted. Discontinuity according to the definition in (5.35) is assumed to be much freer, although as seen in Section 5.5.2, there appear to be some minor constraints on this type of discontinuity as well.

5.6 Free word order and discontinuous expressions: inherently connected?

As seen in the previous section, the definition of discontinuity proposed in Section 5.4.2 captures the discontinuous nominal phrases in Warlpiri, Latin and some Slavic languages as ‘true’ discontinuous expressions. The ‘restricted XP separation’ in the Germanic languages is not discontinuity according to the definition. The definition thus makes a neat distinction between discontinuous expressions that are traditionally associated with (traditional) non-configurational languages, and other types of c-structure separation. I base the discussion in this section on this observation; here I am concerned with the issue of whether and how free

word order and discontinuous expressions (of the type adhering to the definition in Section 5.4.2) are related to each other. The reason that this discussion is especially important is the fact that some languages which are analysed as discourse configurational like Warlpiri and Latin, do not have ‘true’ discontinuous expressions of the kind attested in these languages, for example Hungarian and Japanese.

Summarising the facts, true discontinuous expressions only occur on the discourse configurational end of the spectrum, in Type 2 languages (and in principle also in Type 4 languages). However, the question is why they do not occur in all languages in this group. The connection between free word order in terms of argument functions and fairly unconstrained discontinuous expressions seems intuitive: not having specific grammatical functions tied to specific structural positions makes it possible to have two parts of one grammatical function appearing in different places. Recall the constraints on annotations in Type 2 languages, repeated in Table 5.1.

Table 5.1: Constraints on annotation for a Type 2 language

Argument Functions	Information Structure Roles
Non-specific (for all AFs): (\uparrow AF) = \downarrow	Specific (for at least one ISR) e.g. $\downarrow_{\sigma_i} \in (\uparrow_{\sigma_i}$ TOPIC)

Discontinuous expressions are two or more parts of the same grammatical function, which AFs fall under. The non-specific annotation on all AFs in Type 2 languages thus fits in well with this. In fact, I hypothesise that free assignment of grammatical functions, as shown in Table 5.1, is a prerequisite for true discontinuous expressions to occur.

Now let us look at the information structural side of this issue. For New-Shtokavian, as mentioned, Cavar & Seiss (2011) claim that information structure plays a role in discontinuity. In the examples in (5.21) in Section 5.3.3, repeated in (5.65) in Section 5.5.3, an initial contiguous constituent consisting of an adjective and a noun receives one information structure role, namely either topic or contrastive focus (these are both +PROM according to the feature system that I). In both cases of discontinuity (one in which only a clitic intervenes, and one

in which both a clitic and an adverb intervene) the initial word, the adjective, is said to have a contrastive focus function, and it is always stressed. There is thus a difference between contiguous and discontinuous expressions: in a contiguous expression (forming a constituent in c-structure) the whole expression receives the same information structure role, whereas in a discontinuous expression different subparts may receive different information structure roles. This is in line with work on Latin information structure, as discussed by De Jong (1986). He proposes the following schema for information structural tendencies in discontinuous nominal phrases in Latin:⁴²

(5.72)	NP part 1	intervening element	NP part 2
	emphasis (+focality)	-focality	+focality

The term ‘focality’ is focus as defined by Functional Grammar: the part of the sentence which conveys the most informative part of that sentence (Dik, 1997a,b). There is a distinction between emphasis and focality: emphasis is not necessarily the most informative part of the phrase, but it is (implicitly or explicitly) contrastive or surprising information. This seems to imply that the first part of a discontinuous expression has a contrastive focus function, the intervening element has a topic function, and the second part of the discontinuous expression has a non-contrastive focus function. De Jong (1986) claims that this is in line with the tendency of contrastive elements to precede non-contrastive elements, and of old information to precede new information. The theory of information structure that I have employed in this thesis does not distinguish between contrastive and non-contrastive focus (with the inventory I assume), but it could easily be augmented to do so. By doing this, one can see that the two parts of discontinuous expressions have different information structure roles, just like in the New-Shtokavian data. This seems to show that information structure in languages that allow for discontinuous expressions is more fine-grained than in languages that do not allow them, in being able to express different IS roles for parts of the same f-structural constituent.

The idea that two parts of a discontinuous expression always have different information structural content is contradicted by some of the work in Schultze-Berndt & Simard (2012),

⁴²These are tendencies, and counterexamples are attested (De Jong, 1986).

who specifically focus on the information structural aspect of discontinuous expressions. They discuss information structural constraints on discontinuous expressions in Jaminjung, of the Mirndi family spoken in Australia. They first address the issue that information structure in discontinuous expressions in Australian languages has not been discussed to great extent. Schultze-Berndt & Simard (2012) state that these types of constraints have been widely discussed for discontinuity in certain European languages (e.g. Siewierska (1984); Fanselow (1988); Dahlstrom (1987); Reinholtz (1999); De Kuthy (2002); Fanselow & Cavar (2002); Fanselow & Féry (2006); Kazenin (2009)), but that this type of discussion is lacking for Australian languages. Schultze-Berndt & Simard (2012) claim that the discussion on discontinuity in Australian languages has largely focused on the unconstrainedness of these discontinuous expressions (related to the labelling of these languages as non-configurational), leaving things like information structure out of the picture. An exception to this is McGregor (1997), who discusses the discourse contexts of discontinuous expressions in Gooniyandi, an Australian language from the small Bunuban language family. McGregor shows that information structure is in fact key in the analysis of discontinuous expressions in this language. Schultze-Berndt & Simard (2012) build on this work, and in their investigation of discontinuous expressions in Jaminjung show that discontinuous expressions in this language are triggered either by contrastive argument focus (of the kind discussed in the previous paragraph, and widely discussed in the literature on discontinuity), or by sentence focus. Schultze-Berndt & Simard (2012) claim that the latter type of information structural context has not been widely acknowledged in the literature, and importantly, it shows that it is not always the case that two parts of a discontinuous expression have different information structure values. Important in their approach is the role of prosody, which is used to mark information structure.⁴³ For clarity, here I present Jaminjung examples for each of these two types of discontinuity that Schultze-Berndt & Simard (2012) describe:⁴⁴

⁴³Prosody is generally important in an account of information structure (Mycock & Lowe, 2013). It falls outside the scope of this chapter, but in future work on the information structural aspect of discontinuity in LFG it will need to be considered.

⁴⁴In this example, ^ marks focal accent. The *broлга*, like the emu, is a type of bird, and is the referent of the subject of 'have' which can be filled in from the context (Schultze-Berndt & Simard, 2012).

(5.73) Contrastive argument focus:

[^]*jirrama* *ganuny-ma-ya* *jarlig*, *gumurrinyji* *orait* [^]*bardawurru*
 two 3SG.3DU-have-PRES child emu all.right many
gana-ma-ya ...*jarlig*
 3SG.3DU-have-PRES child
 ‘She (the broлга) has two children. The emu, all right, she has many, children that is.’

(Schultze-Berndt & Simard, 2012, p. 1035)

Here the first part of the discontinuous expression (in preverbal position), *jirrama* (‘two’) is the modifier of the second part (in postverbal position), *jarlig* (‘child’). Schultze-Berndt & Simard (2012) claim that the order modifier > head in discontinuous expressions is most common. It is clear that there is contrastive focus here: there is a contrast between *jirrama* (‘two’) and *bardawurru* (‘many’) in the following clause. Both are marked with focus intonation. Note that this focus intonation is lacking on the second part of the discontinuous expression (*jarlig*, ‘child’). The second type of discontinuous expression, which shows that sentence focus also triggers discontinuity, is exemplified in (5.74).⁴⁵

(5.74) Sentence focus:

jarndu *ga-ram* *luba* *mangurn=mij!*
 boat 3SG-come-PRES big white.person=COM
 ‘There comes a big boat with white people!’

(Schultze-Berndt & Simard, 2012, p. 1041)

As in the example of contrastive argument focus, the two parts of the discontinuous expression appear immediately preverbally and postverbally, but there is no contrastive context. Moreover, according to Schultze-Berndt & Simard (2012) all words in the example (5.74) receive a prosodic prominence, not only the first part of the discontinuous expression. This implies that there is a case of sentence focus, and that prosodically one cannot distinguish between the

⁴⁵Notice that the comitative case on the final word, *mangurn* (‘white person’), is treated as a clitic in Schultze-Berndt & Simard’s (2012) work.

two parts of the discontinuous expression. Rather, Schultze-Berndt & Simard (2012) argue that nominal discontinuity is used as a device to mark sentence focus, without going into further detail of how this can be achieved. In any case, from their work we can conclude two things. First, as already established, it is apparent that information structure plays a role in discontinuity. Secondly, it is not necessarily the case that discontinuous expressions are used when the speaker wants to give distinct information structure values to the two (or more) parts. Information structure (and prosody) of discontinuous expressions is a topic that requires more work cross-linguistically, and I leave this open for further research.

Turning back to how discontinuous expressions fit into the configurationality debate, a crucial observation is that in order to have discontinuous expressions, one requires c-structure heads to be optional, which was addressed in Section 5.5.2 on Latin. Head optionality makes it possible, for example, for an adjective to be separated from the noun that it modifies: both the adjective and the noun form a similar type of constituent and both map to the same f-structure, but the constituent that contains the adjective does not require a head. Head optionality thus seems to be the dividing factor between discourse configurational languages that allow for true discontinuous expressions, and ones that do not.

Assuming that the constraints on annotations are the same for both discourse configurational languages with discontinuous expressions and those without, one comes to the conclusion that languages with discontinuous expressions are a subset of discourse configurational languages, with head optionality in their c-structure rules. In other words, the constraints on constraints on c-structure are the same for all discourse configurational languages: we have seen that for argument functions (and also for adjuncts) there are no syntactic constraints (not taking information structure into account). The subset of discourse configurational languages that allow for discontinuous expressions has an extra level of freedom, as heads are optional in c-structure rules. Note that discourse configurational languages are thus defined by constraints on annotations on c-structure rules, whereas head optionality is a (lack of) constraint on c-structure rules directly. Discontinuity seems to be driven by information structure. Dis-

course configurational languages that allow for discontinuous expressions seem to have a more fine-grained interface between c-structure and i-structure, as they can assign different IS roles to subparts of the same f-structural constituent. This shows that free word order and discontinuous expressions are only connected in the sense that the former is a prerequisite for the latter, but the latter does not automatically follow from the former. I thus hypothesise that head optionality, which expresses a degree of freedom in the c-structure, can only follow if argument functions are freely assigned.

5.7 Conclusion

This chapter has given an overview of some of the types of discontinuous expressions that are attested in the world's languages, with a focus on the type of discontinuity that is taken to be hallmark of non-configurational languages by Hale (1983). The formal definition of discontinuity given in Section 5.4.2 makes a clear distinction between discontinuous nominal expressions of the type that is attested in languages such as Warlpiri and Latin and the type that is attested in languages like English and German. Key here is the condition that two (or more) parts of a discontinuous expressions must map to the same f-structure, in combination with assumptions about c-structure configurations in the different languages. Section 5.6 shows that information structure appears to be the driving force for discontinuity. Furthermore, the section argues that free assignment of grammatical functions allows for discontinuous expressions of the 'non-configurational' kind to occur, but that the latter does not follow automatically from the former. It therefore seems that languages that allow for the type of discontinuity attested in Warlpiri and Latin are a subset of the group of discourse configurational languages, based on their employment of head optionality.

Chapter 6

Binding

6.1 Introduction

In this chapter I will evaluate the status of subject-object asymmetries (and symmetries) in a theory of configurationality in LFG, with a focus on Warlpiri and English binding data. Binding data is interesting because it differs in different languages, and is assumed to reflect subject-object asymmetries, as addressed in Chapter 2. It is a complicated syntactic issue, and has been analysed in terms of many different theoretical approaches. LFG approaches binding in a different way than other syntactic theories, because LFG (generally) appeals to f-structure rather than c-structure in analysing binding phenomena. This assumption in LFG influences the way that binding fits into a theory of configurationality, as will become clear in this chapter. This chapter focuses heavily on Warlpiri, as a dialect of Warlpiri has been described by Simpson (1991) which lacks certain subject-object binding asymmetries as well as an influence of linear order on binding constraints. At first glance this seems to reflect Warlpiri's characteristic of not having grammatical functions tied to phrase structural positions. I want to assess how this fits in with the status of Warlpiri as a discourse configurational language (a language of Type 2). As a comparison, English binding data will also be discussed, as English is traditionally assumed to be on the other 'extreme' end of the configurationality spectrum. Traditionally, data involving coreference and binding have been argued to be important in the discussion of configurational versus non-configurational structures; many researchers believe

that the type of binding and coreference allowed reflects the phrase structure of the language. C-command is assumed to constrain binding relations in this case. I will show, in line with much previous work on binding in LFG, that if one assumes an f-command approach, binding does not reflect phrase structure relations. However, I speculate that free assignment of argument functions, as is present in a language like Warlpiri, makes it possible for a language to lack subject-object asymmetries, which is attested in a set of data provided in Simpson (1991). I also show that even though this may in principle be the case, it is definitely not the case that all languages which may be assumed to be of Type 2 (or even different dialects of Warlpiri) show the same lack of subject-object asymmetries as this one dialect described by Simpson (1991) does.

The focus of this chapter is on arguments from binding given in favour of the structures proposed within LFG (mainly focusing on Simpson (1991)), and some of the arguments given by Legate (2002) against a flat structure for Warlpiri; she argues in favour of a hierarchical phrase structure. These two approaches to Warlpiri syntax reflect two very different assumptions about syntactic structure. The chapter is structured as follows. Section 6.2 provides an introduction to binding theory, and discusses how binding is analysed within LFG. Section 6.3 discusses the structural proposals for Warlpiri, which play an important role in a discussion of the literature on Warlpiri binding. This is followed by an overview of the arguments put forward in the Warlpiri binding debate by Simpson (1991), and arguments against this account by Legate (2002), in Section 6.4. Section 6.5 discusses an f-command based approach to binding, with a brief comparison of the Warlpiri data to binding data from other discourse configurational languages. Section 6.6 discusses the relevance of binding in configurationality and concludes the chapter.¹

¹Some of the work in this chapter was discussed in Snijders (2014).

6.2 Introduction to binding

Binding theory is concerned with the distribution of pronouns and other anaphoric elements in relation to their antecedents. Different types of anaphoric elements are constrained in different ways in terms of what type of antecedent they might corefer with and/or bind to. Consider the following examples:

(6.1) Peter_{*i*} sees himself_{*i*/**j*}.

(6.2) Peter_{*i*} sees him_{**i*/*j*}.

The reflexive pronoun *himself* in (6.1) is bound by the subject of the sentence. The non-reflexive pronoun *him* in (6.2) is not allowed to be bound by the subject of the sentence, but it is allowed to corefer with an antecedent outside its clause. Note that the latter option is coreference and not binding, as an antecedent can only bind a pronoun if it appears inside the same sentence and bears a particular syntactic relation to it.

6.2.1 Traditional binding theory

Traditionally, the binding patterns in examples such as (6.1) and (6.2) are accounted for by a number of conditions on binding like those originally proposed by Chomsky (1981). They are shown in (6.3).

(6.3) Binding conditions following Chomsky (1981, p. 188):²

- **Binding Condition A:** A reflexive anaphor is bound in its governing category: it must have a local antecedent that c-commands it.
- **Binding Condition B:** A pronoun (non-reflexive) is free in its governing category: it may not have a local antecedent that c-commands it.
- **Binding Condition C:** An R-expression is free: it may not have an antecedent that c-commands it.

²The exact phrasing of these conditions has been augmented for clarification.

(6.4) **C-command**: node A c-commands node B iff:

- A does not dominate B
- B does not dominate A
- the first branching node that dominates A also dominates B

Binding Condition A accounts for the binding pattern in (6.1), ensuring that the reflexive pronoun is bound to its coargument. Binding Condition A is further exemplified by the following:

(6.5) Peter_i said that John_j had washed himself_{*i/j}.

The reflexive must be bound in its governing category (locally), in this example by *John*. It cannot be bound by *Peter*, which appears outside its local clause. Binding Condition B accounts for (6.2), ensuring that the pronoun is not bound locally. The locality condition means that the following is acceptable:

(6.6) Peter_i said that he_{i/j} was going for a walk.

With the pronoun *he* appearing in a different clause than *Peter*, the pronoun is not bound in its local clause and coreference is acceptable. Condition C accounts for examples such as the following:

(6.7) He_{*i/*j/k} believed that Peter_i had seen John_j.

Here the pronoun *he* cannot be coreferent with either *Peter* or *John*, because it c-commands both. In traditional Binding Theory, phrase structural configuration is thus appealed to in accounting for binding patterns. Notice the important distinction between coreference and binding: a binding relation between antecedent and pronoun (in the traditional sense) only occurs when the antecedent c-commands the pronoun.

6.2.2 Binding in LFG

LFG's approach to binding is somewhat different from traditional binding theory. In most LFG accounts, f-structure relations rather than c-structure relations are used to account for

binding patterns. This is achieved by the use of f-command rather than c-command, along with the potential incorporation of the grammatical function hierarchy and/or f-precedence. F-command, the grammatical function hierarchy and f-precedence are defined as follows in the LFG literature:³

(6.8) • **F-command:** f-structure f f-commands f-structure g iff:

- f does not contain g
- all f-structures that contain f also contain g

(Dalrymple, 2001)

• **Grammatical function hierarchy:**⁴

SUBJ > OBJ > OBJ _{θ} > OBL _{θ} > COMPL > ADJUNCT

(Bresnan, 2001)

• **F-precedence:** f f-precedes g if the rightmost node in $\phi^{-1}(f)$ precedes the rightmost node in $\phi^{-1}(g)$

(Bresnan, 2001)

F-command and f-precedence are concepts specific to LFG, but the grammatical function hierarchy is assumed to be relevant in other frameworks as well. F-command is very similar to c-command in expressing a type of structural superiority relation, except that it applies to f-structures and not c-structures. F-precedence was discussed in Section 3.2.5: it is an f-structural concept which is defined in terms of c-structure relations via the inverse mapping ϕ^{-1} . It thus relies on linear order. Accounts of binding often rely on the grammatical function hierarchy and linear order: the LFG equivalents of this are the LFG-specific grammatical function hierarchy and f-precedence. To account for binding in English, Bresnan (2001) combines the concepts of f-command and the grammatical function hierarchy into *Syntactic*

Rank:

³The exact phrasing of the definition of f-precedence varies in the literature; here I take the definition by Bresnan (2001). For alternative definitions, see for example Bresnan (1995) and Dalrymple *et al.* (2007). Any differences in definition do not make a difference for the purposes of this chapter.

⁴Bresnan (2001) refers to this hierarchy as the ‘relational hierarchy’. A grammatical function hierarchy of this kind was originally introduced by Keenan & Comrie (1977). Note that COMPL encompasses COMP and XCOMP.

(6.9) **Syntactic Rank:** *A* locally outranks *B* if *A* and *B* belong to the same f-structure and *A* is more prominent than *B* on the grammatical function hierarchy. *A* outranks *B* if *A* locally outranks some *C* which contains *B*.

(Bresnan, 2001, p. 213)

Syntactic Rank is useful in accounting for binding patterns in English (and other languages), but it is not necessary to account for the Warlpiri binding patterns discussed later in this chapter, as will become evident later.

The use of these concepts in English binding patterns can be illustrated by looking at some examples involving reflexive data (with example (6.1) repeated in (6.10a)):

- (6.10) a. Peter_{*i*} sees himself_{*i*/_{*}*j*}.
b. Himself_{_{*}*i*/_{*}*j*} sees Peter_{*i*}.

The differences between these two examples illustrate the asymmetry between subject and object. In traditional binding accounts, the difference in grammaticality between (6.10a) and (6.10b) follows from a difference in c-command relations. In (6.10a) *Peter* (with index *i*) c-commands the reflexive pronoun, rendering the coreference grammatical. Coreference with an external referent (*j*) is ruled out because external referents do not c-command the coreferring pronoun. This is a case in which Binding Condition A is fulfilled. In (6.10b) coreference between *himself* and *Peter* is ruled out because of the structural superiority of the reflexive pronoun, meaning it is not c-commanded (not bound) by an antecedent, violating Binding Condition A. For the same reason as in (6.10a), the external referent coreference is ruled out. Condition C is also violated with the coreference with index *i*: R-expressions cannot be bound. This is under the common assumption that English has a hierarchical structure with VP. This shows that something which might appear to be a phenomenon related to linear order can in fact be explained in structural terms, appealing to the structural asymmetry of subjects and objects in English. From an LFG point of view, we see that (6.10a) and (6.10b) have very similar f-structures, with the only difference being the exact grammatical function

of *Peter* and *himself*.⁵

(6.11) a. F-structure for (6.10a):

$$\left[\begin{array}{l} \text{PRED} \quad \text{'see<SUBJ,OBJ>} \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'Peter'} \end{array} \right] \\ \text{OBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'himself'} \end{array} \right] \end{array} \right]$$

b. F-structure for (6.10b):

$$\left[\begin{array}{l} \text{PRED} \quad \text{'see<SUBJ,OBJ>} \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'himself'} \end{array} \right] \\ \text{OBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'Peter'} \end{array} \right] \end{array} \right]$$

The f-command relations between subject and object are identical for both structures, so something more than just f-command is needed to account for the grammaticality patterns shown in (6.10): the grammatical function hierarchy or f-precedence. Appealing to the grammatical function hierarchy, one could posit that a reflexive pronoun must be bound by a grammatical function higher on the hierarchy. In terms of Syntactic Rank, one can simply say that a reflexive must be bound by an antecedent that outranks it; this is how Bresnan (2001) accounts for the difference between the examples in (6.10). If one were to appeal to f-precedence, one could posit that reflexives may not precede their antecedents. Importantly, something other than the f-command relation alone is needed to account for the data.

Lexical specification of binding constraints

The English data is fairly straightforward, and one can account for it by three binding Conditions, one for reflexives, one for non-reflexives and one for R-expressions. However, this is not a universal pattern. Dalrymple (1993) describes binding patterns in Norwegian and Marathi which do not adhere to the two-way reflexive/non-reflexive distinction found in English. In Norwegian, there are five different types of anaphoric elements, each of which

⁵For clarity I opt for a simple notation with 'himself' as a PRED value. Note that the only minor issue here is the lack of a subject reflexive in the paradigm, e.g. *heself*.

has its own constraints on potential binding. They are shown in Table 6.1 (Dalrymple, 1993, p. 34).

Table 6.1: Binding conditions in Norwegian

	Bound to:	Disjoint from:
<i>seg selv</i>	Subject in coargument domain	
<i>ham selv</i>	Argument in minimal complete nucleus	Subject in minimal complete nucleus
<i>seg</i>	Subject in minimal finite domain	Argument in coargument domain
<i>hans</i>		Subject in minimal complete nucleus
<i>sin</i>	Subject in minimal finite domain	

In this table the binding constraints are defined in terms of positive constraints ('bound to') and negative constraints ('disjoint from'). The domains are defined as shown in Table 6.2.

Table 6.2: Definition of binding domains

Domain	Definition
Coargument Domain	minimal domain with a PRED
Minimal Complete Nucleus	minimal domain with a SUBJ
Minimal Finite Domain	minimal domain with TENSE

Each anaphoric element has its own restrictions and this cannot be accounted for by a two-way distinction between reflexives and non-reflexives, as is the case in English. Rather, Dalrymple (1993) suggests that the binding restrictions for each anaphoric element are *lexically specified*. She achieves this by positing positive and/or negative binding constraints for individual anaphoric elements. They take the following general form:

(6.12) a. Positive binding constraint:

$$((\text{DomainPath} \uparrow) \text{AntecedentPath})_{\sigma} = \uparrow_{\sigma}$$

b. Negative binding constraint:

$$((\text{DomainPath} \uparrow) \text{AntecedentPath})_{\sigma} \neq \uparrow_{\sigma}$$

In these constraints, *DomainPath* is the f-structure that contains the anaphoric element and its antecedent, and *AntecedentPath* is the path from the anaphoric element to its antecedent. For example, if we look at the Norwegian anaphoric element *seg selv*, we see that its antecedent

must be an argument of the same predicate (the ‘Coargument Binding Condition’). In other words, DomainPath does not pass through an f-structure containing PRED:

$$(6.13) \ ((\text{DomainPath GF } \uparrow) \text{AntecedentPath})_{\sigma} = \uparrow_{\sigma} \neg(\rightarrow \text{PRED})$$

(Dalrymple, 1993, p. 131)

The right arrow points to the f-structure that is the value of the attribute that it is associated with (a member of DomainPath GF in this case), and the negative \neg ensures that this value does not have the attribute that follows the arrow, PRED in this case. This is thus a way to constrain DomainPath.

Lexical specification of binding constraints is key to accounting for Norwegian binding data, as well as Marathi binding data (Dalrymple, 1993). A *c*-command approach, which can only make statements about structural superiority and about elements either being bound or being free, could technically have lexical specification of binding constraints, by stating complex constraints on tree configurations. However, some of the Warlpiri binding data presented in this chapter are incompatible with a *c*-command approach. In this chapter I present an analysis of Warlpiri binding which makes use of both *f*-command and lexical specification.

6.3 Structures proposed for Warlpiri in LFG

In order to set the scene for the binding data which is prominent in the discussion of Warlpiri binding (especially in comparison to English), it is important to explain the different types of structures which have been proposed for this language, as they play an important role in this binding discussion. Some of the structures proposed for Warlpiri have been already been discussed in the previous chapters of this thesis, but for the discussion in this chapter focusing specifically on Warlpiri, I will discuss these structures in more detail, especially those proposed within LFG. Important in this discussion, first of all, is the position of the AUX. Despite Warlpiri’s free ordering of grammatical functions, the position of the AUX is set. The AUX will be discussed in Section 6.3.1, followed by a discussion on proposed structures for

Warlpiri in Section 6.3.2.

6.3.1 AUX placement

The AUX in Warlpiri is a complex constituent which expresses negation, modal, aspectual and temporal relations, as well as subject and non-subject person and number features (Laughren, 1999). It may also include a complementiser meaning.⁶ Hale refers to this constituent as ‘auxiliary’, and this term will be used to denote this complex word throughout this thesis. Other than the AUX placement, constituents can appear in any order.

The positioning of the AUX has been observed to be phonologically conditioned, and has therefore been argued to be a clitic which forms a phonological unit with the preceding phonological word (Nash, 1980; Austin & Bresnan, 1996). The AUX commonly appears in second position in sentences, as observed and stated by Hale (1973, 1983), Laughren (1989), Nash (1986), Simpson (1991) among others. Examples of the AUX appearing in second position are the following:⁷

- (6.14) a. *Ngarrka-ngku ka wawirri panti-rni.*
man-ERG AUX kangaroo.ABS spear.NPST
- b. *Wawirri ka panti-rni ngarrka-ngku.*
kangaroo.ABS AUX spear.NPST man-ERG
- c. *Panti-rni ka ngarrka-ngku wawirri.*
spear.NPST AUX man-ERG kangaroo.ABS
‘The man is spearing the kangaroo.’

(Hale, 1983, p. 6)

Hale (1973) goes on to claim that if the AUX is disyllabic or longer, including a complementiser meaning, it may appear in initial position. This is in line with the accounts that assume that

⁶There are two types of AUX stem that express aspect: *ku* (present imperfect) and *lpa* (past imperfect). All other AUX stems are classified as complementisers, as well as expressing other types of information, e.g. future, factive, nonfactive, negative (Hale *et al.*, 1995).

⁷I do not use clitic notation (e.g. =X) in the example in (6.14), for two reasons. First, Hale (1983) does not use this type of notation himself in his example (as is common in a large part of the Warlpiri literature), and second, as we will see imminently, the status of the AUX as a clitic is debated. For these reasons I will not use the clitic notation for the AUX in the following. The exact analysis of the AUX is not important to the discussion I provide here, it is merely important that the AUX appears in an invariant c-structural position.

the AUX can be a clitic (according to Nash (1980); Austin & Bresnan (1996)): if monosyllabic it cannot stand by itself, unless it cliticises to a preceding word. He gives the following examples to motivate this claim:⁸

- (6.15) a. *Wawiri ka-rna purra-mi.*
 kangaroo PRES.IMPF-1SG.SUBJ cook-NPAST
 ‘I am cooking the kangaroo.’
- b. *Kapi-rna wawiri purra-mi.*
 FUT-1SG.SUBJ kangaroo cook-NPAST
 ‘I will cook the kangaroo.’

(Hale, 1973, p. 312)

In (6.15a), the monosyllabic AUX *ka* (with its pronominal marker *-rna*) appears after the first word, whereas in (6.15b) the disyllabic AUX *kapi* (also with its pronominal marker) can appear sentence-initially (although Hale (1973) points out that the AUX in (6.15b) may also appear in second position). In accounts assuming that the AUX can be a clitic, one thus assumes that the AUX is a clitic when monosyllabic, but that it stands on its own when disyllabic.

Legate (2008), who discusses the placement of the AUX in detail, argues against the assumptions made by Hale (1973), and against the general claim that AUX placement is phonological in nature. Rather, she proposes a syntactic account involving syntactic head movement with local morphological reordering. One piece of evidence that AUX placement is not phonological in nature is the definition of *monosyllabic* and *disyllabic* as Hale (1973) uses these terms. As is evident, Hale’s claim that if the AUX is disyllabic or longer it may appear in initial position, assumes that it is only the AUX stem that plays a role in determining the phonological weight of the AUX, and it does not take pronominal markers into account. For example, the AUX in (6.15a), *ka-rna*, is monosyllabic under this assumption, but the AUX as a whole is in fact disyllabic. It seems odd to use this as a criterion, if one is talking about a clitic which needs a phonological host (Legate, 2008).

⁸Recall from Chapter 2 that I use affix notation for pronominal markers, as is most common in the literature on Warlpiri.

The claim that AUX placement in Warlpiri is not (always) phonological in nature is strengthened by examples that make explicit that the AUX does not always appear after the first phonological word. For example, as discussed in Chapter 4, Simpson (2007) shows that not one but two constituents may appear before the AUX, an example of which is shown in (6.16), repeated from example (4.18):⁹

(6.16) A: *Pangurnu-rlu-rlupa pangi-ni?*
 shovel-ERG-1PL dig-NPST
 ‘Let’s dig with a shovel?’

B: *Pangurnu-ju* NYARRPARA-WIYI *ka-nkulu marda-ni?*
 shovel-KN where-before PRES-2PL hold-NPST
 TOPIC FOCUS AUX
 ‘Where have you got a shovel?’

(From Hale (1959) via Simpson (2007, p. 409))

According to Simpson (2007), the first constituent in this example, *pangurnuju* (‘shovel’) is a topic constituent, and the second constituent *nyarrpara-wiyi* (‘where, before’) is a focus constituent (as is also evident from the fact that it is a *wh*-word). This type of example implies that AUX placement is not (only) dependent on phonological factors, but also syntactic ones. This is reinforced by examples with complex syntactic constituents appearing sentence-initially, as argued by Laughren (1989):

(6.17) *Kardiya yurrkunu-rlu manu yapa-ngku turaka-rlu*
 whiteman policeman-ERG and Aboriginal-ERG tracker-ERG
kalaka-ngku-pala *murupi-nyi.*
 ADMON-2SG.OBJ-3DU.SUBJ arrest-VR-NPAST
 ‘A white policeman and an Aboriginal tracker (police aide) can arrest you.’

(Simpson, 1991, p. 130)

The AUX in marked in bold in this example. This example shows that the AUX does not always seem to attach to the first phonological word, as the complex initial constituent does not appear to be one single phonological word. Austin & Bresnan (1996) address this by

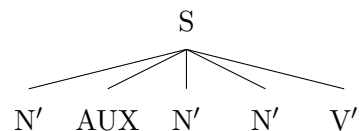
⁹I have changed the clitic notation from the example given by Simpson (2007), in order to remain consistent in my notation throughout this thesis and not to denote pronominal markers or the AUX as clitics.

stating that the AUX in this case attaches to the last phonological word of the sentence-initial constituent. It is unclear how this can be called phonological conditioning of AUX placement, however. This discussion makes clear that the placement of the AUX is definitely not solely phonologically conditioned: syntax plays a role. The one type of analysis does not rule out the other type of analysis, however. Without making detailed assumptions about the motivation behind AUX placement in Warlpiri, for my approach it is crucial that the AUX appears in a set c-structural position, as I want invariant positions of constituents to be reflected in c-structure. I therefore follow Simpson (2007), who positions the AUX in I position. Her structure was shown in Chapter 4 and will be repeated in the next section.

6.3.2 Proposed structures

Having seen some of the word order facts, it should be repeated that many early works on Warlpiri assume that the AUX specifically appears in second position. An example of this is Hale (1983). As discussed in Chapter 2, in his article on non-configurational languages Hale (1983) proposes a dual structure for Warlpiri. In Hale (1983) he proposes is a flat phrase structure, in which there is no structural asymmetry between subjects and objects. This idea is shared by Simpson (1991), who proposes a flat c-structure for simple sentences, which she assumes to reflect the free word order in Warlpiri. This structure was shown in example (5.42) and it is repeated in (6.18):^{10,11}

(6.18) Simpson (1991):



As mentioned in Chapter 5, the AUX is set in this structure and grammatical functions are assigned freely to the N's. Recall that Warlpiri is assumed to only have N, V and PV (preverb)

¹⁰As briefly mentioned in Chapter 5, N' is a notation used by Simpson (1991) to represent a nominal constituent (a maximal projection), similar to NP, but with a relatively flat structure. V' is a verbal maximal projection.

¹¹Recall that the structure in (6.18) is an example to illustrate the type of structure we are talking about, rather than being either the structure of a specific example, or a more abstract structure representing Warlpiri c-structure rules.

lexical categories, and AUX and Particle functional categories (Hale, 1983; Hale *et al.* , 1995; Simpson, 1991). The structure in (6.18) accounts for both verb-headed sentences and nominal-headed sentences such as the following:

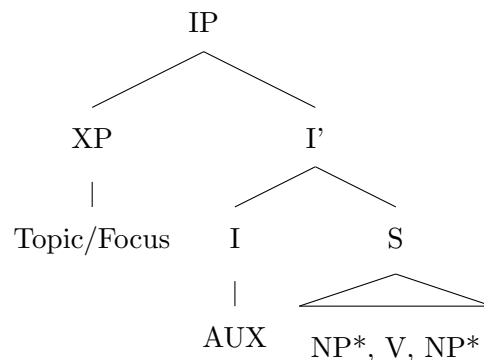
(6.19) *Ngaju mata.*
 I tired
 ‘I am tired.’

(Hale *et al.* , 1995, p. 1430)

This example shows that both V and AUX are optional. The adjective-like word in (6.19) is assumed to be of category N (recall the lack of A categories in Warlpiri), projecting an N', in accord with the structure in (6.18). Note that in (6.18) therefore the verb (V) is optional. A verb is always present in verb-headed sentences (and not in nominal-headed sentences), but this V may appear either preceding or following the auxiliary. The AUX is also optional: if the (main) verb is marked by either an irrealis or a past tense suffix, the auxiliary may be absent (Laughren, 1999). There is no AUX base present in nominal-headed sentences.

The fact that the position of the AUX appears set in the left periphery was a reason for Austin & Bresnan (1996) to posit a more hierarchical left periphery. For simple sentences the structure that they propose is as follows:¹²

(6.20) Austin & Bresnan (1996):



¹²The topic/focus constituent in (6.20) is XP, because it can be either an N' or a V (Simpson, 1991).

Note that only one constituent is allowed to appear before the AUX in this structure, in the specifier position of IP. The exocentric S has a flat structure, with the following c-structure rule:

$$(6.21) \quad S \rightarrow NP^* , V , NP^*$$

Also in (6.20) and (6.21) the V and AUX are optional. In this proposed structure, the left periphery is hierarchical (containing the topic/focus constituent and the auxiliary, if present, occurring obligatorily in second position); the structure to the right of the auxiliary is flat. The flat part of the structure is dominated by S and can contain a verb and any number of NPs (depending on the argument structure of the verb, and whether discontinuous expressions are present). The order within S is free, as shown by the commas separating the constituents under S. Note that the obligatory set position of the auxiliary is captured more straightforwardly in (6.20) than in the flat structure proposed by Simpson in (6.18), as there is a designated structural position for the AUX in (6.20), which is lacking in (6.18).

Austin & Bresnan (1996) thus include an IP in their structure, which accounts for the possibility of one constituent preceding the auxiliary. They state that there is no evidence for a CP in Warlpiri, but Simpson (2007) provides evidence for a CP by showing that more than one constituent may appear before the AUX. In Chapter 4 I showed that two or even three constituents may in fact appear before the AUX. An example in which two constituents (one topic constituent and one focus constituent) appear before the AUX was shown in (6.16) above. As mentioned, Simpson (2007) observes that not only topic and focus may appear before the AUX (together), but also that evidential speech particles or hanging topics are allowed to precede the sentence as a whole. An example of this was shown in (4.65) in Section 4.5.1 (with three constituents before the AUX). Two other examples are shown here, one with the speech act particle *karinganta* ('I assert') preceding the sentence as a whole in example (6.22) and one with a hanging topic (*walyka*, 'cool weather') preceding the sentence as a whole in (6.23):

(6.22) Q: *Nyarrparla ka-npala yula-mi?*
 why PRES-DU cry-NPST
 ‘Why are you two crying?’

A: ***Karinganta*** *wangumarnanypa-lku waja-npa nyuntu-ju.*
 I.assert orphan-now I.say-2SG 2SG-KN
 ‘It’s that you are now an orphan.’

(From Warlpiri Dictionary *karinganta* via Simpson (2007, p. 409))

(6.23) ***Walyka,*** *ngula ka-rlipa ngarri-ni pirriya.*
 cool weather that PRES-1PL call-NPST winter
 ‘“Walyka”, that is what we call winter.’

(Simpson, 2007, p. 408)

A hanging topic is different than a normal topic, because it is juxtaposed to the main clause, and the main clause is grammatically and semantically complete without the topic present. The fact that there can be a topic and a focus constituent preceding the auxiliary, as well as a speech act particle or a hanging topic, was noted by both Laughren (2002) and Legate (2002). Both Laughren and Legate incorporate several potential left periphery positions in order to account for sentences with multiple constituents preceding the auxiliary. This is illustrated in Legate’s proposal for Warlpiri’s structure:¹³

(6.24) Legate (2002):¹⁴

[(Top_{HTLD}) [ForceP [(TopP*) [(FocP) [(FocP_{wh}) [(QuP) [FinP]]]]]]]

(Legate, 2002, p. 225)

In this structure, Legate combines a cartographic style left periphery following Rizzi (1997) and Cinque (1999) with certain word order facts in Warlpiri. This is done within Minimalism: it includes many left periphery projections (all projections except for the FinP is in the left periphery). The hanging topic in a sentence such as (6.23) is in the Top_{HTLD} position. There are multiple left periphery projections, because Legate (2002) argues that non-wh foci (Spec, FocP) and *wh*-foci (Spec, FocP_{wh}) appear in different positions; QuP accounts

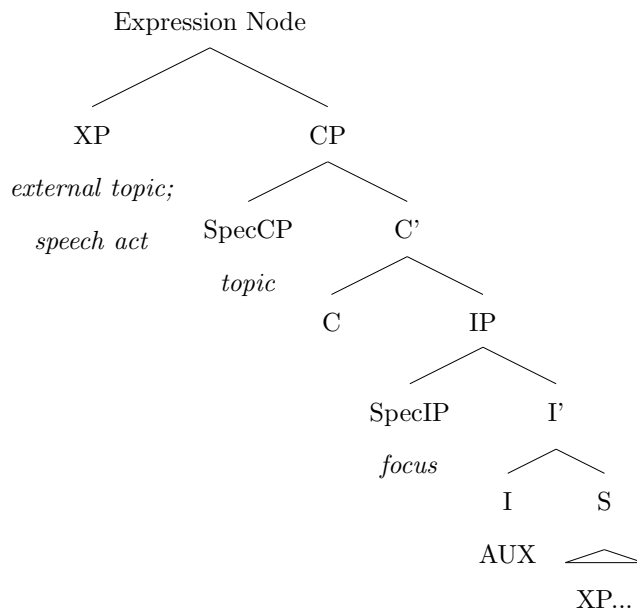
¹³Laughren (2002) proposes a similar hierarchical structure for Warlpiri.

¹⁴‘HTLD’ stands for ‘Hanging Topic Left Dislocation’.

for the positioning of the question complementiser *japa*. Tense and aspect are located in FinP: therefore the position of AUX is in FinP, following the left periphery. For a detailed explanation, see Legate (2002).

From an LFG point of view, these multiple left periphery projections are undesirable, but it is plausible to have more left periphery projections than the IP only structure as proposed by Austin & Bresnan (1996), and moreover, this is desirable based on the data shown above in which two or more constituents appear before the AUX. As discussed in Chapter 4, a more elaborated left periphery is proposed by Simpson (2007). This structure was shown in (4.66) and is repeated in (6.25). This structure is partly based on work by Laughren (2002) and Legate (2002), thereby revising Simpson’s own flat structure shown in (6.18):

(6.25) Simpson (2007):



This structure, with the root node being the exocentric ‘Expression Node’ (following King’s (1995) analysis of Russian hanging topics) makes it possible to have an external (hanging) topic or speech act present before the CP. Recall that I do not take hanging topics into account in the classification I presented in Chapter 4. The presence of both CP and IP in this structure make it possible for both a topic (internal) and a focus to precede the auxiliary, which is located in I.

Despite having a hierarchical phrase structure, Simpson's (2007) analysis is nonetheless different from analyses along transformational lines such as the proposal by Legate (2002). The structure in (6.25) has a hierarchical left periphery, but still includes an exocentric S to account for post-auxiliary free word order. This is not the case in transformational accounts, in which there is no S category, and the post-auxiliary part is assumed to contain (at least) a hierarchical VP (the structure for FinP in (6.24), which marks finiteness, is not specified by Legate (2002)). Legate explicitly argues against the flat and semi-flat structures proposed by Simpson (1991) and Austin & Bresnan (1996). The next section will address some of the arguments put forward by Simpson (1991) and Legate (2002) in their respective discussions of Warlpiri binding, and contrast the different approaches.

6.4 Warlpiri binding and phrase structure configurations

This section discusses the way in which c-structure has been appealed to in the debate on Warlpiri binding, with a focus on non-reflexive binding. The different ways in which non-configurationality (at least in Warlpiri) has been interpreted, by means of a flat structure by Simpson (1991) and a hierarchical configurational structure by Legate (2002)), are key here. The focus is on Simpson (1991) and Legate (2002), because both explicitly discuss binding. Simpson (2007) does not address binding, but it will be illustrated later how the structure proposed in Simpson (2007) can be used to argue for an f-command over a c-command approach. Ultimately the goal is to see if binding has any connection to the classification of languages in terms of their configurationality.

6.4.1 Warlpiri non-reflexive possessive binding data

Before presenting the binding data, two things need to be mentioned. Firstly, there are slight problems with the data, as different works present different grammaticality judgements for similar data. This will be pointed out along the way. Secondly, both Simpson (1991) and Legate (2002) believe that c-command is the important structural relation for defining

binding constraints, making it relatively straightforward to compare the two.¹⁵

Simpson (1991) presents the following non-reflexive binding data, which was originally elicited by Mary Laughren, and uses it as evidence for her flat c-structure:¹⁶

(6.26) Pronoun functions as subject (PRO-SUBJ):

- a. *Jakamarra-kurlangu maliki ka nyanungu-rlu wajili-pi-nyii.*
Jakamarra-POSS dog PRES he-ERG chase-VR-NPST
'He_{*i/j} chases Jakamarra_i's dog.'
- b. *Nyanungu-rlu ka Jakamarra-kurlangu maliki wajili-pi-nyii.*
he-ERG PRES Jakamarra-POSS dog chase-VR-NPST
'He_{*i/j} chases Jakamarra_i's dog.'

(Simpson (1991, p. 179), elicited by Mary Laughren)

(6.27) Pronoun functions as object (PRO-OBJ):

- a. *Jakamarra-kurlangu maliki-rlu ka nyanungu wajili-pi-nyii.*
Jakamarra-POSS dog-ERG PRES him chase-VR-NPST
'Jakamarra_i's dog chases him_{*i/j}.'
- b. *Nyanungu ka Jakamarra-kurlangu maliki-rlu wajili-pi-nyii.*
him PRES Jakamarra-POSS dog-ERG chase-VR-NPST
'Jakamarra_i's dog chases him_{*i/j}.'

(Simpson (1991, p. 179-180), elicited by Mary Laughren)

The only difference between the a. and b. examples in both (6.26) and (6.27) is word order. I refer to the type of examples in (6.26) as PRO-SUBJ (because the pronoun is the subject) and to the type of examples in (6.27) as PRO-OBJ (because the pronoun is the object). In both the PRO-SUBJ and the PRO-OBJ examples, coreference is not allowed between an R-expression

¹⁵Legate (2002), working in Minimalism, only has phrase structural relations like c-command at her disposal, so will necessarily use c-command in her analysis. This is not the case for Simpson (1991), but she specifically argues in favour of a c-command as opposed to an f-command analysis. Her arguments are presented later.

¹⁶Note that the auxiliary *ka* always appears in second position in these sentences. This implies that the possessor *Jakamarrakurlangu* ('Jakamarra's') and *maliki* ('dog') make up one constituent in this context. Remember, however, that more than one constituent may indeed precede the auxiliary in principle (see Section 6.3).

(*Jakamarra*) and a pronoun (*nyanungu*). The fact that the only difference between (6.26a) and (6.26b) is the word order means that these two examples have the same abstract grammatical structure (in LFG, f-structure). The same is true for (6.27a) and (6.27b). Coreference is not possible in either order, for either the PRO-SUBJ or the PRO-OBJ examples. There is a symmetry in patterns between subject and object pronouns: the coreference between pronoun and antecedent is ungrammatical, regardless of whether the pronoun is the subject or the object of the sentence. This seems to imply that the grammatical function hierarchy does not play a role in this data. Notice that the possessive marker in (6.26) and (6.27) is *-kurlangu*: this marker is specific to marking possession on nouns. The possessive marker on free pronouns is *-nyangu* (Meakins & O’Shannessy, 2005), as is evident from (6.28) and (6.29).

Coreference is allowed when the pronoun is marked as the possessor, rather than the noun:

(6.28) Possessive pronoun inside subject (POSS-IN-SUBJ):

- a. *Maliki nyanungu-nyangu-rlu ka Jakamarra wajili-pi-nyi.*
 dog he-POSS-ERG PRES Jakamarra chase-VR-NPST
 ‘His_{i/j} dog chases Jakamarra_i.
- b. *Jakamarra ka nyanungu-nyangu-rlu maliki-rli wajili-pi-nyi.*
 Jakamarra PRES he-POSS-ERG dog-ERG chase-VR-NPST
 ‘His_{i/j} dog chases Jakamarra_i.

(Simpson (1991, p 181), elicited by Mary Laughren)

(6.29) Possessive pronoun inside object (POSS-IN-OBJ):

- a. *Jakamarra-rlu ka wajirli-pi-nyi maliki nyanungu-nyangu.*
 Jakamarra-ERG PRES chase-VR-NPST dog he-POSS
 ‘Jakamarra_i chases his_{i/j} dog.
- b. *Nyanungu-nyangu ka wajirli-pi-nyi maliki Jakamarra-rlu.*
 he-POSS PRES chase-VR-NPST dog Jakamarra-ERG
 ‘Jakamarra_i chases his_{i/j} dog.

(Simpson (1991, p. 180), elicited by Mary Laughren)

These examples will be referred to as POSS-IN-SUBJ (in (6.28)) and POSS-IN-OBJ (in (6.29)), based on the position of the possessor. Together with PRO-SUBJ and PRO-OBJ they form the four different types of sentences that will be examined for their binding properties in this chapter, in both English and Warlpiri. To avoid confusion with example numbering, these labels will be used when appropriate. As one can see, the reading with coreference is grammatical in the POSS examples in (6.28) and (6.29) in any order. This again seems to imply that word order, thus linear precedence (and f-precedence), does not play a role in non-reflexive binding in Warlpiri.¹⁷ Again here we see a type of symmetry between subjects and objects: the antecedent, regardless of whether it is a subject or an object, may corefer with the pronoun. The binding patterns for reflexive constructions are somewhat different; a discussion of these is left until Section 6.5.3.

The observation that linear order and potentially the grammatical function hierarchy do not play a role in non-reflexive binding data in Warlpiri has interesting consequences for the formulation of binding constraints. This can be contrasted with binding data from many other languages, for example English, which is widely discussed in the binding literature. As has been mentioned in Section 6.2, in English linear precedence and/or the grammatical function hierarchy do appear to play a role:¹⁸

(6.30) English PRO-SUBJ:

He_{*i/j} chases John_i's dog.

(6.31) English PRO-OBJ:

John_i's dog chases him_i.

The PRO-SUBJ example in English patterns with the Warlpiri PRO-SUBJ example, in being ungrammatical with coreference. The pattern is reversed in the PRO-OBJ example: the

¹⁷As mentioned, some other data from Nash (as mentioned by Simpson (1991)) seems to imply that linear ordering does in fact play a role in non-reflexive pronominal binding in Warlpiri. This data will be presented in section 6.4.3. For the moment I will only consider the data on which Simpson (1991) and Legate (2002) base their analyses.

¹⁸Also note that **Him chased John's dog* and **John's dog chased he* (OVS order) are completely out in English (with or without coreference) because of linear ordering. This is because English has relatively strict SVO word order. The difference in grammaticality between the examples in (6.30) and (6.31) cannot be explained by appealing to this observation, however.

English example (6.31) is grammatical with the coreferent *i* reading, but the corresponding Warlpiri PRO-OBJ example is ungrammatical with coreference. As outlined earlier, in traditional binding theory the ungrammaticality of coreference in (6.30) is accounted for as a violation of Condition C of Binding Theory, assuming that English has a hierarchical structure.

The coreference patterns for the POSS-IN-SUBJ and POSS-IN-OBJ examples are the same in English as in Warlpiri:

(6.32) English POSS-IN-SUBJ:

His_{*i/j*} dog chases John_{*i*}.

(6.33) English POSS-IN-OBJ:

John_{*i*} chases his_{*i/j*} dog.

In both the POSS-IN-SUBJ and the POSS-IN-OBJ the bound reading with coreference *i* is acceptable. The same is true for Warlpiri, as shown in (6.28) and (6.29). It should be noted that the grammaticality of the English POSS-IN-SUBJ construction is somewhat dubious. According to Simpson, coreference is definitely possible in this case. Native speakers seem to find it an awkward sentence, because they feel that the ordering in which the pronoun precedes the antecedent is not completely acceptable. However, with the right intonation, by saying *his_i dog CHASES John_i*, the sentence appears to be acceptable. For this to work the sentences must be in a context where *John's dog* (and thereby also *John*) is topical. It is definitely the case that (6.32) with coreference is more acceptable than (6.30), the English PRO-SUBJ example (in which the pronoun also precedes its antecedent), which is completely ungrammatical with coreference. If speakers find that the POSS-IN-SUBJ example is actually out, we get a nice pattern, in which English examples of any of the four different kinds (PRO-SUBJ, PRO-OBJ, POSS-IN-SUBJ and POSS-IN-OBJ) are grammatical with a coreferent reading only when the antecedent precedes its coreferring pronoun. It could be argued that this is plausible for cognitive processing, because it implies that a pronoun would not need to be held in memory 'waiting' for an antecedent to come up later in the sentence. However,

there are examples in which a pronoun/nominal precedes its antecedent which are perfectly acceptable: cataphora. An example with a pronoun is *When **she** finally arrived at the hotel, Sarah went straight to bed.* Apparently we cannot appeal to an argument stating that in general, anaphoric elements may not precede their antecedents.¹⁹ Also, the POSS-IN-SUBJ construction is a little worse than the POSS-IN-OBJ construction in English, but it is not completely out, so we must account for this fact. As mentioned, context and intonation might play a role here. Another reason to rule out processing constraints as solely accounting for the binding/coreference data is the fact that in Warlpiri, the ordering pronoun > antecedent is much more acceptable than in English, as shown above. An example such as the POSS-IN-SUBJ example in (6.28a), where the pronoun precedes the antecedent, shows that it is allowed for the pronoun to precede its antecedent. Unfortunately the contexts for these examples are not provided by Simpson (1991): these might have played a role in the grammaticality judgements. If we assume that processing constraints are universal to the human language faculty and are not language-specific, we must assume that the restriction on ordering in English is not (solely) responsible for the ungrammaticality of the English PRO-SUBJ example and the marked acceptability of the English POSS-IN-SUBJ example.

With the assumption that the English POSS-IN-SUBJ example is acceptable, we have an overview of the binding patterns in Warlpiri and English for the data discussed, shown in Table 6.3.

Table 6.3: An overview of the possessive binding data in Warlpiri and English

	Warlpiri	English	Type of sentence
(a) He _i chases J _i 's dog.	*	*	PRO-SUBJ
(b) J _i 's dog chases him _i .	*	✓	PRO-OBJ
(c) His _i dog chases J _i .	✓	✓	POSS-IN-SUBJ
(d) J _i chases his _i dog.	✓	✓	POSS-IN-OBJ

The actual examples displayed in Table 6.3 are in English, but the check list also shows which

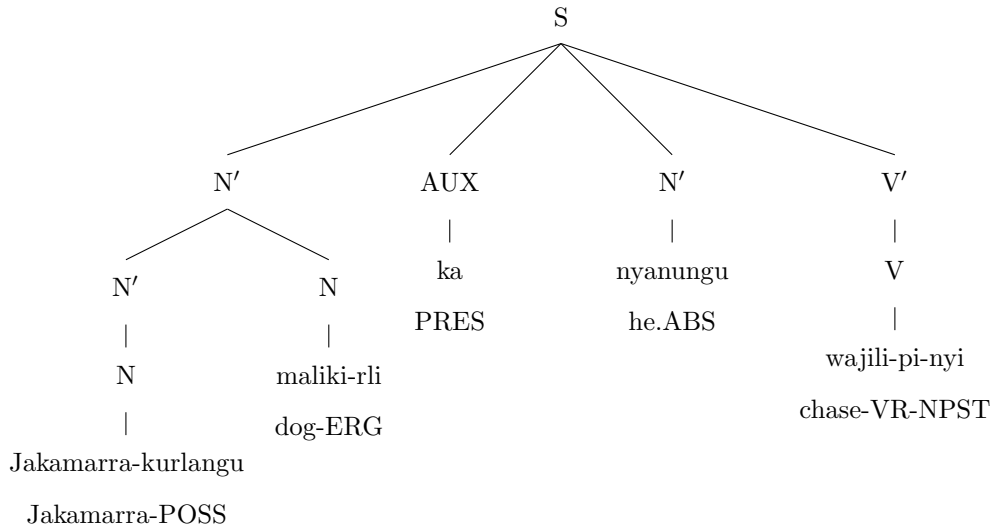
¹⁹At the same time, we need to account for examples in which the antecedent does precede its coreferring expression and coreference is ungrammatical, as in **John_i saw him_i.*

examples in Warlpiri, with the same meaning/grammatical relations, are grammatical with coreference and which ones are not. This overview will be helpful in the following section, which discusses how Simpson uses the data discussed here in her arguments in favour of a c-command approach to binding.

6.4.2 Simpson's arguments for c-command

Recall from example (6.18) that Simpson (1991) assumes a flat structure for Warlpiri, as she believes this to reflect the free word order attested in Warlpiri. She uses this assumption, along with the four different types of Warlpiri sentences in (6.26) (PRO-SUBJ), (6.27) (PRO-OBJ), (6.28) (POSS-IN-OBJ) and (6.29) (POSS-IN-SUBJ) to argue in favour of a c-command approach to binding. Specifically, she assumes that the same constraint on non-reflexive binding applies to both English and Warlpiri, assuming that any difference in binding patterns is due to a difference in c-structure between these two languages. The constraint that she posits is that **a non-reflexive pronoun may not c-command its antecedent**. In order to see how this constraint accounts for the non-reflexive binding data, one needs to look at c-structures. In a flat c-structure, as she assumes for Warlpiri in her 1991 work, subjects c-command objects, and vice versa. I will start by considering the structure of a PRO-OBJ example in Warlpiri, which is ungrammatical under a coreference reading. Its structure is as follows, for the example originally shown in (6.27a):

(6.34) PRO-OBJ Warlpiri structure:



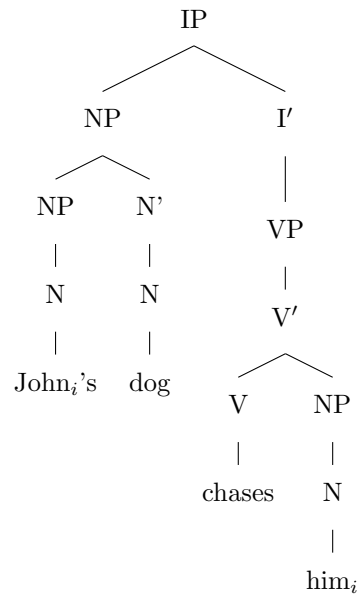
*‘Jakamarra’s dog_i chases him_i.’

Simpson (1991) claims that this example is ungrammatical because in this flat structure, the pronoun *nyanungu* c-commands its potential antecedent, *Jakamarra(-kurlangu)*. We have seen that the relative ordering between antecedent and pronoun does not change the grammaticality of the binding: this follows nicely from the flat structure in (6.34), in which a change of order does not lead to a change in c-command relations. Moreover, the PRO-SUBJ example in Warlpiri (e.g. **He_i chases Jakamarra_i’s dog*) is ungrammatical under coreference for the same reason as (6.34) is: one can imagine a very similar structure for the PRO-SUBJ examples in either order, with the only difference being the case-marking.

This contrasts with the binding data in English: here the PRO-OBJ example is grammatical under coreference, but the PRO-SUBJ example is not. In a c-command approach, this is due to the hierarchical structure of English. The structure of the English PRO-OBJ example is as follows:²⁰

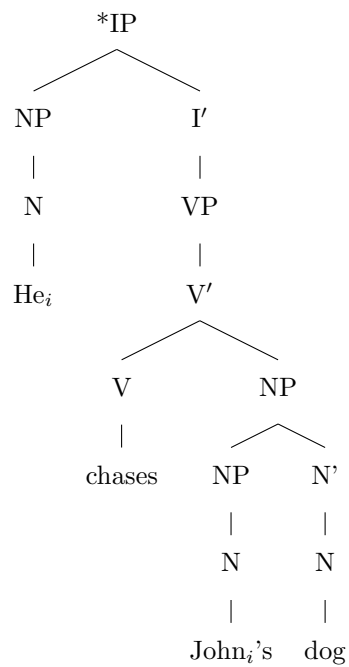
²⁰Simpson (1991) uses an NP for English instead of a DP in her argumentation in favour of c-command: for this reason I show structures with an NP for English in the discussion of her arguments. This decision does not make a difference for the argumentation.

(6.35) PRO-OBJ English structure:



The pronoun does not c-command its antecedent, so the coreference is acceptable. The same does not hold for the PRO-SUBJ example:

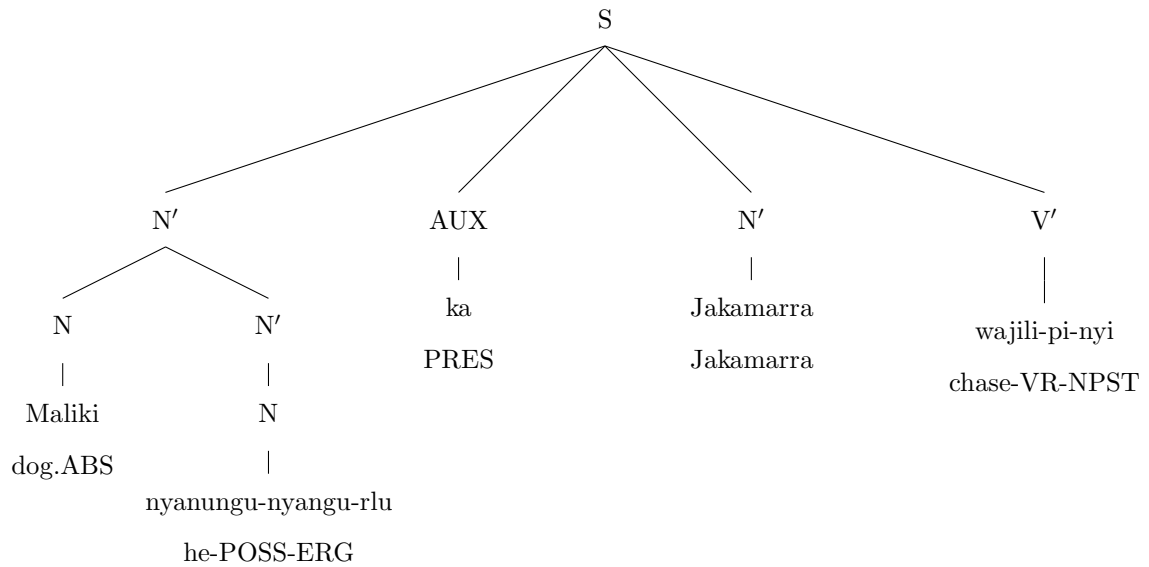
(6.36) Unacceptable PRO-SUBJ English structure:



The pronoun c-commands its antecedent, rendering the coreference ungrammatical.

In contrast, all of the examples (in both languages) in which there is a possessive pronoun are grammatical under a coreferent reading. The reason for this is the fact that the possessive pronoun is embedded inside a larger nominal constituent in both languages. The structure for a POSS-IN-SUBJ Warlpiri example (specifically, the example in (6.28a)) is the following:

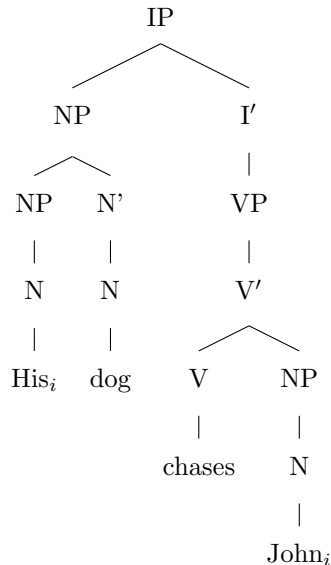
(6.37) POSS-IN-SUBJ Warlpiri structure:



‘His_i dog chases Jakamarra_i.’

The reading with coreference here is grammatical, because the pronoun, embedded inside the larger N', does not c-command its antecedent. Again, the relative order does not matter here. Moreover, the POSS-IN-OBJ example is grammatical with coreference for the same reason; it has the same structure, but different case-marking. In English the possessive pronoun examples are grammatical for a similar reason, with the pronoun being embedded:

(6.38) POSS-IN-SUBJ English structure:



The English POSS-IN-OBJ is grammatical under coreference for the same reason, with the pronoun embedded inside the VP and the antecedent appearing in the left periphery.

Simpson's analysis thus posits the same negative binding constraint to account for both the English and Warlpiri binding data, namely that a non-reflexive pronoun may not c-command its antecedent.²¹ The negative constraint appears to be another way of phrasing the traditional version of Condition C of Binding Theory, which says R-expressions must be free everywhere. However, the negative constraint that a non-reflexive pronoun may not c-command its antecedent makes predictions about examples about which Condition C has nothing to say, i.e. examples where two pronouns are coreferent with each other, such as *he_i saw his_i dog* and *his_i dog saw him_i*. In these types of examples, the question is which of the two pronouns is the antecedent and which one is the coreferring pronoun. If we assume that the first pronoun is the antecedent, then the negative constraint stated by Simpson (1991) is valid for the English coreference patterns. For Warlpiri I have not found any data of this kind, however. If we take examples with two coreferring pronouns out of the equation, the constraint

²¹At first glance it seems that a positive constraint, i.e. *an antecedent must c-command its pronoun* would also account for the data, but this constraint does not account for cases in which there is an antecedent in another clause. This is shown to be possible in Warlpiri, for example by Legate (2002), therefore a positive constraint does not account for the data.

that pronouns may not c-command their antecedent is essentially the same as Condition C in its traditional definition. In that case, Condition C can account for both the Warlpiri and the English data in the same way as the proposed negative constraint does. Simpson does not mention Condition C explicitly, nor give examples where there are two coreferring pronouns. For a full analysis, we also need to take these types of examples into account, and therefore Condition C alone is not sufficient to account for the data presented so far in this chapter.²²

Simpson (1991) argues in favour of this c-command analysis, and specifically against an f-command based analysis. The reason for this seems to be because she wants the same constraint for non-reflexive pronominal binding in both Warlpiri and English. With this goal in mind, her use of c-command instead of f-command to account for the Warlpiri and English binding data seems very plausible. Notice that a uniform f-command approach does not account for the data. As the f-structure for the equivalent sentences in Warlpiri and English are essentially the same, an f-command approach is not able to account for the difference in binding patterns. The f-structures for the PRO-SUBJ and PRO-OBJ examples are as follows:²³

(6.39) PRO-SUBJ f-structure:

$$\left[\begin{array}{l} \text{PRED} \quad \text{'chase(SUBJ,OBJ)'} \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'PRO'} \end{array} \right] \\ \text{OBJ} \quad \left[\begin{array}{l} \text{POSS} \quad \left[\text{PRED} \quad \text{'J'} \right] \\ \text{PRED} \quad \text{'dog'} \end{array} \right] \end{array} \right]$$

(6.40) PRO-OBJ f-structure:

$$\left[\begin{array}{l} \text{PRED} \quad \text{'chase(SUBJ,OBJ)'} \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{POSS} \quad \left[\text{PRED} \quad \text{'J'} \right] \\ \text{PRED} \quad \text{'dog'} \end{array} \right] \\ \text{OBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'PRO'} \end{array} \right] \end{array} \right]$$

These are the f-structures for the PRO-SUBJ and PRO-OBJ examples in both languages.

Recall that the PRO-OBJ examples (' J_i 's dog chases him $_i$ ') are ungrammatical in Warlpiri,

²²Moreover, to check that Condition C is a valid constraint on Warlpiri binding, one would need to examine examples with two coreferent R-expressions, such as *Johni's dog chased Johni*.

²³In terms of linear ordering, the English PRO-SUBJ example in (6.30) has the same ordering as the Warlpiri PRO-SUBJ example in (6.26b) (pronoun > antecedent). In Warlpiri the ordering antecedent > pronoun is also possible for the PRO-SUBJ (see (6.26a)), with the same functional structure. A similar statement is true for the PRO-OBJ examples: the English PRO-OBJ example in (6.31) has the same ordering as the Warlpiri PRO-OBJ example in (6.27a) (antecedent > pronoun), but in Warlpiri the alternative order is also possible (see (6.27b)), and both orders have the same f-structure.

but grammatical in English. A uniform constraint incorporating f-command will thus not be able to account for the data.²⁴

However, there is no need to adopt a uniform analysis, in which the same constraint applies in all languages and any differences can be attributed to the phrase structure. If we assume that different constraints are allowed for different languages, an f-command analysis can in fact account for the data very well, as will be shown. In line with other work on binding in LFG by Dalrymple (1993, 2001), Bresnan (2001) and others, we can simply assume that different languages have different constraints on binding (and coreference), which are lexically specified. In Section 6.2.2 we have seen that Dalrymple (1993) gives clear evidence from languages with multiple reflexives that binding constraints need to be lexically specified. An f-command analysis will be explored in more detail in Section 6.5. First, some data given by Legate (2002) in support of her transformational account (and against Simpson’s (1991) account) will be presented, in an attempt to further explore the role that binding plays in configurationality in different accounts.

6.4.3 Legate’s new data

Zero pronouns

Under the assumption that c-command is the crucial relation in binding, the flat c-structure for Warlpiri seems plausible. However, Legate (2002) provides new data which she uses to argue that in fact, Simpson’s flat structure is untenable. Legate provides examples similar to the PRO-SUBJ and PRO-OBJ ones for Warlpiri in (6.26) and (6.27), but in which the pronoun is not overt. The same grammaticality patterns emerge:

(6.41) a. PRO-SUBJ without overt pronoun:

Maliki Jakamarra-kurlangu paka-rnu.
 dog Jakamarra-POSS hit-PAST
 ‘He_{*i/j} hit Jakamarra_i’s dog.’

²⁴Note that the f-structure for the POSS-IN-SUBJ and POSS-IN-OBJ is also the same for both languages, but the grammaticality judgements for these examples are also the same for both languages.

b. PRO-OBJ without overt pronoun:

Jakamarra-kurlangu maliki-rli paji-rni.
 Jakamarra-POSS dog-ERG bite-PAST
 ‘Jakamarra_i’s dog bit him_{*i/j}.’

(Legate, 2002, p. 47)

Note that in these examples there is no auxiliary present, as the verb is marked for past tense. Both sentences with and without an overt pronoun are ungrammatical with coreference. Legate claims that an LFG approach (and specifically, Simpson’s approach) does not predict this: she claims that from the point of view of LFG, which does not posit empty categories, the coreference in (6.41) should be grammatical. Remember that Simpson claims that sentences involving binding are grammatical with coreference when the pronoun does *not* c-command the antecedent. If this pronoun is thus eliminated, the sentence should be grammatical. Legate (2002) uses this as an argument against Simpson’s c-command analysis for binding in Warlpiri. However, it does not rule out an f-command approach; the missing pronoun will be present in the f-structure. The f-structure for example (6.41a) is the same as for the PRO-SUBJ examples in (6.26) (except for the specific lexical content of the verb), and the f-structure for example (6.41b) is the same as for the PRO-OBJ examples in (6.27) (again except for the verb):

(6.42) a. F-structure for PRO-SUBJ examples (6.26) and (6.41a)

$$\left[\begin{array}{l} \text{PRED} \quad \text{'chase/hit<SUBJ,OBJ>} \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'PRO'} \end{array} \right] \\ \text{OBJ} \quad \left[\begin{array}{l} \text{POSS} \quad \left[\begin{array}{l} \text{PRED} \quad \text{'J'} \end{array} \right] \\ \text{PRED} \quad \text{'dog'} \end{array} \right] \end{array} \right]$$

b. F-structure for PRO-OBJ examples (6.27) and (6.41b)

$$\left[\begin{array}{l} \text{PRED} \quad \text{'chase/bite(SUBJ,OBJ)'} \\ \text{SUBJ} \quad \left[\begin{array}{l} \text{POSS} \quad \left[\text{PRED} \quad \text{'J'} \right] \\ \text{PRED} \quad \text{'dog'} \end{array} \right] \\ \text{OBJ} \quad \left[\text{PRED} \quad \text{'PRO'} \right] \end{array} \right]$$

In terms of f-structure, there is no difference between sentences with or without an overt pronoun. This is evidence in favour of an f-command approach: the same grammaticality patterns in both sets of examples (with or without overt pronoun) follow from the fact that the f-structures are the same for both sets, regardless of the actual c-structural presence or absence of the pronouns. The point that Legate (2002) makes about LFG is thus valid if we assume c-command to be a crucial role in binding relations, but if we take this assumption away, an LFG f-command approach is very capable of accounting for the data without overt pronouns. With the incorporation of lexical specification of binding constraints, f-command allows us to posit one single constraint for overt and zero non-reflexive pronouns in Warlpiri.

Note that the examples in (6.41) do not contain auxiliaries. This means that there are also no pronominal markers present in these examples, as these can be marked on the AUX in Warlpiri. In general, sentences in Warlpiri can contain both a pronoun and a pronominal marker for the same argument, both contributing to the same f-structure:

(6.43) *Ngaju ka-rna parnka-mi.*
 PRO.1SG.ABS PRES-1SG run-NPST
 'I am running.'

(Simpson, 1991, p. 70)

In this example, there is a separate pronoun for the subject of the sentence, contributing the information that it is first person and singular, and this information is also marked in the pronominal marker on the auxiliary. Sentences may also contain one or the other, or none as illustrated by (6.41): in such cases, the missing argument is filled in by context. It would be

interesting to have data with pronominal markers but no overt pronoun, to see if this would make a difference for the grammaticality of the reading with coreference. The f-command approach would predict that the grammaticality patterns do not change, as the f-structure for examples with pronominal markers, but no overt pronouns, is the same as for the other two cases that have been described (with an overt pronoun, or with no marking whatsoever).

Dative suffix data

In addition to the zero pronoun data, Legate (2002) provides data with dative marking to argue against Simpson's (1991) approach. Legate claims that sentences similar to the PRO-SUBJ and PRO-OBJ examples in (6.26a) and (6.27a) are grammatical with a coreferent reading when instead of the possessive suffix (*-kurlangu*), the dative suffix *-ku* is used:

- (6.44) a. *Karnta-ku jaja-lpa nyanungu-rlu jakuru-pu-ngu.*
 woman-DAT grandmother-PAST.IMPF she-ERG goodbye-VR-PAST
 'She_i was announcing her leave to the woman_i's grandmother.'
- b. *Karnta-ku jaja-ngku-lpa nyanungu jakuru-pu-ngu.*
 woman-DAT grandmother-ERG-PAST.IMPF she goodbye-VR-PAST
 'The woman_i's grandmother was announcing her leave to her_i.'

(Legate, 2002, p. 47)

Notice that *jaja* ('grandmother') is attached to the AUX. Legate points out that Simpson's arguments in favour of a flat structure in Warlpiri outlined in Section 6.4.2 (with the main claim that the pronoun may not c-command its referent) do not account for the examples in (6.44): in both sentences the pronoun c-commands its antecedent (assuming a flat structure). This is a fair point, but there are some problems with the data here. First of all, Legate does not show any other orderings of the sentences in (6.44). This might not make a difference to her claim, but it would be interesting to see if word order plays a role here. More importantly, however, Simpson (1991, p.179-180) points out that sentences like the ones in (6.44), but with the possessive *-kurlangu* instead of the dative *-ku*, were indeed found grammatical by some speakers, as shown in earlier work by David Nash.²⁵ According to Nash, the following

²⁵Simpson (1991, p. 179) does not give an exact reference for Nash's findings; she only mentions that it was elicited by him.

examples were found grammatical by some speakers:²⁶

- (6.45) a. *Jakamarra-kurlangu maliki ka nyanungu-rlu wajili-pi-nyi.*
 Jakamarra-POSS dog PRES he-ERG chase-VR-NPST
 ‘He_i chases Jakamarra_i’s dog.’
- b. *Jakamarra-kurlangu maliki-rlu ka nyanungu wajili-pi-nyi.*
 Jakamarra-POSS dog-ERG PRES he chase-VR-NPST
 ‘Jakamarra_i’s dog chases him_i.’

These examples are the same as the Warlpiri PRO-SUBJ and PRO-OBJ presented earlier (in (6.26a) and (6.27a) respectively), but with different grammaticality judgements. This means that for some speakers coreference in these examples is acceptable, unlike in the data shown earlier. It is unclear how large this group is. The sentences in (6.45) parallel the sentences in (6.44) with the dative suffix in terms of grammaticality patterns. Legate gives the examples in (6.44) as evidence against a flat structure, but does not say whether speakers who accept the dative examples in (6.44) as grammatical under the coreferent reading, also judge sentences with the possessive *-kurlangu* as in (6.45) to be grammatical under a coreferent reading. This is problematic for the current discussion. Legate also does not give any examples where a pronoun rather than a noun is marked by a dative marker (the POSS-IN-SUBJ and POSS-IN-OBJ constructions). She does not mention whether it is possible at all for the dative suffix *-ku* to replace the possessive *-nyangu* (on free pronouns) in the way it can replace the possessive suffix *-kurlangu* (on nouns).

Legate (2002) analyses the difference in grammaticality between the PRO-SUBJ and PRO-OBJ examples with the possessive suffix *-kurlangu* in (6.26) and (6.27) on the one hand and with the dative suffix *-ku* in (6.44) on the other hand by saying that R-expressions marked with the possessive *-kurlangu* are in fact adjectival and therefore not available as antecedents of pronouns. Coreference in the dative examples is grammatical, she claims, because of a process of optional scrambling of the object over the subject. The assumption that the possessors are

²⁶Interestingly, Nash found that speakers were willing to accept (6.45a), but not the same sentence with a different word order, namely one in which the pronoun precedes its antecedent, the same as in the original PRO-SUBJ example (6.26b). This is different for (6.45b): both (6.45b) and the alternative word order with pronoun preceding antecedent were found to be acceptable (Simpson, 1991).

adjectival (and thus adjuncts), would give a nice account of the data, because nouns marked with dative case are very often arguments. This difference in argument-/adjuncthood could be argued to be reflected in the difference in grammaticality with coreference. However, dative nominals do not necessarily have to be arguments, and the status of possessors as arguments is debated. Grimshaw (1991) argues that possessors can be either adjuncts or arguments, depending on the type of NP/DP they are the possessor of. For these reasons, this line of reasoning is not very solid.

With regards to the difference in grammaticality judgements, it could simply be the case that there is a group of speakers who accept both the sentences with the dative *-ku* and the possessive *-kurlangu* as grammatical under a coreferent reading, and a group who accept neither of the sentences, whether with the dative or the possessive suffix, as grammatical under a coreferent reading. In that case, one simply needs to assume that the two different groups of speakers have different internal grammars (with respect to binding), each of which needs a proper analysis. I will refer to these two different hypothetical groups as ‘Group A’ (for the group not accepting coreference in the PRO-SUBJ/OBJ examples) and ‘Group B’ (for the group accepting coreference in the PRO-SUBJ/OBJ examples). A c-command LFG analysis for Group A has been given by Simpson (1991), as explained above. The PRO-SUBJ and PRO-OBJ examples in (6.26) and (6.27) are ungrammatical with coreference, because in both sentences the pronoun c-commands its antecedent, which is not allowed. For the potential Group B which does accept the PRO-SUBJ and PRO-OBJ examples with coreference (and are also assumed to accept (6.44) with coreference), it can be said that this constraint (pronouns not being allowed to c-command their antecedents) does not apply, and therefore that coreference in the sentences in (6.44) and (6.45) is allowed.

In order to test whether there are indeed two groups of speakers, I examined whether speakers who judge the PRO-SUBJ and PRO-OBJ data to be grammatical (as shown in (6.45)), also find the dative examples in (6.44) grammatical. Similarly, I wanted to see if there is a group who judge both to be ungrammatical. Data elicited by Margit Bowler

(p.c.) does not confirm that there are two distinct groups of speakers.²⁷ Bowler points out that possession, especially of kinship, is very complex in Warlpiri. This has been noted for Warlpiri by others, and also for other languages. This makes this quest more complicated. Two speakers were presented with PRO-OBJ and PRO-SUBJ examples with the possessive *-kurlangu* suffix, in both order antecedent > pronoun and pronoun > antecedent. The examples are of the following kind:

(6.46) PRO-OBJ example, antecedent > pronoun:

Jakamarra-kurlangu-rlu maliki-rli ka nyanungu wajili-pi-nyi.
 Jakamarra-POSS-ERG dog-ERG PRES he.ABS chase-VR-NPST
 ‘Jakamarra_i’s dog chases him_i.

The judgements for the four sentences, elicited by Bowler (p.c.), are displayed here (with agreement between the speakers), where A refers to ‘antecedent’ and P to ‘pronoun’:

(6.47) Judgement of examples with possessive *-kurlangu*:

Type of example	Order	Judgement
PRO-SUBJ	A > P	X
PRO-SUBJ	P > A	X
PRO-OBJ	A > P	✓
PRO-OBJ	P > A	✓

This result illustrates that ordering does not seem to play a role in these judgements, which is in line with Simpson’s (1991) data. However, the judgement between the PRO-SUBJ and PRO-OBJ examples is different, which does not align with Simpson’s observations, and is also different than the patterns found by Nash. This is evidence that another type of analysis than the one by Simpson (1991) is required to account for the data. This will be discussed in more detail later.

²⁷As mentioned, Bowler (p.c.) makes the interesting observation that at the time of elicitation (2013), Warlpiri speakers case-mark all subparts of a constituent, which is different from observations by Hale *et al.* (1995) and others that case is only marked once on Warlpiri nominal constituents.

Both of these altered examples have a different structure from the original ones. In both (6.49a) and (6.49b), the pronoun is now a possessor rather than serving as an argument of the verb. These sentences are thus different constructions, and not relevant for the issue at hand; this is reflected in the translations. In (6.49a), the pronoun is in absolutive case and is marked as a possessive. It is unclear whether it is the possessor of the dative *karnta-ku* ('woman') or of the ergative *jaja-ngku* ('grandmother').²⁸ In (6.49b) the possessive suffix is present on both the dative argument as well as the pronoun; it is unclear why this is marked twice. In any case, based on the fact that the speaker proposes the examples in (6.49) as alternative constructions to the original ones in (6.48), we may conclude that this speaker does not accept the PRO-SUBJ and PRO-OBJ examples with dative suffix in (6.48).

In summary, Bowler's data shows that speakers judge sentences with possessive *-kurlangu* to be grammatical in the PRO-OBJ construction, in both orders, in which the antecedent precedes the pronoun or vice versa. The PRO-SUBJ examples were not found to be grammatical. The dative data was judged to be grammatical by one speaker (for both PRO-OBJ and PRO-SUBJ sentences), and not grammatical by the other speaker. We can draw a few conclusions from this. Firstly, there do not appear to be two groups of speakers, as speculated. Judgements for the possessive *-kurlangu* sentences do not align with judgements for the dative *-ku* sentences. Secondly, the grammatical function hierarchy seems to play a role in the possessive *-kurlangu* sentences, shown by the fact that PRO-OBJ examples are grammatical but PRO-SUBJ examples are not. This is contradictory to data presented by Simpson (1991), as we have seen: in the examples she gives there is no difference in grammaticality between PRO-OBJ and PRO-SUBJ examples (or between POSS-IN-OBJ and POSS-IN-SUBJ examples). Thirdly, the dative data is somewhat messy. As mentioned, Bowler points out that possession in general, and possession of kinship in particular, is very complex in Warlpiri. At this point it seems difficult to say very much about kinship possession, because the data set is not very large and not very conclusive (even taking Legate's (2002) dative data into account). It can,

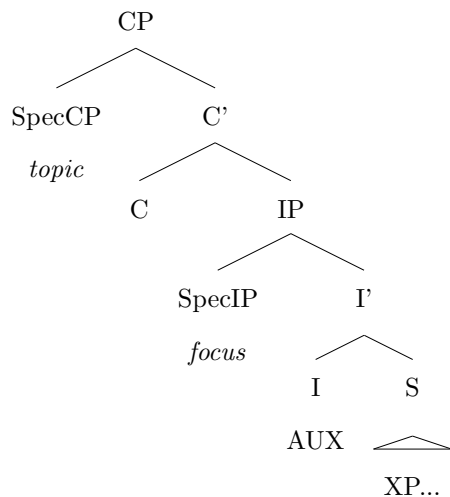
²⁸Bowler (p.c.) remarks that she is puzzled by the absolutive case of the pronoun here, and that it could potentially be due to the use of the possessive suffix *-nyangu* with pro-drop which is possible for kinship terms.

however, be concluded that different speakers have different grammaticality judgements for this type of binding data, illustrating variety in idiolects. The difference between the possessive *-kurlangu* data provided by Bowler and by Simpson (1991) could be due to dialectal differences (or even differences in age), but it is difficult to draw hard conclusions about this due to the limited amount of data and a lack of background information about the speakers. Nonetheless, the facts shown here imply that a more fine-grained analysis is needed than one relying on c-command (or f-command) alone: lexical specification of binding constraints for individual speakers and potentially different dialects is a way to solve this problem. This will be incorporated into the analysis in Section 6.5.

6.4.4 A more hierarchical structure

Apart from the arguments put forward by Legate (2002) against the approach by Simpson (1991) (problems that can be solved in an f-command approach, as will be shown in the next section), there is one additional problem: the argumentation in Simpson (1991) does not hold with the more recently proposed structure for Warlpiri in Simpson (2007), the structure that I assume for Warlpiri. This more hierarchical structure, presented in Section 4.5.1 and repeated in Section 6.3, is repeated again here, with the ‘Expression Node’ left out for clarity:

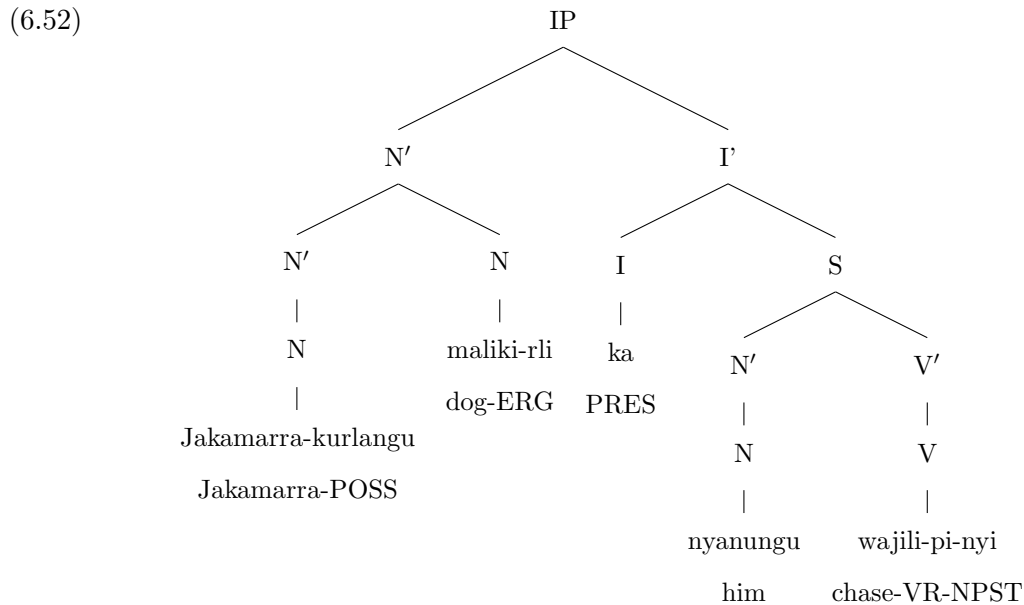
(6.50) Simpson (2007):



Simpson’s (1991) argument that Warlpiri’s flat structure accounts for the same patterns for

both PRO-SUBJ and PRO-OBJ examples (in either order) on the one hand, and POSS-IN-SUBJ and POSS-IN-OBJ examples (in either order) on the other hand, no longer holds with a hierarchical structure. As an illustration of this, consider the structure of a PRO-OBJ example (with antecedent > pronoun) under Simpson's (2007) assumptions about phrase structure:

- (6.51) *Jakamarra-kurlangu maliki-rli ka nyanungu wajili-pi-nyu.*
 Jakamarra-POSS dog-ERG PRES him chase-VR-NPST
 'Jakamarra_i's dog chases him_{*i/j}.'



In this example, the pronoun does not c-command its antecedent, or vice versa. If we imagine the alternative order, with pronoun > antecedent, then the pronoun does c-command its antecedent (but not vice versa). Considering that both orders are said to be equally ungrammatical with coreference, c-command cannot be used as an argument to account for the data discussed by Simpson (1991). An alternative is needed, and it comes in the form of an f-command analysis which is discussed in the next section.

6.5 An f-command analysis

Simpson's (1991) c-command approach accounts for the difference in coreference patterns between Warlpiri and English by positing different c-structures for these languages. In her

analysis, precedence/functional rank is automatically built into the binding requirements for English, but not for Warlpiri. This is because in English, there is an asymmetric relation between subject and object (subject c-commanding object but not vice versa), because of the presence of the VP. In Warlpiri, assuming a flat structure, this is not the case, meaning that linear ordering should not matter to binding, which is borne out. This seems like a surprising result cross-linguistically. As described in Section 6.2.2, f-command and f-structural relations play a role in, among others, Dalrymple's (1993; 2001) and Bresnan's (2001)'s accounts of binding constraints. The use of f-command to account for binding (as opposed to c-command) reflects LFG's standard view of binding relations, in which f-structure rather than c-structure plays a role in establishing particular kinds of relations between constituents, such as the relation of a predicate to its arguments (particularly compared to transformational theories). Moreover, we have seen two clear arguments in favour of an f-command approach. Firstly, the c-structure that Simpson (2007) proposes is no longer compatible with a c-command approach, and necessitates an alternative analysis of the binding patterns. Secondly, the zero pronoun data presented by Legate (2002) and illustrated in Section 6.4.3 is evidence in favour of an f-command approach, as the similar patterns for data with zero pronouns and data with overt pronouns can be explained by the fact that they have the same f-structure. For these reasons, an f-command analysis will be pursued in this section.

It should also be noted that the argument that Simpson (1991) uses against an f-command approach, namely the idea that the same constraint should account for binding patterns in both languages, is not very strong. There does not seem to be a good reason for a binding analysis to be uniform for both languages. As argued by Dalrymple (1993) (and discussed in Section 6.2.2), the binding properties of a pronoun or nominal are lexically specified. Dalrymple provides evidence from Marathi and Norwegian that lexical specification is necessary to account for binding patterns in these languages. This is also how she accounts, for example, for the difference in grammaticality between *John_i's dog chases him_i* and **John_i's dog chases himself_i*: the non-reflexive pronoun *him* and the reflexive pronoun *himself* have different binding constraints, which are lexically specified. One can claim that the antecedent of *him* is

not allowed to f-command it in its local domain. This reflects the traditional definition of Condition B (a negative binding constraint); it ensures that, also in f-command terms, the pronoun is not bound in its local domain. Reflexives, on the other hand, need to be bound in their local domain: the antecedent of *himself* needs to f-command it (reflecting the traditional definition of Condition A, a positive binding constraint). This illustrates that the concept of lexical specification can account for differences in constraints for pronouns within one language (reflexive and non-reflexive ones), as well as accounting for the difference in binding patterns of similar pronouns in different languages. One can simply assume that different factors/domains are important for binding/coreference patterns in different languages. These can be lexically specified for individual (pro)nouns: in this way, cross-linguistic differences can be analysed in a straightforward fashion.

An overview of the relevant data is repeated in Table 6.4.

Table 6.4: Repeated overview of the possessive binding data in Warlpiri and English

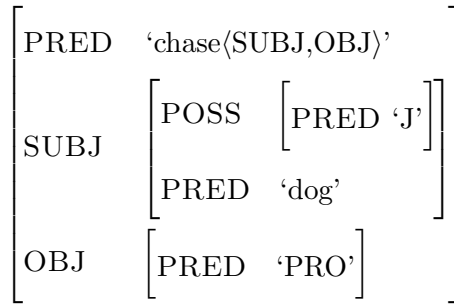
	Warlpiri	English	Type of sentence
(a) He _i chases J _i 's dog.	*	*	PRO -SUBJ
(b) J _i 's dog chases him _i .	*	✓	PRO -OBJ
(c) His _i dog chases J _i .	✓	✓	POSS-IN-SUBJ
(d) J _i chases his _i dog.	✓	✓	POSS-IN-OBJ

For reference in the next few sections, here are the corresponding f-structures for these examples, assumed to be the same for both languages:

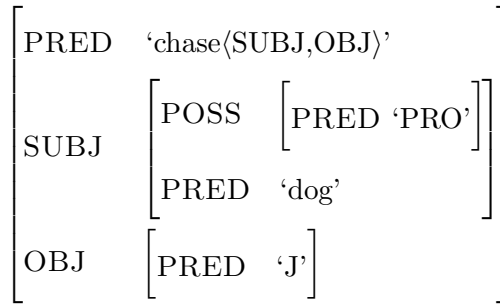
(6.53) a. PRO-SUBJ:

$$\left[\begin{array}{l} \text{PRED} \quad \text{'chase<SUBJ,OBJ>} \\ \text{SUBJ} \quad \left[\text{PRED} \quad \text{'PRO'} \right] \\ \text{OBJ} \quad \left[\begin{array}{l} \text{POSS} \quad \left[\text{PRED} \quad \text{'J'} \right] \\ \text{PRED} \quad \text{'dog'} \end{array} \right] \end{array} \right]$$

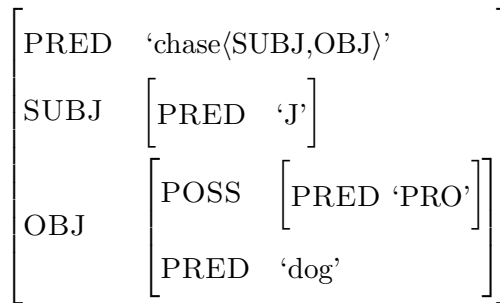
b. PRO-OBJ:



c. POSS-IN-SUBJ:



d. POSS-IN-OBJ:



6.5.1 Warlpiri

An f-command approach can easily account for the Warlpiri pronoun data in Table 6.4, because there is a neat pattern, reflected in the two different types of f-structures in (6.53), with the pronoun as an argument of the verb in (6.53a) and (6.53b) and the pronoun as a possessor in (6.53c) and (6.53d). Assuming that f-command is the relevant factor, we can explore the following potential constraints for the non-reflexive pronoun *nyanungu* in Warlpiri:²⁹

²⁹Choosing to specify binding constraints lexically means that the (potential) constraints are specifically tied to the pronoun *nyanungu*.

(6.54) Alternative formulations of binding constraints for *nyanungu* in Warlpiri:

a. ‘A pronoun must be f-commanded by its antecedent.’ (positive constraint)

OR

b. ‘A pronoun may not f-command its antecedent.’ (negative constraint)

OR

c. Both of the above (negative and positive constraint)

The first constraint, (6.54a), contradicts the traditional definition of Condition B (stating that a non-reflexive pronoun must be free in its governing category), and therefore seems implausible cross-linguistically.³⁰ Also, as mentioned above, this constraint prohibits pronouns coreferring with antecedents outside their local clause. This constraint can therefore be ruled out. For the same reason, (6.54c) can be ruled out. The remaining option, (6.54b), seems much more plausible. It covers cases in which there are two pronouns in a sentence, as mentioned earlier. More data would be needed to test whether (6.54b) is valid for examples with two pronouns, i.e. one needs to test whether the coreference in the Warlpiri version of a sentence such as *his_i dog bit him_i* is grammatical.³¹ Due to a lack of data of this kind, we can for the moment only make a claim about when the antecedent is an R-expression:

(6.55) Binding constraint on the non-reflexive *nyanungu* in Warlpiri:

‘*Nyanungu* may not f-command its antecedent (if the antecedent is an R-expression).’

In order to see if this constraint is valid, we would also need to check if this non-reflexive pronoun, when appearing as an argument of the verb, cannot corefer with its coargument. The constraint posited in (6.55) is a constraint on the pronoun *nyanungu*, but one could posit the same constraint in relation to R-expressions: *an R-expression must be free*. This is

³⁰Bresnan (2001) assumes that constraints are lexically specified, but mentions that the traditional binding conditions (Condition A, B and C) do appear to express a tendency in binding in some of the world’s languages. However, she does note that typologically, these three conditions are inadequate, because they do not account for binding in all languages. As shown, counterexamples come from languages with multiple reflexives, for which one cannot state one simple condition, because the reflexives have different domains in which they can have binding relations.

³¹With data like this, the picture becomes more complicated however, because in this case it is not clear which of the pronouns is the antecedent and which is the coreferring pronoun.

equivalent to Condition C in traditional binding theory, with the difference that the binding relation assumed is f-command, but not c-command. The constraint in (6.55) is essentially a different way of saying that R-expressions may not be bound. We could express this in the following way:³²

(6.56) Binding constraint on R-expressions in Warlpiri:

‘An R-expression must be free: it may not be f-commanded by a coreferring pronoun.’

Notice that this f-command version of Condition C accounts for Warlpiri but not for English. Recall that English PRO-SUBJ examples (**he_i chases John_i's dog*) are not grammatical, but PRO-OBJ examples (*John_i's dog chases him_i*) are grammatical. As they have the same f-structure as the Warlpiri examples discussed here, we see that the same constraint cannot apply. Condition C has been addressed in LFG by Bresnan (2001), who adopts a version of Principle of C from Evans (1980) translated into LFG. She posits the following version, referring to it as the “anti-binding” condition, which she hypothesises to be universal (Bresnan, 2001, p. 226). For clarity I have also repeated the definition of Syntactic Rank from (6.9):

(6.57) **Anti-binding:**

A pronominal *P* cannot be referentially dependent on a nominal that it asymmetrically outranks.

(6.58) **Syntactic Rank:** *A* locally outranks *B* if *A* and *B* belong to the same f-structure and *A* is more prominent than *B* on the grammatical function hierarchy. *A* outranks *B* if *A* locally outranks some *C* which contains *B*.

(Bresnan, 2001, p. 213)

Anti-binding is a version of Condition C that focuses on the pronoun, as opposed to the constraint in (6.56) which focuses on R-expressions.³³ The condition states, on the one hand, that

³²For the moment I am not making any predictions about whether an R-expression may or not may be bound by another R-expression. This seems highly unlikely, but important at the moment is that (6.56) is a ‘translation’ of (6.55).

³³For this reason, the constraint in (6.57) also does not take examples into account in which R-expressions are bound by other R-expressions.

a pronominal may not corefer with a nominal that it f-commands (included in the meaning of ‘outranks’). Additionally, the f-structure of the pronoun may not be higher on the grammatical function hierarchy than the f-structure of the nominal, or the f-structure that the nominal is embedded in. The incorporation of the grammatical function hierarchy via the use of the relation of ‘outranking’ accounts for English, but, as we have seen, it does not account for the Warlpiri data. This does not mean that Anti-Binding does not hold for Warlpiri. In principle it does, as shown by the fact that the PRO-SUBJ examples are ungrammatical. However, it is not sufficient by itself to account for the Warlpiri data. Specifically, it does not account for the ungrammatical PRO-OBJ examples in Warlpiri. Therefore one needs to consider the other two options stated in (6.55) and (6.56).

There are thus two ways of stating the constraint on the binding data that has been discussed in this chapter; a constraint on non-reflexives in (6.55) and a constraint on R-expressions in (6.56). Both can be formalised following Dalrymple (1993). Recall the formalisation of negative constraints, repeated here from (6.12):

$$(6.59) \quad ((\text{DomainPath} \uparrow) \text{AntecedentPath})_{\sigma} \neq \uparrow_{\sigma}$$

DomainPath is the f-structure that contains the anaphoric element and its antecedent, and AntecedentPath is the path from the anaphoric element to its antecedent. The constraint in (6.55), repeated here in (6.60), can be formalised as shown in (6.61).

(6.60) Binding constraint on the non-reflexive *nyanungu* in Warlpiri:

‘*Nyanungu* may not f-command its antecedent (if the antecedent is an R-expression).’

$$(6.61) \quad \begin{array}{c} ((\text{GF} \uparrow) \quad \text{GF}^* \quad \quad \quad \text{GF} \quad \quad \quad)_{\sigma} \neq \uparrow_{\sigma} \\ \neg(\rightarrow \text{PRONTYPE}) \end{array}$$

DomainPath is GF, meaning that DomainPath is unconstrained. Important here is the fact that there is no functional uncertainty inside DomainPath. This means that DomainPath consists of GFs that are arguments of verbs (or adjuncts, although there is no adjunct data so this could mean we might want to say AF for argument function instead of GF). The path

from pronoun to antecedent is $GF^* GF$: one can go out from the f-structure of the anaphoric element and then go as deep into the f-structure containing the antecedent (GF^*), as long as one ends at a GF which does not have a $PRONTYPE$ attribute, i.e. an R-expression. This constraint is a way of representing the f-command relation, with the \neq representing that it is a negative constraint. Importantly, the constraint says something about what types of elements the pronoun may or may not f-command, and not about what types of elements it may or may not be f-commanded by. Note that this constraint prevents the pronoun from f-commanding itself, by ensuring that the antecedent does not have a $PRONTYPE$ attribute in its f-structure; this is a desirable outcome.

The constraint in (6.56) can be formalised in a similar way, but this time it expresses something about what types of elements the R-expression may or may not be f-commanded by. This means that now $DomainPath$ is not length one, but $AntecedentPath$ is length one:

(6.62) Binding constraint on R-expressions in Warlpiri:

‘An R-expression must be free: it may not be f-commanded by a coreferring pronoun.’

(6.63) $((GF^+ \uparrow) GF)_\sigma \neq \uparrow_\sigma$

This is the general f-command constraint described by Dalrymple (1993, p. 156). There are several reasons to prefer the rule in (6.63) over the rule in (6.61). Firstly, it is more straightforward, as it does not require a specification involving $PRONTYPE$ (although as mentioned, with the right data, we might be able to remove this restriction). Moreover, the constraint in (6.63) fits in better with Dalrymple’s (1993) work, as she in general posits constraints on what types of elements may or may not c-command the element that the constraint is on. In other words, Dalrymple’s constraints always have an $AntecedentPath$ of length one. She states explicitly that $AntecedentPath$ must be a singleton path, the grammatical function borne by the antecedent (Dalrymple, 1993, p. 157). This means that even though the constraint in (6.61) describes the f-command relation of the f-commander accurately, it does not fit in with the general trend to posit constraints for f-commanded elements. This suggests

that, instead of viewing this discussion as a discussion on constraints on non-reflexive binding, we might want to view it as a discussion on R-expressions. I assume that the constraint in (6.56), formalised in (6.63), is the one that accounts for the Warlpiri data discussed by Simpson (1991).³⁴ The constraint formalised in (6.63) is an f-command version of Condition C, even though it covers a different set of data than the c-command version of Condition C. For example, the c-command version of Condition C covers English examples such as *John_i's dog chases him_i*, because *him* is embedded inside the VP and thus does not c-command *John*, but the f-command style Condition C does not work for this example, as *him* f-commands the embedded *John*.

From an LFG point of view, the constraint proposed here on R-expressions is unusual, because it only incorporates f-command and nothing else (this can equally be said about a constraint on the pronominal *nyanungu*, as also this constraint only involves f-command). In Section 6.2.2 it was shown that in many LFG accounts of binding, it is assumed that f-command plays a role together with something else, such as the grammatical functional hierarchy. This is the case in for example Bresnan's (2001) use of Syntactic Rank, which makes reference to the grammatical function hierarchy, shown in (6.9). In Warlpiri, such an elaborate relation to account for (at least) this set of data is not needed: we have a constraint which only takes f-command into account. The outcome that f-command on its own can account for the Warlpiri data is unexpected and therefore very interesting. The lack of subject-object asymmetries seems to reflect in some way Warlpiri's non-configurational (or discourse configurational) nature and free assignment of grammatical functions. Also, the lack of influence of f-precedence seems in some way be linked to free word order of argument functions. This will be addressed in more detail in Section 6.6. Firstly, in order to show how this f-command only analysis for Warlpiri contrasts with potential analyses for English (in which subject-object asymmetries are attested), a brief overview of the corresponding analysis of English will be given in the next section. The fact that the grammatical function

³⁴Note that accepting the constraint on R-expressions does not technically exclude having a constraint like the one in (6.55) on the anaphoric element *nyanungu*, although it would make such a constraint redundant.

hierarchy is assumed to play a role in accounting for subject-object asymmetries (for example in English) leads me to speculate that there is a link between the grammatical function hierarchy and subject-object asymmetries, which will also be discussed in Section 6.6). The next section serves as an introduction to a case where f-precedence and/or the grammatical function hierarchy do play a role in accounting for binding patterns.

6.5.2 English

In order to account for the English non-reflexive binding patterns, one cannot rely only on f-command to account for the binding data. An f-command only analysis does not explain the difference in grammaticality between the English PRO-OBJ and PRO-SUBJ examples in a. and b. of Table 6.4 respectively. The f-command relations in these sentences are the same, but one of them is acceptable with coreference whereas the other one is not. In English we need an additional restriction. This section briefly explores two options which can aid f-command in accounting for the English data: f-precedence and the grammatical function hierarchy.

Recall the definition of f-precedence (Bresnan's (2001) definition):

(6.64) **F-precedence:** f f-precedes g if the rightmost node in $\phi^{-1}(f)$ precedes the rightmost node in $\phi^{-1}(g)$

We can assume that the difference in grammaticality between the PRO-OBJ and the PRO-SUBJ examples in English comes from a difference in f-precedence. In both examples, the pronoun f-commands its antecedent but not vice versa. In the PRO-OBJ example (*John_i's dog chases him_i*) the antecedent f-precedes the pronoun, and in the PRO-SUBJ example (*he_i chases John_i's dog*) the antecedent does not f-precede the pronoun. We could thus state that a pronoun may not f-precede its antecedent in English, but this would rule out the existence of cataphora, as explained earlier. Therefore, the f-command relation is also important. This becomes further evident from the POSS-IN-SUBJ and POSS-IN-OBJ examples, as shown in Table 6.4. In the POSS-IN-SUBJ English example, the pronoun f-precedes the antecedent as it does in the PRO-SUBJ example, but the coreference is grammatical. The difference

between these two examples (PRO-SUBJ and POSS-IN-SUBJ) is the f-command relation: in the PRO-SUBJ example the antecedent does not f-command the pronoun (but the pronoun does f-command its antecedent), and in the POSS-IN-SUBJ example the antecedent does f-command the pronoun (but the pronoun does not f-command its antecedent). In an f-precedence based analysis for English, we thus need to take both f-command and f-precedence relations into account. The following is a statement of the f-precedence based constraint on binding of English pronouns:

(6.65) Binding constraints on non-reflexive pronominal binding in English (f-precedence):

‘A pronoun may not both f-command and f-precede its antecedent.’

This constraint thus accounts for the ungrammaticality of the PRO-SUBJ example for English in (6.4a).

An f-precedence account is possible, but an analysis incorporating the grammatical function hierarchy is equally an option to account for the data.³⁵ At first glance it seems that the grammatical function hierarchy is a problematic relation to account for the possessive data discussed in this chapter. The reason for this is that in the PRO-SUBJ and PRO-OBJ examples we are looking at a pronoun functioning as an argument of the verb, its antecedent being the possessor of its coargument; this becomes clear from the f-structures in (6.53). In the POSS-IN-SUBJ and POSS-IN-OBJ examples, the antecedent is an argument of the verb, and its coreferring pronoun is the possessor of a coargument. The possessor does not appear on the grammatical function hierarchy. This is addressed by Bresnan (2001) in her definition of Syntactic Rank, repeated here from (6.9):

(6.66) **Syntactic Rank:** *A* locally outranks *B* if *A* and *B* belong to the same f-structure

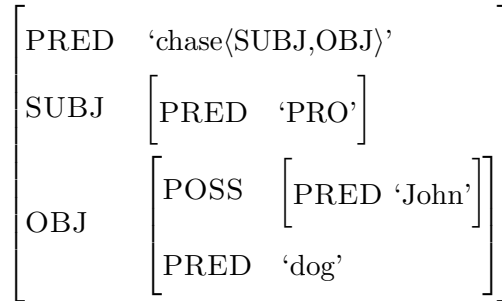
and *A* is more prominent than *B* on the grammatical function hierarchy. *A* outranks *B* if *A* locally outranks some *C* which contains *B*.

(Bresnan, 2001, p. 213)

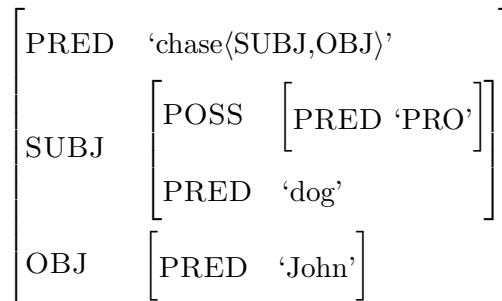
³⁵In English, linear order roughly corresponds to the grammatical function hierarchy. It could thus very well be the case that an analysis incorporating f-precedence and an analysis incorporating the grammatical hierarchy are both valid, and/or linked to each other.

The f-structures for PRO-SUBJ and POSS-IN-SUBJ are repeated here to illustrate the use of Syntactic Rank:

(6.67) a. PRO-SUBJ:



b. POSS-IN-SUBJ:



Syntactic Rank provides a way to refer to the relation between an argument and the possessor of a coargument. We can say that in the PRO-SUBJ f-structure, the pronoun locally outranks *John's dog*, which means that the pronoun outranks *John*, because the f-structure for *John* is contained in the f-structure of *John's dog*. In the PRO-OBJ example, the pronoun does not outrank *John*, as the pronoun is now lower on the grammatical function hierarchy than *John's dog*. In the POSS-IN-SUBJ the pronoun does not outrank *John*, because it is embedded. The same is true for the POSS-IN-OBJ examples. A constraint stating that a non-reflexive pronoun may not outrank its antecedent thus explains the English non-reflexive binding patterns discussed in this chapter. This also becomes evident from the Anti-Binding Condition, defined in (6.57) in the previous section. This shows that either an approach taking f-precedence into account, or an approach taking the grammatical function hierarchy into account, in addition to f-command, can help account for the English versions of the four types of examples discussed in this chapter.

The difference between the English and Warlpiri non-reflexive pronominal binding facts can be analysed by positing different constraints for the pronouns in the different languages. In English f-command and either f-precedence or the grammatical function hierarchy (incorporated into the concept of Syntactic Rank) seem to play a role, while in Warlpiri only f-command is relevant. As mentioned, it is a remarkable find that in Warlpiri f-command on its own accounts for the binding data. It appears that in most languages, f-command alone is inadequate to account for binding patterns. Here I have shown that an analysis with f-command and not c-command as the relevant feature for binding and coreference is very capable of accounting for the Warlpiri data, unlike what Simpson has argued. It is true that the analysis proposed here is not uniform like Simpson's analysis, but there is no real reason to assume that an analysis for binding should be uniform. Moreover, there are good reasons to assume an f-command over a c-command approach, as it solves some of the issues discussed in the beginning of this section. Importantly, we can say that binding constraints are lexically specified for different pronouns (within a language and across different languages). This means that sentences with the same/similar f-structure in different languages can have different grammaticality status, depending on the exact constraints specified for that type of (pro)noun in that particular language.

6.5.3 Additional evidence for lexical specification

So far the discussion has focused on the data brought forward by Simpson (1991) (elicited by Mary Laughren), used to argue in favour of her c-command approach. However, there are different sets of data for different Warlpiri speakers, with different grammaticality judgements. Some of this data has been mentioned along the way but it will be discussed in more detail in this section. Firstly, there is data that Simpson herself mentions as a side remark: data elicited by David Nash which shows different grammaticality patterns than the data that Simpson presents in her argumentation. Secondly, data elicited by Bowler also shows different judgements than Simpson's (1991) data. Moreover, it seems that reflexive data, at least for some speakers, does not show the same lack of subject-object asymmetries as the data

presented by Simpson (1991). Both the different grammaticality judgements for the non-reflexive data, as well as the judgements for the reflexive data, can be used to show that lexical specification provides the right tools to account for the wide range of binding patterns.

Different judgements

Simpson (1991) notes that elicitation work by Nash shows different grammaticality patterns for the PRO-SUBJ and PRO-OBJ than the ones she uses for her analysis. Different speakers appear to have different grammaticality judgements for the type of non-reflexive data discussed. The data elicited by Nash is as follows:

(6.68) PRO-SUBJ examples as elicited by David Nash:

- a. *Jakamarra-kurlangu maliki ka nyanungu-rlu wajili-pi-nyi.*
 Jakamarra-POSS dog PRES he-ERG chase-VR-NPST
 ‘He_i chases Jakamarra_{i/j}’s dog.’
- b. *Nyanungu-rlu ka Jakamarra-kurlangu maliki wajili-pi-nyi.*
 he-ERG PRES Jakamarra-POSS dog chase-VR-NPST
 ‘He_i chases Jakamarra_{*i/j}’s dog.’

(Simpson (1991, p. 179))

(6.69) PRO-OBJ examples as elicited by David Nash:

- a. *Jakamarra-kurlangu maliki-rli ka nyanungu wajili-pi-nyi.*
 Jakamarra-POSS dog-ERG PRES him chase-VR-NPST
 ‘Jakamarra_i’s dog chases him_{i/j}.’
- b. *Nyanungu ka Jakamarra-kurlangu maliki-rli wajili-pi-nyi.*
 him PRES Jakamarra-POSS dog-ERG chase-VR-NPST
 ‘Jakamarra_i’s dog chases him_{i/j}.’

(Simpson (1991, p. 179-180), elicited by Mary Laughren)

In this set of data, we see that the PRO-SUBJ example is actually judged to be grammatical (unlike the pattern analysed by Simpson (1991)), but only in the order antecedent > pronoun. Both orders of the PRO-OBJ examples were found to be grammatical by Nash. This is

a very different pattern than the one originally described by Simpson. In the PRO-SUBJ examples elicited by Nash linear order seems to play a role, and the constraint posited in (6.56) disallowing an R-expression f-commanded by a coreferring pronoun is not valid for the data in (6.68) and (6.69). Without attempting to posit a full analysis for this set of data, we can make the following generalisation (using the concept of Syntactic Rank):

(6.70) Generalisation about Nash's data:

The pronoun *nyanungu* may not both f-precede and outrank its antecedent.

It seems that in this set of data, both f-precedence and the grammatical function hierarchy play a role. Nash's set of data is evidence in favour of an approach incorporating lexical specification, as it provides a way to posit different constraints for different dialects and/or speakers.

This approach might also account for the grammaticality of the data elicited by Margit Bowler. Recall that the patterns that she found for the PRO-SUBJ and PRO-OBJ examples are as follows, with A referring to 'antecedent' and P referring to 'pronoun':

(6.71) Judgements recorded by Bowler:

Type of example	Order	Judgement
PRO-SUBJ	A > P	X
PRO-SUBJ	P > A	X
PRO-OBJ	A > P	✓
PRO-OBJ	P > A	✓

In this set of data, f-precedence does not play a role, but the grammatical function hierarchy does. One can say that a pronoun may not outrank its antecedent. All three sets of data (the data by presented by Simpson (1991) and elicited by Mary Laughren, the data from Nash that Simpson (1991) and the data elicited by Bowler) display different grammaticality patterns for the PRO-SUBJ and PRO-OBJ examples. This is strong evidence that binding patterns, at least for non-reflexives, can be different in different idiolects. Lexical specification of binding

constraints provides a neat way to solve this problem, by positing different constraints for individual speakers (or different dialects).

Reflexive binding

Not only can lexical specification be used to account for different judgements for the same anaphoric element, it can also be used to account for differences between different anaphoric elements in one language, as described by Dalrymple (1993). The symmetry that was found in the data discussed by Simpson (1991) is lacking in reflexive binding data. Bresnan (2001) presents the following reflexive binding data from English and Warlpiri, commenting on the similarity in binding patterns:³⁶

- (6.72) a. Lucy is hitting herself.
b. *Herself is hitting Lucy.

(Bresnan, 2001, p. 7)

- (6.73) a. *Napaljarri-rli ka-nyanu paka-rni.*
Napaljarri-ERG PRES-REFL hit.NPST
'Napaljarri is hitting herself.'
b. **Napaljarri ka-nyanu paka-rni.*
Napaljarri.ABS PRES-REFL hit.NPST
'Herself is hitting Napaljarri.'

(Bresnan, 2001, p. 7)

Here we see that the reflexive cannot serve as the subject with the object as its antecedent. There thus seems to be an asymmetry between subject and object in reflexive binding. This is reinforced by Simpson (1991), who also claims that the reflexive must have the subject as its antecedent. An important difference between the Warlpiri non-reflexive data seen so far and the Warlpiri reflexive data in (6.73) is that the reflexive is expressed via a pronominal marker on the AUX, rather than a free pronoun. If we assume that the reflexive contributes a PRO at f-structure (which is necessary for Completeness), then this should not be a problem for an f-command binding analysis.

³⁶Simpson (1991) notes that the reflexive pronoun *-nyanu* also serves as the reciprocal pronoun.

This reflexive data shows that the lack of subject-object asymmetry which seems so striking in Warlpiri (at least in the dialect/speakers that Simpson (1991) provides data for), is not available across the board. This is hardly surprising, as otherwise one might not expect there to be two different types of pronouns (reflexive and non-reflexive). The two have different forms, and also different binding conditions. The reflexive pronominal marker is strikingly similar to the English reflexive. This data reinforces the fact that within one language, not only may different speakers/dialects have different patterns for single anaphoric elements, but different anaphoric elements can show different constraints on binding. This is not a new finding, as shown by the discussion of the traditional Binding Conditions (A, B, and C) in Section 6.2. However, lexical specification is more fine-grained than assuming universals; it allows one to posit different constraints for different speakers/dialects, as well as for different anaphoric elements. Thereby it is better able to account for the range of data discussed in this chapter.

6.5.4 Binding in other languages traditionally labelled ‘non-configurational’

To complete the picture, I want to briefly address the role of linear order in binding and coreference for two languages that, like Warlpiri, have traditionally been classified as non-configurational in the literature, namely Malayalam and Japanese. As discussed in Chapter 2, Japanese has traditionally been classified as non-configurational (Hale, 1980; Chomsky, 1981), and Malayalam has also been classified as such by Mohanan (1982). Interestingly, in these languages linear order, and thereby f-precedence, does appear to play a role in binding/coreference relations.

For example, Mohanan (1983) makes the claim that in Malayalam pronouns cannot precede their antecedents. This becomes clear from the following examples:

- (6.74) a. *kuttiyute ammaye awan nulli*
 child.GEN mother.ACC he pinched
 ‘He_i pinched the child_i’s mother.’

- b. **awante ammaye kutti nulli*
 his mother-ACC child pinched
 ‘The child_i pinched his_i mother.’

(Mohanana, 1983, p. 664)

This set of data first of all shows that f-precedence is important in binding/coreference in this language. Example (6.74a) is grammatical because the pronoun follows the antecedent, and example (6.74b) is not grammatical because the pronoun precedes its antecedent. Secondly, in terms of Syntactic Rank, example (6.74a) shows that a pronoun is allowed to outrank its antecedent. The pronoun (*awan*, ‘he’) in this example f-commands its antecedent (*kuttiyute*, ‘child’), and appears higher on the grammatical function hierarchy than the constituent in which its antecedent is embedded (*kuttiyute ammaye*, ‘the child’s mother’). From the data presented in the previous part of this chapter we have seen that one cannot say this about Warlpiri. The binding patterns in Malayalam are thus very different than in Warlpiri. Interestingly, Malayalam data with null pronominals renders a different pattern:

- (6.75) a. *aanaye nulliyatinə seeṣam kutti uraṅgi*
 elephant-ACC pinched.it after child-NOM slept
 ‘The child_i slept, after he_{i/j} pinched the elephant.’
- b. *awan aanaye nulliyatinə seeṣam kutti uraṅgi*
 he-NOM elephant-ACC pinched.it after child-NOM slept
 ‘The child_i slept, after he_{*i/j} pinched the elephant.’

(Mohanana, 1983, p. 665)

These two examples only differ in one respect: in (6.75a) there is no overt pronoun, and in (6.75b) there is an overt pronoun, which precedes its antecedent. The coreference is only grammatical in the first case. Under the assumption that the two examples (6.75a) and (6.75b) have the same f-structure, the data shows that in an account of binding/coreference in Malayalam, one cannot only depend on f-structural relations between pronoun and antecedent. F-precedence, reflected in c-structure, needs to be taken into account. Crucially, relative linear order of overt pronoun and antecedent plays a role in this language, unlike in the Warlpiri dialect discussed by Simpson (1991).

Japanese has been claimed to have the same constraint on linear order between pronoun and antecedent as Malayalam, namely that the antecedent of a pronoun must f-precede the pronoun (Dalrymple, 2001). This becomes clear from work by Kameyama (1989). Consider the following examples:

- (6.76) a. **kare-no imooto-o Taroo-ga sewasiteiru (koto...)*
 his-GEN sister-ACC Taro-NOM be.taking.care.of that
 ‘...(that) Taro_i was taking care of his_i sister’
- b. *Taroo-ga kare-no imooto-o sewasiteiru (koto...)*
 Taro-NOM his-GEN sister-ACC be.taing.care.of that
 ‘...(that) Taro_i was taking care of his_i sister’

(Kameyama (1989) via Dalrymple (2001, p. 171))

These examples show that the antecedent must f-precede the pronoun. Again, we have an instance where linear ordering plays a role in binding/coreference. This shows that we cannot say that universally, freedom of ordering of argument functions (in languages that allow for this) is reflected in the relative linear order of constituents which are in a coreference relation to each other. It shows that the freedom which is attested in the Warlpiri dialect discussed by Simpson (1991) does not extend to other languages which have been analysed as having similar word order constraints. This will be addressed in somewhat more detail in the next section.

6.6 Conclusion and implications for configurationality

This chapter has shown that even though Simpson’s (1991) c-command analysis for the binding data that she presents for Warlpiri and English largely works under the assumption that Warlpiri has a flat structure and English does not, her reasoning is no longer valid when assuming the structure proposed in Simpson (2007). A c-command account cannot account for the lack of subject-object asymmetries with a hierarchical structure. As mentioned, I assume the hierarchical structure proposed in Simpson (2007) over a flat one as in Simpson (1991) and earlier work, as I believe the former better captures facts about word order, as discussed

in Chapter 4. For this reason, I present an f-command based approach, which accounts for the data presented by Simpson (1991).

I incorporate lexical specification into my analysis, following Dalrymple (1993). This makes it possible to account for the range of data that is discussed in Section 6.5.3, which shows that constraints on binding are different for different dialects and/or idiolects. This goes against Simpson's (1991) use of a uniform analysis to account for different languages, but I assume that there is no need to posit a uniform analysis. Moreover, and crucially, a uniform analysis along the lines of Simpson (1991) cannot account for the variation in the data discussed in Section 6.5.3.

An important find is that f-command by itself can account for the Warlpiri data discussed by Simpson (1991), which is remarkable, since it is commonly assumed that the grammatical function hierarchy always plays a role in binding data. I have shown that in English, the grammatical function hierarchy (or f-precedence) is necessary to account for the binding patterns. The analysis for Simpson's (1991) set of data does not make reference to either the grammatical function hierarchy (or f-precedence): this implies that it does not play a role, at least for this set of data. However, data from Malayalam and Japanese, which have traditionally been labelled non-configurational like Warlpiri, shows that f-precedence does play a role in these languages.

Even though an f-command approach does not make any predictions about the c-structural configuration of a language, and thus does not directly bear on issues related to configurationality, it seems that a lack of subject-object asymmetries could potentially be related to non-configurationality in some way.³⁷ The free assignment of grammatical functions in Warlpiri, resulting in a lack of c-structural asymmetry between (at least) subject and object, appears to lead to the grammatical functional hierarchy not playing a role in this particular set of data. Even though f-command does not relate directly to the c-structure, the two are

³⁷The one point at which an f-command approach can make reference to c-structure is f-precedence. Even though f-precedence relates to f-structure relations, the ordering referred to in its definition is in c-structure.

potentially connected in the sense that f-command binding analyses can make reference to the grammatical function hierarchy, and the grammatical function hierarchy can in principle be reflected in c-structure. For example, the f-command binding analysis for English appeals to the grammatical function hierarchy; this grammatical function hierarchy also plays a role in the c-structure of English, shown by the structural asymmetry between subject and object. The role of the grammatical function hierarchy seems to be lacking both in the f-command analysis of the data by Simpson (1991) as well as in the c-structure of Warlpiri. Moreover, f-precedence does not play a role in this set of data. It seems tempting to say that this is potentially connected to the same fact, namely that grammatical functions are assigned freely and there is no strict ordering of them. However, this claim is contradicted by other data presented in this thesis, both from other dialects/idiolects of Warlpiri, and by the Malayalam and Japanese data, in which f-precedence does clearly play a role. With regards to the hypothesis that the grammatical function hierarchy does not play a role in phenomena such as binding, this is also not a solid claim, which becomes evident from the fact that different binding patterns are attested for the same data which lacks subject-object asymmetries, as shown in Section 6.5.3. However, one might be able to say that Warlpiri's characteristic of having grammatical functions assigned freely makes it *possible* to have this subject-object symmetry in the binding patterns. In this sense, binding appears in some sense related to free assignment of grammatical functions, a characteristic of Type 2 (and Type 4) languages. In order to make substantive claims on this issue, data from other languages which are similar to Warlpiri in its assignment of grammatical functions are needed, other than the Malayalam and Japanese examples shown in Section 6.5.4. For example, it would be interesting to see if other Australian languages which are similar to Warlpiri (e.g. Jiwari) lack subject-object asymmetries in the same way that the subset of Warlpiri data does. In any case, the potential correlation is interesting, especially considering that an f-command analysis of binding does not directly make any predictions about c-structure, and therefore about configurationality.

Chapter 7

Conclusion

The central issue of configurationality was discussed in this thesis by reference to three characteristics often appealed to in the debate on configurationality: free word order, discontinuous expressions and subject-object asymmetries. The first two of these have been attributed to languages traditionally classified as non-configurational (which I assume to be discourse configurational languages). I showed that configurationality is dependent on c-structure, more specifically on constraints on annotations on c-structure nodes. This became evident in Chapter 4. Chapter 5 and Chapter 6 argued that discontinuous expressions and possibly a lack of subject-object asymmetries are related to free assignment of grammatical functions, which is found in discourse configurational languages, but that the characteristics do not necessarily follow from this free assignment.

Chapter 4 tackled word order variation in several different languages, in an attempt to give a formal space of possibilities for word order configuration. I clarified some of the terminology used in previous work, by making the point that languages traditionally classified as non-configurational languages should be classified as discourse configurational languages, as their word order is dependent on the discourse and they seem to have set positions for at least some information structure roles. I defined scrambling, which has often been used in describing discourse configurationality, as information structure induced word order variation that does not result in obligatory annotations on c-structure nodes for specific information structure

roles. With these assumptions, and also assuming that argument functions and information structure roles are the main factors determining word order in the world's languages, I set out a four-way space of possibilities of word order variation. Crucial in this classification are constraints on annotations in the c-structure rules of a language, especially whether they are specific for particular argument functions and/or information structure roles, or whether there is free assignment of argument functions and/or information structure roles. I believe that this type of classification is what underlies configurationality. This assumes that configurationality is used in the theoretical sense of the word, namely that set positions for specific elements are reflected in the c-structure of a language. The main goal of this chapter was to set out a space of possibilities, but I also showed that Type 1, Type 2 and Type 3 languages exist, and that there is no evidence for the existence of Type 4 languages. However, that does not make this type any less theoretically possible. I speculated that subtypes of the four types are possible, but that one needs to take into account factors other than obligatory or free annotations in order to characterise these subtypes. This is an important task for further research.

Discontinuous expressions were discussed in Chapter 5. I showed that discontinuous expressions are not constituents in c-structure, in order to avoid crossing branches. Chapter 5 provided a formal definition for discontinuous expressions, which crucially assumes that the subparts of a discontinuous expression map to the same f-structure. I showed that this definition covers the type of discontinuity attested in Warlpiri, Latin and some Slavic languages. It does not cover similar phenomena which are attested in English, German and Dutch; this is a desirable outcome of the definition. Languages that allow for discontinuous expressions according to my definition are a subset of discourse configurational languages, languages of Type 2 defined in Chapter 4, based on head optionality. Discontinuous expressions are allowed because of free assignment of grammatical functions, but they do not follow automatically from this free assignment, illustrated by the fact that there are many discourse configurational languages which do not allow for discontinuous expressions of the kind attested in Warlpiri and Latin, for example Hungarian and Japanese.

Chapter 6 gave an overview of some of the (non-reflexive) binding patterns attested in Warlpiri, in an attempt to see if and how a lack of subject-object asymmetries in binding is connected to configurationality. I showed that a c-command approach along the lines of Simpson (1991) is ruled out under the assumption that Warlpiri has an articulated left periphery with specific positions for specific information structure roles as proposed by Simpson (2007). I proposed an f-command approach incorporating lexical specification, in order to account for the different grammaticality judgements in different dialects/idiolects. An important finding is that the set of data discussed by Simpson (1991) can be accounted for with an f-command only analysis, without any reference to the grammatical function hierarchy (or f-precedence), which is very uncommon. As I assume that configurationality is related to c-structure and not f-structure, technically binding patterns should not be correlated with the status of a language in terms of its configurationality. However, I speculated that it is possible that the lack of subject-object asymmetries attested in a subset of the Warlpiri data is related to its status as a discourse configurational language. Free assignment of grammatical functions leads to a lack of structural asymmetry between subject and object. This seems to be reflected in the set of data which lacks subject-object asymmetries, which do not automatically follow from free assignment of grammatical functions. Further work on this issue is desirable: it would be especially interesting to see if any other discourse configurational languages other than the one discussed in that chapter allow for the type of subject-object asymmetries attested in a subset of the Warlpiri data.

Apart from further work on lack of subject-object asymmetries and characterising subtypes of the four different types of languages presented in Chapter 4, there are a few remaining issues. One of them is the status of verbs as being assigned specific information structure roles, especially in relation to information structure. This thesis has focused on argument functions (and at times grammatical functions in general) and their interaction with information structure roles, but verbs can also play an important role in information structure. Some of these issues are discussed in King (1997) and Dalrymple & Nikolaeva (2011), but more work is needed on this issue. Secondly, relating to the discussion of subtypes of the

four types, a proper analysis of scrambling is needed. Assuming that scrambling is defined as information structure induced word order variation not dependent on specific structural positions for IS roles (thus not directly relating to configurationality in the theoretical sense), one still needs to capture how exactly the information structure results in specific word orders. This is relevant in distinguishing languages like Dutch and German from English (and from each other, as Dutch and German have different restrictions on scrambling), but also in establishing how word order in the right part of the sentence is determined in languages with a discourse configurational left periphery. One potential way of doing this could be via an OT-LFG method, but I leave this open for further research.

In conclusion, this thesis shows that configurationality can be understood in terms of constraints on c-structure rule annotations, where the c-structure rules are themselves constraints on c-structures. One can characterise four different types of languages based on their syntactic structure. Each of the four types has a different set of constraints on their annotations for argument functions and information structure roles. I assume that this four-way distinction is what underlies configurationality.

Bibliography

- Adesola, Oluseye. 2006. On the Absence of Superiority and Weak Crossover Effects in Yoruba. *Linguistic Inquiry*, **37**(2), 309–318.
- Adesola, Oluseye. 2010. The Non-agreeing Subject Resumptive Pronoun in Yoruba. *In*: Aboh, Enoch O., & Essegbey, James (eds), *Topics in Kwa Syntax*. Studies in Natural Language and Linguistic Theory. Dordrecht: Springer.
- Aissen, Judith. 1992. Topic and Focus in Mayan. *Language*, **68**(1), 43–80.
- Alsina, Alex. 2008. A Theory of Structure-Sharing: Focusing on Long-Distance Dependencies and Parasitic Gaps. *Pages 5–25 of*: Butt, Miriam, & King, Tracy Holloway (eds), *Proceedings of the LFG08 Conference*. CSLI Publications.
- Alsina, Alex. 2014. *Simplifying the Syntactic Representation of Unbounded Dependencies in LFG*. Paper presented at the LFG14 Conference, Ann Arbor, MI.
- Andréasson, Maia. 2007. The Architecture of I-Structure. *Pages 26–43 of*: Butt, Miriam, & King, Tracy Holloway (eds), *Proceedings of the LFG07 Conference*. CSLI Publications.
- Andrews, Avery D. 1996. Semantic case-stacking and inside-out unification. *Australian Journal of Linguistics*, **16**(1), 1–55.
- Asudeh, Ash. 2011. Towards a Unified Theory of Resumption. *Pages 121–187 of*: Rouveret, Alain (ed), *Resumptive Pronouns at the Interfaces*. Amsterdam/Philadelphia: John Benjamins Publishing Company.

- Asudeh, Ash. 2012. *The Logic of Pronominal Resumption*. New York; Oxford: Oxford University Press.
- Asudeh, Ash, & Toivonen, Ida. 2015. Lexical-Functional Grammar. *Pages 373–406 of*: Heine, Bernd, & Narrog, Heiko (eds), *The Oxford Handbook of Linguistic Analysis*, 2nd edn. Oxford: Oxford University Press.
- Austin, Peter. 2001. Word order in a free word order language: the case of Jiwari. *Pages 305–323 of*: Simpson, Jane, Nash, David, Laughren, Mary, Austin, Peter, & Alpher, Barry (eds), *Forty years on: Ken Hale and Australian languages*. Canberra: Pacific Linguistics.
- Austin, Peter, & Bresnan, Joan. 1996. Non-configurationality in Australian Aboriginal languages. *Natural Language and Linguistic Theory*, **14(2)**, 215–268.
- Austin, Peter K. 1981. Case Marking in Southern Pilbara Languages. *Australian Journal of Linguistics*, **1(2)**, 211–226.
- Austin, Peter K. 1995. Double Case Marking in Kanyara and Mantharta Languages. *Pages 363–379 of*: Plank, Frans (ed), *Agreement by Suffixaufnahme*. Oxford: Oxford University Press.
- Badan, Linda, & Del Gobbo, Francesca. 2011. On the syntax of topic and focus in Chinese. *Pages 63–90 of*: Benincà, Paola, & Munaro, Nicola (eds), *Mapping the Left Periphery*. Oxford: Oxford University Press.
- Badejo, Bamidele R. 1983. La Topicalisation en Yoruba. *Pages 237–243 of*: Kaye, Jonathan, Koopman, Hilda, Sportiche, Dominique, & Dugas, André (eds), *Current Approaches to African Linguistics*, vol. 2. Dordrecht: Foris Publications.
- Bailyn, John F. 2002a. Scrambling to Reduce Scrambling - Part 1. *Glott International*, **6(4)**, 83–90.
- Bailyn, John F. 2002b. Scrambling to Reduce Scrambling - Part 2. *Glott International*, **6(5)**, 109–124.

- Baker, Mark C. 1996a. *Notes on dependent-marking-style nonconfigurationality in Australian languages*. Unpublished Manuscript, McGill University.
- Baker, Mark C. 1996b. *The Polysynthesis Parameter*. Oxford: Oxford University Press.
- Baker, Mark C. 2001. The Natures of Nonconfigurationality. *Pages 407–438 of*: Baltin, Mark R., & Collins, Chris (eds), *The Handbook of Contemporary Syntactic Theory*. Malden, MA: Blackwell Publishers.
- Bamgbose, Ayo. 1966. *A Grammar of Yoruba*. West African language monograph series, no. 5. Cambridge: Cambridge University Press.
- Bamgbose, Ayo. 1967. *A short Yoruba grammar*. Lagos: Academy Press.
- van der Beek, Leonoor. 2003. The Dutch it-cleft constructions. *Pages 22–42 of*: Butt, Miriam, & King, Tracy Holloway (eds), *Proceedings of the LFG03 Conference*. CSLI Publications.
- Bender, Emily. 2000. The Syntax of Mandarin *Bǎ*: Reconsidering the Verbal Analysis. *Journal of East Asian Linguistics*, **9**, 105–145.
- Bisang, Walter, & Sonaiya, Remi. 2000. Information structuring in Yoruba. *Linguistics*, **38**, 169–197.
- Blake, Barry J. 1983. Structure and word order in Kalkutungu; the anatomy of a flat language. *Australian Journal of Linguistics*, **3**, 143–176.
- Bögel, Tina, Butt, Miriam, Kaplan, Ronald M., King, Tracy Holloway, & Maxwell, John T., III. 2010. Second Position and the Prosody-Syntax Interface. *Pages 106–126 of*: Butt, Miriam, & King, Tracy Holloway (eds), *Proceedings of the LFG10 Conference*. CSLI Publications.
- Bolkestein, A. Machteld. 2001. Random Scrambling? Constraints on Discontinuity in Latin Noun Phrases. *Pages 245–258 of*: Moussy, C. (ed), *De lingua Latina novae quaestiones*. Louvain: Peeters.

- Booij, Geert. 2002. Separable Complex Verbs in Dutch: A Case of Periphrastic Word Formation. *Pages 21–42 of: Dehé, Nicole, Jackendoff, Ray, McIntyre, Andrew, & Urban, Silke (eds), Verb-Particle Explorations.* Berlin: Mouton de Gruyter.
- Börjars, Kersti, Engdahl, Elisabet, & Andréasson, Maia. 2003. Subject and object positions in Swedish. *Pages 43–58 of: Butt, Miriam, & King, Tracy Holloway (eds), Proceedings of the LFG03 Conference.* CSLI Publications.
- Bresnan, Joan. 1978. A Realistic Transformational Grammar. *Pages 1–59 of: Halle, Morris, Bresnan, Joan, & Miller, George A. (eds), Linguistic Theory and Psychological Reality.* Cambridge, MA: MIT Press.
- Bresnan, Joan (ed). 1982. *The Mental Representation of Grammatical Relations.* Cambridge, MA: MIT Press.
- Bresnan, Joan. 1995. Linear order, syntactic rank, and empty categories: On weak crossover. *Pages 241–274 of: Dalrymple, Mary, Kaplan, Ronald M., Maxwell, John T., III, & Zaenen, Annie (eds), Formal Issues in Lexical-Functional Grammar.* Stanford University: CSLI Publications.
- Bresnan, Joan. 2001. *Lexical-Functional Syntax.* Malden, MA; Oxford: Blackwell Publishers Inc.
- Bresnan, Joan, & Kaplan, Ronald M. 1982. Introduction: Grammars as mental representations of language. *In: Bresnan (1982).*
- Bresnan, Joan, & Mchombo, Sam A. 1987. Topic, Pronoun and Agreement in Chicheŵa. *Language*, **63**(4), 741–782.
- Butt, Miriam, & King, Tracy Holloway. 1996. Structural Topic and Focus without Movement. *In: Butt, Miriam, & King, Tracy Holloway (eds), Proceedings of the LFG96 Conference.*
- Butt, Miriam, & King, Tracy Holloway. 2000. Null Elements in Discourse Structure. *In: Subbarao, Karumuri Venkata (ed), Papers from the NULLS Seminar.* Delhi: Motilal Banarsidass.

- Carnie, Andrew. 2012. *Syntax: a Generative Introduction*. 3rd edn. Chichester: Wiley.
- Cavar, Damir, & Seiss, Melanie. 2011. Clitic Placement, Syntactic Discontinuity and Information Structure. *Pages 131–151 of: Butt, Miriam, & King, Tracy Holloway (eds), Proceedings of the LFG11 Conference*. CSLI Publications.
- Cavar, Damir, & Wilder, Chris. 1992. *Long Head Movement? Verb-movement and Cliticization in Croatian*. Tech. rept. Johann Wolfgang Goethe Universität, Institut für Deutsche Sprache und Literatur II, Frankfurt am Main.
- Chao, Yuen-Ren. 1968. *A grammar of spoken Chinese*. Berkeley: University of California Press.
- Chapin, Paul G. 1970. Samoan Pronominalization. *Language*, **46**(2), 366–378.
- Choi, Hye-Won. 1999. *Optimizing Structure in Context: Scrambling and Information Structure*. Dissertations in Linguistics. Stanford, CA: CSLI. Revised and corrected version of 1996 Stanford University dissertation.
- Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.
- Cinque, Guglielmo. 1999. *Adverbs and Functional Heads. A Cross-Linguistic Perspective*. New York: Oxford University Press.
- Cinque, Guglielmo. 2004. Issues in adverbial syntax. *Lingua*, **114**, 683–710.
- Craig, Colette Grinevald. 1977. *The Structure of Jacalteco*. Austin and London: University of Texas Press.
- Crowley, Terry. 1983. Uradhi. *Pages 306–428 of: Dixon, R.M.W., & Blake, B.J. (eds), Handbook of Australian Languages*, vol. 3. Canberra: A.N.U. Press.
- Dahlstrom, Amy. 1987. Discontinuous Constituents in Fox. *Pages 53–73 of: Kroeber, Paul, & Moore, Robert E. (eds), Native American Languages and Grammatical Typology*. Bloomington: Indiana University Linguistics Club.

- Dalrymple, Mary. 1993. *The Syntax of Anaphoric Binding*. Stanford, CA: CSLI.
- Dalrymple, Mary. 2001. *Lexical-Functional Grammar*. Syntax and Semantics, vol. 34. San Diego; London: Academic Press.
- Dalrymple, Mary. 2006. Lexical Functional Grammar. *Pages 82–94 of*: Brown, Keith (ed), *Encyclopedia of Language and Linguistics*, 2nd edn. Amsterdam: Elsevier.
- Dalrymple, Mary, & Nikolaeva, Irina. 2011. *Objects and Information Structure*. Cambridge Studies in Linguistics. Cambridge: Cambridge University Press.
- Dalrymple, Mary, Kaplan, Ronald M., Maxwell, John T., III, & Zaenen, Annie (eds). 1995. *Formal Issues in Lexical-Functional Grammar*. Stanford, CA: CSLI.
- Dalrymple, Mary, Kaplan, Ron, & King, Tracy Holloway. 2001. Weak Crossover and the Absence of Traces. *In*: Butt, M., & King, T.H. (eds), *Proceedings of the LFG01 Conference*. CSLI Publications.
- Dalrymple, Mary, Kaplan, Ron, & King, Tracy Holloway. 2007. The Absence of Traces: Evidence from Weak Crossover. *Pages 85–102 of*: Zaenen, Annie, Simpson, Jane, King, Tracy Holloway, Grimshaw, Jane, Maling, Joan, & Manning, Chris (eds), *Architectures, Rules, and Preferences: Variations on Themes by Joan W. Bresnan*. Stanford: CSLI Publications.
- Danckaert, Lieven. 2012. *Latin Embedded Clauses: The Left Periphery*. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Davies, William D. 1999. Madurese and Javanese as strict word-order languages. *Oceanic Linguistics*, **38**(2).
- De Kuthy, Kordula. 2002. *Discontinuous NPs in German: A Case Study of the Interaction of Syntax, Semantics, and Pragmatics*. Studies on Constraint-Based Lexicalism. Stanford, CA: CSLI.

- Demuth, Katherine, & Johnson, Mark. 1989. Interaction Between Discourse Functions and Agreement in Setswana. *Journal of African Languages and Linguistics*, **11**, 21–35.
- Dench, Alan Charles. 1991. Panyjima. *Pages 124–243 of: Dixon, R.M.W., & Blake, Barry (eds), Handbook of Australian Languages*, vol. 4. Sydney: Oxford University Press.
- Derbyshire, Desmond C. 1977. Word order universals and the existence of OVS languages. *Linguistic Inquiry*, **8**(3), 590–599.
- Derbyshire, Desmond C. 1986. Topic continuity and OVS order in Hixkaryana. *Pages 237–306 of: Sherzer, Joel, & Urban, Greg (eds), Native South American Discourse*. Berlin: Mouton de Gruyter.
- Derbyshire, Desmond C., & Pullum, Geoffrey K. 1981. Object initial languages. *IJAL*, **47**(3).
- Devine, Andrew M., & Stephens, Laurence D. 2000. *Discontinuous syntax: hyperbaton in Greek*. New York: Oxford University Press.
- Devine, Andrew M., & Stephens, Laurence D. 2006. *Latin Word Order*. Oxford: Oxford University Press.
- Dik, Simon C. 1997a. *The Theory of Functional Grammar, Part 1: The Structure of the Clause*. Functional Grammar Series, no. 20. Berlin: Mouton de Gruyter.
- Dik, Simon C. 1997b. *The Theory of Functional Grammar, Part 2: Complex and Derived Constructions*. Functional Grammar Series, no. 21. Berlin: Mouton de Gruyter.
- den Dikken, Marcel. 1992. Empty operator movement in Dutch imperatives. *Pages 51–64 of: Gilbers, D., & Looyenga, S. (eds), Language and Cognition*, vol. 2. Groningen: University of Groningen.
- Donohue, Cathryn, & Sag, Ivan A. 1999. Domains in Warlpiri. *Pages 45–50 of: Proceedings of the Sixth International Conference on HPSG*. Edinburgh: University of Edinburgh.

- Emonds, Joseph. 2004. Unspecified Categories as the Key to Root Constructions. *Pages 75–120 of: Adger, D., De Cat, C., & Tsoulas, G. (eds), Peripheries: Syntactic Edges and their Effects.* Dordrecht: Kluwer.
- Engdahl, Elisabet. 1997. Relative Clause Extractions in Context. *Pages 51–79 of: Working Papers in Scandinavian Syntax*, vol. 60.
- Engdahl, Elisabet, Andréasson, Maia, & Börjars, Kersti. 2004. Word order in the Swedish midfield - an OT approach. *In: Karlsson, Fred (ed), Proceedings of the 20th Scandinavian Conference of Linguistics.*
- Erteschik-Shir, Nomi. 2007. *Information Structure: the Syntax-Discourse Interface.* New York: Oxford University Press.
- Evans, Gareth. 1980. Pronouns. *Linguistic Inquiry*, **11**, 337–62.
- Falk, Yehuda N. 2001. *Lexical-Functional Grammar: An Introduction to Parallel Constraint-Based Syntax.* Stanford, CA: CSLI.
- Fanselow, Gisbert. 1988. Aufspaltung von NPn und das Problem der “freien” Wortstellung. *Linguistische Berichte*, **114**, 91–113.
- Fanselow, Gisbert, & Cavar, Damir. 2001. Remarks on the Economy of Pronunciation. *Pages 107–150 of: Müller, Gereon, & Sternefeld, Wolfgang (eds), Competition in Syntax.* Berlin: Mouton de Gruyter.
- Fanselow, Gisbert, & Cavar, Damir. 2002. Distributed Deletion. *Pages 65–107 of: Alexiadou, Artemis (ed), Theoretical Approaches to Universals.* Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Fanselow, Gisbert, & Féry, Caroline. 2006. *Prosodic and Morphosyntactic Aspects of Discontinuous Noun Phrases - a Comparative Perspective.* Unpublished manuscript. University of Potsdam.

- http://web.uni-frankfurt.de/fb10/fery/publications/Prosodic_and_morphosyntactic_aspects_of
 . [Accessed 12 October 2015].
- Forst, Martin, King, Tracy Holloway, & Laczkó, Tibor. 2010. Particle Verbs in Computational LFGs: Issues from English, German and Hungarian. *Pages 228–248 of: Butt, Miriam, & King, Tracy Holloway (eds), Proceedings of the LFG10 Conference*. CSLI Publications.
- Gambhir, Vijay. 1981. *Syntactic restrictions and discourse functions of word order in standard Hindi*. Ph.D. thesis, University of Pennsylvania.
- Gazdik, Anna. 2010. Towards an LFG analysis of discourse functions in Hungarian. *Pages 59–92 of: Kiefer, Ferenc, & Bánréti, Zoltán (eds), Twenty Years of Theoretical Linguistics in Budapest*. Presented at the TLP20 Conference.
- van Gelderen, Véronique. 2003. *Scrambling Unscrambled*. Ph.D. thesis, University of Leiden.
- Gibson, Edward. 1998. Linguistic complexity: locality of syntactic dependencies. *Cognition*, **68**, 1–76.
- Gil, David. 1983. Stacked Adjectives and Configurationality. *Linguistic Analysis*, **12**, 141–158.
- Givón, Talmy. 1983. *Topic continuity in discourse. A quantitative cross-language study*. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Givón, Talmy. 2001. *Syntax*. Vol. 1. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Granites, Robin J., Hale, Kenneth L., & Odling-Smee, David. 1976. *Survey of Warlpiri grammar*. Ms., MIT, Cambridge, MA.
- Greenwood, Leonard Hugh Graham (ed). 1935. *Cicero: The Verrine Orations, Volume II*. Cambridge, MA: Harvard University Press. Volume 293 of Loeb Classical Library.
- Grimshaw, Jane. 1991. *Argument Structure*. Cambridge, MA: The MIT Press.

- Haider, Hubert. 1986. Configurationality in Disguise: Word Order and the V-2 Property. *Pages 39–64 of:* Abraham, Werner, & de Meij, Sjaak (eds), *Topic, Focus and Configurationality: Papers from the 6th Groningen Grammar Talks, Groningen, 1984*. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Hale, Kenneth L. 1959. *Walbiri field notes*. Australian Institute of Aboriginal and Torres Strait Islander Studies MS 865 Nos A4540-6, A4589, Ngaliya A4599.
- Hale, Kenneth L. 1973. Person marking in Walbiri. *Pages 308–344 of:* Anderson, S.R., & Kiparsky, P. (eds), *A festschrift for Morris Halle*. New York: Rinehart & Winston, Inc.
- Hale, Kenneth L. 1976. The adjoined relative clause in Australia. *Pages 78–105 of:* Dixon, R.M.W. (ed), *Grammatical categories in Australian languages*. Canberra: Australian Institute of Aboriginal Studies.
- Hale, Kenneth L. 1980. Remarks on Japanese Phrase Structure: Comments on the Papers on Japanese Syntax. *Pages 185–203 of:* Otsu, Y., & Farmer, A. (eds), *Theoretical Issues in Japanese Linguistics*. MIT Working Papers in Linguistics 2.
- Hale, Kenneth L. 1981. *On the position of Walbiri in a typology of the base*. Bloomington: Indiana University Linguistics Club. Reproduced, with Postscript, from 1979.
- Hale, Kenneth L. 1982. Preliminary Remarks on Configurationality. *Pages 86–96 of: Proceedings of the North Eastern Linguistic Society*, vol. 12.
- Hale, Kenneth L. 1983. Warlpiri and the grammar of non-configurational languages. *Natural Language and Linguistic Theory*, **1.1**, 5–47.
- Hale, Kenneth L. 1989. On nonconfigurational structures. *Pages 293–300 of:* Marácz, Laszlo, & Muysken, Pieter (eds), *Configurationality: the typology of asymmetries*. Dordrecht: Foris.
- Hale, Kenneth L. 1994. Core structures and adjunctions in Warlpiri syntax. *Pages 185–219 of:* Corver, N., & van Riemsdijk, H. (eds), *Studies in Scrambling. Movement and*

- Non-Movement Approaches to Free Word-Order Phenomena*. Hawthorne, NY: Walter de Gruyter.
- Hale, Kenneth L., Laughren, Mary, & Simpson, Jane. 1995. Warlpiri Syntax. *Pages 1430–51 of*: Jacobs, Joachim, von Stechow, Arnim, Sternefeld, Wolfgang, & Vennemann, Theo (eds), *Syntax. Ein internationales Handbuch zeitgenössischer Forschung: An International Handbook of Contemporary Research*. Berlin New York: Walter de Gruyter.
- Halle, Morris, & Marantz, Alec. 1993. Distributed Morphology and the Pieces of Inflection. *Pages 111–176 of*: Hale, Kenneth L., & Keyser, Samuel Jay (eds), *The View from Building 20: Essays in Honor of Sylvain Bromberger*. Cambridge, MA: MIT Press.
- Halpern, Aaron. 1995. *On the Placement and Morphology of Clitics*. Stanford, CA: CSLI Publications. Revised version of 1992 Stanford University dissertation.
- Hamilton, Michael. 2014. *The phrase structure of Mi'qmaq: A configurational account of a "non-configurational" language*. Unpublished manuscript.
- Haspelmath, Martin, & Sims, Andrea D. 2010. *Understanding Morphology*. Understanding Language Series. London: Hodder Education.
- Hawkins, John A. 1994. *A Performance Theory of Order and Constituency*. Cambridge: Cambridge University Press.
- Hawkins, John A. 2004. *Efficiency and Complexity in Grammars*. Oxford: Oxford University Press.
- Herman, József. 1985. La disparition de la déclinaison latine et l'évolution du syntagme nominal. *Pages 345–57 of*: Touratier, Christian (ed), *Syntaxe et latin*. Aix-en-Provence: Université de Provence.
- Herman, József. 2003. Notes syntaxiques sur la langue de Trimalcion et de ses invités. *Pages 139–46 of*: Herman, József, & Rosen, Hannah (eds), *Petrioniana. Gedenkschrift für Hubert Petersmann*. Heidelberg: Winter.

- Hewson, John. 2008. *Yoruba*. Chapter 21 in ‘Verbal Categories in Niger-Congo Languages’ by Derek Nurse, Sarah Rose and John Hewson at Memorial University. <http://www.mun.ca/linguistics/nico/Ch21.pdf>. Accessed 30/07/2014.
- de Hoop, Helen. 1992. *Case Configuration and Noun Phrase Interpretation*. Ph.D. thesis, University of Groningen.
- de Hoop, Helen. 1997. Scrambled Definites. *Pages 37–59 of: Dekker, Paul, van der Does, Jaap, & de Hoop, Helen (eds), De Dag: Proceedings of the Workshop on Definites*. Utrecht: Utrecht Institute of Linguistics OTS.
- de Hoop, Helen. 2000. Optional Scrambling and Interpretation. *Pages 153–168 of: Bennis, Hans, Everaert, Martin, & Reuland, Eric (eds), Interface Strategies*. Amsterdam: Royal Netherlands Academy.
- de Hoop, Helen. 2003. Scrambling in Dutch: Optionality and Optimality. *In: Karimi, S. (ed), Word Order and Scrambling*. Malden, MA: Blackwell Publishing.
- Hooper, William Davis, & Ash, Harrison Boyd (eds). 1935. *Marcus Porcius Cato, On agriculture; Marcus Terentius Varro, On agriculture*. Cambridge, MA: Harvard University Press. Volume 283 of Loeb Classical Library.
- Huddleston, Rodney, & Pullum, Geoffrey K. 2002. *The Cambridge Grammar of the English Language*. Cambridge: Cambridge University Press.
- Ishihara, Shinichiro. 2000. Scrambling and Its Interaction with Stress and Focus. *MIT Working Papers in Linguistics*, **38**, 95–110.
- Ishii, Y. 2001. Presuppositional Effects of Scrambling Reconsidered. *In: Proceedings of the COE international symposium*. Kanda University of International Studies.
- Jelinek, Eloise. 1984. Empty categories, case, and configurationality. *Natural language and Linguistic Theory*, **2**, 39–76.

- Ji, Jen-i Jelina. 1996. *Preverbal NP Positions in Mandarin Chinese*. Ph.D. thesis, The University of Arizona.
- Jones, Susie. 2006. Focus in Yorùbá: a semantic/pragmatic account. *Pages 143–160 of: ZAS Papers in Linguistics*.
- de Jong, Jan R. 1986. Hyperbaton en informatiestructuur. *Lampas*, 323–331.
- Kameyama, Megumi. 1989. *Functional Precedence Conditions on Overt and Zero Pronominals*. Tech. rept. Microelectronics and Computer Technology Corporation.
- Kaplan, Ronald M. 1987. Three Seductions of Computational Psycholinguistics. *Pages 149–181 of: Whitelock, P., Wood, M.M., Somers, H.L., Johnson, R., & Bennett, P. (eds), Linguistic Theory and Computer Applications*. London: Academic Press. Reprinted in M. Dalrymple, R.M. Kaplan, J.T. Maxwell III and A. Zaenen, editors, *Formal Issues in Lexical-Functional Grammar*, pages 339–367, CSLI Publications, Stanford University, 1995.
- Kaplan, Ronald M. 1989. The Formal Architecture of Lexical-Functional Grammar. *Pages 3–18 of: Huang, Chu-Ren, & Chen, Keh-Jiann (eds), Proceedings of ROCLING II*. Reprinted in M. Dalrymple, R.M. Kaplan, J.T. Maxwell III and A. Zaenen, editors, *Formal Issues in Lexical-Functional Grammar*, pages 7–27, CSLI Publications, Stanford University, 1995.
- Kaplan, Ronald M., & Bresnan, Joan. 1982. Lexical-functional grammar: a formal system for grammatical representation. *In: Bresnan (1982)*.
- Kaplan, Ronald M., & Zaenen, Annie. 1989. Long-Distance Dependencies, Constituent Structure and Functional Uncertainty. *Pages 17–42 of: Baltin, Mark, & Kroch, Anthony (eds), Alternative Conceptions of Phrase Structure*. Chicago, IL: University of Chicago Press. Reprinted in M. Dalrymple, R.M. Kaplan, J.T. Maxwell III and A. Zaenen, editors, *Formal Issues in Lexical-Functional Grammar*, pages 137–165, CSLI Publications, Stanford University, 1995.
- Kaplan, Ronald M., & Zaenen, Annie. 2003. West-Germanic Verb Clusters in LFG. *Pages*

- 127–150 of: Seuren, Pieter, & Kempen, Gerard (eds), *Verb constructions in German and Dutch*. Amsterdam: John Benjamins Publishing Company.
- Kaplan, Ronald M., Maxwell, John. T., III, & Zaenen, Annie. 1987. *Functional Uncertainty*. *CSLI Monthly Newsletter* Stanford University.
- Kay, Martin. 1979. Functional Grammar. *Pages 142–158 of*: Chiarello, C., Kingston, J., Sweetser, E.E., Collins, J., Kawasaki, H., Manley-Buser, J., Marschak, D.W., O'Connor, C., Shaul, D., Tobey, M., Thompson, H., & Turner, K. (eds), *Proceedings of the Fifth Annual Meeting of the Berkeley Linguistic Society*. Berkeley Linguistics Society, University of California, Berkeley.
- Kayne, Richard S. 1994. *The Antisymmetry of Syntax*. Linguistic Inquiry Monographs, no. 25. Cambridge, MA: MIT Press.
- Kazenin, Konstantin. 2009. Discontinuous nominals, linear order, and morphological complexity in languages of the North Caucasus. *Linguistic Typology*, **13**(3), 391–415.
- Keenan, Edward L. 1976. Remarkable subjects in Malagasy. *Pages 247–301 of*: Li, Charles N. (ed), *Subject and Topic*. New York: Academic Press.
- Keenan, Edward L., & Comrie, Bernard. 1977. Noun Phrase Accessibility and Universal Grammar. *Linguistic Inquiry*, **8**, 63–99.
- Kempson, Ruth, & Kiaer, Jieun. 2010. Multiple long-distance scrambling: Syntax as reflections of processing. *Journal of Linguistics*, **46**(3), 127–192.
- Kenesei, István. 1992. Az alárendelt mondatok szerkezete [The structure of subordinate clauses]. *Pages 601–637 of*: *Strukturális magyar nyelvtan 1. Mondattan. [Structural Hungarian grammar 1. Syntax.]*. Budapest: Akadémiai Kiadó.
- Kenesei, István, Vago, Robert M., & Fenyvesi, Anna. 1998. *Hungarian*. London: Routledge.
- Kessler, Bratt. 1995. *Discontinuous constituents in Latin*. Washington University

- in St. Louis. Unpublished manuscript. <http://spell.psychology.wustl.edu/~bkessler/latin-discontinuity/discontinuity.ps>. Accessed 09/12/2011.
- Kim, Alan Hyun-Oak. 1988. Preverbal focusing and type XXIII languages. *Pages 147–169 of: Hammond, Michael, Moravcsik, Edith A., & Wirth, Jessica (eds), Studies in Syntactic Typology*. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- King, Tracy Holloway. 1995. *Configuring Topic and Focus in Russian*. Dissertations in Linguistics. Stanford, CA: CSLI.
- King, Tracy Holloway. 1997. Focus Domains and Information-Structure. *In: Butt, Miriam, & King, Tracy Holloway (eds), Proceedings of the LFG97 Conference*. CSLI Publications.
- Kirkwood, H.W. 1977. Discontinuous Noun Phrases in Existential Sentences in English and German. *Journal of Linguistics*, **13**(1), 53–66.
- Kiss, Katalin É. (ed). 1995a. *Discourse Configurational Languages*. Oxford: Oxford University Press.
- Kiss, Katalin É. 1995b. Introduction. *In: Kiss (1995a)*.
- Kiss, Katalin É. 1995c. NP Movement, Operator Movement, and Scrambling in Hungarian. *In: Kiss (1995a)*.
- Kiss, Katalin É. 1998. Discourse-Configurationality in the Languages of Europe. *Pages 681–728 of: Siewierska, A. (ed), Constituent Order in the Languages of Europe*. Berlin: Mouton de Gruyter.
- Kiss, Katalin É. 2002. *The Syntax of Hungarian*. Cambridge: Cambridge University Press.
- Kiss, Tibor. 2005. Semantic Constraints on Relative Clause Extraposition. *Natural Language and Linguistic Theory*, **23**(2), 281–334.
- Kroeger, P.R. 1993. *Phrase Structure and Grammatical Relations in Tagalog*. Dissertations in Linguistics. Stanford, CA: CSLI.

- Kuno, Susumu. 1982. The focus of the question and the focus of the answer. *Pages 134–157 of*: Schneider, Robinson, Tuite, Kevin, & Chametzky, Robert (eds), *Papers from the Parasession on Nondeclaratives*. Chicago: Chicago Linguistics Society.
- Kuno, Susumu, & Takami, Ken-Ichi. 1993. *Grammar and Discourse Principles: Functional Syntax and GB Theory*. Chicago: University of Chicago Press.
- Laczkó, Tibor. 2014a. Essentials of an LFG Analysis of Hungarian Finite Sentences. *Pages 325–345 of*: Butt, Miriam, & King, Tracy Holloway (eds), *Proceedings of the LFG14 Conference*. CSLI Publications.
- Laczkó, Tibor. 2014b. Outlines of an LFG-XLE Account of Negation in Hungarian Sentences. *Pages 304–324 of*: Butt, Miriam, & King, Tracy Holloway (eds), *Proceedings of the LFG14 Conference*. CSLI Publications.
- Lapointe, Steven Guy. 1980. *A Theory of Grammatical Agreement*. Ph.D. thesis, University of Massachusetts at Amherst.
- LaPolla, Randy J. 1993. Arguments against ‘Subject’ and ‘Direct Object’ as Viable Concepts in Chinese. *Bulletin of the Institute of History and Philology*, **63**, 759–813.
- LaPolla, Randy J. 1995. Pragmatic relations and word order in Chinese. *Pages 297–329 of*: Dowling, Pamela, & Noonan, Michale (eds), *Word Order in Discourse*. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- LaPolla, Randy J. 1998. *Topicalization and the question of lexical passives in Chinese*. Presented at the Third Annual Conference on Chinese Linguistics.
- Laughren, Mary. 1989. The configurationality parameter and Warlpiri. *Pages 319–353 of*: Marácz, Laszlo, & Muysken, Pieter (eds), *Configurationality: the typology of asymmetries*. Dordrecht: Foris.
- Laughren, Mary. 1999. Constraints on the Pre-auxiliary Position in Warlpiri and the Nature of the Auxiliary. *In*: Henderson, John (ed), *Proceedings of the 1999 Conference of the Australian Linguistic Society*.

- Laughren, Mary. 2002. Syntactic constraints in a ‘free word order’ language. *Pages 83–130 of: Amberber, M., & Collins, P. (eds), Language Universals and Variation.* Westport, CT: Praeger.
- Ledgeway, Adam. 2012. *From Latin to Romance: morphosyntactic typology and change.* Oxford: Oxford University Press.
- Legate, Julie Anne. 2002. *Warlpiri: Theoretical Implications.* Ph.D. thesis, Massachusetts Institute of Technology.
- Legate, Julie Anne. 2008. Warlpiri and the theory of second position clitics. *Natural Language and Linguistic Theory*, **26**, 3–60.
- Legate, Julie Anne. 2009. *Clausal Recursion and Embedding in Warlpiri.* Unpublished manuscript. http://www.ling.upenn.edu/~jlegate/warlpiri_recursion.pdf. Accessed 14/06/2015.
- Legate, Julie Anne. 2011. Warlpiri *Wh*-Scope Marking. *Syntax*, **14**(2), 97–121.
- Li, Charles N., & Thompson, Sandra A. 1976. Subject and Topic: A New Typology of Language. *Pages 457–489 of: Li, Charles N. (ed), Subject and Topic.* New York: Academic Press.
- Li, Charles N., & Thompson, Sandra A. 1989. *Mandarin Chinese. A Functional Reference Grammar.* London and New York: University of California Press.
- Lüdeling, Anke. 2001. *On Particle Verbs and Similar Constructions in German.* Stanford, CA: CSLI Publications.
- Manfredi, Victor, & Oyelaran, Olasope. 2000. *Weak focus-movement islands in Yoruba.* Paper presented at the 34th Annual Conference on African linguistics, Boston University.
- Marantz, Alec. 1996. *“Cat” as a Phrasal Idiom.* Unpublished Manuscript, MIT.

- McCawley, James D. 1968. Concerning the base component of a transformational grammar. *Foundations of Language*, 4, 243–269. Reprinted in J.D. McCawley. *Grammar and meaning: Papers on Syntactic and Semantic Topics*. Taishukan, Tokyo, 1973.
- McCawley, James D. 1982. Parentheticals and Discontinuous Constituent Structure. *Linguistic Inquiry*, 13(1), 91–106.
- McGregor, William B. 1997. *Functions of noun phrase discontinuity in Gooniyandi*. Vol. 4. Pages 83–114.
- Meakins, Felicity, & O’Shannessy, Carmel. 2005. Possessing Variation: Age and Inalienability Related Variables in the Possessive Constructions of Two Australian Mixed Languages. *Monash University Linguistics Papers*, 4(2), 43–64.
- Mithun, Marianne. 1987. Is basic word order universal? *Pages 281–328 of: Tomlin, Russell (ed), Grounding and Coherence in Discourse*. Typological Studies in Language 11. Amsterdam/Philadelphia: John Benjamins Publishing Company. Reprinted 1992 in *The Pragmatics of Word Order Flexibility*. Typological Studies in Language 22. Doris Payne, ed. Amsterdam: John Benjamins. 15-61.
- Miura, Hidematsu. 2008. *Grammatical relations, reflexives and pseudo-raising in Japanese*. Ph.D. thesis, SUNY Buffalo.
- Mohanan, K.P. 1982. Grammatical relations and clause structure in Malayalam. *Pages 504–589 of: The mental representation of grammatical relations*. Cambridge, MA: MIT Press.
- Mohanan, K.P. 1983. Functional and Anaphoric Control. *Linguistic Inquiry*, 14(4), 641–674.
- Mohanan, Tara. 1994. *Arguments in Hindi*. CSLI Publications.
- Mycock, Louise. 2006. *The Typology of Constituent Questions: a Lexical-Functional Grammar analysis of ‘wh’-questions*. Ph.D. thesis, University of Manchester.
- Mycock, Louise. 2007a. Constituent question formation and focus: a new typological perspective. *Transactions of the Philological Society*, 105(2), 192–251.

- Mycock, Louise. 2007b. The Role of Prosody in Constituent Question Formation: a comparison of Hungarian and Japanese. *The Phonetician*, **95**, 7–18.
- Mycock, Louise. 2010. Multiple-Clause Constituent Questions: Intonation and Variation in Hungarian. *Acta Linguistica Hungarica*, **57**, 268–287.
- Mycock, Louise. 2013. Discourse Functions of Question Words. *Pages 419–439 of: Butt, Miriam, & King, Tracy Holloway (eds), Proceedings of the LFG13 Conference*. CSLI Publications.
- Mycock, Louise, & Lowe, John J. 2013. The Prosodic Marking of Discourse Functions. *Pages 440–460 of: Butt, Miriam, & King, Tracy Holloway (eds), Proceedings of the LFG13 Conference*. CSLI Publications.
- Nadathur, Prerna. 2013. Weak Crossover and the Direct Association Hypothesis. *Pages 461–481 of: Butt, Miriam, & King, Tracy Holloway (eds), Proceedings of the LFG13 Conference*. CSLI Publications.
- Nash, David. 1980. *Topics in Warlpiri Grammar*. Ph.D. thesis, MIT. Published in 1986 by Garland, New York.
- Nash, David. 1986. *Topics in Warlpiri Grammar*. Outstanding Dissertations in Linguistics. Third Series. New York, London: Garland Publishing Inc.
- Neeleman, Ad. 2002. Particle Placement. *In: Dehé, Nicole, Urban, Silke, McIntyre, Andrew, & Jackendoff, Ray (eds), Explorations in Verb-Particle Constructions*. Berlin: Mouton de Gruyter.
- Neeleman, Ad, & Reinhart, Tanya. 1998. Scrambling and PF interface. *Pages 309–353 of: Butt, Miriam, & Gueder, Wilhelm (eds), The projection of arguments*. CSLI Publications.
- Nordlinger, Rachel. 1998a. *Constructive Case: Evidence from Australian Languages*. Stanford, CA: CSLI Publications. Revised version of 1997 Stanford University dissertation.
- Nordlinger, Rachel. 1998b. *A grammar of Wambaya*. Canberra: Pacific Linguistics.

- Nordlinger, Rachel, & Bresnan, Joan. 1996. Nonconfigurational tense in Wambaya. *Pages 440–460 of: Butt, Miriam, & King, Tracy Holloway (eds), Proceedings of the LFG96 Conference.* CSLI Publications.
- Obenauer, Hans Georg. 1976. *Etudes de syntaxe interrogative du français: quoi, combien et le complémenteur.* Linguistische Arbeiten, vol. 34. Tübingen: Max Niemeyer Verlag.
- Ojeda, Almerindo E. 2006. Discontinuous Dependencies. *Pages 624–630 of: Brown, K. (ed), Encyclopedia of Language and Linguistics.* Amsterdam; London: Elsevier.
- Otoguro, Ryo. 2006. *Morphosyntax of Case: A Theoretical Investigation of the Concept.* Ph.D. thesis, University of Essex.
- Panhuis, Dirk. 1982. *The Communicative Perspective in the Sentence: A Study of Latin Word Order.* Amsterdam/Philadelphia: Benjamins Publishing Company.
- Partee, Barbara H., ter Meulen, Alice, & Wall, Robert E. 1990. *Mathematical methods in linguistics.* Dordrecht, London: Kluwer Academic.
- Payne, John. 2008. English without VPs. *Journal of Human Sciences*, 119–132.
- Pensalfini, Rob. 1992. *Degrees of freedom: word order in Pama-Nyungan languages.* Unpublished honours thesis, University of Western Australia, Perth.
- Pensalfini, Rob. 2004. Towards a Typology of Configurationality. *Natural Language & Linguistic Theory*, 359–408.
- Pensalfini, Rob. 2006. Configurationality. *Pages 23–27 of: Brown, K. (ed), Encyclopedia of Language and Linguistics.* Amsterdam; London: Elsevier.
- Pickering, Martin, & Barry, Guy. 1991. Sentence processing without empty categories. *Language and Cognitive Processes*, **6**, 229–259.
- Pinkster, Harm. 1990. *Latin Syntax and Semantics.* London: Routledge.

- Pinkster, Harm. 2005. The language of Pliny the Elder. *Pages 239–256 of: Reinhardt, T., Lapidge, M., & Adams, J.N. (eds), The Language of Latin Prose.* Oxford: Oxford University Press.
- Platero, Paul. 1982. Missing Noun Phrases and Grammatical Relations in Navajo. *International Journal of American Linguistics*, **48**(3), 286–305.
- Polinsky, Maria, & Potsdam, Eric. 2001. Long-Distance Agreement and Topic in Tsez. *Natural Language & Linguistic Theory*, **19**, 583–646.
- Pollard, Carl, & Sag, Ivan A. 1994. *Head-driven phrase structure grammar.* Chicago: Chicago University Press.
- Poortvliet, Marjolein. 2012. *Direct Object Scrambling in Dutch: an Information Structural approach.* Unpublished Master's dissertation, University of Oxford.
- Postal, Paul. 1964. Constituent structure: A study of contemporary models of syntactic description. *International Journal of American Linguistics III*, **30**(1). Publication 30 of the Indiana University Research Center in Anthropology, Folklore, and Linguistics.
- Progovac, Ljiljana. 1996. Clitics in Serbian/Croatian: Comp as the Second Position. *Pages 411–428 of: Halpern, Aaron, & Zwicky, Arnold (eds), Approach Second: Second Position Clitics and Related Phenomena.* Stanford: CSLI Publications.
- Puskás, Genoveva. 2000. *Word order in Hungarian: the syntax of \bar{A} -positions.* Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Radanović-Kocić, Vesna. 1988. *The Grammar of Serbo-Croatian Clitics: A Synchronic and Diachronic Perspective.* Ph.D. thesis, University of Illinois.
- Radanović-Kocić, Vesna. 1996. The Placement of Serbo-Croatian Clitics: A Prosodic Approach. *Pages 429–445 of: Halpern, Aaron, & Zwicky, Arnold (eds), Approach Second: Second Position Clitics and Related Phenomena.* Stanford: CSLI Publications.

- Radford, Andrew. 1988. *Transformational grammar: a first course*. Cambridge: Cambridge University Press.
- Reinholtz, Charlotte. 1999. On the characterization of discontinuous constituents: Evidence from Swampy Cree. *International Journal of American Linguistics*, **65**(2), 201–227.
- Rizzi, Luigi. 1997. The Fine Structure of the Left Periphery. In: Haegeman, L. (ed), *Elements of Grammar*. Dordrecht: Kluwer.
- Rochemont, Michael S., & Culicover, Peter W. 1990. *English focus constructions and the theory of grammar*. Cambridge Studies in Linguistics, no. 52. Cambridge: Cambridge University Press.
- Ross, John Robert. 1967. *Constraints on Variables in Syntax*. Ph.D. thesis, MIT, Cambridge, MA.
- Saito, Mamoru. 1989. Scrambling as semantically vacuous A'-movement. *Pages 182–200 of: Alternative conceptions of phrase structure*. Chicago: University of Chicago Press.
- Saito, Mamoru. 1992. Long Distance Scrambling in Japanese. *Journal of East Asian Linguistics*, **1**, 69–118.
- Sayed, Asad B. 2005. Minimalist Parsing of Subjects Displaced from Embedded Clauses in Free Word Order Languages. *Pages 97–102 of: Proceedings of the ACL Student Research Workshop*.
- Schultze-Berndt, Eva, & Simard, Candide. 2012. Constraints on noun phrase discontinuity in an Australian language: The role of prosody and information structure. *Linguistics*, **50**, 1015–1058.
- Schütze, Carson T. 1994. Serbo-Croatian Second Position Clitic Placement and the Phonology-Syntax Interface. *Pages 373–473 of: Carnie, Andrew, & Harley, Heidi (eds), MIT Working Papers in Linguistics 21, Papers on phonology and morphology*. MIT.

- Sekerina, Irina. 1997. *The Syntax and Processing of Split Scrambling Constituents in Russian*. Ph.D. thesis, SUNY Graduate School and University Center.
- Sekerina, Irina. 1999. The Scrambling Complexity Hypothesis and Processing of Split Scrambling Constituents in Russian. *Journal of Slavic Linguistics*, **7**(2), 265–304.
- Sells, Peter. 2001. *Structure, alignment and optimality in Swedish*. Stanford CA: CSLI Publications.
- Shackleton Bailey, David Roy (ed). 2001. *Cicero: Letters to Friends, Volume I*. Cambridge, MA: Harvard University Press. Volume 205 of Loeb Classical Library.
- Shieber, Stuart M. 1986. *An Introduction to Unification-Based Approaches to Grammar*. CSLI Lecture Notes, no. 4. Stanford University: CSLI Publications.
- Shyu, Shu-Ing. 2014. Topic and Focus. *Pages 100–125 of: The Handbook of Chinese Linguistics*. Hoboken: Wiley-Blackwell.
- Siewierska, Anna. 1984. Phrasal Discontinuity in Polish. *Australian Journal of Linguistics*, **4**, 57–71.
- Siewierska, Anna. 1988. *Word Order Rules*. London: Croom Helm.
- Simpson, Jane. 1991. *Warlpiri Morpho-Syntax: a Lexicalist Approach*. Studies in Natural Language and Linguistic Theory, vol. 23. Dordrecht: Kluwer Academic Publishers.
- Simpson, Jane. 2007. Expressing Pragmatic Constraints on Word Order. *Pages 403–427 of: Zaenen, Annie, Simpson, Jane, King, Tracy Holloway, Grimshaw, Jane, Maling, Joan, & Manning, Chris (eds), Architectures, Rules, and Preferences: Variations on Themes by Joan W. Bresnan*. Stanford, CA: CSLI Publications.
- Simpson, Jane Helen. 1983. *Aspects of Warlpiri Morphology and Syntax*. Ph.D. thesis, MIT.
- Simpson, Jane Helen, & Bresnan, Joan. 1983. Control and obviation in Warlpiri. *Natural Language & Linguistic Theory*, **1**, 49–64.

- Snijders, Liselotte. 2012a. *Constraints on Discontinuous Nominal Phrases in Latin from a Lexical-Functional Grammar Perspective*. Unpublished Master's dissertation, University of Oxford.
- Snijders, Liselotte. 2012b. Issues Concerning Constraints on Discontinuous NPs in Latin. *Pages 565–581 of: Butt, Miriam, & King, Tracy Holloway (eds), Proceedings of the LFG12 Conference*. CSLI Publications.
- Snijders, Liselotte. 2014. Non-reflexive Binding in Warlpiri. *Pages 524–544 of: Butt, Miriam, & King, Tracy Holloway (eds), Proceedings of the LFG14 Conference*. CSLI Publications.
- Speas, Margaret. 1990. *Phrase structure in natural language*. Dordrecht; London: Kluwer Academic.
- Spencer, Andrew. 2005. Case in Hindi. *Pages 429–446 of: Butt, Miriam, & King, Tracy Holloway (eds), Proceedings of the LFG05 Conference*. CSLI Publications.
- Spevak, Olga. 2010. *Constituent order in Classical Latin prose*. Studies in Language Companion Series. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Takami, Ken-ichi. 1999. A functional constraint on extraposition from NP. *Pages 23–56 of: Kamio, Akio, & Takami, Ken-ichi (eds), Function and Structure: In honor of Susumu Kuno*. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Takano, Yuji. 1998. Object Shift and Scrambling. *Natural Language and Linguistic Theory*, **16**, 817–89.
- Tallerman, Maggie. 2011. *Understanding Syntax*. London: Hodder Education.
- Thiersch, Craig Lee. 1978. *Topics in German Syntax*. Ph.D. thesis, MIT, Cambridge, MA.
- Thráinsson, Höskuldur. 2003. Object Shift and Scrambling. *Pages 148–202 of: The Handbook of Contemporary Syntactic Theory*. Blackwell Handbooks in Linguistics. Malden, MA: Blackwell.

- Toivonen, Ida. 2003. *Non-Projecting Words: A Case Study of Swedish Particles*. Studies in Natural Language and Linguistic Theory. Dordrecht: Kluwer Academic Publishers.
- Tremblay, Antoine. 2005. Word Order in Mandarin Chinese and Grammatical Relations. *In: Proceedings of PACLIC 19, the 19th Asia-Pacific Conference on Language, Information and Computation*.
- Van Valin, Robert D. 2001. *An Introduction to Syntax*. Cambridge: Cambridge University Press.
- Van Valin, Robert D., & LaPolla, Randy J. 1997. *Syntax. Structure, Meaning and Function*. Cambridge: Cambridge University Press.
- Vincent, Nigel. 1998. Tra grammatica e grammaticalizzazione: Articoli e clitici nelle lingue (italo)-romanze. *Pages 411–440 of: Ramat, Paolo, & Roma, Elisa (eds), Sintassi storica*. Rome: Bulzoni.
- Wall, Robert. 1972. *Introduction to Mathematical Linguistics*. New York: Prentice Hall.
- Wasow, Tom. 2002. *Postverbal behavior*. Stanford, CA: CSLI Publications.
- Webelhuth, Gert. 1985. German is configurational. *Linguistic Review*, 4, 203–246.
- Webelhuth, Gert. 1989. *Syntactic saturation phenomena and the modern Germanic languages*. Ph.D. thesis, University of Massachusetts, Amherst.
- Wilder, Chris, & Cavar, Damir. 1994. Long Head Movement? Verb-Movement and Cliticization in Croatian. *Lingua*, 93, 1–58.
- Yoo, Eun-Jung. 2001. Floating Quantifiers and Lexical Specification of Quantifier Retrieval. *In: Ts'ou, Benjamin K., Kwong, Olivia O.Y., & Lai, Tom B.Y. (eds), Proceedings of the 15th Pacific Asia Conference on Language, Information and Computation*.
- Zaenen, Annie, & Kaplan, Ronald M. 1995. Formal Devices for Linguistic Generalizations: West Germanic Word Order in LFG. *In: Linguistics and Computation*. CSLI Lecture

Notes, no. 52. Stanford University: CSLI Publications. Reprinted in M. Dalrymple, R.M. Kaplan, J.T. Maxwell III and A. Zaenen, editors, *Formal Issues in Lexical-Functional Grammar*, pages 215-239, CSLI Publications, Stanford University, 1995.

Zec, Draga, & Inkelas, Sharon. 1990. *The Phonology-Syntax Connection*. Chicago: The University of Chicago Press.