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SECOND
EDITION

Ian Roberts

Diachronic Syntax

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Diachronic Syntax

IAN ROBERTS
SECOND EDITION

OXFORD
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To all parameter-setting devices everywhere,
but most especially Julian and Lydia
(whose cognitive states have crystallized since the first edition)

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Preface to the second edition

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*San Polo di Torrile,
September 2020*

Preface to the first edition

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*Downing College
Cambridge
January 2006*

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List of abbreviations and acronyms

AAVE	African-American Vernacular English
ABSL	Al-Sayyid Bedouin Sign Language
ACC	accusative case
AMP	Algonquian Macroparameter
AN	adjective-noun
APiCS	<i>Atlas of Pidgin and Creole Structures</i> (Michaelis et al. 2013)
AP	adjective phrase
ASL	American Sign Language
BC	blocking category
BCC	Borer-Chomsky Conjecture
BDT	Branching Direction Theory
BP	Brazilian Portuguese
CCH	Cross-Categorial Harmony
CI	Conditional Inversion
CL	clitic
CORREL	correlative marker
CNSL	consistent null-subject language
CP	complementizer phrase
DAT	dative case
DP	determiner phrase
DR	Diachronic Reanalysis
E&F	Emonds and Faarlund (2014)
EF	Edge Feature
EM	External Merge
EME	Early Middle English
ENE	Early Modern English
EP	European Portuguese
EPP	Extended Projection Principle
FC	free choice

LIST OF ABBREVIATIONS AND ACRONYMS

FE	Feature Economy
FF	formal feature
FLB	Faculty of Language in the Broad sense
FLN	Faculty of Language in the Narrow sense
FOFC	Final-Over-Final Condition
G ₁	Generation 1
G ₂	Generation 2
HC	Haitian Creole
HPSG	Head-Driven Phrase Structure Grammar
IG	Input Generalization
IE	Indo-European
IM	Internal Merge
IP	inflection phrase
IS	information structure
ISL	Israeli Sign Language
ISN	Idioma de Señas Nicaragüense
L ₁ A	first-language acquisition
L ₂ A	second-language acquisition
LA	Labelling Algorithm
LAD	Language Acquisition Device
LCA	Linear Correspondence Axiom
LFG	Lexical-Functional Grammar
LSN	Lenguaje de Señas Nicaragüense
ME	Middle English
MidF	Middle French
MMM	Maximize Minimal Means
MSc	Mainland Scandinavian
NA	noun-adjective
NE	Modern English
NOM	nominative case
NP	noun phrase
NPA	Negative Polarity Adverb
NPI	negative polarity item
NSL	null-subject language

LIST OF ABBREVIATIONS AND ACRONYMS

NNSL	non-null-subject language
NSP	Natural Serialisation Principle
OE	Old English
OF	Old French
OHG	Old High German
ON	Old Norse
OS	Old Saxon
OV	object-verb
P&P	principles and parameters
PAC	Probably Approximately Correct
PCM	Parametric Comparison Method
PEI	Prince Edward Island
PF	phonological form
PIE	Proto Indo-European
PL	plural marker
PLD	primary linguistic data
PNSL	partial null-subject language
PP	prepositional phrase
PRT	particle
PSN	Pidgin de Señas Nicaragüense
QI	quantity-insensitive
QP	quantifier phrase
QS	quantity-sensitive
RAH	Rich Agreement Hypothesis
RI	root infinitives
RL	Receiving Language
RNSL	radical null-subject language
SCL	subject clitic
SL	Source Language
SOV	subject-object-verb
SVO	subject-verb-object
TL	Target Language
TMA	tense/mood/aspect
TP	tense phrase

LIST OF ABBREVIATIONS AND ACRONYMS

UG	Universal Grammar
UT	utterance time
VO	verb-object
VP	verb phrase
VSO	verb-subject-object
WALS	<i>World Atlas of Language Structures</i> (Haspelmath et al. 2013)
WHL	Weinreich, Labov, and Herzog (1968)
WLB	Willis, Lucas, and Breitbarth (2013)

Introduction

Just under 1,000 years ago, a monk named Ælfric translated the Latin Vulgate Bible into English. Here are a few lines from his translation of the passage in Genesis (3:1–4) describing the temptation of Eve:¹

Ēac swelce sēo nǣdre wæs gēappre þonne ealle þā oðre niētenu þe God ġeworhte ofer eorðan; and sēo nǣdre cwæð tō þām wīfe: ‘Hwȳ forbēad God ēow þæt ġē ne æten of ælcum trēowe binnan Paradisum?’ Þæt wīf andwyrde: ‘Of þara trēowa wæstmē þe sind on Paradisum wē etað: and of þæs trēowes wæstmē, þe is onmiddan neorxenawange, God bebēad ūs þæt wē ne æten, ne wē þæt trēow ne hrepoden þȳ lǣs wē swulten.’ Þā cwæð sēo nǣdre eft tō þām wīfe: ‘Ne bēo ġē nāteswhōn dēade, þēah ġē of þām trēowe eten.’

This is the West Saxon dialect of Old English (OE), the nearest thing to a standard language of Anglo-Saxon England. Different varieties of OE were spoken in England from the time of the Anglo-Saxon invasions of the island of Britain in the fifth century until, according to the usual chronology, the Norman invasion in 1066. After this Norman French became the language of the ruling class; the English of the period 1066–1500 is conventionally known as Middle English (ME). Early Modern English (ENE) conventionally dates from 1500, though sometimes 1476, the date of the introduction of printing into England, is taken as the beginning of this period. Modern English (NE) refers to the period from 1700 to the present. OE and NE are strikingly different; for most speakers of NE, OE appears to be a foreign language. To the untrained eye passages such as the above are indecipherable.

¹ The text is taken from Mitchell and Robinson (1992: 174). Details regarding the source of the text are given by Mitchell and Robinson (1992: 173). I have followed Mitchell and Robinson’s ‘normalization’ of the orthography and accents (see Mitchell and Robinson (1992: 11–12)). On Ælfric’s life and work, with particular emphasis on his authorship of the first grammar of Latin written in English, see Law (2003: 193–5).

By contrast, here is the King James Bible version of the same passage, from 1611. This variety of English is of course somewhat archaic, representing a literary variety of the ENE, but it is nonetheless relatively comprehensible for modern readers:

Now the serpent was more subtil than any beast of the field which the LORD God had made. And he said unto the woman, Yea, hath God said, Ye shall not eat of every tree of the garden?

2 And the woman said unto the serpent, We may eat of the fruit of the trees of the garden:

3 But of the fruit of the tree which *is* in the midst of the garden, God hath said, Ye shall not eat of it, nor shall ye touch it, lest ye die.

4 And the serpent said unto the woman, Ye shall not surely die. (Mitchell and Robinson 1992: 175)

Here we are observing language change. As our OE passage illustrates, languages can change almost out of recognition in the course of a millennium. This book aims to present some recent ideas regarding certain aspects of this phenomenon of language change, in the context of an influential general theory of language.

The particular aspect of language change that this book is concerned with is syntactic change, change in the ways in which words and phrases are combined to form grammatical sentences. If we update all the other aspects (vocabulary, orthography, etc.) of our passage from Ælfric above, but keep the syntax the same as the OE, we have something like the following:

Also such the snake was deceitfuller than all the other beasts that God made on earth; and the snake said to the woman: 'Why forbade God you that ye not eat of each tree in Paradise?' The woman answered: 'Of the trees' fruit that are in Paradise we eat: and of the tree's fruit, that is in-the-middle-of Paradise, God bade us that we not eat, nor that we the tree not touch lest we die.' Then said the serpent back to the woman: 'Not be ye not-at-all dead, though that ye of the tree eat.'

This is a word-for-word rendering of the passage into NE (hence 'in-the-middle-of' is hyphenated, as it corresponds to the single OE word *onmiddan*, and similarly 'not-at-all' for *nāteswhōn*). Although it is now comprehensible, my rendering brings to light a number of syntactic differences between Ælfric's English and today's. Of these we can note the form of the question the serpent puts to Eve: 'Why forbade God you . . . ?' In NE, main verbs like *forbid* do not invert with subjects in questions, the auxiliary *do* being used instead (i.e. 'Why did God forbid

you...?'). We see another instance of 'main-verb inversion'—but this time not in a question—in the penultimate line: 'Then said the serpent back to the woman'. Another striking difference occurs twice in the last two sentences: Eve says 'that we the tree not touch' and the serpent, in his reply, says 'though that ye of the tree eat'. Here we see the order subject (*we/ye*), object ((*of*) *the tree*), verb (*touch/eat*); this is an order which NE does not usually allow but which is usual in OE subordinate clauses. Further differences can be observed. Look, for example, at the position of the negative word *ne*: I have translated this as 'not'; although in fact *ne* died out in late ME, and in NE *not* derives from OE *nan wuht* 'no wight' ('no creature'). Notice too the occurrence of 'that' in various places where it is not allowed in NE, such as following 'though' in the last sentence. I have not attempted to represent the OE case marking on nouns and articles, but this can be observed in the different forms of the word I have translated as 'the': *sēo* (nominative singular masculine), *þæt* (nominative/accusative singular neuter), *þāra* (genitive plural), *þæs* (genitive singular masculine/neuter), *þām* (dative singular masculine/neuter), etc. These case markings have all but disappeared in NE, a development which, although in itself a morphological or phonological change, may have affected English syntax.

So we can see that English syntax has changed in a number of ways in the past 1,000 years. But during that period the language has been passed on from generation to generation in the normal way, first in England and later in the various countries where English speakers settled. Children have learnt the language at their mothers' knees, and there is no good reason to think that invaders or other foreign influences caused the kinds of changes we have just observed, with the possible exception of the Norse invaders of the ninth to eleventh centuries (see §5.2.2). In particular, although English has absorbed a great deal of vocabulary from French and Latin in the past millennium, there is no clear evidence that either of these two languages has influenced English as far as the types of changes we have just observed are concerned. So how and why do changes like these take place? That is the central question this book will address.

The recorded histories of other languages also attest to syntactic change. The example of Ælfric's Bible translation could easily be replicated by comparing an excerpt from a twelfth-century *chanson de geste* with Modern French, or by comparing Plato's syntax with Modern Greek, or the Vedic hymns with Modern Hindi. Like all other

types of language change, syntactic change can be observed wherever we compare surviving ancient texts with those in a corresponding modern language. As has often been observed, change appears to be almost an inherent feature of all aspects of language. Language, to use McWhorter's (2001: 52) phrase, appears to show a kind of 'structured variation'. The purpose of this book is to present some recent ideas concerning this structured variation in syntax and apply them to change over time. To do this, we must develop a general theory of the nature of the structures and of the nature of the variations.

The theory of syntactic variation is the object of the first chapter, and so I will say no more about it here. Concerning the nature of syntactic structure, I will adopt what is arguably the most influential theory of recent years: that developed by Noam Chomsky and his associates and usually known as **generative grammar**.² The most recent variant of generative grammar is known as the **Minimalist Programme**, and I will assume a version of this in what follows. However, since my goal here is neither to develop nor to defend this particular version of generative syntax, I will try to keep the technical details to a minimum. I hope that readers who are fully conversant with these details will not see my approach as too simplistic, and that those who are unfamiliar with them will not be deterred.

Three aspects of Chomsky's thinking about language are central to what follows, and we must be explicit about these. The first is the idea that sentences can be exhaustively divided up into smaller constituents, down at least to the level of the word,³ and that the basic combinatorial principles are **discrete**, **algorithmic**, **recursive** and purely **formal**. By 'discrete' I mean that the elements of syntax are clearly distinguished from one another: clines, squishes, fuzzy sets, and continua play no role. By 'algorithmic', I mean that syntactic structures can be determined in an explicit, step-by-step fashion. By 'recursive', I mean that syntactic operations can apply to their own output, thus in principle creating infinite structures from a finite set of symbols and operations. And by 'formal' I mean that syntactic operations are not directly

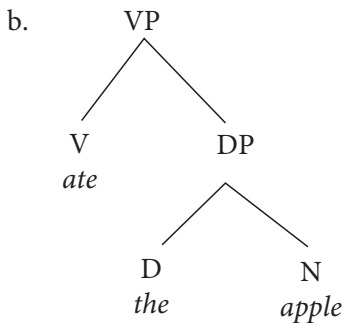
² Boldfaced items in the text are defined in the Glossary.

³ This idea is not original to Chomsky. It was an aspect of the American structuralist school of linguistics which was dominant in the United States prior to the 1950s, and has older historical antecedents; Seuren (1998: 219) traces it back to Wundt (1880).

determined by semantics, but can be seen as operations which manipulate symbols independently of any denotation those symbols may have.

The simplest way to illustrate these ideas is in terms of the basic operation **Merge**, proposed in Chomsky (1995). Merge combines two syntactic elements (in the simplest case, two words) into a more complex entity which consists of those two elements and its label, the label being determined by one of the two elements. More recently, Chomsky (2013, 2015) has proposed that Merge just combines two elements, with the label of the resulting syntactic object being supplied by a separate **Labelling Algorithm**. For example, Merge may combine the noun *apple* with the determiner *the*, forming the larger phrase *the apple*. The resulting phrase is usually regarded as a determiner phrase (DP) in current work, reflecting the assumption that the label of the larger unit formed by Merge is contributed by the determiner *the*. Merge may then combine the verb *ate* with the DP *the apple*, giving the phrase *ate the apple*, which is taken to be a verb phrase (VP)—the verb determines the label of the larger unit in this case. The structure that results from these operations can be represented as a **labelled bracketing**, as in (1a), or as a **tree diagram**, as in (1b):

(1) a. $[_{VP} [_{V} \text{ ate }] [_{DP} [_{D} \text{ the }] [_{N} \text{ apple }]]]]$



These two representations are entirely equivalent, the choice between them being determined by didactic or typographical considerations.

Merge is discrete, in that it combines distinct elements (words, categories); algorithmic, in that it can be seen to apply in a mechanical, step-by-step fashion (and it can be formalized rather more precisely than I have done here—see Chomsky 1995: 241ff.; Stabler 1997; Stabler and Collins: 2016: 47f.); recursive, in that it applies to its own output, as our example illustrates with the DP formed by Merge being itself part of

the input to the next operation of Merge forming the VP; and formal in that reference is not made to the meaning of the symbols combined.

The second aspect of Chomsky's thinking which is important for our purposes has two components: that the fundamental principles of syntax are universal, and that they may therefore reflect some aspect of human cognition. These two points are logically distinct, although they naturally go together. The first idea is that operations like Merge are not specific to any particular language but are **formal universals of language**. This is a radical and thought-provoking idea,⁴ which has given rise to much debate over many years. It implies that principles such as Merge must have been operational in Ælfric's English, Plato's Greek, etc., every bit as much as they are in present-day English, Greek, etc. Assuming formal universals in this way means that our approach to historical questions adheres to the **uniformitarian hypothesis**, the idea that 'the languages of the past . . . are not different in nature from those of the present' (Croft 2003: 233; see Roberts 2017a for discussion). Rather than attempt to justify Chomsky's radical idea here, I hope that the chapters to follow will show that this idea has a number of very interesting empirical and conceptual consequences.

Chomsky's further proposal that the formal universals of language represent an aspect of human cognition has given rise to even more controversy. What is most relevant in the present context is that it allows us to relate syntactic structure to children's acquisition of their first language. During the early years of life these universals are put into action as the child develops the capacity to speak and understand. There are two ways to think about how this may happen. On the one hand, if the universals themselves must be acquired, then this of course must happen during language development. On the other hand, if the universals are inherited (since language is common to all—and only—humans, and inherited universals may be thought of as ultimately derivable from the nature of the human genome, along with other

⁴ Again, I do not mean to imply that it is new. In the Western tradition, the concept of universal grammar has its origins in Plato and Aristotle; see Maat (2013). The Cartesian Port-Royal grammarians in the seventeenth century and the medieval speculative grammarians (the *modistae*) (Law 2003: 264) developed what we could in hindsight think of as theories of UG. Chomsky (1965: ch. 1, 1966/2009) discusses his own view of some of the historical antecedents of his ideas on this and other matters. Chomsky (1966/2009) is critically reviewed by Aarsleff (1970) and is also commented on by Simone (1998), among many others (see the references given in Simone 1997: 150); see in particular McGilvray (2009, 2017).

specifically human features), then they are simply applied to the task of language acquisition. The celebrated argument from the **poverty of the stimulus** (which I will briefly review at the beginning of Chapter 1) asserts that the second of these views is the more plausible of the two. But, whether we accept this or not, it is clear that *differences* between languages must be acquired as part of the process of first-language acquisition. Going back to our notion of structured variation, we see that, while the universal structures may be either inherited or acquired, the variation must be acquired (on the problem of acquiring variation, see Fodor and Sakas 2017; Crisma, Guardiano, and Longobardi 2019; Roberts and Longobardi 2019). Since historical change is variation in time, this in turn implies a connection between historical change and language acquisition. This is an old idea (Paul 1920); see Harris and Campbell (1995: 31); Morpurgo-Davies (1998: 248–51), which has been taken up most notably and influentially by Lightfoot (1979, 1991, 1999) in the context of generative grammar. In much of what follows we will explore the ramifications of this idea.

The third idea of Chomsky's is the distinction he makes between Externalized Language (E-language) and Internalized Language (I-language); see Chomsky (1986: 19–24). These are two quite distinct conceptions of language. I-language refers to the intensional, internal, individual knowledge of language. E-language is really an 'elsewhere' concept, referring to all notions of language that are not I-language. Universal Grammar (UG) is a more general notion than I-language; indeed, it can be defined as 'the general theory of I-language' (Berwick and Chomsky 2016: 90). Concepts such as Merge, and formal universals of language more generally, as introduced above, are concepts relating to I-language, in fact to UG as the general theory of I-language. E-language is arguably a more complicated notion than I-language, involving society, culture, history, and so on. Concepts like 'English' and 'French' in their everyday senses are E-language concepts.

In the context of studying syntactic change, notions such as 'Old English', 'Middle English', etc., are clearly E-language concepts; earlier we defined them in a directly historical way, as is standard practice in historical linguistics. Our evidence for these languages exists purely in the form of texts, and as such is also E-language. However, we take these texts to reflect the I-language of the individuals who produced them (just as the text you are now reading reflects my I-language). What we are concerned with in studying syntactic change, then, is

seeing how observable differences in the syntax of E-languages in texts must reflect changes in I-languages across different generations. The E-language vs. I-language distinction can shed some light on what we called above the ‘odd state of affairs’ that OE texts are very hard for untrained speakers of NE to understand. The term ‘English’ in both ‘Old English’ and ‘Modern English’ is an E-language term; it cannot refer to any individual’s I-language as it designates a historical entity more than 1,000 years old. But we assume, somewhat simplifying a more complex historical reality, that there has been a continuous line of transmission of I-languages from generation to generation among (at least a certain subset of) ‘English speakers’ over that millennium, and that in that process the nature of the I-languages has changed significantly, as their E-language by-products show. Our goal here is to investigate how and why I-languages can apparently change in this way (see Battye and Roberts 1995: 7–9, Hale 1998, 2007, and Walkden 2014: 31–7 for further discussion of the connections between I-language and syntactic change).

To sum up, three of Chomsky’s ideas are central to the discussions to follow: the idea that there are formal universals of syntax, the idea that these universals are an aspect of human cognition and the distinction between I-language and E-language. I have sketched these ideas here, but I have not attempted to do them justice. Recent introductions to the theory of syntax, all of which go over these points to a greater or lesser extent, are Haegeman (1994, 2005); Poole (2002); Adger (2003); Lasnik, Uriagereka, and Boeckx (2004); Radford (2004, 2009, 2016); Hornstein, Nunes, and Grohmann (2005); Carnie (2006); Larson (2010); Freidin (2012); Sportiche, Koopman, and Stabler (2013); and Koenenman and Zeijlstra (2017). A basic grounding in Chomsky’s ideas about the cognitive status of language is presented in Smith (2004), while Chomsky (2000, 2002, 2005) goes into these questions in more detail and, in the case of the latter two, with specific reference to the Minimalist Programme. However, this book is not intended to build directly on the textbooks in the sense of providing more sophisticated analytical techniques or theory-internal reflections. Discussions of the relative merits of the Minimalist Programme, or of any other designated approach to the nature of the formal universals of syntax, will not figure: I will simply adopt an informal version of minimalism.

In the widest sense, then, the goal of this book is to illustrate how Chomsky’s three ideas just summarized can form the basis for the study of historical syntax. These ideas can shed light on how and why English

has changed since Ælfric's time in the ways we observed above, and allow us to integrate our account of these changes with a general theory of structure and variation in syntax. I hope that this book will provide a clear conception of the implications of Chomskyan thinking for traditional questions in historical linguistics and a different perspective on the nature of UG and first-language acquisition. For those already familiar with Chomskyan syntax, I hope it will provide an illustration of the importance and relevance of syntactic change for our conception of how grammatical systems vary syntactically over time and how such systems are acquired. In this sense, the book is written from an explicitly Chomskyan perspective, although the emphasis is on the interpretation and extension of Chomsky's thinking, rather than on the defence, exegesis, or criticism of specific proposals—technical or philosophical—in Chomsky's writings.

Finally, I should point out what this book is *not* intended to do. It is not intended as a manual for syntactic analysis; the textbooks cited above fulfil this function. Neither is it intended as a guide for doing historical work, whether of a traditional philological kind or of a computational, corpus-driven kind. Instead, as stated above, the book is intended as an introduction to a particular area of linguistic theory.

Further reading

At the end of each chapter, I will give a few details and comments on the more important works mentioned, as well as other relevant works. Naturally, a number of works are mentioned in more than one chapter; I will comment on each work at the end of the first chapter in which it is mentioned. Thus, if the reader does not find a comment on a work at the end of a later chapter, the preceding chapters should be checked. Not every single reference mentioned in the text is commented on in these sections, but all of the more significant and useful works are.

The further reading mentioned in this chapter falls into various categories.

Works on the history of linguistics

Robins (1967) is the classic introduction to the history of linguistics, 'from Plato to Chomsky' as the subtitle says. **Law (2003)** is a very

thorough overview of the history of linguistic thought in Western Europe from antiquity to 1600. **Chomsky (1966/2009)** contains Chomsky's own assessment of the seventeenth-century antecedents to his thinking on the nature of language, mind, and grammar. **Aarsleff (1970)** is a very critical assessment. **Morpurgo-Davies (1998)** surveys the history of linguistics in nineteenth-century Western Europe, and provides a valuable perspective on the development of modern historical linguistics. **Seuren (1998)** is a very interesting history of Western linguistics, usefully combined with a history of logic in Western Europe. The views expressed on generative grammar are somewhat idiosyncratic, however. **Allan (2013)** is an extremely wide-ranging and useful handbook, covering all major periods and subfields, including chapters on non-Western linguistic traditions.

Textbooks on syntax

Adger (2003) is an introduction to minimalist syntax, which presupposes no prior knowledge of earlier versions of syntactic theory. Similarly, **Freidin (2012)** presupposes no background, and provides an excellent conceptual introduction to the overall goals of generative grammar and the Minimalist Programme. **Koenenman and Zeijlstra (2017)** also presupposes no prior knowledge of syntax, and provides a particularly reader-friendly introduction to aspects of the Minimalist Programme. **Larson (2010)** is another excellent general introduction, presupposing no prior knowledge, with a particular emphasis on theory-construction. **Radford (2004, 2009, 2016)** are very comprehensive introductions, again presupposing no prior knowledge of syntax. **Sportiche, Koopman, and Stabler (2013)** is very comprehensive and sophisticated, presupposing no prior knowledge and reaching an advanced level. **Carnie (2006)** is a more general introduction and combines elements of minimalist syntax with those of the earlier government-and-binding theory, as do **Ouhalla (1994)** and **Roberts (1996)**. **Haegeman (1994)** is the most comprehensive introduction to government-and-binding theory available, and **Haegeman (2005)** is a general introduction to syntactic theory. **Poole (2002)**, **Lasnik, Uriagereka, and Boeckx (2004)**, and **Hornstein, Nunes, and Grohmann (2005)** are introductions to

the technical aspects of the Minimalist Programme written by teams of leading experts in the field.

Chomsky's work and introductions to it

Chomsky (1965) remains in many ways the foundational text of generative grammar; Chapter 1 of this book is arguably Chomsky's fullest and most lucid introduction to the goals of generative grammar to date. **Chomsky (1995)** is a collection of papers from the early 1990s, including (Chapter 3) the first exposition of the Minimalist Programme, and (Chapter 4) some very important refinements of those initial ideas. The technical notions of minimalism are further developed and refined in **Chomsky (2000, 2001)** and elsewhere (see the Further reading sections in later chapters), while **Chomsky (2002; 2005)** present the conceptual background to the Minimalist Programme. **Cook and Newson (2007)** is an accessible introduction to Chomsky's thinking on UG, although some of the ideas presented are a little outdated. **Smith (2004)** is more up to date, and covers Chomsky's thinking on a range of issues, including politics. **Roberts (2017c)** is a general handbook on UG, which contains several chapters dealing with fundamental aspects of Chomsky's thinking.

Historical linguistics

Lightfoot (1979) is arguably the foundational text in diachronic generative syntax, and the direct inspiration for much of the material in this book. **Lightfoot (1991)** develops a number of the central ideas of the earlier work, as well as introducing the notion of 'degree-of learnability', which will play a role in our discussion, notably in Chapter 3. **Lightfoot (1999)** restates and elaborates a number of the ideas from the earlier works. **Lightfoot (2006)** further elaborates these ideas, with the emphasis on the emergence of new languages. **Harris and Campbell (1995)** is a very interesting survey of the issues in diachronic syntax from a non-Chomskyan theoretical perspective, and contains a number of clarifications of core questions, as well as some interesting novel proposals. **Mitchell and Robinson (1992)** is the most comprehensive introduction to Old English and Anglo-Saxon literature and culture

available. **Paul (1920)** is a classic statement of the concepts and methods of historical linguistics, written by a major neogrammarian. This work remains influential to this day. **Yang (2002a)** introduces the influential ‘variationist’ approach to language change, and **Yang (2016)** is devoted to the very important Tolerance Principle (which we look at in §2.1.2). **Ledgeway and Roberts (2017c)** is a handbook covering the major concepts in syntactic change.

1

Formal comparative and historical syntax

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Introduction

In this chapter, I will present the way in which syntactic variation is analysed in current theory. The central notion is that of **parameter of Universal Grammar**, a term which is fully explicated in §1.1. The rest of the chapter is devoted to illustrating certain parameters of Universal Grammar (UG), with examples taken from both the synchronic and the diachronic domains. We establish that this analytic device, which has been used to describe synchronic variation across languages, can also be used to describe diachronic changes between different stages of the same language.

Before introducing parametric variation, however, we need to be more precise about what does *not* vary, i.e. about the nature of the formal universals of syntax that were mentioned in the Introduction.

Chomsky has always argued that one of the goals of linguistic theory is to develop a general theory of linguistic structure that goes beyond simply describing the structures of individual languages (see Chomsky

1957: 50; Matthews 2001: 100ff. and references given there). In other words, a major concern of linguistic theory is to develop a characterization of a possible human grammar. To do this, we elaborate a theory of the formal universals of human language, known as **Universal Grammar (UG)**. Roberts (2017c: 9) defines UG as follows: ‘UG is the general theory of I-languages, taken to be constituted by a subset of the set of possible generative grammars, and as such characterizes the genetically determined aspect of the human capacity for grammatical knowledge’. Thus, UG embodies the essential invariant parts of the structure of language. Whilst our main concern in this book is with syntax, UG also contains principles related to phonology, morphology, and semantics. Whether these aspects of language are subject to parametric variation in the same way as syntax is an open question; there is some reason to think that this is true of phonology and morphology (see the discussion of Dresher 1999 in §3.3.2, for an example of a phonological parameter), while it is possible that semantics is not subject to variation. However, owing to my own lack of relevant expertise, I will leave these other subsystems of UG aside and concentrate on syntax.

One important way in which syntax makes human language possible has to do with its recursive nature. As mentioned in the Introduction, recursion makes it possible to construct infinite structures from a finite number of elements. The recursive nature of syntax is a necessary component of what Chomsky has called the ‘creative aspect of language use’: the fact that humans are able to produce and understand utterances that have never been produced before. This formal property of natural-language syntax allows us to give expression to our freedom of will.

In saying that UG defines a possible human language, I mean that UG is intended as a general theory of the structure of human language; we have seen that Berwick and Chomsky (2016: 90) define it as the general theory of I-language. Thus UG is not simply an account of the structure of the set of languages that happens to exist at this—or any other—historical moment. To be more precise, UG is intended to give an account of the nature of human *grammar*, rather than *language*; the notion of grammar, or I-language, is more precise and less subject to confusion due to social, political, and cultural factors than that of language (or, regarding the latter factors, E-language). Moreover, whilst a language can be thought of just as a set of strings of symbols, a grammar is more abstract, being the device which determines which

sets of symbols are admitted in the language. In other words, even if we had at our disposal the means, both intellectual and practical, to write an exhaustive description of the grammar of every language currently spoken and every language for which textual evidence survives, any resulting inductive distillation of the results of such a survey would not yield UG. It could yield an extensional definition of the common features of all currently (and recently) existing grammars, and would be universal in this weak sense. But what UG aims for is an intensional characterization of the class of human grammars: a characterization of what makes a grammar what it is. UG should tell us what the defining properties of any possible human grammar are.

A natural question to ask is whether UG is a purely abstract entity (for example, a set of some kind) or whether it has some physical or mental existence. Chomsky's view is that UG has mental reality, in that it is part an aspect of the human mind, the **language faculty**. We can define UG as our theory of a central facet of the language faculty, the mental faculty or faculties which both facilitate and delimit the nature of grammar. This view has the advantage that UG can now be seen as being in principle a theory of an aspect of physical reality; the language faculty—as a mental reality—is physically instantiated in the brain (somehow—a number of complex philosophical, psychological, and neurological issues arise here). In a very important article, Hauser, Chomsky, and Fitch (2002) distinguish the **Faculty of Language in the Narrow sense (FLN)** from the **Faculty of Language in the Broad sense (FLB)**. They propose that the FLB includes all aspects of the human linguistic capacity, including much that is shared with other species: 'FLB includes an internal computational system (FLN, below) combined with at least two other organism-internal systems, which we call "sensory-motor" and "conceptual-intentional"' (Hauser, Chomsky, and Fitch 2002: 1570); 'most, if not all, of FLB is based on mechanisms shared with nonhuman animals' (Hauser, Chomsky, and Fitch 2002: 1572). FLN, on the other hand, refers to 'the abstract linguistic computational system alone, independent of the other systems with which it interacts and interfaces' (Hauser, Chomsky, and Fitch 2002: 1570). This consists in just the operation which creates recursive hierarchical structures over an unbounded domain, Merge, which 'is recently evolved and unique to our species' (Hauser, Chomsky, and Fitch 2002: 1572). Chomsky's (2005) three factors in language design relate to FLB. These are:

- (1) Factor One: the genetic endowment, UG.
 Factor Two: experience, **Primary Linguistic Data (PLD)** for language acquisition.
 Factor Three: principles not specific to the faculty of language/non-domain-specific optimization strategies and general physical laws.

In this context, UG is just one factor that contributes to FLB.¹ Furthermore, there is nothing mysterious about the idea that the language faculty may be genetically inherited—the **innateness hypothesis**. This is the idea that the particular aspects of cognition which constitute the language faculty are a consequence of genetic inheritance, and it is no more or less surprising and problematic than the general idea that cognition is to some degree genetically facilitated. And if cognition is physically instantiated in the brain (somehow), then the claim is just that aspects of the physical functioning of the brain are genetically inherited.

To recapitulate: it is a goal of linguistic theory to attempt to develop a general characterization of a possible human grammar. It is reasonable, although not a matter of logical necessity, to take this characterization to be a reflection of some aspect of how the mind works, i.e. as a facet of human cognition which we call the language faculty. If cognition has a physical basis in the brain, then so does the language faculty. Finally, it

¹ Since aspects of the language faculty may not be domain-specific on this view, it may not be correct to think in terms of a specialized ‘mental module’ for language, although there is some evidence from language pathology for this (see in particular Smith and Tsimpli 1995 and Smith 2004). There is also evidence for a critical period specific to language acquisition, see Guasti (2016: 22–5), which may in turn favour the postulation of a ‘language module’, although not as a logical necessity. Clearly, though, the claim that language is a facet of cognition and physically instantiated in the brain does not entail the postulation of a language module. For a response to Hauser, Chomsky, and Fitch (2002), defending the conception of modularity, see Pinker and Jackendoff (2005); Jackendoff and Pinker (2005).

In this connection, it is worth considering an interesting terminological proposal made by Rizzi (2017: 111–12). He suggests that we may want to distinguish ‘UG in the narrow sense’ from ‘UG in the broad sense’, deliberately echoing Hauser, Chomsky, and Fitch’s FLN–FLB distinction. UG in the narrow sense is just the first factor of (1), while UG in the broad sense includes third factors as well. Furthermore, Tsimpli, Kambanaros, and Grohmann (2017) find it useful to distinguish ‘big UG’ from ‘small UG’ in their discussion of certain language pathologies. The definition of UG from Roberts (2017c) given above is ambiguous between these two senses of UG, in that it states that UG ‘characterizes the genetically determined aspect of the human capacity for grammatical knowledge’. This genetically determined property could refer narrowly to the first factor or more broadly to both the first and the third factors; the distinction is determined by domain-specificity in that the first factor is specific to language and the third more general.

may be that the language faculty is genetically inherited; that some aspect of the human genome determines its existence in all normal humans.

The innateness hypothesis is highly controversial. As mentioned in the Introduction, the principal argument for it is the poverty-of-the-stimulus argument. Here I will briefly summarize this argument (for a more detailed presentation, see Roberts 1996: 265–71; Jackendoff 2002: 82–7; and, in particular, Guasti 2016: 9–22; Lasnik and Lidz 2017; Pullum and Scholz (2002) present a very strong version of the poverty-of-the-stimulus argument, which they subject to a detailed critique; see Lasnik and Lidz 2017 for discussion). As its name implies, the poverty-of-the-stimulus argument is based on the observation that there is a significant gap between what seems to be the experience facilitating first-language acquisition (the PLD in (1)) and the nature of the linguistic knowledge which results from first-language acquisition, i.e. one’s knowledge of one’s native language. The following quotation summarizes the essence of the argument:

The astronomical variety of sentences any natural language user can produce and understand has an important implication for language acquisition... A child is exposed to only a small proportion of the possible sentences in its language, thus limiting its database for constructing a more general version of that language in its own mind/brain. This point has logical implications for any system that attempts to acquire a natural language on the basis of limited data. It is immediately obvious that given a finite array of data, there are infinitely many theories consistent with it but inconsistent with one another. In the present case, there are in principle infinitely many target systems... consistent with the data of experience, and unless the search space and acquisition mechanisms are constrained, selection among them is impossible... No known ‘general learning mechanism’ can acquire a natural language solely on the basis of positive or negative evidence, and the prospects for finding any such domain-independent device seem rather dim. The difficulty of this problem leads to the hypothesis that whatever system is responsible must be biased or constrained in certain ways. Such constraints have historically been termed ‘innate dispositions’, with those underlying language referred to as ‘universal grammar.’ (Hauser, Chomsky, and Fitch 2002: 1576–7)

Similarly, in introducing the general question of the nature of the learning problem for natural languages, Niyogi (2006: 16) points out that the basic problem is

the inherent difficulty of inferring an unknown target from finite resources and in all such investigations, one concludes that *tabula rasa* learning is not possible. Thus children do not entertain every possible hypothesis that is consistent with the data

they receive but only a limited class of hypotheses. This class of grammatical hypotheses *H* is the class of possible grammars children can conceive and therefore constrains the range of possible languages that humans can invent and speak. It is UG in the terminology of generative linguistics.

As an illustration of the complexity of the task of language acquisition, consider the following sentences:

- (2) a. The clowns expect (everyone) to amuse them.
 b. The clowns expected (everyone) to amuse themselves.

If *everyone* is omitted in (2a), the pronoun *them* cannot correspond to *the clowns*, while if *everyone* is included, this is possible. If we simply change *them* to the reflexive pronoun *themselves*, as in (2b), exactly the reverse results. In (2b), if *everyone* is included, the pronoun *themselves* must correspond to it. If *everyone* is left out, *themselves* must correspond to *the clowns*. (One might object that facts such as these are semantic, but they are usually considered to be partially determined by syntax—the usual analyses of these phenomena are described in the textbooks cited in the Introduction.) The point here is not how these facts are to be analysed, but rather the precision and the subtlety of the grammatical knowledge at the native speaker's disposal. It is legitimate to ask where such knowledge comes from.

Another striking case involves the interpretation of missing material, as in (3):

- (3) John will go to the party, and Bill will—too.

Here there is a notional gap following *will*, which we interpret as *go to the party*; this is a 'missing' VP, and the phenomenon is known as VP-ellipsis. In (4), we have another example of VP-ellipsis:

- (4) John said he would come to the party, and Bill said he would—too.

Here there is a further complication, as the pronoun *he* can, out of context, correspond to either *John* or *Bill* (or an unspecified third party). Now consider (5):

- (5) John loves his mother, and Bill does—too.

Here the gap is interpreted as *loves his mother*. What is interesting is that the missing pronoun (the occurrence of *his* that isn't there following *does*) has exactly the three-way ambiguity of *he* in (4): it may

correspond to *John*, to *Bill* or to a third party. Example (5) shows we have the capacity to apprehend the ambiguity of a pronoun which is not pronounced.

The above cases are examples of native grammatical knowledge. The basic point in each case is that native speakers of a language constantly hear and produce novel sentences in that language, and yet are able to make very subtle judgements of interpretation and ambiguity. They are also able to distinguish well-formed sentences from ill-formed ones. Here is a further example, uttered while planning a party, for example. This example is based on Radford (2004: 15):

(6) Who did he think was likely to drink what?

This sentence has a natural interpretation, known as the ‘pair-list’ interpretation, according to which an answer to ‘who’ and an answer to ‘what’ are paired (i.e. ‘He thought John was likely to drink vodka, Mary gin, Bill orange juice’, etc.). We understand the sentence this way naturally, and moreover we immediately understand that *he* cannot refer to the same individual as *who* (more technically, *he* must be disjoint from *who*). Also, we can recognize the following variants of this example as ungrammatical (indicated by an asterisk), even if they are trying to mean the same thing:

- (6') a. *Who did he think that was likely to drink what?
- b. *What did he think who was likely to drink?
 (cf. What did he think John was likely to drink?)
- c. *Who was he thought likely to drink what?
- d. *Did he think who was likely to drink what?

The question is why and how we are able to distinguish previously unheard examples like (6) from ungrammatical but extremely similar ones such as (6'). In first-language acquisition, **negative evidence**—information about ungrammatical sentences—is unavailable; children may be exposed to ungrammatical sentences but they are not told that they are ungrammatical; where explicit instruction is intended, it appears to be either ignored or misunderstood. Meaning probably isn't much help in distinguishing the examples in (6), as the sentences in (6') mean the same as those in (6), to the extent they mean anything, which (6'a) pretty clearly does. This knowledge must either come from experience or from within. If we truly have no experience of novel sentences like (6), then it must come from within. Moreover, if the

knowledge of these properties of English comes from within, it must represent some aspect of UG, as there is no genetic disposition to English. Here we see the links between the poverty of the stimulus, the postulation of an innate language faculty, and UG.

To put it another way, if we deny that knowledge of grammar of the type illustrated in (2)–(6) can be innate, then we must maintain that the conditions of language acquisition and the nature of our minds (minds by hypothesis lacking any special predisposition to grammatical knowledge) are such that we are able to glean subtle aspects of the interpretation of pronouns purely from experience, including absent pronouns as in (5); we must also be able to distinguish sentences like (6) from non-sentences like (6'). Despite much criticism of the poverty-of-the-stimulus argument (see Pullum and Scholz 2002 and the references given there), no clear account of why and how native speakers can do any of this has emerged. On the other hand, introductory textbooks of the kind referred to earlier offer such an account in terms of an innate UG.

Of course, a natural response is to say that, while we may never have heard (6), we have heard plenty of examples like it. But here we must be very clear about what 'like (6)' actually means. If 'like (6)' means 'containing the same, or nearly the same words, as (6)' then of course (6') are very like (6); these examples contain exactly the same words as (6) in all cases except one. But the examples in (6') are ungrammatical while (6) is grammatical. Construing 'like (6)' in any other sense involves attributing knowledge of some aspect of syntactic structure to speakers who recognize the difference between (6) and (6'), and this is exactly what the poverty-of-the-stimulus argument is trying to explain. Thus the question of the mental status and the origins of that knowledge is begged.

The idea of some kind of superficial resemblance among sentences as informing language acquisition has underlain many behaviourist theories of acquisition. Chomsky (1959) showed how one rather well-worked-out behaviourist theory of language acquisition was doomed to failure. More recently, Guasti (2002: 10–17) provides a detailed discussion of why mechanisms such as imitation, reinforcement, and association are unable to account for the first-language acquisition of such aspects of grammar. Moreover, there is evidence that first-language acquisition takes place on the basis of 'positive evidence' only, in the sense that children do not have access to information

regarding what is *not* allowed; they only hear examples of what is possible (see Guasti 2002: 3–4, 2016: 4–5, and the references given there; this issue is complex as it involves making assumptions regarding what children ‘do’ with what they hear, about which almost nothing is known). Also, language acquisition takes place in a largely uniform way across children from different social groups and language backgrounds, does not rely on explicit instruction, and happens very quickly given the complexity of the task and the relatively rudimentary nature of more general reasoning and other cognitive skills at an early age. Most of first-language acquisition is effectively accomplished by the age of 6.

The poverty-of-the-stimulus argument asserts that, given the factors mentioned above, it is highly implausible to think that there is no predisposition to language at all. If there is a ‘predisposition to language’, then some aspect of linguistic knowledge is innate. In the absence of any account of how grammatical knowledge like that illustrated in (2–6)—and myriad similar examples (see Anderson and Lightfoot 2002: 198–206; Crain and Pietroski 2002; Fodor and Crowther 2002; Jackendoff 2002: 82–7; Freidin 2012: 1–14; and the references given in these sources)—may be determined purely on the basis of experience by a mind with no predisposition to language, we conclude that knowledge of language arises from the interaction of innate knowledge with relevant experience. This does not mean that UG directly determines facts of the type in (2)–(6) regarding ellipsis, anaphora, etc., but rather that such facts can be seen as consequences of fairly abstract innate principles interacting with experience. The question of the balance between innate knowledge and experience is difficult and complex; it is also to a considerable extent an empirical matter, i.e. it cannot be determined purely by theoretical speculation. (This point is made by Pullum and Scholz (2002).) We will come back to this in §1.1 below. The important point is that the innateness hypothesis can provide a solution to the poverty-of-the-stimulus problem. As Guasti says:

The nativist hypothesis explains why language acquisition is possible, despite all limitations and variations in learning conditions. It also explains the similarities in the time course and content of language acquisition. How could language acquisition proceed in virtually the same ways across modalities and across languages, if it were not under the control of an innate capacity? (Guasti 2016: 22)

For many years, Chomsky has argued for an innate language faculty, and takes UG to be the theory of this faculty. Here I will follow this

view, in part because of the force of the poverty-of-the-stimulus argument as just given. In the chapters to follow, I will try to show that this point of view can be revealing for our understanding of language change.

1.1. UG and variation in grammatical systems

In the previous section, we saw the reasons for postulating the existence of an innate language faculty. Nevertheless, it seems that we cannot escape the fact that different languages have different grammars. We can easily observe that a sentence which is syntactically well-formed in one language may be ill-formed in some other language. Compare the following very simple sentences and non-sentences in English and German:

- (7) a. Tomorrow John will visit Mary.
 b. *Morgen Johann wird besuchen Maria.
 c. Morgen wird Johann Maria besuchen.
 d. *Tomorrow will John Mary visit.

Example (7a) is a quite unremarkable English sentence, but its exact syntactic counterpart in German—a word-for-word translation with the words retaining their English order—is ungrammatical in German. Conversely, (7c) is a correct German rendering of the English (7a), but if we translate it back into English retaining the German word order, we arrive at the impossible (7d). The conclusion is clear: English syntax differs from German syntax. How are we to reconcile this conclusion with the postulation of a uniform language faculty?

One simple way to answer the question would be to say that English speakers and German speakers are genetically distinct: one aspect of this genetic difference is a difference in the respective language faculties, which has the consequence that English and German have different syntax. This gives rise to the differences observed in (7). However, this view cannot be maintained, since we have ample evidence from immigrant communities the world over that children of speakers of one language are perfectly able to become native speakers of the language of their adopted community. In the case of English and German, it suffices to point to the large numbers of German-speaking immigrants to the United States in the late nineteenth and early twentieth centuries whose

descendants have, by now for several generations, been native speakers of English. This simple fact is incompatible with the idea that the syntactic differences observed in (7) are attributable to some genetic difference between English speakers and German speakers. (Of course, this view would also lead us to postulate genetic differences in cognition between different nationalities and ethnic groups, a highly dubious move on ethical grounds. As we see, however, there is no support for this position, and good evidence against it, in this as in many other domains.)

If differences between the grammars of different languages cannot be accounted for in directly genetic terms, then how are we to account for them, given the assumption of an innate UG? It would seem that these differences are not part of the innate language faculty. However, it does not take much technical knowledge of syntax to be able to tell that the differences in word order between English and German in (7) involve fairly central aspects of syntax. (They involve at least the position of the verb and the position of the direct object, as we shall see in §1.3 and §1.6.) Moreover, there are good reasons to think that syntactic variation across languages is not random; this conclusion has been established by language typologists (quite independently of the assumption of UG in the sense described in the previous section). For example, in (7) we can see that in English the verb always precedes the direct object; one aspect of the ungrammaticality of (7d) is the fact that the direct object precedes the verb (**Mary visit*). For this reason, English is referred to as a **VO (verb-object) language**. On the other hand, in German non-finite verbs generally follow their objects (cf. *Maria besuchen* in (7c) and the ungrammaticality of the reverse order in (7b)); German may therefore be considered a kind of **OV language**. Language typologists have shown that a number of other variant traits are correlated with VO vs. OV order (see Comrie 1989, Song 2001, 2011, 2012, Croft 2003, and Moravcsik 2013 for introductions to **language typology** and **word-order typology**; we will return to these questions in more detail in §1.6, §2.5, and §3.5). It is thus now generally accepted that syntactic variation among languages is not random. For this reason, coupled with the fact that fairly central properties seem to vary, we might want to 'build variation in' to our theory of the language faculty.

What seems to be required is a way of expressing syntactic variation within the theory of the language faculty itself. This is achieved by adopting the notion of parameters of variation. The central idea is quite

simple: alongside the invariant principles of UG there may be certain limited options which remain open, to be ‘filled in’, as it were, by experience. These options determine the parameters along which grammars may vary, and are thus known as the parameters of variation. In this view, the language faculty consists of invariant principles and associated parameters. In terms of the three factors of language design in (1), we could consider both the principles and parameters to be innate, i.e. part of the first factor, as well as the range of options specified by the parameters. Experience, the second factor, is necessary only to fix the values of the parameters. Alternatively, the third factors may play a role too; we will develop this idea in what follows. On this latter view, variation stems less from the innate endowment and more from the interaction of the three factors (see also Crain and Thornton 2013: 415; Guasti 2016: 21).

We can illustrate the interaction of principles and parameters in an informal way using our examples of word-order differences between English and German seen in (7). We saw that English is a VO language and that German is OV (at least where V is non-finite). So we could say that UG determines the nature of V (the universal theory of syntactic categories, i.e. Nouns, Verbs, etc., would do this), the nature of O (the universal theory of **grammatical functions** such as subject, direct object, indirect object, etc., would do this) and how they combine to form a VP (this may be determined in part by the nature of Merge, as we saw in the Introduction, and in part by the theory of grammatical functions, which would state for example that a determiner phrase (DP) merged with V is a direct object). So UG dictates that a Verb and its direct object combine by Merge to form a VP. The parametric option concerns the linear order of V and O—UG says nothing about this. Hence grammars may choose either of the two logical options: OV or VO. As we saw, German takes the former option while English takes the latter.

There are several points to note regarding this brief and somewhat simplified illustration. First, we see that the role of experience lies simply in determining the linear order of rather salient elements: verbs and their direct objects. The actual learning task is thus rather simple, and, impoverished though it may be, the stimulus is presumably not so defective that this information cannot be detected by language acquirers. So we reconcile poverty-of-the-stimulus considerations with cross-linguistic variation. This, in essence, is the great

attraction of this approach. It also specifies quite clearly the relation between experience and the innate faculty. If an invariant UG is associated with a set of binary parameters of variation, such that grammatical knowledge arises in the learner as it ‘interrogates’ the linguistic data it is exposed to and thereby sets the parameters that define its grammar; Fodor and Sakas (2017: 263), following Yang (2006: 127ff.), called this the ‘20 questions’ model of learning.

Second, just as in the game of twenty questions, a choice has to be made: not deciding is not an option. At the relevant level of abstraction, the task of acquisition of syntax consists purely in fixing the values of parameters in this way. The ability to acquire a given language may thus be construed as the ability to set the parameters to determinate values. Each grammar must choose a value for each parameter, although certain values may be determined by default—I return to this point in §3.5. An implication of this in the present case is that all languages can and must be defined as OV or VO; ‘free word-order’ languages cannot exist, for example.

Third, options may be determined by ‘gaps’ in UG principles. This appears to be the case in our example of OV vs. VO: everything about the Merge of V and its object to form a VP is determined by invariant Merge except the relative order of merged elements. These elements must be ordered, and if UG provides no specification, a parametric option is created. It seems that the content of the parametric option is simply to force a consistent choice on a grammar. We can take this approach further and view parameters as emergent properties of the three factors of language design given in (1); see Roberts (2012a, 2019a), Biberauer and Roberts (2015, 2017). Parameters arise from the interaction of the three factors, if we construe the latter as follows:

- (8) Factor One: underspecified Universal Grammar (UG).
 Factor Two: Primary Linguistic Data (PLD).
 Factor Three: two third-factor principles, e.g.:
 - (i) Feature Economy (FE) (Roberts and Roussou 2003: 201):
 Postulate as few formal features as possible.
 - (ii) Input Generalization (IG) (based on Roberts 2007: 275 and §3.5):
 Maximize available features.

Together, the two third-factor conditions given here form an optimal search/optimization strategy of a minimal kind (Biberauer (2017) unifies them as Maximize Minimal Means); we will look at these and other

third factors more closely in §3.5. Roberts (2012a) argues that these third factors interact with the other two factors to give rise to parametric variation, expressed in the form of parameter hierarchies. I will return to these points in §3.4 and §3.5. This approach is conceptually attractive as it makes variation an inherent part of the system rather than an unexplained accretion.

Fourth, parameters are usually thought of as binary, either/or options. This of course relates to the previous two points. The importance of this idea is that, like other aspects of UG, parameters are discrete entities: here as elsewhere, clines, continua, squishes, and the like are ruled out. This idea does not prevent us from postulating parameters with more than two values; such parameters can always be reconstrued as networks of binary parameters. Again, I will say much more about hierarchies of parameters in §3.4 and §3.5.

The parameters of UG tell us what is variant, and by implication what is invariant, in UG. They do three things that are of considerable general interest. First, they predict the dimensions of language typology. In our example, this implies that all languages can be divided into VO or OV. The VO languages include, in addition to English, the Romance languages, Greek, the Bantu languages, Thai, and many Papuan languages. The OV languages include Latin, the Indic languages, the Dravidian languages, Japanese, Korean, the Turkic languages, and many Amerindian languages (see Dryer 2013a and §1.6). Parameters can thus play a central role in the classification of languages. An important facet of this idea is that parameters may be able to define clusters of covarying properties, of the type stated by implicational and other types of universal put forward by typologists and others. We will come back to **implicational universals** in §1.6. For example, VO vs. OV order seems to correlate with the relative order of auxiliaries and main verbs. We observe that auxiliary-verb (AuxV) and VO pattern together in English, while in German VAux and OV pattern together (again, we limit our attention to non-finite auxiliaries in German for the sake of simplicity):

- | | | |
|-----|---|--------|
| (9) | a. John can visit Mary. | (AuxV) |
| | b. Johann wird Maria besuchen können . | (VAux) |

Such clustering of variant properties is of central importance for language typology, since it establishes that syntactic variation is non-random. I will explore this and other word-order correlations more in §1.6.

Second, parameters should predict aspects of first-language acquisition. As noted above, first-language acquisition of syntax consists largely, perhaps exclusively, in fixing the values of parameters. In that case, we expect to be able to observe the effects of this parameter-fixing process in the development of syntax. Intensive research on this topic over recent years has provided some intriguing conclusions on this point, which we will review in §3.1. (See Guasti 2016 for a much more detailed summary.) If variant properties cluster, as mentioned above, then it may be that one aspect of a grammar is acquired ‘for free’ once another is acquired (for example, AuxV order as a consequence of VO order). If this idea can be maintained, the task of the language acquirer is further simplified, and acquisition and typology are bound together.

Third, and of most concern to us here, parameters can tell us which aspects of syntax are subject to change in the diachronic dimension. On the basis of the English and German examples in (7), we can see that the relative order of the verb and its direct object, as a parameter, may be subject to change. In fact, we observed this in the Introduction when we compared *Ælfric’s* English with present-day English. There we saw that, at least in OE subordinate clauses, direct objects precede their verbs (‘that we the tree not touch’; ‘though that ye of the tree eat’), while of course such orders are not possible in present-day English. If variant properties cluster together, then the clear prediction is that, all other things being equal, they will change together. (We will look at the case of VAux and OV order in the history of English in §1.6.2 and §2.5.) The nature of parametric change will be a central focus of this book.

In this section, we have seen the motivation for the notion of parameter in UG, and, albeit in a fairly rough form, an example of a parameter. We have also suggested that parameters may arise from the interaction of the three factors in language design as in (8). The rest of this chapter is devoted to giving more detailed examples of parameters, both in the synchronic and the diachronic domains.

1.2. Null subjects

The first phenomenon we will look at is null subjects. We will see that there are three different kinds of null-subject language, alongside non-null-subject languages such as English. As with all the parameters to be discussed in this chapter, we first present the relevant phenomena in

the synchronic dimension, and then present the diachronic corollaries, i.e. the evidence that the synchronic variation described by a parameter finds parallels in diachronic change.

1.2.1. *Null subjects in the synchronic dimension I: consistent null-subject languages*

The original motivation for the postulation of a null-subject parameter is that certain languages allow finite clauses to express a definite, referential, pronominal subject covertly, or silently. In other languages, this is impossible. The contrast is illustrated by the following examples:

- (10) Parla italiano. [Italian]
 speaks-3SG Italian
 ‘He/she speaks Italian.’
- (11) Habla español. [Spanish]
 speaks-3SG Spanish
 ‘He/she speaks Spanish.’
- (12) *Parle français. [French]
 speaks-3SG French
 ‘He/she speaks French.’
- (13) *Speaks English.

These examples show us that where French and English require an overt pronoun, Italian and Spanish permit a phonologically **null pronoun** *pro*. Hence (10) and (11) have the form *pro parla italiano* and *pro habla español* respectively. This null pronoun can alternate with an overt form:

- (14) Lui/lei parla italiano. [Italian]
 he/she speaks Italian
 ‘He/she speaks Italian.’
- (15) Él/ella habla español. [Spanish]
 he/she speaks Spanish
 ‘He/she speaks Spanish.’

The overt pronoun-containing cases are generally agreed by native-speakers to be interpreted as ‘emphatic’.

Null-subject languages of the Spanish or Italian type also permit alternations between null and overt pronouns in embedded contexts, which don't always have the same interpretation:

- (16) Todos los estudiantes_i piensan que ellos_i/*pro*_i [Spanish]
 Every student thinks that (they)
 son inteligentes.
 are intelligent.

According to Montalbetti (1984), the overt pronoun *ellos* here resists the bound-variable interpretation ('For every *x*, *x* a student, *x* thinks *x* is intelligent').

Generally *pro* behaves like overt pronominals as far as its interpretative properties are concerned. So, in an example like (17), both covert *pro* and overt *él* can either refer to *Juan* or to some linguistically unspecified male third party, just like English *he* in the translation:

- (17) Juan_i piensa que *pro*_{i/j}/*él*_{i/j} es inteligente. [Spanish]
 J. thinks that he is intelligent.

Furthermore, *pro* acts like a typical pronoun in that it only allows 'strict' interpretations, those which are identical to the interpretations of an overt antecedent. Hence in (18b) the silent pronoun can refer to *su propuesta*, but where the *su* refers to *María* (a rather natural reading out of context) so must the understood *su* in (18b):

- (18) a. María cree que su propuesta será [Spanish]
 Maria believes that her proposal will-be
 aceptada.
 accepted.
 b. Juan también cree que—será aceptada.
 Juan also believes that—will-be accepted.

This behaviour contrasts with what we observe under VP-ellipsis in English as in (19):

- (19) John wants his proposal to be accepted and Bill does—too.

Here, the elided material following *does* can be understood as containing a fully ambiguous pronoun: Bill may either want his own proposal to be accepted, or he may want John's proposal to be accepted. The latter is known as the 'strict' reading (since the elided material has exactly the same interpretation as the overt material in the previous

clause), and the former is known as the ‘sloppy’ reading. The silent material in (19) corresponds to an elided VP, not a pronoun. In (18) the silent material is a pronoun. Pronouns typically only allow ‘strict’ readings. In the terminology introduced in Hankamer and Sag (1976), VP-ellipsis is a case of ‘surface’ anaphora while *pro*, as a typical pronoun, involves ‘deep’ anaphora.

So we postulate *pro* because it acts like an overt pronoun in an English-type language and is interpreted as an argument. More generally, if subject arguments typically denote individuals while pronouns, like other nominal expressions, denote individuals, then we should treat *pro* as a nominal. Moreover, there are cases where subjects are semantically empty. These are known as ‘expletive’ or ‘non-referential’ subjects. English has two such subject pronouns, *it* and *there*, illustrated in (20):

- (20) a. It is raining.
 b. It seems that John is intelligent.
 c. There arrived a train.

In null-subject languages of the Spanish-Italian type, there is no overt counterpart to such pronouns. Instead, the subject is obligatorily silent in the translations of (20), as the following Italian examples illustrate:

- (21) a. Piove. [Italian]
 rains
 ‘It is raining.’
 b. Sembra [che Gianni sia intelligente].
 seems that John be intelligent
 ‘It seems that John is intelligent.’
 c. È arrivato un treno.
 is arrived a train
 ‘There arrived a train.’

One way to account for the appearance of overt expletive pronouns in English of the kind seen in (20) is to propose the following (see Chomsky 1982: 10):

- (22) The Extended Projection Principle (EPP):
 Every clause must have a filled subject position.

We can generalize (22) to null-subject languages of the Spanish-Italian type if we postulate expletive *pro* here (see Rizzi 1982, 1986a). Since

(22) is not a requirement for a phonologically overt subject, silent *pro* satisfies the EPP in (22).

We can extend this idea to a construction known as ‘free inversion’ in Italian and similar languages. Here, the subject appears in a position which follows the verb; in fact it follows the whole ‘verbal complex’ of auxiliary and participle in compound tenses:

- (23) Ha telefonato Marco. [Italian]
 has telephoned Marco
 ‘Marco has called.’

Taking ‘subject position’ in (22) to refer specifically to a preverbal subject position, we postulate *pro* in this position in (23), just as in (21). An important advantage of this idea, first pointed out by Rizzi (1982), is that it allows us to account for a contrast in certain kinds of wh-interrogatives between English and Spanish/Italian-type languages. In English, a wh-question cannot be formed on the subject of a finite subordinate clause where a complementizer is present. This phenomenon, known as the *that-trace effect*, is illustrated by the contrast in (24):

- (24) a. *Who did you say that — would fix the bike?
 b. Who did you say — would fix the bike?

In (24a), wh-question-formation on the subordinate-clause subject is degraded, while in (24b), where there is no complementizer present, such question-formation is allowed. Languages such as Spanish and Italian do not show this effect, as the example in (25) illustrates:

- (25) Chi hai detto che — ha telefonato? [Italian]
 who have-2SING said that has telephoned
 ‘Who did you say called?’

Rizzi (1982) showed that, despite initial appearances, Italian has ‘*that-trace effects*’ too; this was based on a complex argument regarding the interpretation of negative quantifiers which I will not go into here. Rizzi then attributed the grammaticality of (25) to the fact that the wh-question is formed on the postverbal, ‘freely-inverted’ subject position seen in (23). Owing to the possibility of ‘free inversion’ then, Italian has a wh-question-formation option for subjects that English doesn’t have. Since ‘free inversion’ is possible thanks to the availability of expletive *pro* to occupy the preverbal subject and thereby satisfy the Extended Projection Principle of (22), ultimately the contrast in wh-questions

between Italian and English can also be traced back to the availability of *pro* in the former language but not the latter.

All of this led Rizzi (1982) to postulate the following ‘parametric cluster’. Italian has all the properties in (26), while English has none of them:

- (26) a. The possibility of a silent, referential, definite subject of finite clauses.
- b. ‘Free subject inversion’.
- c. The apparent absence of complementizer-trace effects.
- d. Rich agreement inflection on finite verbs.

Properties (26a–c) are all consequences of the availability of *pro* in the preverbal subject position, as we have seen. The natural question to ask at this point is what allows a language to have *pro*. (26d) is a plausible answer: languages like Italian and Spanish clearly differ from languages like English in that the finite verb shows a rich array of subject-agreement markers. This is illustrated for Italian, Spanish, and Greek (another language of this kind) in (27):

- (27) a. *Italian*: bev-o, bev-i, bev-e, bev-iamo, bev-ete, bev-ono.
- b. *Spanish*: beb-o, beb-es, beb-e, beb-emos, beb-éis, beb-en.
- c. *Greek*: pin-o, pin-is, pin-i, pin-ume, pin-ete, pin-un.
- All: ‘I drink’, etc.

In (27), we observe that all six person-number combinations making up the present tense of the verb ‘to drink’ have distinct endings, and the same is true for nearly all tenses of nearly all verbs in these languages and others like them. This obviously contrasts with the minimal person-number inflection of English, limited to the marking the third-person singular of the present tense with -s, and with the Mainland Scandinavian languages (Danish, Swedish, and Norwegian) which entirely lack person-number agreement on finite verbs and which, like English, do not allow null subjects.

However, there are languages which are ‘poorer’ in agreement inflection than the languages shown in (27) but ‘richer’ than English or Mainland Scandinavian. Compare, for example, the German and Romanian verb paradigms in (28):

- (28) a. *German*: schlaf-e, schläf-st, schläf-t, schlaf-en, schlaf-t, schlaf-en.
- b. *Romanian*: dorm, dorm-i, doarm-e, dorm-im, dorm-iți, dorm.
- Both: ‘I sleep’, etc.

Here we see five out of six distinct forms in each case. However, German is not a null-subject language while Romanian is. Outside of the really clear cases like (27), then, ‘rich agreement’ is not a fully reliable guide to what determines the presence of *pro*; see Roberts (2019a: 289–92) for further discussion of ‘rich agreement’ and the suggestion that it is a second- and third-factor phenomenon in terms of the three factors in (1).

Italian, Spanish, and Greek are examples of the first type of null-subject language to be discussed in the generative literature, notably by Rizzi (1982) as we have seen. Following Roberts and Holmberg (2010), we call these ‘consistent null-subject languages’ (or CNSLs). The properties of CNSLs are as follows:

(29) Consistent null-subject languages:

- (i) the possibility of leaving the definite subject pronoun unpronounced in any person-number combination in any tense;
- (ii) rich agreement inflection on the verb;
- (iii) 3sg null subjects restricted to a definite interpretation; an arbitrary null subject (in a finite clause) needs a special marker in the 3sg;
- (iv) conform to the cluster in (26);
- (v) allow overt subject pronouns, but with a different interpretation.

We have seen all of the properties listed in (29) except for (29iii). This is shown by examples such as (30):

- (30) Qui non (si) può fumare. [Italian]
Here not (SI) can smoke
'He/she/one can't smoke here.'

This example features a null subject *pro*. If the ‘medio-passive/impersonal’ clitic *si* is left out, *pro* must be interpreted as definite, translating therefore as ‘he’ or ‘she’. If *si* is included, on the other hand, *pro* is interpreted as indefinite, translating roughly as ‘one’. The important point is that the indefinite interpretation is unavailable without the presence of the special marker *si* (on whose status, see Manzini 1986; Cinque 1988; D’Alessandro 2007). In the next two subsections, we look at the other main types of null-subject languages: radical and partial null-subject languages.

1.2.2. Null subjects in the synchronic dimension II: radical null-subject languages

Many languages, including Japanese and Chinese, appear to allow null arguments very freely as subjects and objects with no agreement-marking at all to ‘recover’ their content:

- (31) a. John-wa [zibun-no tegami-o] suteta. [Japanese]
 John-TOP self-GEN letter-ACC discarded.
 ‘John threw out his (own) letters.’
 b. Mary-mo — suteta.
 Mary-also discarded.
 ‘Mary threw out—too.’

Should we analyse the silent object in (31b) as a *pro* comparable to the null subject in our Italian and Spanish examples in the previous subsection? If so, the notion that *pro* is connected to rich agreement will clearly have to be abandoned, or at the minimum radically modified, since there is no agreement marking of any kind in Japanese.

An alternative approach to null arguments in languages of this kind has been developed in recent years, originating in proposals by Oku (1998) and Tomioka (2003). This approach relies on the fact that Japanese doesn’t have determiners, and so the null arguments could be cases of NP-ellipsis where no determiners are present. This idea is seen most clearly if we assume that nominals can have at least two levels of internal structure, illustrated with a simple English example in (32):

- (32) [_{DP} the/this/a/every [_{NP} man]]

Here DP stands for Determiner Phrase; as a first approximation *the/this/a* and *every* can be seen as determiners of various kinds. In certain contexts, notably after demonstratives, the NP can be elided:

- (33) I like those shirts but I don’t like [_{DP} these [_{NP} —]].

In a language like Japanese, where determiners are not obligatory in referential nominals (this is not to imply that Japanese lacks demonstratives and quantifiers, but it does lack definite and indefinite articles and it does allow singular count nouns in argument positions—see (36), (37)), we could envisage a structure like the following:

- (34) [_{DP} Ø [_{NP} —]]

Such a nominal would constitute a silent argument, but it would not be *pro*.

In this connection, Tomioka (2003) put forward the following generalization (Tomioka 2003: 336):

- (35) Tomioka's Generalization:
 'All languages which allow discourse pro-drop allow (robust) bare NP arguments... Null pronouns in Discourse Pro-Drop languages are simply the result of N'-Deletion/NP-Ellipsis without determiner stranding.'

Languages like English and Italian have rich determiner systems, including definite and indefinite articles. In these languages, bare singular count nouns cannot function as arguments; they must be marked by some form of determiner:

- (36) a. *John read book. [Italian = (36a)]
 b. *Gianni ha letto libro.

In Japanese, on the other hand, bare singular count nouns are readily found:

- (37) Taroo-ga hono-o yonda. [Japanese]
 Taro-NOM book-ACC read
 'Taro read a/the book.'

As the translation shows, *hono-o* in this example can be read out of context as either definite or indefinite.

In the previous subsection we introduced the distinction between 'strict' and 'sloppy' readings of pronouns and elided material. This distinction is illustrated in the following English examples:

- (38) a. John threw out his letters and Bill did—too.
 b. John threw out his letters and Bill threw them out too.

In (38a) we have VP-Ellipsis and a sloppy reading (Bill threw out *his* letters) is allowed. Following the terminology introduced by Hankamer and Sag (1976), this is 'surface anaphora'. On the other hand, the pronoun in (38b) does not allow the sloppy reading: *them* here can only refer to John's letters. There is no strict vs sloppy ambiguity; this is 'deep anaphora'.

The key observation regarding Japanese is that (31b) allows the sloppy interpretation ('Bill threw out *his* letters'). Therefore, like the

English VP-ellipsis example (38a), this is a case of surface anaphora, and as such appears to be a case of ellipsis (of NP, in terms of the structure in (34)), rather than *pro* (which, as a pronoun, is associated with deep anaphora).

(31b) features a silent object, but the parallel observation can be made about silent subjects in Japanese, as the following examples show:

- (39) a. Taro_o-wa [zibun-no kodomo-ga eigo-o [Japanese]
 Taro-TOP self-GEN child-NOM English-ACC
 hanasu to] omotteiru.
 speak c think
 ‘Taro_i thinks that his_i child speaks English.’
 b. Ken-wa [— furansugo-o hanasu to] omotteiru.
 Ken-TOP e French-ACC speak c think
 ‘Ken thinks that—speaks French.’

The null subject in (39b) can be interpreted as either Ken’s child or as Taro’s child; the former is a case of the sloppy reading. The fact that the sloppy reading is allowed means that this is a further case of surface anaphora, implying that here too we have ellipsis and not *pro*. Compare (39) with its English counterpart in (40):

- (40) Taro thinks that his child speaks English, but Ken thinks that he speaks French.

Here, only the strict reading is available for *he* in the second clause. So this is deep anaphora, typical of pronouns. This example contrasts minimally with the Japanese examples in (39).

A further observation concerns what are known as ‘quantificational readings’ of numeral and other expressions, as in:

- (41) a. Sannin-no mahootukai-ga Taro_o-ni ain-ni [Japanese]
 Three-GEN wizard-NOM Taro-DAT see-to
 kita.
 came
 ‘Three wizards came to see Taro.’
 b. Hanako-ni-mo ai-ni kita.
 Hanako-DAT-also see-to came
 ‘They came to see Hanako too.’

In (41b) the three wizards in question do not have to be interpreted as the same three as in (41a). This is a further example of surface anaphora, akin to sloppy readings of pronouns, and further supports the idea that these null arguments are cases of ellipsis rather than *pro*. Compare again the parallel English examples, with a pronoun and with VP-Ellipsis:

- (42) a. Three wizards came to visit John. They came to visit me too.
 b. John met three wizards and I did—too. —quantificational reading possible.

In (42a) the pronouns *they* can take *three wizards* in the previous sentence as its antecedent, and here it is understood that *they* refers to the same three wizards as *three wizards* in the first sentence (e.g. Gandalf, Dumbledore, and Merlin). In (42b), on the other hand, while the elided VP is understood as ‘met three wizards’, the three wizards can be a different set of three wizards as compared to the antecedent. The consistent pattern is that ellipsis is associated with quantificational readings of numeral phrases (as opposed to coreferent readings), while pronominal anaphora is associated with strictly coreferent readings. Following this pattern, we are led to see the null arguments in Japanese as cases of nominal ellipsis.

I conclude that null arguments in radical null-subject languages involve ellipsis, not *pro*. More generally, we can summarize the properties of radical null-subject languages (RNSLs) as follows:

- (43) (i) no restrictions on omission of subject or object pronouns of any kind;
 (ii) no agreement inflection on the verb (or anywhere else, seemingly);
 (iii) null subjects can be either definite (= ‘he/she’) or indefinite (= ‘one’);
 (iv) nothing really comparable to ‘free-inversion’ and these languages don’t generally conform to the cluster in (26), but many of these languages lack overt wh-movement and many may lack complementizers;
 (v) sloppy readings possible, supporting the idea that the silent arguments are cases of ellipsis.

Property (43iii) is illustrated by examples like the following:

- (44) Haru-ga kure-ba, tabi-ni de-taku-naru. [Japanese]
 spring-NOM come-when trip-TO leave-want-become
 ‘When spring comes, one wants to go on a trip.’

Here the null subject has an indefinite interpretation, as its translation by ‘one’ reveals. There is no special marker comparable to Italian *si* here.

1.2.3. *Null subjects in the synchronic dimension III: partial null-subject languages*

Starting with Holmberg (2005), a third type of null-subject language has been recognized, known as partial null-subject languages (PNSLs). The properties of PNSLs are as follows:

- (45) (i) person restrictions on omission of a definite subject pronoun, especially third-person in root contexts;
 (ii) not necessarily very rich agreement inflection on the verb;
 (iii) 3sg null subjects can have an indefinite interpretation without the need for a special marker;
 (iv) subjects are typically preverbal, there is no general ‘free-inversion’ option, hence these languages don’t generally conform to the cluster in (26);
 (v) allow overt subject pronouns with no interpretative difference.

Holmberg (2005) illustrates property (45i) with Finnish:

- (46) a. (Minä) puhun englantia ‘I speak English, etc.’ [Finnish]
 I speak-1SG English
 b. (Sinä) puhut englantia
 You speak-2SG English
 c. *(Hän) puhuu englantia
 He/she speak-3SG English
 d. (Me) puhumme englantia
 We speak-1PL English
 e. (Te) puhutte englantia
 You speak-2PL English
 f. *(He) puhuvat englantia
 They speak-3PL English

In general, third-person null subjects are not possible with definite interpretations in main clauses. Regarding third-person null subjects in subordinate clauses, Holmberg (2005: 539) says: ‘A 3rd person definite subject pronoun can be null when it is bound by a higher argument, under conditions that are rather poorly understood’. He illustrates this with the following example:

- (47) Pekka_i väittää [että hän_{i/j}/Ø_{i/*j} puhuu [Finnish]
 Pekka claims that he speaks
 englantia hyvin].
 English well.

Here we see that the overt subject pronoun in the subordinate clause, *hän*, may take the main-clause subject *Pekka* as its antecedent or may refer to a contextually given male individual. The null subject, by contrast, can only have the linguistic antecedent *Pekka* as its antecedent. This contrasts with what we see in CNSLs; see the Spanish example in (17).

A further contrast with CNSLs concerns the possibility of an indefinite interpretation for third-person singular main-clause subjects without a special marker, as in:

- (48) Täällä ei saa polttaa. [Finnish]
 Here not may smoke
 ‘One can’t smoke here.’

This example contrasts minimally with the Italian example in (30). Other PNSLs include Marathi and other Indo-Aryan languages (Holmberg, Nayudu, and Sheehan 2009), Russian (Barbosa 2019), Hebrew (Borer 1984, 1986, 1989; Landau 2004; Shlonsky 2014), Brazilian Portuguese (Figuereido-Silva 2000; Holmberg 2010; §1.2.5, §4.2.6), Icelandic (Holmberg, p.c.). As we will see in §1.2.6, several old Germanic languages also appear to have been PNSLs at some point in their history (see Walkden 2014, Rusten 2019 on Old English; Axel 2007 on Old High German; Kinn 2016 on Old Norwegian; and Kinn, Rusten, and Walkden 2016 on early Icelandic; and §1.2.6).

1.2.4. *Null subjects in the synchronic dimension IV: types of null subjects*

So we arrive at the following typology of null-subject languages:

- (49) a. Consistent NSL (Italian, etc.): agreement-determined subject-pronoun drop; null arguments intrinsically definite.
 b. Radical NSL (Japanese, etc.): apparently free pronoun-drop, argument-ellipsis.
 c. Partial NSL (Finnish, etc.): subject pronoun-drop restricted according to persons and structural context; null arguments intrinsically indefinite.

The obvious question to ask now is why we find these different types of null-subject language. Roberts (2019a: 250) makes a connection between null subjects and the nature of determiner systems. Alongside ‘rich agreement’, as discussed above, we can informally describe a notion of ‘rich determiners’: languages which overtly mark both definiteness and indefiniteness in nominals, usually along with gender and number marking on the articles. In these terms, we can cross-classify ‘rich agreement’ and ‘rich determiner’ languages as follows:

(50)	Rich D?	Rich agreement?	
	+	+	Italian, etc., i.e. consistent NSLs (CNSLs)
	–	+	partial NSLs (PNSLs)
	–	–	radical NSLs (RNSLs)

The fourth logical possibility is given in (51); this characterizes non-null-subject languages (NNSLs) such as English (English has definite and indefinite determiners, but they do not bear overt number and gender features):

(51)	+	–	the fourth possibility: non-NSLs
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In these terms, CNSLs and NNSLs (Romance, Germanic, etc.) have definite and indefinite articles. We must add a proviso for the Southern and Western Slavic languages (with the exception of Bulgarian/Macedonian); these languages are CNSLs but do not have definite or indefinite determiners. On the other hand, they do have rich clitic systems, which can be analysed as determiner-like elements bearing person and number features. Russian, a PNSL, has lost its pronominal clitic system, and contrasts minimally with Polish, a CNSL, which has retained its clitics. PNSLs typically have ‘more’ verbal agreement inflection than English, but have no articles or clitics (Russian/Finnish), only definite articles (Hebrew, Icelandic) or the possibility of bare singular count nouns in argument position (Brazilian Portuguese). Finally, RNSLs lack articles and clitics altogether.

We expect from the above that PNSLs contrast with CNSLs (and NNSLs) in allowing bare nominals in argument positions:

- (52) a. Kirja on pöydällä. [Finnish]
 book is table-on
 ‘The book is on the table.’
 b. polis-An-nI cor pakaD-I-A [Marathi (Holmberg
 police-PL-ERG thief.M catch-PERF-M et al. 2009)]
 ‘The police caught the thief.’
 c. Cachorro(s) gusta(m) da gente. [BP]
 Dog(s) like(s) of people
 ‘Dogs like people.’

So it seems that the type of null subject is partly a consequence of the nature of the determiner system. Why should this be the case? We saw above (see (34)) that apparent argument ellipsis in RNSLs is the result of NP-ellipsis under a null determiner. Barbosa (2019) argues at length that *pro* should be seen as a minimal NP, rather than as a full DP. In these terms, we can characterize the three kinds of null-subject language as follows:

- (53) RNSL: [DP Ø [NP *e*]] (*e* = ellipsis site)
 PNSL: [DP Ø/D_[-def] [NP *pro*]]
 CNSL: [DP D_[±def] [NP *pro*]]

(Here we see that PNSLs may entirely lack determiners, as in Finnish and Russian, or may have determiners which do not make definiteness distinctions, as in Hebrew and Icelandic.)

We now need to complete the picture by looking at what happens in NNSLs. In a classic paper, Postal (1966) argued that in English *pro*-nouns are really a kind of determiner. One important piece of evidence for this idea comes from non-possessive adnominal pronouns (studied in great detail in Höhn 2017), as in examples such as the following:

- (54) We professors love you students.

The definite article can be seen as the third-person version of the determiner, with *we* as first-person and *you* as second-person:

- (55) a. [DP [D The] [NP professors]] love [DP [D the] [NP students]].
 b. [DP [D We] [NP professors]] love [DP [D you] [NP students]].

Now, adopting Barbosa’s proposal that *pro* is an NP, we can propose the following structure for sentences containing apparently simple pronouns:

(56) [_{DP} [_D We] [_{NP} *pro*]] love [_{DP} [_D you] [_{NP} *pro*]].

The difference between CNSLs and PNSLs, on the one hand, and NNSLs on the other, is that in the former languages the pronominal D can form a morphosyntactic unit (a complex head D+V to a first approximation) with the finite verb, while in NNSLs this doesn't happen. The operation forming a complex head is known as incorporation; see the discussion of verb-movement in §1.3.

We are now able to give a more precise account of the properties which distinguish the various kinds of null-subject languages, including NNSLs such as English. Let us take 'rich D' as in (50) and (51) to mean that Person and Number features are associated with the determiner system (following the idea in Longobardi 2008 and Richards 2014 that Person and Definiteness may reduce to the same thing), while 'rich agreement' refers to the same property of the position occupied by the finite verb (which, as we will see in detail in §1.3.1.1, is the Tense position, so incorporation creates a complex D+T/V head). Then we can reformulate (50) and (51) as follows, at the same time subsuming (53):

- (57) a. **RNSL:** T_[-Person] ... [_{DP} Ø_[-Person] ... [_{NP} *e*]]
 b. **PNSL:** T_[+Person] ... [_{DP} D/Ø_[-Person] ... [_{NP} *pro*]]
 c. **CNSL:** T_[+Person] ... [_{DP} D_[+Person] ... [_{NP} *pro*]]
 d. **NNSL:** T_[-Person] ... [_{DP} D_[+Person] ... [_{NP} *pro*]]

We can now understand why CNSLs and PNSLs, but not NNSLs, allow a pronoun in D to incorporate into T, if we suppose that a condition on incorporation is that the category which incorporates cannot have a positive feature that the incorporation host lacks. This condition is met in (57b) and (57c), but not in (57d). The condition may be met in RNSLs, but these are really distinct kinds of system, in that both Person and NP *pro* appear to be absent. As we have observed, RNSLs fail to show any form of clitics or agreement; in these languages then, it seems all bets are off.

The different types of null-subject systems are distinguished by the different features associated with their D and T heads. This is consistent with a general approach to the nature of parameters known as the **Borer-Chomsky Conjecture**, which we can state as follows:

- (58) All parameters of variation are attributable to differences in the features of the functional heads in the Lexicon (Borer 1984: 27–9; Chomsky 1995: 6; Baker 2008: 155f.).

Since D and T are functional heads (as opposed to lexical heads such as Nouns, Verbs, and Adjectives), differentiating the various null-subject systems as in (57) is in line with the Borer-Chomsky Conjecture.

We conclude that the current state of synchronic knowledge regarding null-subject languages involves at least the following empirical and theoretical claims. First, there are (at least, see below) three types of null-subject language: CNSLs, RNSLs, and PNSLs, with the distinct properties as given in (29), (43), and (45) above. Second, only CNSLs are expected to conform to the parametric cluster in (26). Third, the internal structure of DP and the nature of the D-system are relevant for null subjects.

There are also a number of open questions. First, the question of the nature and characterization of both ‘rich agreement’ and ‘rich determiners’ is to some extent open, and in any case in need of greater precision (as we will see in §1.2.6). Second, does the four-way typology given above (including NNSLs) exhaust the typology of NSLs? Barbosa (2019: 511–12) argues that there is a further type, which she calls ‘semi-prodrop’ languages. Semi-prodrop languages are more restricted than PNSLs, allowing only non-referential and indefinite null subjects; fully referential, definite null subjects are never possible in languages of this kind. Barbosa suggests that various creoles and Icelandic are of this type (see §5.3 on creoles). It is not clear how this type, if it is distinct from PNSLs (see Roberts 2019a: 249, n. 46 on this), would fit in to the typology suggested above. Third, it should be apparent from the above discussion that RNSLs are radically different from the other types; we will return to this point in §1.2.8. Fourth, null objects, both direct and indirect, need to be integrated into our typology. Finally, the position and status of overt preverbal subjects in CNSLs needs to be clarified. To see what is at issue here, consider a simple subject-verb-object sentence in a CNSL such as Italian:

- (59) Gianni parla italiano. [Italian]
 John speaks Italian.

There are two options for the position of the subject here. On the one hand, it may be a true preverbal subject occupying a preverbal subject position directly comparable to the position of the subject in the English translation. Alternatively, it could be in a left-dislocated position with *pro* (now construed as [_{DP} D[_{NP} *pro*]]) in the true subject position. This would be the null-subject counterpart of an English sentence like *John, he speaks Italian*. The alternatives are schematized in (60):

- (60) a. [Gianni V O]
 b. [Gianni [*pro* V O]]

Barbosa (2019), following a line of work going back to Borer (1986), argues that (60b) is the correct analysis in that the subject occupies a topicalized or left-dislocated position (although she does not propose there is a *pro* in subject position). This conclusion is not uncontroversial; see the discussion and references in Roberts (2010a). The distinction between (60a) and (60b) may be relevant for certain cases of diachronic change, as we will see in §1.2.7.

Having illustrated the various kinds of null-subject system in the synchronic domain and the associated parameters in (57), it is now time to look at cases of diachronic change involving these systems.

1.2.5. *Null subjects in the diachronic dimension I: European and Brazilian Portuguese*

In (29) we listed the properties of CNSLs as follows:

- (29) (i) the possibility of leaving the definite subject pronoun unpronounced in any person-number combination in any tense;
 (ii) rich agreement inflection on the verb;
 (iii) 3sg null subjects restricted to a definite interpretation; an arbitrary null subject (in a finite clause) needs a special marker in the 3sg;
 (iv) conform to the cluster in (26);
 (v) allow overt subject pronouns, but with a different interpretation.

These are to be contrasted with the properties of PNSLs, repeated here from (45):

- (45) (i) person restrictions on omission of a definite subject pronoun, especially third-person in root contexts;
 (ii) not necessarily very rich agreement inflection on the verb;
 (iii) 3sg null subjects can have an indefinite interpretation without the need for a special marker;
 (iv) subjects are typically preverbal, there is no general ‘free-inversion’ option, hence these languages don’t generally conform to the cluster in (26);
 (v) allow overt subject pronouns with no interpretative difference.

When a CNSL changes into a PNSL, then, we expect to observe the following:

- (61) (i) the introduction of person restrictions on null subjects;
 (ii) possible loss of rich agreement on the verb;
 (iii) loss of special markers for indefinite markers of null subjects;
 (iv) loss of ‘free inversion’ and associated apparent complementizer-trace effects;
 (v) loss of interpretative differences between overt and null subjects.

Given the nature of the diachronic record of many languages, properties (61iii–v) may be difficult to observe. On the other hand, erosion of inflection in general, including verbal agreement inflection, is easy to observe; in particular, it has very clearly happened in many Germanic languages. The introduction of person restrictions on null subjects can be observed through the selective increase in the use of overt pronouns in some persons but not others, perhaps in specific contexts, as we shall see.

All of the changes in (61) can be observed in the recent history of Brazilian Portuguese (BP), since the early nineteenth century. This has been documented by Duarte (1993, 1995, 2019). Concerning (61i), Figueiredo-Silva (2000: 134) claims that in main clauses in an ‘out-of-the-blue’ context (e.g. where there is no salient discourse topic; see Barbosa 2019: 489, note 1) third-person null subjects are dispreferred, while first- or second-person null subjects are readily possible (I will return to this point in §4.2.6):

- (62) a. *pro* encontrei a Maria ontem. [BP]
 meet.1SG.PST the Mary yesterday
 ‘I met Mary yesterday.’
 b. **pro* encontrou a Maria ontem.
 meet.3SG.PST the Mary yesterday

European Portuguese, on the other hand, readily allows third-person null-subject pronouns at greater frequency than BP; see Duarte (2019: 108, table 7).

Concerning (61ii), it is well-known that BP has undergone a reorganization of the pronominal system in such a way that formerly third-person pronouns came to be used as 2sg, 2pl, and 1pl forms, replacing the earlier pronouns, with the result that 3sg verbal inflection is now used in these persons as well. The effect is a levelling of the verb paradigm, as shown in (63):

- (63) a. *EP and former BP paradigm:*
 (eu) falo (nos) falamos
 (tu) falas (vos) falais
 (ele/ela) fala (eles) falam
- b. *Reorganized colloquial BP paradigm:*
 eu falo a gente fala
 você fala vocês falam
 ele/ela fala eles falam
 ‘I speak, etc.’

(There are some complications concerning the use of *tu* in twentieth-century BP; see §4.2.6, note 29.) The effect of the reorganization of the pronominal system is a reduction of the number of distinctions in the verbal inflection from six to three. As such the new system arguably falls below the threshold for ‘rich’ agreement and is thus incompatible with CNSL status (see also Roberts 2014b).

Concerning (61iii) (Holmberg 2010: 92), following an earlier observation by Rodrigues (2004), observed the following contrast between European and Brazilian Portuguese:

- (64) a. É assim que faz o doce. [BP]
 Be.3SG.PRES thus that make.3SG.PRES the.MSG sweet
 ‘This is how one makes the dessert.’
- b. É assim que se faz o doce. [EP]
 be.3SG.PRES thus that SE make.3SG.PRES the.MSG sweet
 ‘This is how one makes the dessert.’

In (64a), the arbitrary/indefinite interpretation of the null subject (corresponding to English *one*) is available without the presence of the ‘impersonal’ clitic *se*, while in European Portuguese *se* is required for this interpretation; (64a) is grammatical in European Portuguese, but the null subject must have the definite interpretation ‘he/she’.

Concerning (61iv), European Portuguese shows all the standard hallmarks of a CNSL:

- (65) a. ‘*Free inversion*’:
 Telefonou ontem o João.
 called-3SG yesterday John
 ‘John called yesterday.’

b. *Wh-movement of a subject over a finite complementizer:*

Que aluno disseste que – comprou um computador?
 which student said-2PL that – bought-3SG a computer
 ‘Which student did you say bought a computer?’
 (Barbosa, Duarte, and Kato 2005: 1)

BP, on the other hand, does not allow free inversion, except with unaccusative verbs—see Kato (2000), although it does allow *wh*-movement as in (21c); this fact about BP remains anomalous.

Finally, examples comparable to (16) do not show the interpretative difference in BP observed by Montalbetti (1984) for Spanish, in that in examples like (66) the overt pronoun *ele* can have a bound-variable interpretation (thanks to Eugênia Duarte, p.c., for providing this example):

- (66) Cada um podia fazer as perguntas que ele
 Each one could-3SG do-INFIN the questions that he
 queria.
 wanted-3SG
 ‘Each one could ask the questions that he wanted.’
 (Rádio CBN)

It appears, then, that BP has changed, or is changing, from a CNSL to a PNSL in its fairly recent history; we will return to the possibly ongoing nature of this change, and some empirical complications, in §4.2.6. This is correlated with the weakening of agreement seen in (63) and with the possibility of bare count nouns in argument positions as seen in (52c).

1.2.6. *Null subjects in the diachronic dimension II: early Germanic*

Another example of a change from CNSL to PNSL and, at least sporadically, to NNSL comes from the early Germanic languages, although here the textual record is less abundant than in Portuguese. With the exception of Modern Icelandic, which is arguably a kind of PNSL (although, as we mentioned in §1.2.4, Barbosa (2019) treats Icelandic as a ‘semi prodrop’ language, distinct from canonical PNSLs), the Modern Germanic languages are all NNSLs. However, it is now fairly clearly established that this was not exactly the situation in several of the older Germanic languages: OE, Old High German (OHG), Old Norse (ON), Old Saxon (OS) and Gothic (see van Gelderen 2000, 2013, Rusten 2019 on OE; Axel 2007 on OHG; Falk 1993,

Sigurðsson 1993, Faarlund 2004b, Håkansson 2013, Kinn 2016, Kinn, Rusten, and Walkden 2016 on ON; Ferraresi 1997, 2005, Miller 2019: 381–2 on Gothic; and in particular Walkden 2014: 157–227 on OS and for general overview and analysis). All of these languages allowed referential null subjects to varying degrees, in contrast to the modern languages (although Modern Dutch and German apparently allow expletive null subjects; see Wurmbrand 2006, Biberauer 2010 for convincing arguments that these putative null subjects are simply absent positions rather than subject positions filled by ‘expletive *pro*’).

Null subjects in the old Germanic languages are illustrated by the following examples:

- (67) a. Nu scylun hergan hefaenricaes uard.² [OE]
 Now must.1PL praise heavenly-kingdom.GEN guard
 ‘Now we must praise the lord of the heavenly kingdom.’
 (*Caedmon’s Hymn*, Cambridge University Library MS M, l 1;
 van Gelderen 2000: 126, (16); Walkden 2014: 172)
- b. Sume hahet in cruci. [OHG]
 some.ACC hang.2PL to cross
 ‘Some of them you will crucify.’
 (Monsee Fragments XVIII.17; Matthew 23:34; Axel 2007: 293;
 Walkden 2014: 184)
- c. þer dipi ok drak miolk [Old Swedish]
 there sucked and drank milk
 of moþor spina
 of mother.GEN teats
 ‘There he sucked and drank milk from his mother’s teats.’
 (*Tjuvabalken in Den äldre Codex of Westgöta-Lagen*, dated
 1225; Falk 1993: 143, (1a); Walkden 2014: 164)
- d. naht jah dag in diupipai was [Gothic]
 night-ACC.SG and day.ACC.SG in deep was
 Mareins
 sea.GEN.SG
 ‘a night and a day (I) was on the deep of the sea’
 (2Cor 11: 25B; Miller 2019: 382)

² For discussion of variation in the incidence of *we* in this example across various mss., see Walkden (2014: 172).

- e. Giuuitun im thô eft te Hierusalem [OS]
 went.3PL REFL.DAT then after to Jerusalem
 iro sunu sôkean
 their son seek.INF
 ‘They then went to Jerusalem to seek their son.’
 (*Heliand* 806–7; Walkden 2014: 192)

These examples illustrate the occurrence of null subjects in the older Germanic languages, showing that something significant has changed in the languages that have survived (i.e. all of them except Gothic). But what kind of null-subject systems are they? We can immediately exclude the possibility that these are RNSLs from the simple presence of verbal subject-agreement marking in all of these languages, illustrated in more detail below (see also Walkden 2014: 203–9 for discussion, and dismissal, of this possibility). So we are left with the option of CNSLs or PNSLs. Here the diagnostics (29) and (45) are relevant, as well as their diachronic counterparts in (61). In practice, given the nature of the available data, only diagnostics (i) (person restrictions on null subjects) and (ii) (presence of ‘rich’ agreement) are easily applicable, although (iii) (indefinite subjects with/without a special marker) and (v) (interpretative differences between null and overt subjects) can also play a role in determining the status of these languages. Throughout the following discussion, I will leave (61iv) aside.

It seems fairly clear that Gothic was a CNSL. Walkden (2014: 201) states that ‘Gothic seems to pattern with Italian-style languages’. Harbert (2007: 221) says ‘[a]mong the GMC languages, this possibility [‘full’ prodrop—IR] is attested only in GO[thic]’, and Miller (2019: 381) says ‘Gothic was the most null-subject Germanic language’. The agreement paradigm for the present tense of Gothic *nasjan* (‘to save’) is as follows:

- (68) nasj-a, nasj-is, nasj-ip, nasj-ōs (1DU), nasj-ats (2DU), nasj-am,
 nas-ip, nasj-and (‘I save’, etc.; Walkden 2014: 198, table 5.17,
 following Wright 1910: 150–1)

Here we see seven distinct endings out of eight forms (the usual six person/number combinations, plus first- and second-person dual). This corresponds to the definition of ‘rich agreement’ given in Roberts (1993a: 127), which allows up to one syncretism; in (67) we observe a syncretism between 3sg and 2pl (there is also a syncretism between 1sg and 3sg in the past tense; see Walkden 2014: 199). Null subjects are

found in all persons and, to the extent the data allow us to determine, all tenses in Gothic. Combined with the observation of ‘rich agreement’ in (67), we see that diagnostics (61i) and (61ii) hold for Gothic.

Concerning (61iii), the older Indo-European languages—all very plausibly CNSLs given their very rich agreement paradigms (see §4.4.4)—had synthetic mediopassive forms whose logical external argument was typically a null arbitrary pronoun. Strikingly, Gothic has a synthetic passive of this kind (Miller 2019: 216; see also Harbert 2007: 317f.):

- (69) saei gabairada weihs haitada [Gothic]
 REL bear.3SG.PASS holy.NOM.SG.M call.3SG.PASS
 sunus gudis
 son.NOM god.GEN
 ‘the holy one who will be born will be called the son of God’
 (Luke 1:35; Miller 2019: 216)

Information concerning diagnostics (61iv) and (61v) is unavailable for Gothic.

The attested corpus of Gothic dates largely from the sixth century, and as such, aside from a few North Germanic runic inscriptions (Faarlund 2004a: 908), is the oldest attested form of Germanic. Thus we may expect Gothic to be more conservative than the other attested Germanic languages—closer to the other older Indo-European languages, e.g. Latin—for the simple reason that it is older. One thing that we clearly see when we compare Gothic with the other early Germanic languages is that the other languages all have more impoverished agreement paradigms, as (70) shows:

- (70) a. Present tense of Old Icelandic *taka* (‘to take’):
 tek, **tek-r**, **tek-r**, tøk-um, tak-ið, tak-a (‘I take’, etc.; Faarlund 2004b: 49).
 b. Present tense of OE *nerian* (‘to save’):
 ner-ie, ner-est, ner-eþ, **ner-iaþ**, **ner-iaþ**, **ner-iaþ** (‘I save’, etc.; Walkden 2014: 198, following Mitchell and Robinson 1992: 46).
 c. Present subjunctive of OHG *nerine* (‘to save’):
neri-e, neri-ēs(t), **neri-e**, neri-ēm, neri-ēt, neri-ën (‘I save’, etc.; Walkden 2014: 199, following Braune and Eggers 1975: 256).
 d. Present tense of OS *nērian* (‘to save’):
 nēri-u, nēri-s, nēri-ēd, **nēri-ad**, **nēri-ad**, **nēri-ad** (‘I save’, etc.; Walkden 2014: 199, following Cordes and Holthausen 1973: 109–11).

Here the syncretic forms are boldfaced. The Old Icelandic and OHG paradigms show just one syncretism here, but Walkden (2014: 199) shows that fuller paradigms of present and past indicative and subjunctive show at least one further syncretism, which is not the case in Gothic. The OE and OS present tenses show two syncretisms in the plural across all four tense/mood paradigms. So these languages all have slightly, but crucially, impoverished agreement forms compared to Gothic (and compared to canonical CNSLs such as Italian). They also lack inflection for dual number.

Furthermore, all of the languages except Gothic show person restrictions. In Old Icelandic, first- and second-person singular and plural pronouns are null in 1.6% of examples and third-person singular and plural pronouns are null in 4.8% (Kinn, Rusten, and Walkden 2016: 49, table 5, data based on the IcePaHC corpus of Wallenberg et al. 2011). Although the incidences are low (and decline through the Old Icelandic period, see Kinn, Rusten, and Walkden 2016: 53, table 8), the person asymmetry is clear and statistically significant, as Kinn, Rusten, and Walkden show. Intriguingly, it is the opposite of that observed in BP; see (62). Finally, arbitrary/indefinite null subjects can appear in Old Icelandic with no special marker:

- (71) *má þar ekki stórskipum fara* [Old Icelandic]
 Can there not big-ships.D travel
 ‘One cannot travel there with big ships’
 (Hkr II.10.1; Faarlund 2004b: 221)

Old Icelandic thus displays three of the diagnostics of PNSLs. Moreover, the very low overall incidence of null subjects, averaging well under 5% of all examples, suggests that null and overt subjects did not show interpretative differences in that overt subjects could appear wherever null ones did not. So, Old Icelandic, despite the low overall incidence of null subjects, had the properties of a PNSL (as, arguably, does Modern Icelandic, as we mentioned above).

Concerning OE, Walkden (2014: 174–84) investigated the incidence of null subjects in twenty-five OE texts of over 15,000 words from the York-Toronto-Helsinki Parsed Corpus of Old English Prose (Taylor et al. 2003) and the York-Helsinki Parsed Corpus of Old English Poetry (Pintzuk and Plug 2001). He concludes that ‘[m]any of these texts ... show a frequency of overt pronouns of 98–100% in all clause types’

(176); see also the data presented in Rusten (2019: 36–9, 42, tables 2.1 and 2.2, 111). The vast majority of these texts are in the ‘standard’ literary variety of OE, West Saxon. However, Walkden (2014: 179, table 5.9), following Berndt (1956: 65–8) and van Gelderen (2000: 133, table 3.1), also shows that in two Anglian OE texts, the *Rushworth Gospels* and the *Lindisfarne Gospels*, first- and second-person singular and plural null subjects average 5.75% of examples and third-person singular and plural null subjects average 67.0%. In *Beowulf*, *Bald’s Leechbook*, *Bede* and MS E of the *Chronicle*, all texts traditionally classified as West Saxon but known to have Anglian features, first- and second-person null subjects occur in 0.7% of examples, and third-person null subjects occur in 15.3%. Walkden concludes that Anglian OE had null subjects subject to a clear person constraint.

Rusten (2019) based his quantitative study of null subjects in OE on five corpora (the York-Toronto-Helsinki Parsed Corpus of Old English Prose, the York-Helsinki Parsed Corpus of Old English Poetry, The Penn-Helsinki Parsed Corpus of Middle English (Kroch and Taylor 2000a), the Parsed Corpus of Middle English Poetry (Zimmerman 2016) and the Penn-Helsinki Parsed Corpus of Early Modern English (Kroch et al. 2004), a total of 181 texts and 1.6 million words). He concludes that ‘Walkden’s dialect-split hypothesis must be considered falsified’ (Rusten 2019: 91). However, in line with Walkden’s observations on the Anglian texts, Rusten finds a general split between third-person and non-third-person null subjects, particularly clear in poetic texts, in favour of third-person null subjects (Rusten 2019: 99, tables 4.3 and 4.4). He also finds that the strongest bias in favour of null subjects is in verb-initial clauses, in both prose and poetry (Rusten 2019: 103, tables 4.5 and 4.6, 109). However, these biases are very weak statistically, leading him to conclude that they are ‘a type of “residue” that surfaces very unevenly in different genres and texts’ (Rusten 2019: 120) and they may be ‘reflective of a formerly productive partial pro-drop property’ (Rusten 2019: 173; see also p. 179). He thus concurs with Walkden’s conclusion that the null-subject ‘property must have been lost... during and before the time that our earliest texts were being produced’ (Walkden 2014: 221) (although Walkden states this solely for West Saxon OE while Rusten intends it as applying to all OE dialects). The example from *Cædmon’s Hymn* in (66a) is consistent with this conclusion, being from a text which is somewhat older than most of the surviving OE corpus; *Cædmon’s Hymn* is usually dated to

the late seventh century, while most OE texts are from the ninth and tenth centuries (see also note 2).

Let us look at these conclusions in the light of the diagnostics in (29) and (45). Concerning diagnostic (61v), as in Old Icelandic the general incidence of overt subjects strongly suggests that there were no interpretative restrictions on overt subject pronouns; one indication of this is the general use of *hit* as the overt subject of meteorological verbs, as in (72):

- (72) & hit rinde ða ofer eorðan feowertig daga [OE]
 And it rained then over earth forty days
 & feowertig nihta on an
 and forty nights on one
 ‘and it rained then over earth forty days and forty nights without
 cease’
 (Gen 7.12; Rusten 2019: 14)

Concerning (61iii), generic null subjects are attested in OE with no special marker (here the finite verb *mæg* is 3sg):

- (73) Þær mæg nihta gewhæm niðwundor [OE]
 There may night.GEN.PL each evil-wonder
 seon, fyr on flode.
 see, fire on flood
 ‘There one may each night see an evil portent, fire on flood.’
 (Beowulf 1365; Rusten 2019: 126)

We saw above in (68b) that OE verbal agreement shows two systematic syncretisms, and therefore does not count as ‘rich’, diagnostic (61ii). Finally, we have seen the evidence for residual person restrictions, diagnostic (61i). Still leaving aside diagnostic (61iv), we see that OE has all the properties of a PNSL listed in (45). Given the extremely low incidence of null subjects generally, as pointed out by Rusten (2019) (and Walkden for West Saxon), however, it seems that the main part of the OE corpus is essentially non-null-subject, but that there are residual PNSL properties.

Null subjects in OHG were analysed in detail in Axel (2007); see also Axel and Weiß (2011) and the summary and discussion in Walkden (2014: 184–90). Axel (2007: 314) says that ‘[i]n the older OHG prose texts a person split can clearly be observed’, as shown in Axel (2007: 315, table 3). As in ON and OE, third-person null subjects are

preferred; see Walkden (2014: 188–9, table 5.13, figure 5.10). So OHG conforms to diagnostic (61i) for PNSLs. Concerning ‘rich’ agreement, diagnostic (61ii), we saw in the discussion of (68) that OHG shows one syncretism more than Gothic. Concerning diagnostic (61iii), Axel (2007: 296) gives several examples of arbitrary null subjects with 3pl agreement:

- (74) *tho brahtun imo luzile* [OHG]
 Then brought.3PL him little
 ‘then little children were brought to him’
 (T 337, 27; Axel 2007: 296; my English translation)

(This example translates a Latin passive, *oblati sunt* ‘they were brought’.) Again, it is impossible to evaluate diagnostic (61iv). Concerning diagnostic (61v), Axel (2007: 324) says that ‘there are some indications in the OHG texts that in contrast to Modern Italian, null subjects and overt subject pronouns had the same referential properties in postfinite environments’. For example, in (75) ‘the overt realization of the subject pronoun does not trigger an emphatic or contrastive reading’:

- (75) *Dhar ir quhad... chiuuiso meinida ir dhar* [OHG]
 Where he said... certainly meant he there
sunu endi fater
 son and father
 ‘where he said... he certainly meant there the Son and the Father’
 (I 273; Axel 2007: 324)

(Here there is no overt pronoun in the Latin original.) As far as can be determined, then, OHG meets the criteria for a PNSL. This is true of the earlier OHG texts from the eighth and ninth centuries. Axel (2007: 321–2) points out that in later OHG ‘presumably before the turn of the eleventh century...referential null subjects are hardly attested anymore’. OHG may then have undergone the transition from PNSL to NNSL around 1000AD, two or three centuries later than OE.

Finally, Walkden (2014: 190–5) discusses OS. Here too third-person null subjects are preferred; see Walkden’s (2014: 193–4) table 5.16 and figure 5.12. OS shares with OE syncretic forms in the plural across all the verb tense/mood paradigms, as shown in (68d); Hogg (1992: 148) says that this is characteristic of North Sea Germanic, including Old Frisian, and so may represent a single very early change in this branch

of West Germanic (see also Harbert 2007: 216). Evidence concerning diagnostics (61iii–iv) is unavailable. OS thus appears to be a PNSL.

Walkden (2014: 225) concludes that Proto West Germanic and Proto Northwest Germanic, i.e. the ancestors of all the languages under discussion except Gothic, must have been PNSLs. He tentatively concludes, citing Grimm (1837: 203), Paul (1919: 22), Lockwood (1968: 64), and Fertig (2000: 8), that Proto Germanic was a CNSL. Ringe (2006: 234) also points out that Proto Germanic ‘probably continued to be a pro-drop language’ (i.e. continuing from Indo-European, see §4.4.4). This conclusion is supported by the Gothic evidence we have seen, by the fact that Gothic is the oldest attested Germanic language and by the fact that all the oldest attested daughters on other branches of Indo-European (i.e. Latin, Greek, Old Irish, Sanskrit, Old Church Slavonic) show rich agreement and apparently unrestricted referential null subjects and as such are almost certainly CNSLs (see the discussion of syntactic reconstruction in §4.4.4). The change from CNSL to PNSL may have taken place between Proto Germanic and Proto Northwest Germanic or it may have taken place separately in Proto West Germanic and Proto North Germanic; parsimony would suggest the former scenario (see again §4.4.4). At some stage just before the attestation of (most of) the OE corpus, OE seems to have become an NNSL; the same change occurred in OHG around 1000 AD, according to Axel (2007: 321–2). If Modern Icelandic is a PNSL, this change has not occurred there, but it has occurred in the history of the Mainland Scandinavian languages, which are clearly NNSLs today (see Håkansson 2013 on Old Swedish; and Kinn 2011, 2016 on the history of Norwegian; some modern Mainland Scandinavian dialects remain PNSLs, see Sigurðsson 1993 and Rosenkvist 2010 on Ölvdalian). Across Germanic, then, we see a development from CNSL to PNSL to NNSL. Walkden (2014: 226) observes that the development from CNSL to PNSL can also be inferred in the development of Marathi (and other Indo-Aryan PNSLs; see Roberts 2019a: 300 and the references given there) from Sanskrit and in the development of Russian, argued by Holmberg, Nayudu, and Sheehan (2009) to be a PNSL, from Old Church Slavonic. As we have seen, the change can also be documented in the recent history of Brazilian Portuguese.

If we consider the change from CNSL to PNSL in the light of (61), we have inferred the introduction of person restrictions on null subjects in Germanic by comparing Gothic with the other old Germanic languages, and Duarte’s (1993, 1995, 2019) evidence shows this happening