

Introduction

This book traces the history of the concept of parameter in Generative Grammar, from the first steps of the Principles and Parameters (P&P) model in the late 1970s to the advent of the Minimalist Program (MP), examining how this notion was implemented during this transition, and how it has developed since then. The analysis in this book starts from the systematization of the so-called Standard Theory of Generative Grammar in Chomsky (1965) and continues up to the latest developments of the MP.

Chapter 1 offers an overview of the protohistory of the concept of parameter by focusing on the factors, both theoretical and empirical, at the basis of the systematic formulation of this notion in Chomsky (1981a). The theoretical factors are identified with the distinction between descriptive and explanatory adequacy and Chomsky's proposed solution to the so-called problem of the poverty of the stimulus. The empirical factor consists in the outcome of Rizzi's and Taraldsen's pre-parametric inquiries, which shed new light on the systematicity of linguistic variation.

Chapter 2 examines the individual formulation of the main parameters that were proposed in Generative Grammar within the Government-Binding (GB) Theory of the eighties. While the parameters at issue are taken from the list that is proposed in Rizzi (2014), in the first part of the chapter they are retrospectively classified according to the specific syntactic property they would refer to in current minimalist theories.

Chapter 3 focuses on the debate about the concept of parameter which took place during the first decade of the twenty-first century. The first two positions discussed are Kayne's (2000, 2005) microparametric approach, which draws from the idea that parametric variation is located in the lexicon, and Baker's (2001, 2008a) macroparametric approach, which instead relies on the classical idea that parameters are expressed on principles. These two approaches are then confronted with Newmeyer's (2004, 2005) criticism, which points out their descriptive and theoretical flaws. Finally, two lines of linguistic inquiry which are particularly relevant to the evaluation of the notion of parameter carried on in this chapter are presented, namely Roberts and Holmberg's (2010) parametric model and Longobardi's and his collaborators' Parametric

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Comparison Method (PCM). On the one hand, the parametric model proposed by Roberts and Holmberg (2010) overcomes the limitations of micro- and macroparameters by combining a lexically based, microparametric view of linguistic variation with the idea that parametric variation is an emergent property of the interaction of Universal Grammar (UG), primary linguistic data, and third factor considerations. On the other hand, the unprecedented results achieved by the PCM in establishing the genealogical relations among languages on the basis of syntactic comparison arguably attest to the validity of the parametric model for linguistic variation.

Chapters 4 and 5 evaluate the classical parameters of the GB Theory which still play a role in current generative theory. Chapter 4 reviews the null subject parameter, the verb movement parameter, the polysynthesis parameter, and the overt vs. covert *wh*-movement parameter, while Chapter 5 is devoted to the history of the head-complement parameter. While on the one hand null subject, verb movement, and polysynthesis can be reconciled with Roberts and Holmberg's theory, which is based on the assumption that the *locus* of parameters is the functional lexicon, on the other it is argued that *wh*-movement and head directionality pertain to the sensorimotor interface, as envisioned by Berwick and Chomsky (2011).

Finally, Chapter 6 draws the conclusions of the historical review performed in the previous chapters and ends with final remarks on the latest views on parametric variation. In particular, it is argued that Chomsky's (2021a) extra-syntactic account of head movement suggests the possibility of developing a unified theory overcoming the duality between the 'syntactic parameters' accounting for the emergence of null arguments and verb movement on one side and 'linearization parameters', like the ones responsible for overt vs. covert *wh*-movement and head directionality, on the other.

1 The Birth of the Concept of Parameter in Generative Grammar and Its Development until *Lectures on Government and Binding*

1.1 The Theoretical Foundations of Generative Grammar

The theoretical framework founded by Noam Chomsky and known as Generative Grammar has been one of the most productive linguistic theories since its birth in the late fifties. While pursuing its ultimate goal of investigating the very nature of human language, the necessity of answering such questions as “what constitutes knowledge of a language, how does such knowledge develop and how is such knowledge put to use” (Chomsky 1981b, p. 32) has urged generative linguists, especially Chomsky, to delve not only into the technical description of more and more grammar systems to expand their collection of linguistic data but also into the theoretical foundations of linguistics itself. This constant effort has characterized Chomskyan linguistics since its very beginning, and its effects have played a large part in allowing Generative Grammar to develop over the course of time as a scientific research program.

Although the cornerstones of Generative Grammar have never really changed throughout the years, Chomsky himself has never been shy of rediscovering, and in some cases even questioning, his own theoretical assumptions. This behavior, which could erroneously be interpreted as a sign of weakness and inconsistency, actually derives from the inherent need to develop and strengthen the status of modern linguistics as an empirical science. The approach of Generative Grammar to language description and analysis is in fact strictly deductive: Starting from a general hypothesis, which in this case is precisely the innateness of language faculty, Chomsky’s inquiry proceeds by formulating specific speculations in a form that can conceivably be falsified by a test on observable data, derived in turn from linguistic analysis. As long as these speculations are confirmed by empirical evidence, the theoretical model works and is assumed as valid. On the other hand, once the data run contrary to these predictions or, from a conceptual perspective, the theory itself exhibits unnecessary redundancies, the hypothesis is amended or abandoned. A historical analysis of the development of Generative Grammar is thus

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extremely important to fully understand its theoretical steps and to correctly evaluate the progressive efforts of Chomsky and his associates through the different phases which have characterized this theoretical framework from its very beginning to this day.

1.1.1 *The Research Program in Aspects of the Theory of Syntax*

Despite the profound evolution of Generative Grammar's conceptual frameworks, the theoretical foundations of Chomsky's syntactic theory have practically remained the same as those outlined in *Aspects of the Theory of Syntax* (Chomsky 1965), the seminal work in which the original model of Generative Grammar (the phase which has been known as the Standard Theory or Standard Model) was systematically laid out. Although this book was published eight years after Chomsky's first published book *Syntactic Structures* (1957), it represents a reference point for any generative linguists since it "summarized the work of the decade between the mid-1950s and the mid-1960s and reshaped it in a very systematic model" (Graffi 2001, p. 350).

The first chapter of Chomsky (1965), aptly named "Methodological Preliminaries," is particularly important since it sets forth the fundamentals of Chomsky's linguistic research program. The first aspect to clarify is what the term 'generative grammar', as used by Chomsky, refers to. According to Chomsky, a *generative grammar* is a theory of language which is not merely concerned with the taxonomic description of neither a specific language nor a set of languages but whose primary aim is the explicit "description of the ideal speaker-hearer's intrinsic competence" (Chomsky 1965, p. 4), which in turn is meant as "a system of rules that can iterate to generate an indefinitely large number of structures" (Chomsky 1965, pp. 15–16):

A grammar of a language purports to be a description of the ideal speaker-hearer's intrinsic competence. If the grammar is, furthermore, perfectly explicit – in other words, if it does not rely on the intelligence of the understanding reader but rather provides an explicit analysis of his contribution – we may (somewhat redundantly) call it a *generative grammar*. (Chomsky 1965, p. 4)

This aspect had already been highlighted in one of Chomsky's earliest works, namely *The Logical Structure of Linguistic Theory (LSLT)*, which had been written in the mid fifties, despite being published in 1975. In *LSLT*, great emphasis is placed on the capacity of a grammar to *generate* a potentially infinite set of well-formed sentences by means of "an 'intuitive sense of grammaticalness'" (Chomsky 1975a, p. 95), inherently possessed by each native speaker. As the notion of 'grammaticalness' is an intuitive reality rather than an extrinsic one, "the set of grammatical sentences cannot" simply

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“be identified with the linguist’s corpus of observed sentences” but instead coincides with the speaker’s ability to generate “a larger, in fact, infinite class of grammatical sentences” (Chomsky 1975a, p. 129):

The problem for the linguist, as well as for the child learning the language, is to determine from the data of performance the underlying system of rules that has been mastered by the speaker-hearer and that he puts to use in actual performance. Hence, in the technical sense, linguistic theory is mentalistic, since it is concerned with discovering a mental reality underlying actual behavior. (Chomsky 1965, p. 4)

In these terms, within Chomsky (1965) linguistic competence is assumed to be a strictly psychological concept. This psychological interpretation of linguistic theory is reaffirmed not only by making “a fundamental distinction between *competence* (the speaker-hearer’s knowledge of his language) and *performance* (the actual use of language in concrete situations)” (Chomsky 1965, p. 4) but also by regarding the account of the inherent connection between language and mind as the primary means of evaluating the adequacy of two or more candidate grammars. As Chomsky notes, here the term ‘grammar’ is used with a “systematic ambiguity” (Chomsky 1965, p. 25): in order to refer, on the one hand, to the mentally represented system of knowledge attained by the ideal speaker-hearer and which represents his linguistic competence and, on the other hand, to the theory proposed by the linguist in order to account for this psychological system. The study of grammar, understood in this way, forces the linguist to choose, among the multiple possible ‘theories of language’, the one which adheres the most to the mental reality of grammar:

To facilitate the clear formulation of deeper questions, it is useful to consider the abstract problem of constructing an “acquisition model” for language, that is, a theory of language learning or grammar construction. Clearly, a child who has learned a language has developed an internal representation of a system of rules that determine how sentences are to be formed, used, and understood. Using the term “grammar” with a systematic ambiguity (to refer, first, to the native speaker’s internally represented “theory of his language” and, second, to the linguist’s account of this), we can say that the child has developed and internally represented a generative grammar, in the sense described. He has done this on the basis of observation of what we may call *primary linguistic data*. (Chomsky 1965, pp. 24–25)

Based on such conditions, the central aim of linguistic theory is precisely to account for the process of language acquisition. In fact, with regard to the first of the two aforementioned definitions of grammar, the child himself has to be able to construct his own ‘theory of language’ from among a set of multiple possible alternatives. According to Chomsky, this clearly suggests that, “as a precondition for language learning, he must possess, first, a linguistic theory that specifies the form of the grammar of a possible human language,

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and, second, a strategy for selecting a grammar of the appropriate form that is compatible with the primary linguistic data” (Chomsky 1965, p. 25):

It seems clear that many children acquire first or second languages quite successfully even though no special care is taken to teach them and no special attention is given to their progress. It also seems apparent that much of the actual speech observed consists of fragments and deviant expressions of a variety of sorts. Thus it seems that a child must have the ability to “invent” a generative grammar that defines well-formedness and assigns interpretations to sentences even though the primary linguistic data that he uses as a basis for this act of theory construction may, from the point of view of the theory he constructs, be deficient in various respects. (Chomsky 1965, pp. 200–201, n. 14)

With regard to the “respects in which one can speak of ‘justifying a generative grammar’” (Chomsky 1965, p. 26), Chomsky postulates two different levels according to which a linguistic theory can be evaluated. From a purely descriptive perspective, the linguist’s task is to give a correct account of the intrinsic competence of the idealized native speaker. This corresponds to the level of *descriptive adequacy*: according to this notion, “a linguistic theory is *descriptively adequate* if it makes a descriptively adequate grammar available for each natural language” (Chomsky 1965, p. 24). On such terms, the linguist can meet this condition by formulating a system of rules whereby the linguistic facts occurring in a given language are systematically predicted. The grammar is therefore justified on purely empirical grounds or, as Chomsky says, on *external* grounds (see Chomsky 1965, p. 27). However, “although even descriptive adequacy on a large scale is by no means easy to approach,” according to Chomsky “it is crucial for the productive development of linguistic theory that much higher goals than this be pursued” (Chomsky 1965, p. 24). This higher goal is represented by *explanatory adequacy*, which requires a linguistic theory to succeed “in selecting a descriptively adequate grammar on the basis of primary linguistic data” (Chomsky 1965, p. 25), that is, a theory which effectively explains how the child develops a system of knowledge of his native language starting from the examples of linguistic performance he is exposed to. Considering the psychological reality of linguistic theory, every hypothesis on the nature of linguistic competence corresponds to a hypothesis on the nature of the human mind. Therefore, the primary task of Generative Grammar becomes that of reconciling language description with those specific and innate mechanisms which are directly responsible for language acquisition:

On a much deeper and hence much more rarely attainable level (that of explanatory adequacy), a grammar is justified to the extent that it is a *principled* descriptively adequate system, in that the linguistic theory with which it is associated selects this

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grammar over others, given primary linguistic data with which all are compatible. In this sense, the grammar is justified on *internal* grounds, on grounds of its relation to a linguistic theory that constitutes an explanatory hypothesis about the form of language as such. The problem of internal justification – of explanatory adequacy – is essentially the problem of constructing a theory of language acquisition, an account of the specific innate abilities that make this achievement possible. (Chomsky 1965, p. 27)

According to Chomsky, the criterion of shaping a linguistic theory which is not only able to correctly predict a set of linguistic phenomena but whose framework closely adheres to those general principles underlying the nature of language meant as an innate mental faculty can really allow linguistics to develop as a scientific theory. This higher benchmark is actually determinant in strengthening linguistic theory as it allows the linguist to select, among two or more conflicting grammars on a par with each other as far as descriptive adequacy is concerned, the one which is more justified on *internal* grounds than the others, that is, on grounds of its relation to those principles which provide an answer to how the child develops his own linguistic competence. Although a purely descriptive grammar may still seem alluring, it does not provide any explanation “concerning the universal properties that determine the form of language” (Chomsky 1965, p. 35). In fact, its predictive power is based on a mere generalization rather than on a principled theory. Therefore, it “provides no answer to the [...] question: How does the child come to know that the facts are as specified in the descriptively adequate grammar?” (Chomsky 1981b, p. 37):

Clearly, it would be utopian to expect to achieve explanatory adequacy on a large scale in the present state of linguistics. Nevertheless, considerations of explanatory adequacy are often critical for advancing linguistic theory. Gross coverage of a large mass of data can often be attained by conflicting theories; for precisely this reason it is not, in itself, an achievement of any particular theoretical interest or importance. As in any other field, the important problem in linguistics is to discover a complex of data that differentiates between conflicting conceptions of linguistic structure in that one of these conflicting theories can describe these data only by *ad hoc* means whereas the other can explain it on the basis of some empirical assumption about the form of language. (Chomsky 1965, p. 26)

To summarize briefly, in the very first part of Chomsky (1965) there are two fundamental concepts which still characterize Chomsky’s research program to this day. First, there is the idea of language as an innate mental faculty, according to which generative linguistics is primarily concerned with shedding light on the nature of linguistic competence, the internally represented grammar shared by all the native speakers of a given language. Second, as Generative Grammar is the study of an actual mental faculty, linguistic theory imposes the linguist to construct a grammar not only of descriptive value but that is able to account for the specific innate endowment which allows language acquisition.

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1.1.2 *The Paradox of Language Learning: The Logical Problem of the Poverty of the Stimulus*

As pointed out in the previous section, Generative Grammar is a linguistic theory whose primary aim is to develop a formal apparatus which can account for every well-formed linguistic expression in a given language and, at the same time, produce an infinite set of sentences by means of a limited set of rules and functional elements. Hence, here the word ‘generative’ has two possible meanings. If it is related to the creative processes of language, ‘generative’ means *productive* since this linguistic theory provides “a real understanding of how a language can (in Humboldt’s words) ‘make infinite use of finite means’” (Chomsky 1965, p. 8). With regard to the description of the speaker’s linguistic knowledge, this term has the meaning of *explicit*, since it aims at making his ‘intuitive sense of grammaticalness’, that is the implicit properties of his internalized grammar, explicit (see Graffi 2008, p. 10). However, because of its psychological implications, linguistic theory cannot exempt itself from taking into account the apparent paradox represented by the relation between the process of language acquisition and the so-called problem of the *poverty of the linguistic stimulus*. According to Chomsky, in fact, the most striking aspect of language acquisition is that the primary linguistic data to which the child has access, even in the best-case scenario, cannot be sufficient to explain the level of proficiency he is bound to reach in his language once he has become a mature native speaker:

The child who acquires a language in this way of course knows a great deal more than he has “learned.” His knowledge of the language, as this is determined by his internalized grammar, goes far beyond the presented primary linguistic data and is in no sense an “inductive generalization” from these data. (Chomsky 1965, pp. 32–33)

This logical problem led Chomsky to postulate the existence of an innate “language-acquisition device,” often abbreviated to ‘LAD’, “capable of utilizing such primary linguistic data as the empirical basis for language learning” (Chomsky 1965, p. 32) and which, according to Generative Grammar’s psychological interpretation, “is only one component of the total system of intellectual structures that can be applied to problem solving and concept formation” (Chomsky 1965, p. 56) – in this case, the task of constructing a grammar. In order to really account for the development of a native speaker’s linguistic competence, as Chomsky writes:

This device must search through the set of possible hypotheses [...] and must select grammars that are compatible with the primary linguistic data [...]. The device would then select one of these potential grammars [...]. The selected grammar now provides the device with a method for interpreting an arbitrary sentence [...]. That is to say, the device has now constructed a theory of the language of which the primary linguistic data are a sample. The theory that the device has now selected and internally represented specifies its tacit competence, its knowledge of the language. (Chomsky 1965, p. 32)

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This human-specific cognitive structure, later referred to as ‘universal grammar’ (UG), has been described by Chomsky as a sort of ‘black box’ which takes primary linguistic data as its input and produces a language-specific grammar as its output (see Chomsky 1981b, pp. 34–35). Since this input-output system, being a mental reality, is not directly observable, for the sake of explanatory adequacy the task of the generative linguist is that of determining the nature of this device considered to underlie language acquisition by formulating hypotheses on the basis of the primary linguistic data associated with each grammar:

Much information can be obtained about both the primary data that constitute the input and the grammar that is the “output” of such a device, and the theorist has the problem of determining the intrinsic properties of a device capable of mediating this input-output relation. (Chomsky 1965, p. 47)

This theoretical advancement, however, would only truly represent “the construction of a reasonable acquisition model” if that linguistic theory managed “to reduce the class of attainable grammars compatible with given primary linguistic data” (Chomsky 1965, p. 35), namely the set of grammars with which the child is naturally endowed and which represent his initial linguistic hypotheses. On the one hand, the speed at which a child acquires such a complex construct of rules as his native tongue, especially considering the scattered and relatively scarce linguistic input he is exposed to, clearly implies the existence of a limited set of core properties, common to all languages, which restrict the class of possible grammars and without which such a task would be theoretically impossible:

A theory of linguistic structure that aims for explanatory adequacy incorporates an account of linguistic universals, and it attributes tacit knowledge of these universals to the child. It proposes, then, that the child approaches the data with the presumption that they are drawn from a language of a certain antecedently well-defined type, his problem being to determine which of the (humanly) possible languages is that of the community in which he is placed. Language learning would be impossible unless this were the case. (Chomsky 1965, p. 27)

On the other hand, according to Chomsky, “the existence of deep-seated formal universals [...] implies that all languages are cut to the same pattern” (Chomsky 1965, p. 30). The fact that all languages share a common core of basic properties – which can thus be regarded as *universal* – suggests the existence of an actual limit to linguistic variation: a limit deriving from the nature of the human brain itself, and whose role is to provide an innate and universal template which represents the basis not only of every *existing* language but of every *possible* language:

Consequently, the main task of linguistic theory must be to develop an account of linguistic universals that, on the one hand, will not be falsified by the actual diversity of

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languages and, on the other, will be sufficiently rich and explicit to account for the rapidity and uniformity of language learning, and the remarkable complexity and range of the generative grammars that are the product of language learning. (Chomsky 1965, pp. 27–28)

For this purpose, the next step of Chomsky's research consisted in elaborating a series of constraints on both the form and the applicability of grammatical rules. While the idea that "the critical factor in the development of a fully adequate theory is the limitation of the class of possible grammars" (Chomsky 1965, p. 61) had already been stated in Chomsky (1965), it wasn't until the early seventies that this part of Generative Grammar's research program was put into practice and, then, eventually led to the development of the P&P model.

1.2 Prehistory of the Term 'Parameter'

Since the systematization of the Standard Model, Generative Grammar has undergone many changes in the types of rules and representations used to reconcile the formal description of individual languages and the more general quest for linguistic universals. Since the mid sixties, the syntactic theory founded by Chomsky has been known by different names, each one reflecting a distinct theoretical stage of its continuous development: in the seventies, 'Extended Standard Theory' (EST); in the eighties, 'Government-Binding Theory' (GB Theory) or 'Principles and Parameters Theory' (P&P Theory); and finally, since the early nineties, 'Minimalist Program' (MP). Although these labels represent, in chronological order, "the three different phases (until now) of the Chomskyan program" (Graffi 2001, p. 425), EST, P&P, and MP share the same programmatic purpose outlined in Chomsky (1965), that is, to "account for the rapidity and uniformity of language learning, and the remarkable complexity and range of the generative grammars that are the product of language learning" (Chomsky 1965, p. 28). In this chapter, I will show how the first use of the term 'parameter', although still quite far from assuming the more complex and specific meaning it will be given in the P&P model, related to the specific theoretical context represented by the EST phase.

1.2.1 *The Extended Standard Theory and the Search for Linguistic Universals*

In the decade which coincides with the phase of Generative Grammar known as EST, Chomsky's personal research specifically focused on the identification of those innate universals which, according to the theoretical assumptions laid out