

This Handbook essentially delivers two books in one. On one hand, Linguistic informed phenomena are presented to the reader in general terms—topics, related to Child Language Acquisition, Language Impairment, as well as the Brain-Language Corollary. On the other hand, the handbook presents as its fundamental core the kind of theoretical syntax that has come to be regarded amongst Chomskyan linguists. What ‘Feature Theory’ Grammar allows us to do is essentially break down the components of traditional ‘parts-of-speech’ words to a finer-grained analysis. This lets us tinker with certain sub-particles of the word in order to see how one isolated feature might project and contribute to a phrase over another. It is not too far of the mark then to suggest that ‘Feature Theory’ is in fact a linguistics response to a ‘Periodic Table’ of language.

Perhaps one of the most important aspects that have emerged from out of the Chomskyan revolution of generative grammar is the two-fold claim that (i) language is ‘creative’, and (ii) language is ‘error’ prone. (It would eventually be these two simple observations that would go on to dismantle prior behaviorism and its hold on language (B.F. Skinner)). The former ‘creativity’ was captured by Chomsky’s now famous poetic sentence *Colorless green dreams sleep furiously* which sought to show how the semantics of a proposition (the ‘meaning’ of language) can pass as being entirely vacuous and still the syntax (the ‘arrangement’ of language) can be effectively parsed by our mental grammar. In one sense, this was a clear attempt to tear at the very seams of language, illustrating that language is not merely processed as a communicative measure (‘functionalism’), but that a more abstract overarching phrase structure is what governs its underlying structure (‘formalism’). Regarding the latter, ‘errors’, perhaps it is here where generative grammar has made its largest impact. It is fair to say the prior to generative linguistics, errors were looked upon as something that belonged in the waste-paper basket, shedding little light if any on potential linguistic processing. Well, as it has turned out, the nature of our errors—made both by children and adults alike—are not at all random but rather speak to the systematic underpinning of language, reflecting a theory of how and where language gets processed in the brain.

For instance, common phonological errors, ‘slips-of-the-tongue’ known as spoonerisms show a high level of systematic processing and can’t be dismissed as simple random transpositions. In the famous spoonerism *John tasted the whole worm* (meant as ‘John wasted the whole term’), note how it is only the initial consonants of the two words that gets displaced, the /w/ and the /t/ (and that both products of displacement are potential words in English). One would never find a slip such as *\*John masted the whole terw*. Other grammatical slips such as *The drive was caring* (meant as ‘The car was driving.’) show that errors actually abide by morphological principles. In this example, only the lexical words (noun—‘car’, verb—‘drive’) switch but not the functional affix {ing} which stays put. One would be hard pressed to find the slip *\*The driving was car*. The question here as to ‘What gets misplaced, what stays put, and why?’ addresses the dual nature behind brain processing—i.e., the distinction between lexical vs. functional items and how both get processed in different parts of the brain. Or consider when young children utter the word /bʌzɡedi/ for ‘spaghetti’. This classic error can’t just be dismissed as a random misplacement of sounds. Rather, the fact that the /s/ deletes speaks to

early syllable development (children early-on can't generate initial consonant clusters) and so this deletion is rule-based. The /s/ however reinserts within the word in order to preserve a [[CVC] [CVCV]] syllable structure, again abiding by a phonological rule. The /p/ becomes voiced to /b/—not haphazard, but yet again another phonological rule. These are just a few of the kind of examples which are developed in this text, all of which promote the idea that language (mistakes and all) are systematic and rule-based—data which provide strong evidence that language is underwritten by a quite elaborate set of *Principles and Parameters*, subconscious though it may be to the actual speaker.



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Minimum of English Grammar  
An Introduction to Feature Theory  
*with a special note on the nature of early child  
grammars of English*

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*California State University—Northridge*



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San Diego, CA

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First published in the United States of America in 2009 by University Readers

Cover painting by Zoë Galasso

Cover design by Monica Hui Hekman

13 12 11 10 09      1 2 3 4 5

Printed in the United States of America

ISBN: 978-1-934269-41-1



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## PART I: SECTION I

‘Minimum of English Grammar’ begins by analyzing the segments of language in a systematic way. This is done by first recognizing that there exist two fundamentally different processes which underpin grammatical categorization—namely Lexical vs. Functional categorization. The sentence is first examined with an eye on how its overarching structure might be broken down into smaller constituents, making up the respective phrase and clause level. Both lexical as well as morpho-syntactic features having to do with specific parts-of-speech categories are examined. Movement is then introduced showing how and where segments of a sentence may actually undergo transformation from a base-generated structure. Finally, aspects of developing a grammar are discussed in line with what is currently known about brain development and morphological processing.

### Part 1

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# Preface



The completion of this comprehensive handbook has been a personal, long-drawn process, coinciding with the past eight years of my teaching linguistics at California State University, Northridge. I have learned much during this time and, I believe, my own growth and appreciation for linguistics is mirrored here in the pages and different phases of my writing. I step away from this work with a deep sense that ‘I’ was the tutorial student all along.

## Theoretical Framework

The past few years have witnessed a shift in reasoning in how traditional grammar should be conceptualized. This shift, I believe, has done well to naturally aid students in achieving a higher and more comprehensive level of linguistics. The aim of this handbook is to provide a first-course reading to recent developments in syntactic theory—particularly working within the framework of Chomsky’s 1995 **Minimalist Program**. More specifically, the text focuses on a theory called **Feature Theory** as it pertains to the more basic levels of syntax. Although Feature Theory is an integral part of Chomsky’s overall theory stated within the Minimalist Program, there is nothing inherent to the theory itself which would otherwise bar it from being presented alongside, say, other textbooks on the topic of grammar which, in fact, may correlate to other syntactic theories. In other words, the principles behind Feature Theory, as presented herein, are understood to be based upon universal characteristics of language—characteristics which transcend all common discussion of grammar. For example, recent work on Features has refocused attention on traditional distinctions placed on **Form Class Words vs. Structure Class Words (Lexical vs. Functional Categories)**, **Inflectional vs. Derivational morphology**, and **Movement analogies**.

However, it is this shift in reasoning away from what were traditional notions of crude *broad* ‘categorical labels’ (Noun, Verb) and the refocus on what makes-up such categories to begin with—in terms of their fine-grained *narrow* ‘bundle of features’—that I’d like to address as the fundamental pedagogical aspect of this text. I feel it is only by taking advantage of this Feature Awareness that the linguistics student can come to fully appreciate the elaborate fine weaving of the English syntactic tapestry. Once there, the student finds that grammar blossoms naturally and ultimately reveals itself in one fell swoop.

## Objectives

The specific aim of this handbook is twofold:

First, the text brings together—I think, in an entirely new integral fashion—the myriad language topics of the sort typically attributed to those linguistics courses required of the *Liberal Studies* student in pursuit of a *Teaching Credential*. Such courses tend to include: *English Grammar*, *An Introduction to Language & Linguistics*, *Language Acquisition*, and *Language Variation and Change*. This course-work traditionally requires, as a foundation, good working knowledge of the three sub-disciplines of linguistics: Phonetics & Phonology, Morphology, and Syntax.

Second, the text is designed as a first-course reader for Linguistics undergraduates (and first year graduate students alike) who wish to be introduced and/or reintroduced to some leading tenets of Chomskyan Syntax.

In addition to the core (adult) grammatical components presented herein, the text also attempts to sketch out what we have discerned in the field of *Early Child Language*. There is in a real sense some ‘backwards engineering’ at work here as we discover how adult grammar comes to inform our understanding of child grammar. The unpacking of these basic grammatical elements (and their orders of acquisition) allows us to establish just how the child’s grammatical knowledge gets processed incrementally, based on a protracted maturational time-table. The elements of child language grammar are first introduced one step at a time, and are presented as partial sections usually at the end of each relevant chapter. For instance, in Chapter 3 where morphology is discussed, an end section brings forward some discussion of the morphological development in children. The elements then culminate, making-up an independent chapter on its own right (Chapter 11). This backwards engineering of unfolding of material from ‘adult-to-child’ allows students to first grapple with the complete scope of a full-fledge (adult) grammatical construct in question before they are asked to consider how a ‘partial and truncated’ (child) construct might manifest in early language development. For instance, in Chapter 5, we first turn our attention to the essential components of a particular adult phrase (along with the full range of feature projections) before we come to consider the wider implications behind an impoverished phrase in language development. As mentioned, Chapter 11 *A Special Note on the Nature of Early Child Grammars of English* attempts to pool together these partial sections under one chapter, drawing a fuller and more concise picture of what we take to be the main thrust behind child language acquisition. The special note also serves as a basic introduction to the syntactic development of children. This extended chapter arises out of a pedagogical need to get students to apply key grammatical concepts to the larger field of language acquisition and syntactic development: such a need has arisen in recent years (particularly with regards to teacher preparation) to dovetail English Grammar with that of Language Acquisition. I hope that the integral nature of this handbook is a first good step in that direction.

The handbook attempts (i) to provide students with a good working knowledge of grammatical features as they have to do with the more formal aspects of functional grammar, and (ii) to allow students to utilize this working knowledge to build ‘syntactic trees’ (diagramming)

one feature at a time. Ultimately, the hands-on work will provide students with an inside peek at the multi-layered fine structure of grammar—starting with the more primitive, basic foundations of what makes a simple sentence to the unraveling of those finer grained features which form the makings of complex functional grammar. A final goal of the text is to present English grammar in such a way that it can easily assimilate into other integral aspects of *child language acquisition* and *specific language disorders (language in special populations)* found in the latter sections and chapters of the text.

Finally, the handbook introduces the student to general aspects related to the idea that there is **Biological Basis for Language**. These topics include the **Brain Basis of Language**, Brain Regional Processing dealing with a **Modular Theory** of language—**Broca’s vs. Wernicke’s** area, as well as the **Dual Mechanism Model** which shows that the brain partitions language into two fundamentally different processes. Based on these topics, we can at least begin to ask the right questions regarding ‘what happens when things go wrong’ with language (e.g., **Specific Language Impairment (SLI)**, **Asperger’s** and **Williams’ Syndromes**, etc.).

### **A Word on Writing Style and Presentation**

Whenever possible, I have tried to keep the writing as transparent and non-convoluted as possible. There is a fair amount of overlap, repetition and redundancy built-in regarding the presentation of introductory material found in the earlier sections and chapters of the text. For instance, material might be briefly presented in earlier sections and chapters only to return with more depth of analysis in the latter portions of the text. This introductory material opening-up the first chapters is buttressed by more articulated material found in subsequent chapters. I feel the **repetitive** nature of the text offers a lecture-like quality and helps the reader to gradually come to grips with the material over the length of the text. Most often, however, repetitive material is found within diverging contexts.

The presentation style is ‘onion-like’ in layering whereby old information may be advanced at a later time in a new light. I feel this approach benefits the students’ overall comprehension of linguistics. I also have made a point of keeping self-internal references to a bare minimum, with the sole exception of references made of diagram sentence types to the sentence ‘template’ structures as found in Part-2 of the text.

The handbook is designed to be progressive in nature, with the early chapters forming a broad, basic level of understand, (suited for any incoming freshman), while subsequent chapters provide more detailed analyses, designed as a potential review for more advanced students of syntax. The latter Appendix sections related to DP, TP, etc. should be approached as an exercise outlet for the more advanced student of syntax.

### **Handbook Topics**

The topics treated in this handbook revolve around a singular attempt to integrate the kinds of linguistic courses required for those going into the teaching profession. Specifically, the book has

emerged out of my many years of teaching for the California State University **PACE Program** (Program for Adult College Education), an accelerated **Teaching Credential Program** which pools linguistics orientated material ranging from an ‘Introduction of Language & Linguistics’, ‘English Grammar’, ‘Language Acquisition’, and ‘Language Variation and Change’.

**Possible course titles** for which this handbook could be used include: Analyzing English Grammar, Introduction into English Syntax, History of English, Introduction to Language and Linguistics, Introduction to Child Language Acquisition.

## ACKNOWLEDGMENTS

The shape of this present book has taken form out of a lengthy process covering the past several years of my teaching linguistics at California State University, Northridge. I thank my faithful *PACE/Teacher Prep* students as well as my Liberal Studies and Linguistics Majors between 2006–2008 who have read and commented on revised and re-revised drafts of this text. All errors of course are my own: with close to approaching two hundred thousand words, and only a handful of editorial eye-balls, mistakes are bound to pass, being uncovered later by the reader. So, to the reader: my apologies in advanced for your self-correction. But on other essential matters regarding the adopted linguistic theory, my hope is that I have understood, expressed, and passed on to the reader at least the core spirit of the theory in the least egregious of manners.

I am very grateful for the fine staff at ‘University Readers’. Particularly, I’d like to thank Tracey Barraza for bringing this text to publication as well as Jessica Knott for her keen eye in editing the drafts. No work comes from out of a bubble—and so I thank all my dear colleagues, friends and family members (on both sides of the Atlantic) for their continuous support.

I’d like to mention a special appreciation to Andrew Radford, my former mentor, for shaping my early informative years as I grappled through the complexities of English syntax, generative grammar and child language acquisition.

To my wife *Nathalie* who kept reminding me throughout my doldrums that this seemingly endless work was really not the devil in disguise...

And to my son: *Nicolas*, and daughters *Zoë*, and *Daphne* for their cleverness in reminding me that there is indeed a world turned away from the keyboard...and a joyful one at that...

JG

# Part I





# Part 1

## Foreword



### A NOTE ON PRESCRIPTIVE VS. DESCRIPTIVE GRAMMARIANS

**T**he study of Language & Linguistics has a lot going for it. Sure, in typical cocktail parlance, it might take the odd linguist some doing to get beyond the initial misconceptions that most people have about the field. But once common ground is found and a shared point of departure is reached, the kinds of intuitive questions that get asked by most people emerge within a certain scope of genius: it seems people of all walks-of-life are naturally drawn to topics surrounding Language & Linguistics, and the kinds of questions people come to ask are seldomly naive in nature...

I know of no other topic that does more to touch on the collective nerve of what it means to be uniquely human...

I find such sophisticated questioning falls into two broad classes of wonderment:

1. How is it that language has evolved with such an elaborate labyrinth of complexity? How are we to describe this complexity, and how is it that only humans have evolved such a system?
2. How can we possibly explain the fact that children arrive to acquire such a complex weave of sophistication, and seemingly so effortlessly without instruction?

The first question covers aspects of **language evolution** as well as the Darwinian puzzle of how there has arisen in the first place a 'species-specific', biologically determined human computational system absent the natural selective powers which otherwise would be required to necessitate such a system. The second question addresses the well known **leanability problem**.

What linguistic theory grapples with on a daily basis is how to refine and reshape what we in fact intuitively know about our own language in ways which render this tacit knowledge worthy of empirical study. The main challenge for linguists over the years has always been to divert what seems to be a naturally occurring language phenomenon (of an implicit nature) and to make it explicit. In other words, our charge as linguists is to turn as a formal object of study that which otherwise seems plain and comes quite natural to us. This move from subjective

(inner/implicit) language to objective (outer/explicit) language than allows for what privately occurs in the heads of the speaker to be open to hypotheses testing and scientific procedure.

There are therefore two different aspects at play here: (i) ‘L’ language (in its own right), that which we might have in our heads at any given moment, and (ii) *language* about ‘L’ language. Language with a capital ‘L’ includes one’s native **competency** and **performance**. It might also include the term Language, in general, as a universal system of human communication, etc. Such a universal description of Language moves beyond the mere description of French, German, English, etc., and addresses the universal aspects of what underwrites a possible language. The latter usage of *language* (in italics) suggests a language one step removed—i.e., a language of play: descriptive, theoretical and argumental. This latter philosophical form of language refers to *language* about ‘L’ language. Sometimes, this latter term suggests a kind of ‘theory-theory’ (a theory about a theory, within a theory), as a way to separate and make scientifically objective that which might otherwise be subjective and naturally occurring.

While it surely is the case that this latter ‘language-language’ is abstract and roughly forms the theoretical branch of linguistics, it is often the former usage of ‘L’ language—i.e., the competence and performance issues of a specific language—which presents the lay person with the greatest stigma. I believe the greatest stain on the discipline of Language & Linguistics—the one we common-folk carry with us like a scarlet letter, deterring us from ever really coming to understand and appreciate the field—is the inheritable error of forced prescriptive grammar that has been laid upon us. It is the bad childhood memory of the belligerent parochial teacher which is often provoked when the word ‘grammar’ comes to mind. These early school-year experiences have remained embedded in our collective consciousness and have shaped our misguided prescriptions about language at large, over many generations.

Enter, the 19<sup>th</sup> century personality of the **prescriptive grammarian** whose job it was to raise, maintain and preserve the standard of spoken/written language. In German prescription, there was even a term for the array of competency speakers held of their spoken language: ‘Low German vs. High German’. In such contexts, notice there is seldom any room for compromise, within the prescription itself, for the possibility that there might be, in fact, two separate but equally legitimate mini-grammars—where both stand at opposite poles along the German language spectrum. A speaker of both versions would by definition be bilingual—that is, the speaker would be working with two different mini-grammars. This may be a more productive way to characterize the prescription. However, the intent of the prescription as suggested above is to cast ‘Low German’ as a sub-standard version of the ideal German—that is, a version which should be *corrected*. Today, most remaining prescriptive grammarians still cling to the idea that their discipline and enforcement of language policy proportionately determines the standards gained and/or lost for the given language. In their view, such enforcement can only work ‘top-down’. Since 1635, the French have had an ‘Ivory-Tower’ response to such prescription in the way of the Académie Française. The academy’s charge is to oversee the common French spoken in the Parisian streets below. While the United States has had no such officially run institution, nonetheless, we have received our daily dollop of prescription from a long tradition of English primers and grammar texts

which sought long ago to make English a purified Latin Language (seemingly despite the fact that English is a Germanic language).

Many prescriptive grammarians feel incumbent to take on the role of facilitator in bringing about such ‘top-down’ enforcement of language—as they would claim, for the preservation of ‘standard’ English sways so delicately in the balance. As much as I too want to be a part of that good-teaching bandwagon, correcting students’, peers’, my children’s, as well as my own grammatical errors along the way, I know just as well that no attempt can be made strong enough to block the impending change. You see, as the **descriptive grammarian** knows all too well, language, like any other living organism, just changes. Perhaps we should rather ask ‘Why shouldn’t language change?’ We all should be just as willing to allow for naturally occurring language change as we are willing to accept the change that besets us in our natural environment. Simply put, there can be no hope for a top-down enforcer of language persuasive enough to keep still what is a naturally occurring phenomenon of change. Besides, if we examine very closely what a native speaker actually ‘knows’ of his/her language (at a tacit level), and gets right, it goes well beyond what might even be prescribed by such a top-down traditional primer.

For example, let’s look at one token sentence here and see the two differing tacks taken by the **prescriptive** vs. **descriptive** approach:

(1) Who does he ‘wanna’ see?

First of all, the prescriptive grammarian would take issue with two erroneous formations: (i) the wrong **case marking** on the object ‘who’ (corrected to the accusative case ‘whom’ since ‘he’ is the Nominative/Subject of the sentence), and (ii) the ‘wanna’ contraction (corrected to the infinitive verb ‘want to see’ rendering the corrected sentence found in (2):

(2) Whom does he want to see?

The fact that native English speakers no longer mark the *wh-word* ‘who’ for the Accusative/Object case by affixal particle {m} is a topic with which Prescriptive grammarians have a field day. The fact that the meaning of the sentence goes unaltered despite such deletion surely should interest all grammarians however prescriptive or descriptive they might be. Now, contra brut prescription, the descriptive grammarian would rather point to the fact that while the affix {m} does indeed delete in ‘whom’ (rightly or wrongly so), native speakers nonetheless are strict in never deleting the affix in words such as ‘them’, ‘him’, ‘me’—notwithstanding the fact that the {m}-affix in all four examples has a common origin. So, there is in fact some kind of a grammatical underwriting determining whether or not certain affixes delete. In any event, the manner of deletion here is much too precise to be painted with too broad a stroke. Certainly, at the every least, descriptive grammarians must take note of the fact that native speakers indeed pay attention to such affixal distinctions, irrespective of whether or not such knowledge only surfaces at a mere visceral level.

Regarding the observed ‘wanna’ contraction in (3) below, prescriptive grammarians would likely fail to observe that those who do delete the infinitive ‘to’ particle as cited in (1) nonetheless are strict enough in never deleting it in other infinitive types—where (4) is unattested, co-opted by (4’).

Consider (3) below showing a licit ‘wanna’ contraction with infinitive ‘to’ deletion:

- |                                   |                                  |
|-----------------------------------|----------------------------------|
| (3) Who do you ‘wanna’ help?      | (O.K. ‘wanna’ contraction)       |
| (4) *Who do you ‘wanna’ help you? | (never produced: *ungrammatical) |
| (4’) Who do you want to help you? |                                  |

While (3) is often spoken, (4) is never spoken by a native speaker. That is, here in (4) where we might expect the putative case of careless deletion, one is never produced. It seems the average speaker knows much more than she is typically given credit for. (Pardon, but it seems rather awkward for me to prevent the preposition stranding of ‘for’ in this last sentence, as is so oft prescribed by good grammarians. I’ll leave it as is). This is just one example. The present text is replete with such examples showing, in fact, very sophisticated native speaker competency of language. The kind of knowledge speakers have will be revealed in this text and will prove that grammar is a **mental phenomenon** that occurs in the speaker’s brain/mind. It is the sort of knowledge that is innate, and though at times implicit and inaccessible even to the speaker herself, it comes to us all quite naturally in a whim. It is the job of the linguist to make such knowledge explicit and accessible.

Consider, for instance, **constituency**. Most average native speakers of English (or any other language for that matter) know very little if anything about phrase constituency. Yet, speakers have competency at a tacit level informing them never to break-up the following wh-phrase:

- (5) You would like to visit [*which friends*]?  
(5’) [*Which friends*] would you like to visit?  
(6) \*[*Which*] would you like to visit [*friends*]?

Native speakers know never to split [*which friends*] as the wh-word ‘which’ fronts to the beginning of the sentence in forming the wh-question via wh-movement, as attested in (6) above. They somehow realize that the entire **phrase** must move. Despite this realization, they nonetheless seem to have no problem splitting ‘to infinitives’ (e.g., *to see*), again, much to the chagrin of the prescriptive grammarian:

- (7) I want to never see you again.

Yet, as shown above, they fail to split *which friends*. So, what kind of knowledge is at hand here? Furthermore, native speakers have a tacit knowledge about what types of items can be duplicated (in the surface phonology) and which items can’t. For instance, consider the examples below:

- (8) (a) I do do the laundry!  
 (b) I \_\_\_ do the laundry. (o.k. deletion)
- (9) (a) I think that that professor is quite good.  
 (b) I think \_\_\_ that professor is quite good. (o.k. deletion)
- (10) (a) She had had a bad day.  
 (b) She \_\_\_ had a bad day. (o.k. deletion)

But notice how the tacit knowledge native speakers have prevents them from deleting the surface copied item ‘is’ in (11) below (the asterisk\* marks an ungrammatical structure and/or unobtainable utterance):

- (11) (a) What the problem is is that we simply don’t have enough money.  
 (b) \*What the problem \_\_\_ is that we simply don’t have enough money.

While the above examples illustrate knowledge about how the classic **lexical** vs. **functional** items contrast in specific constructions, (the nature of lexical vs. functional material forms the cornerstone of part-1), even further subtle knowledge regarding question constructions is required in the examples below—i.e., the teasing apart of what appears to be a surface copied item ‘is’:

- (12) (a) The boy [who is my friend] is coming.  
 (b) Is the boy [who is my friend] ~~is~~ coming?  
 ↑ \_\_\_\_\_ | (= Is the boy who is my friend coming?)  
 (c) \*Is the boy [who ~~is~~ my friend] is coming?  
 ↑ \_\_\_\_\_ | (= \*Is the boy who my friend is coming?)

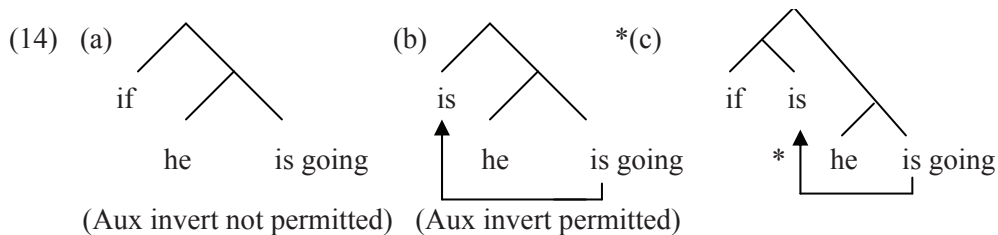
No native speaker would ever fumble with (12c). AUX inversion is a rather sophisticated piece of knowledge native speakers have in formulating their question sentences. So, there seems to be much more than what initially meets the eye with regards to such discriminate linguistic knowledge. It is obvious one cannot say that both items—(i) ‘is’ of the embedded clause, and (ii) ‘is’ of the main clause—are operating under the same rules. Yet, given that both items have the same surface phonology (i.e., sound representation), what exactly is it that allows these two items to behave so differently? Surely, even prescriptive grammarians would want to say something about such knowledge. (The above example in (11) involves what is referred to as Auxiliary inversion for question operations. English grammar specifies

that only the AUX of the question-clause can invert, and not an AUX of an outside matrix or embedded clause).

Taking this knowledge still even further, let's consider the following examples again dealing with inversion:

- (13) (a) I want to know [ is [he is going?]] (grammatical in MAE)  
 (I want to know *is he going?*)  
 (b) \*I want to know [if is [he is going?]] (ungrammatical in MAE)  
 \*(I want to know *if is he going?*)  
 (c) I want to know [if [he is going?]] (grammatical in MAE)  
 (I want to know *if he is going?*)

It seems English grammar prevents the merging of both [*if* and *is*] together, positioned in the same 'slot-like' **node** ahead of its matrix clause. However whenever 'if' doesn't surface (as in 13a), it seems the Aux 'is' now has a place to invert above the main phrase. There are some very subtle implications here, much of which gets explored in this text. Let it suffice for the moment to say that it seems both items *if* and *is* share the same syntactic node above the main phrase (*he is going*) whereby this higher node can host only one of the two items at a time, thus disallowing both items to simultaneously surface in the phono-syntax.



(The syntactic trees above are a means of representing linguistic hierarchical structure and are built-up of nodes—e.g., the node hosting 'if' (in 14a) is said to be higher-up in the tree than the node which hosts 'he', etc.).

To boot, there are other fine examples which fall outside of Mainstream American English (MAE) which present us with additional evidence suggesting there to be indeed a full operational grammar at work even within sentence constructs which might otherwise appear to be the handiwork of a speaker's 'reduced' competency or the result of a 'lazy' tongue. Consider below again the same item 'is' as seen in its contractive usage:

- (15) (a) John *is* smart. (Uncontracted base form)  
 (b) John's smart. (Contracted form) (grammatical in MAE)  
 (c) John  $\emptyset$  smart. (Contraction deletion) (grammatical only in AAE)

In MAE, example (15c) would be ungrammatical since the verb ‘is’ in its contracted form is completely deleted, rendering the sentence verbless. However, (15c) is totally acceptable and grammatical in African American English (AAE). One might be too quick in suggesting that there is a lack of grammar here in AAE (a result of laziness, etc). While, at first blush, it indeed seems likely that something is *just* being deleted, we need to look more closely at the behavior and distribution of such perceived ‘laziness’. Consider what happens to the same item ‘is’ when it’s located at the end of a sentence, a location which doesn’t permit contractions:

- (16) (a) John’s not smart. Yes, he *is*! (MAE/AAE)  
 (b) \*John’s not smart. Yes, he’s! \*(MAE/AEE)  
 (c) \*John’s not smart. Yes, he! \*(AAE)

For both MAE and AAE grammars, the contracted form {‘s} cannot affix sentence final, rendering (16b) ungrammatical for both MAE and AAE grammars. In considering (16c), what appeared to be an earlier accepted ‘is’ deletion (as found in 15c) seems to no longer apply. *Yes, he?* (in response to *John’s not smart*) is ungrammatical in AAE. There is obviously something at play here beyond the mere fact of a surface word deletion. It rather appears a grammar is in full operation stipulating the following rule contrast between MAE and AAE—namely, where **contraction** is possible in MAE, **deletion** is possible for AAE. A tenable grammar can be written: MAE contraction equates to AAE deletion. Where no contraction is possible for MAE, neither is contraction/deletion possible for AAE.

So, to sum up the facts here, we conclude that it is much too easy to be prescriptive in dismissingly saying that a form of unconstrained ‘laziness’ is what is behind certain word deletions found in variant grammars of English that fall just outside of the mainstream (dialects, pidgins, vernaculars, ebonics, Spanglish, certain slang, etc.). As is shown, even for those structures which appear to be breaking with traditional rules of prescriptive grammar, they are in fact obeying their own rules as defined by their mini-grammar. These differences in acceptability amount to there being slightly different optimal grammars, as correctly observed by descriptive grammarians. And for those who can shift between, say, MAE and AAE, they are to be considered bilingual. This slight difference between grammars is not unlike what Americans face when dealing with, say, British English (BE)—for example, as with differences in the acceptability of certain passive, dative constructs using the verb ‘give’ where the preposition ‘to’ must be used for MAE but not for BE:

- (17) (a) An award was given Mary. (grammatical in BE)  
 (b) \*An award was given Mary. \*(ungrammatical in MAE)  
 (c) An award was given *to* Mary. (grammatical in MAE)

Though notice how the same preposition ‘to’ deletion (shadowed) in the active counterpart becomes less acceptable in BE:

- |  |                             |
|--|-----------------------------|
| (d) *John gave an award Mary.          | *(ungrammatical in BE, MAE) |
| (e) John gave an award <i>to</i> Mary. | (grammatical in BE, MAE)    |

As I see it, there are two components to a prescriptive approach:

- (i) To explain common errors made and to correct them. (This is the ‘error correction’ side of the equation).
- (ii) To explain why certain errors are never made.

As a descriptive grammarian myself, both components must be equally addressed. Though, and as it turns out, the latter may prove the more interesting of the two.

So, on this note, let’s begin to explore the subtle nature of this tacit mental grammar we have. As we do so, by and by as linguists—whose job it is to sort, account and ultimately explain grammar—we shall come to do both: correct and describe, describe and correct...

# 1

## A Biological Basis for Language

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### 1.1 INTRODUCTION

Language is quite possibly the most unique of all complex systems known to man, with little if any antecedents to its nature and origin traceable back to a Darwinistic world. It appears that mere communicative needs as would be determined by a Darwinian model could not have possibly provided any great selective pressure to produce such an elaborate system as language that relies heavily on properties of **abstraction**. What one gains from language rather is an inner symbolic thought process, autonomous and private onto itself, built upon a **mentalese** which is to a large degree not optimal for serving mere communicative needs. Complicating the picture even more so is the fact that language seems to sit in a kind of ‘no-man’s land’, at a crossroads between being an innate, biologically determined system (on the one hand), and a learned, environmentally driven system (on the other). In other words, language is one and the same both **subjective** and **objective** in nature. Because of this, it seems any approximate understanding of language must be informed by a hybrid model of its **dualistic** nature. Such a model must straddle and bring together both Abstract/Mental and Physical/Material worlds. This coming together should by no means be interpreted as an attempt ‘to make nice’ with opposing philosophical camps, but rather, hybrid modeling of language and mind goes far in addressing the very complex and abstract nature of language, particularly in light of the current knowledge linguists have gained over what I think has been a very prosperous half century of linguistics.

What makes the above statements tricky, however, is that while there may be some level of (mental) learning going on for our first language, presumably based on the (material) frequency of input, (as with vocabulary learning), it has to be a ‘strange’ kind of learning unconnected to mere conscious observation and will. For instance, a child cannot willfully choose not to learn his/her native language. Nor can a child (subconsciously) fail to observe the hidden structures of language. So any talk of ‘learning’ must be accompanied by the fact that this type of learning, or whatever it is, is silent, automatic and biologically determined. The environmental aspect of language is evidenced by the fact that some input-driven learning, subconscious though it may be, is what triggers the otherwise innate mechanisms behind the acquisition of language. In fact, the term **acquisition** comes with its own portmanteau of claims, chief among them being the claim that the child is born with an already

predetermined template for language termed **Universal Grammar**, a (human only) species-specific **Language Faculty** that situates in a specific region of the human brain and gives rise to language acquisition. Some will argue that second language, a language ‘learned’ beyond the so called **Critical Period** (Lenneberg)—reached around puberty when the brain goes through phases of neurological restructuring—is not qualitatively/quantitatively the same as ‘acquisition’ as seen via first language, with some linguists suggesting that **learning** can never approximate the natural state of **acquisition**. (Two cases come to mind regarding the Critical Period: (i) The case of a ‘Genie’, (S. Curtiss), and (ii) the case of ‘Christopher’ (N. Smith, I-M. Tsimpli). I suppose the notion of trying to learn such a complex system that is meant to be biologically determined presents linguists with some fairly serious issues, many of which are not even close to being resolved, nor will they be any time soon.

While the traditional treatment of grammar usually concerns itself with the basics behind language structure, our treatment of grammar also attempts to frame the general discussion of **language uniqueness** so that, overall, we can gain valuable insight into how the Human Language Faculty works as a complex, rule-based system. In understanding our English grammar, we do so first by understanding the abstract nature of language and how the integral parts of language fit together, down from the smallest levels of the **phoneme**, **morpheme** and **word**, up to the largest levels of **sentence** and **syntactic processing**.

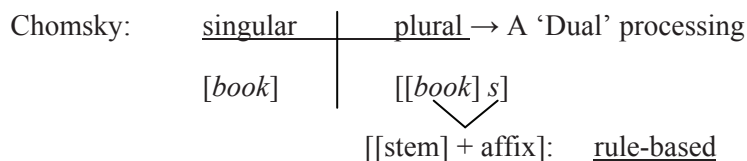
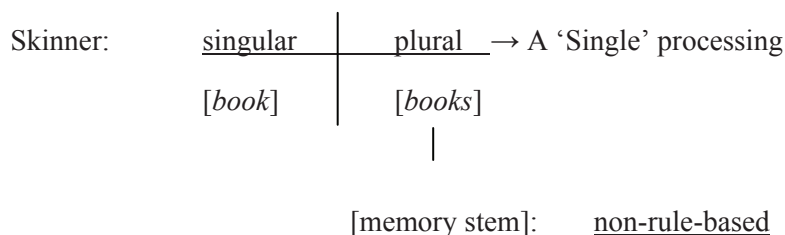
## 1.2 INNATE RULES OF GRAMMAR: THE LOGICAL PROBLEM OF LANGUAGE ACQUISITION

Perhaps the most crucial thrust of this text is the notion that language is **rule-based** (as opposed to being simply **memory-based**). In what has now become known as one of the most pivotal moments in contemporary linguistics, the theoretical and formal debates between **B.F. Skinner** and **Noam Chomsky** (as represented in Chomsky 1959) are to be considered not simply as a philosophical divide (say, between **Empirical** and **Rational** schools-of-thought (respectively)), but as a new pedagogical approach in coming to understand current experimental results showing how the brain partitions the incoming speech stream into (i) **stems** (which incorporate the associative-memory component of the brain), versus (ii) **affixes** (which incorporate the rule-component of the brain). These distinctions in stem+morphosyntactic processing have been attested in specific language tasks whereby the use of various **brain imaging devices** (fMRI and/or ERP electroencephalography) have shown where **word** recognition and retrieval elicit activity in areas of the brain involved with associative-memory—e.g., [*stem*] → [*book*—and where **affix** formations elicit activity in areas of the brain which involve a computation—e.g., [[*stem*]+*affix*] → [[*book*]-*s*]. In other words, before Chomsky it was not at all clear whether or not there was even a distinction to be made in processing between how **words** are stored and how **affixes** are stored. This ‘dual’ distinction is now part-and-parcel of what makes-up the Chomskyan revolution—namely, that language is processed in two fundamentally different ways. All are still not on board however with such a clear dual distinction: (**Connectionism** and **Single Mechanism Models**

vs. **Computational and Dual Mechanism Models**). (For recent debates, see Seidenberg, Elman vs. Marcus).

### 1.3 THE DUAL MECHANISM MODEL

Out of a Chomskyan processing distinction came the **Dual Mechanism Model** (DMM). The DMM (or sometimes referred to as the **Words & Rules Theory** (Pinker)) claims there to be a stark contrast between stem formation and affix attachment. Where it was assumed by Skinner that both the stem [*book*] and stem/affix [*books*] would be uncomposed and memorized as chunks, the DMM would claim that there is a clear demarcation between stems and affixes—so that while stems [*book*] may take on ‘Skinner-like’ properties of associationism, affixes {s} take on ‘Chomsky-like’ properties of rule computation. The processing distinctions can be drawn as follows:



**Wugs Test.** It is this aspect of the debate which motivated the classic ‘Wugs test’ to be performed by Berko in which young children were observed to add the plural rule [N+{s} = plural] to nonce (non-existent) words such as *wug*. The fact that the children in the experiment produced *wug-s*—a word formation that could not have been simply memorized as a chunk from any preceding input, it being a nonce word not found in the input—proved that children had an abstract rule capacity for plural which could be applied, absent any priming effect which would otherwise enable the word formation of *wugs* to be retrieved via brute memory. The tacit computational rule [N+{s}= plural] as found analogously in the language (e.g., *car*>*car-s*, *book*>*book-s*, etc.) is the inductive manner in which children applied the process, a true rule application.

For Skinner, the plural {s} would be incorporated and memorized as an entirely new word: viz., a speaker would have a list of words of her language, part of which would contain both the words *book* and *books*, treated both as different items in the **lexicon**. For Chomsky, while the stem *book* would indeed be stored as part of the lexicon, the affix {-s} of *book-s* would come about via a mental processing of [stem+affix] concatenation, or [[book] + {s}]. It is this processing distinction that makes the classic debate so valuable. For instance, first generation Chomskyan studies in which children (for the first time) were observed showed evidence for what is called **over-regularization** of Nouns (plural) and Verbs (past). For example, Chomsky might ask: ‘how could it be possible for children to make attested errors such as e.g., *goed* (= went) , *drawed* (= drew), *bringed* (= brought), *putted* (put), *tooths/teeths*, etc. if children have stored as chunks all items?’ Recall, the nature of **chunking** is based on a 1-to-1 sound-meaning association. For example, the child’s production of [*Goed*] as a lexical chunk necessarily entails that the child would have heard it likewise as a chunk, as found in the input. Well, clearly, children are not gaining access to such erroneous utterances from the direct input (provided that moms and dads, brothers and sisters don’t speak that way). So, the errors must be coming from somewhere other than the direct input. If Skinner believes in a direct input-to-output 1-to-1 processing of *what comes in goes out* in terms of language, with the brain/mind simply serving as a memory way-station of sorts, then clearly such a direct 1-to-1 processing cannot account for both **creativity** and **child errors** (creativity in the sense that children can readily apply the rule to novel words, as in Berko’s **Wugs test**, errors in the sense as shown above). In fact, it is this coupled phenomenon of creativity and errors which weakened the ‘too strong a claim’ made by Skinner in the famous 1957/1959 exchange with Chomsky regarding language and associationism—viz., Skinner’s claim that all language reduces to associative memorization. Therefore the only other means by which children (and adults for that matter) can produce such errors if not via external means is via internal means (i.e., via rules—the malformation and/or under-development of rules). Given this, let’s turn to what might amount to evidence for a hidden internal **generative grammar** of language whereby systematic structure is sought out in an environment otherwise reaming with uncertainty.

#### 1.4 HIDDEN STRUCTURE

It seems grammar of any language involves hidden structures which are not necessarily penetrable to simple surface phenomena. That is, one often cannot glean the structure of language by simply observing the surface structure of a phonological string (say, by observing mere adjacency patterns found in the input). It seems some hidden computational device must be behind how the child goes about acquiring her language. It seems phonological adjacency is not sufficient input as mere attention to sequential input alone would often yield wrong grammatical hypotheses. So, if language input *per se* is not sufficient, what else could be available given that children do eventually work out their grammars? The fact that mere observational powers are not enough to establish a full grammar has led to notions that the child comes

equipped, as part of her language endowment, with a predetermined language template we term **Universal Grammar (UG)**. The fact that UG comes free suggests that there is something to the notion that language grammar is innate, as famously argued by Noam Chomsky (1959) in his first attack against behaviorist theories of the day which naively suggested that mere imitation could spawn grammar.

Consider the following famously cited observations which have led to the **Innateness Hypothesis** and theories of language acquisition, noting the mere (S)ubject, (V)erb, (O)bject phonological surface adjacency.

- (1) John heard [me tell the truth].                      (2) John heard [I tell the truth].  
           S    V [S...V.....]                                      S    V [S...V.....]

It seems the single frame [(*heard*) *Me/I tell*] on the surface creates a fair amount of ambiguity. How CASE (*I vs. Me*) is assigned is not so obvious for a child based on mere observational input: some computational mechanism (solving the ‘logical problem of language acquisition’) is required to somehow decipher these two ambiguous structures despite the fact that on the surface level phonology, the strings *heard me/me tell* and *heard I/I tell* abide by similar adjacency rules. Some other grammatical factor must present itself in the computation allowing the child to gain access to the syntactic distinction. The factor here would be grammatical Tense and Agreement noting that T/AGR license the subject of the clause to projecting either a NOMinative *I* or an ACCusative *me*. For instance, in (1) above, the ACC *me* is licensed given that its licensing verb is Non-finite (e.g., *telling*) (= John heard *me telling* the truth) and only ACC case pronouns can be licensed by a Non-finite verb (non-finite meaning no Tense/Agreement). Conversely, the NOM subject *I* in (2) is licensed by its finite verb (e.g., *tells*) in the same clause (= John heard (that) *he tells* the truth).

Likewise, consider the examples below complicating the picture even more so with (3) seemingly showing that NOM Subjects *I* must come first in an SVO sequence, though example (4) seemingly shows on the surface phonology an Accusative *Me* subject working against that SVO hypothesis.

- (3) *I give* up chocolate!  
 (4) *Me, give* up chocolate?!

Again, of course while the underlying computational structure is not the same—with the NOM *I* subject in (3) functioning as the subject of simple present tense exclamative sentence and the ACC subject *me* in (4) functioning in the **default** Case form for purposes of focus of an otherwise imperative echo question—there is nothing in the direct phonological input that would indicate to the child, one way or the other, which case of the Pronoun would have to be used, Nominative or Accusative. (The default form in English is the ACC case in the sense that whenever there is no structural Case—i.e., nothing in the sentence structure that would license

Case for the subject—the default ACC form is utilized (e.g., *Who likes ice cream?... Me! Me* accusative (and not *I* nominative) is the default form which automatically surfaces for such unlicensed Case assignment. E.g., What, *me*, (you think) *I* should give up chocolate?! = [What [me give up chocolate]].

Further examples come from the nature of Reflexives. Consider the position of the Reflexive Pronoun in the examples below (the index <sub>i</sub> shows that the two elements share coreference) (\* indicates an ungrammatical structure):

(5) [Mary<sub>i</sub> washed herself<sub>i</sub>].

S        V        O

(6) \* [Herself<sub>i</sub> washed Mary<sub>i</sub>].

\* O        V        S

Notice that only SVO (Subject, Verb, Object) is possible for this configuration, and not OVS as shown by (\*6). So, what a child might take away from this phonological sequencing is that OVS is strictly not allowed.

In considering examples (7) and (8), while the above SVO hypothesis obtained by the child would be correct, it would also have to somehow trump other observational phonological sequencing that does allow for a contradictory OVS order, as in ‘Herself tired Mary’ (where ‘herself’ (‘her’) would be considered the object of a clause).

(7) Washing [herself<sub>i</sub> tired Mary<sub>i</sub>].

O    V    (S?)        (showing surface OVS order)

(8) \*Washing [Mary<sub>i</sub> tired herself<sub>i</sub>].

(S?)    V    O        (showing surface SVO order)

In fact, given our SVO preference above (5), we now must reconcile this new example (7) that doesn’t allow in the bracketed clause our previously correct SVO order, but rather stipulates for what appears to be an OVS order (though it might be better thought of as an OVX order with X at least not being a NOM subject. Even still, an erroneous OV order would be hypothesized as based on the surface phonology). In sum, what was deemed incorrect in (6) due to incorrect OVS word order, is now a possible construction in (7), and what was a correct word order in (5) is now incorrect in (8). How is the child ever to make-out such counter-data found in the input?

The last consideration is the nature of embedded clauses. Consider below:

- (9) John thinks that [Tom<sub>i</sub> likes himself<sub>i</sub>].  
(10) \*John<sub>i</sub> thinks that [Tom likes himself<sub>i</sub>].

It seems that the antecedent (the item being referred back to) of the Reflexive Pronouns (*himself*) must be the closest Noun (DP) (i.e., the DP antecedent and Reflexive must position in the same bracketed clause, ruling out (10) above). However, once again, there may be competing analogies upon which a child could deduce. For instance, sometimes there are possible multiple antecedents (13).

Consider the examples below:

- (11) \*John promised [Tom<sub>i</sub> to like himself<sub>i</sub>]. (cf. 9)  
(12) John<sub>i</sub> promised [Tom to like himself<sub>i</sub>]. (cf. 10)  
(13) [John<sub>i</sub> gave Mary a picture of himself<sub>i</sub>].  
→ [John<sub>i</sub> gave Mary *John's picture*<sub>i</sub> of himself<sub>i</sub>].

Given our rule for (9, 10) which suggests that the antecedent of the reflexive must be in the same clause, we immediately encounter opposing evidence taken from (11, 12) above. Further consider below how it might be complicated for the child to devise a surface phonological analogy leading to the usage of Tense.

- (14) [He is banned from traveling].  
(15) The government demanded that [he be banned from traveling].  
(16) [He has finished the exam by noon].  
(17) The Prof. ordered that [he have finish the exam by noon].  
(18) [She speaks to her lawyer about the matter].  
(19) I suggest [she speak to her lawyer about the matter].  
(20) I didn't know [John smokes].  
(21) I have never known [John smoke].

Note that the fine task of figuring out Tense is no simple matter. One could claim that Finite Verbs (Verbs which show Tense) must be licensed by a NOM Case subject (e.g., *He is/has/speaks/wanted...*). However, as found in (15, 17, 19, 21), these grammatically correct structures do not show this NOM-subject-to-Finite-verb correlation: viz., while the subject is NOM (*He, She*), the verb is seemingly a Non-Finite infinitive without tense (*be/have/speak/smoke*). Of course, in order to properly talk about these structures, we must be able to spell-out their appropriate grammars. By speaking about such complex grammars suggestively as if they were mere combinatory phonological strings completely dismantles any working notion of a grammar and leaves us with not means to account for the richness of language and the hidden knowledge children must have in order to secure their language.



And finally, it seems once the child does gain the upper hand on these hidden syntactic structures, it still may not be enough. Consider below the sentence pairs which contain identical (hidden) syntactic structures yet which manifest ambiguous or different readings.

- (26) (a) John saw Mary with *a telescope*.  
(b) John saw Mary with *a boy*.
- (27) (a) I *know* John who is standing at the bar.  
(b) I *know* John standing at the bar.  
(c) I *found* John who is standing at the bar.  
(d) I *found* John standing at the bar.

Although (26) has the same hidden syntactic structure, there are two possible readings for (26a), but not so for (26b): (viz., (26a) *John has a telescope (with which he sees Mary) vs. Mary has a telescope (as seen by John)*). Likewise, the hidden structure of (27a-d) are essentially the same though only (27a-c) derive the same reading. (27d) doesn't necessarily derive the same reading (viz., the *finding* of *John* (in 27d) is in fact seemingly pegged to his location *at the bar*). In the other three readings (a-c), the 'knowing' and 'finding' of 'John' is not pegged to the location *at the bar*).

Notwithstanding such syntactic closeness, these ambiguous structures too will eventually have to be sorted out by the child, seemingly on a **lexical level** in addition to a **syntactic level** since the different readings stem from differences in **semantics** and not entirely from **syntax**. Whatever these innate rules may be which guide the child toward syntax, these same rules will similarly have to guide the child with both her learning of word and subsequent mapping of word onto syntax.

## I.5 BIOLOGICAL BASIS FOR LANGUAGE

We now know that the 'brain-to-language' correlation is physiologically real: that is, we see specific language tasks (such as retrieval of *verbs*, *nouns*, such as *phrase structure constituency*) activate specific areas of the brain. In sum, what we shall term **Lexical Categories** in this book (e.g., *Nouns, Verbs, Adjectives, Adverbs*) will be said to activate the **Temporal Lobe** region of the brain (Wernicke's area), and what we shall term **Functional Categories** (e.g., *Determiners, Auxiliaries/Modals*) will be said to activate the **Left Frontal Lobe** region of the brain (Broca's area).

When we reach that juncture in our discussion which requires the drawing of tree diagrams, we must keep in mind that we are not simply drawing trees, but rather, what we are drawing is indeed a modeling of what we believe is going on inside the brain: a brain-to-language mapping. In fact, we will come to view trees as being cryptic models of the inner-trappings of our brains, so that when we process some aspect of language, we might visualize what is going on in our heads. Trees allow us to model such a mapping.

### 1.5.1 Brain/Mind-language relation

It is now largely accepted that language is subserved by two major regions of the brain: **Broca's area** (left-front hemisphere), and **Wernicke's area** (temporal lobe). As stated above, the differing activation areas seem to present us with categorical distinctions between **lexical** substantive words and **functional** abstract words. Also, it has been reported that the same distinctions hold between (rule-based) **Inflectional** morphology—e.g., the insertion of {s} after a noun to make it plural, (e.g., *book-s*)—and (rote-learned) **Derivational** morphology—e.g., the insertion of {er} after a verb to change it into a noun (e.g., *teach-er*). The picture is much more complicated as is made out here, with some overlap of processing that may blur clear distinctions. However, overall, the brain does seem to behave as a Swiss Army knife of sorts, with specific language tasks activating specific regions of the brain. This **dual distinction** is best shown in brain imaging studies using **fMRI** (functional Magnetic Resonance Imaging) and **ERPs** (event related potentials) whereby different areas of the brain undergo different blood flow as triggered by specific language-based tasks.

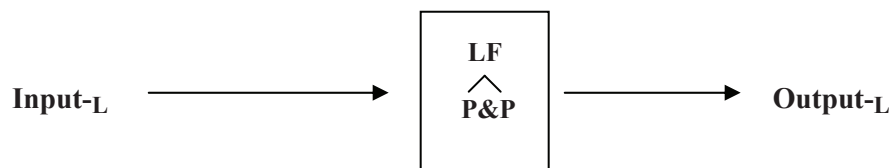
### 1.5.2 Connectionism vs. Nativism

**Connectionism.** Some cognitive psychologists and developmental linguists wish to attribute a greater role of grammar and language development to the **environmental interface**. By stressing the 'exterior' environmental aspect, connectionists attempt to show correlations between the nature of the language input and subsequent language processing leading to output. Connectionism suggests that there is often a one-to-one mapping between input and output as based on thresholds of type/token item frequency. Their models assume that though language input is 'stochastic' in nature (i.e., random), the child has an inborn statistical calculus ability to count and uncover patterns which lead to the formation of a given grammatical state. They further suggest that the only way a child can gain access to the stochastic surface level phenomena of language is by brute powers of analogical association. Such powers of association are assumed to be part of the general knowledge the child brings to bear on the data, a general knowledge as found in cognitive problem solving skills.

Unlike the **nativist position** (on the one hand) which upholds the view that the language faculty is **autonomous** in nature and **formal** in processing (i.e., not tethered to 'lower-level' cognitive arenas of the brain), connectionists argue against **formalism** and do not assume (nor believe) such 'higher-level' processing specific to language. Connectionists prefer a more **functionalist** stance in claiming that language development arises in its own niche as the need to communicate increases. Due to their functionalist stance, connectionists don't theoretically need to stipulate for an autonomous rule-based module in the brain. Connectionists rather believe that brut cognitive mechanisms alone are in of themselves enough to bring about language development. In stark contrasts to the nativist position stated below, connectionism assumes language development proceeds much in the same manner as any form of learning. (See Marcus for an overview of the ongoing debate).

*Nativism.* Other cognitive psychologists and developmental linguists rather place the burden of language acquisition squarely on the **innate interface** by stressing the internal aspect generating the grammar. While innate models also support the notion that the environment is stochastic in nature, they do so by stressing that the perceived input is at such a high level of randomness, with apparently ambiguous surface-level phenomena found at every turn, that one must rather assume a preconceived template in order to guide the child into making appropriate hypotheses about her language grammar. Otherwise, without such an innate template to guide the child, the randomness is simply too pervasive to deduce any workable analogy to the data. An important rationale of nativism is its claim that language development is much too stochastic in nature for the available input to make much of an impact on the child's learning scheme. Much of the work behind nativism is to show just how the child's perceived data is much too impoverished to determine an appropriate grammar of that target language (as was determined by the poverty of stimulus argued earlier in this chapter). In other words, since an appropriate minimum level of order is missing in the input, an innate module of the brain termed **Universal Grammar** (more currently being called the **Language Faculty**) must step in to supply whatever rules might be missing from the environmentally driven input.

The nativist model places its emphasis on the inner working of the brain/mind relationship to language by stipulating that there are innate **principles** which guide the language learner into making appropriate hypotheses about the **parameters** of a grammar being acquired. This Principles and Parameters model as illustrated below shows how (i) the language input first passes through the Language Faculty (LF), (ii) the LF determines the correct parameter settings (Principles & Parameters), and (iii) the parameterized language gets spelled-out in the output:



### 1.5.3 The Principles and Parameters Model

In summary, with more detailed discussion to follow, the Principles and Parameters Theory (PPT) removes the (conscious) burden of 'learning' language off of the child and rather positions the innate LF as a (subconscious) 'intervening computational system'. Chomsky claims it is this specific LF which is housed as an autonomous module for language, and not some general cognitive learning apparatus, which plays the greater role in the language acquisition process. In one sense, PPT interpretations suggest that LF holds all possible human grammars in the head of a child at any one time prior to parameterization (which is at about two years of age). In this sense, very young children, say before the age of two, are really citizens of the world. This is one way to view the term **Universal Grammar**. Even potential grammars that don't get realized in terms of a language are held as potential bundles of parameter settings

waiting to be set by the relevant input the child would receive. This greatly reduces the role of ‘active’ **learning** and rather emphasizes the role of ‘passive’ **triggering** of the appropriate parameter settings which then form the spell-out of a specific language (say, English or French or German). In other words, PPT redefines a ‘Language’ as a set of specific bundles of arrangements of parameter settings (of which there could be as many as twenty or so).

Some of the basic parameters have to do with **Word Order** of a specific language type. For instance, languages that are SVO (Subject, Verb, Object) reduce to a parameter that specifies that **Head** of a **Phrase** place in **initial position**—

(28) [VP [V (head) *like*] [N (complement) *ice-cream*] ],                    (+ **Head initial**)

or if a language allows verbs to invert or wh-words to move—

(29) Auxiliary inversion ( [Aux Do] [ you [~~do~~] smoke?] ) or,                    (+ **Aux Invert**)



(30) [What do [you ~~do~~ study ~~what~~?]].                    (+ **Wh-movement**)



Based on parameters being binary in nature [+/- setting], we could account for languages which do not allow such verb or wh-movement (as found in Chinese) or of languages which rather maintain the Head of a Phrase as Head Final (or [-Head initial]) (as found in Korean)—

(31) [VP [N ice-cream] [V like]].

There are sound reasons to be suspect of any putative form of active learning of language outside of what parameters would provide. As noted earlier, it may very well be that language is just that kind of a biologically determined system (as is cell division or the acquisition and fending off of a virus) which can’t be learned, delearned, or abridged (by statistical counting or otherwise). And so nativists take as their biological null hypothesis the assumption that some maturational scheduling of the innate LF must serve as a surrogate learning mechanism and, in time, deliver the language grammar.

## 1.6 THE CRITICAL PERIOD HYPOTHESIS

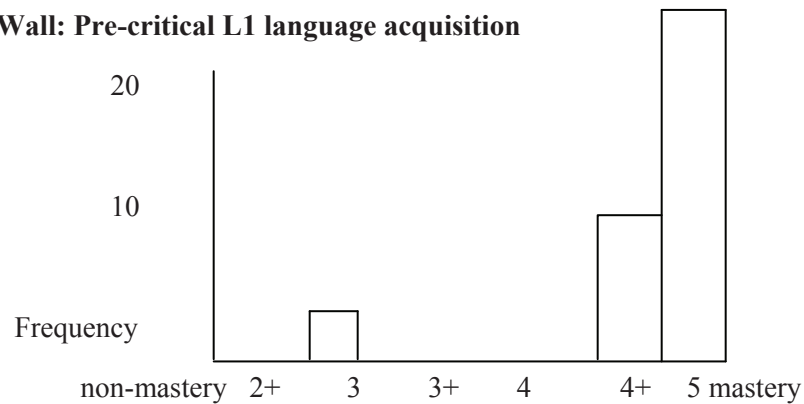
If language is biologically determined, might there be a closing window of opportunity for such a biological system to manifest a full fledged grammar? Many think so. In fact, the critical period has been used to help account for the well known fact that the learning of a second language (during adulthood) seldomly seems to progress as smoothly as the acquisition of a first native language (during childhood). But to speak of a critical period is somewhat strange. One doesn’t

typically speak about critical periods when we are dealing with ‘learned endeavors’, i.e., cognitive problem solving skills, etc. For instance, one doesn’t necessarily assume that there is some upper age limit that would prevent a wishful adult from, say, learning how to drive a car, granted there is no disability that would otherwise hamper cognitive learning. Conversely, pre-critical period child language doesn’t seem to follow the typical **bell shape curve** found in learned activities which show a statistical bell curve of distributional mastery for the given activity. (See insert below). It seems that if there is a critical period, it doesn’t support any putative culture-bound ‘learning of language’ *per se*. Rather, it seems a critical period has more to do with an endowed human gift for ‘acquiring a language’—an acquisition that (i) is our free birth right, making-up part of our species-specific genetic code (the mental/internal component), that (ii) must be triggered by the natural input (the material/external component), and that (iii) then closes up at around puberty, fully after the acquisition has been secured. If there is any concept of learning taking place within language acquisition, it would be with the material/external second component, though nativists would prefer to us the term **parameter setting** instead of **learning**, since parameter setting is considered to be done on a more passive, subconscious level.

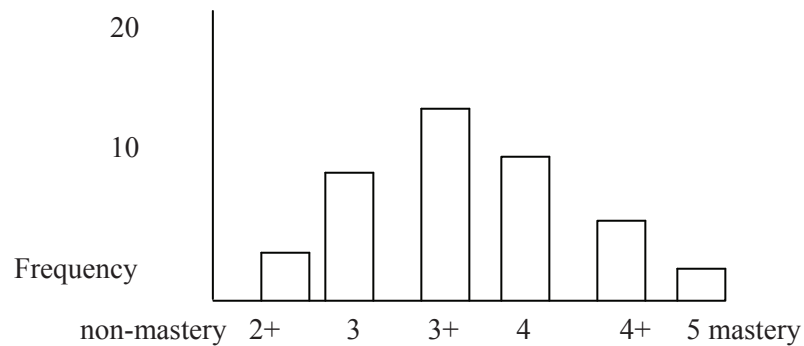
One of the more striking distinctions made between nativism and classic behaviorism is that the former assumes parameter setting and language knowledge thereof to be of an implicit nature, (i.e., grammar is considered a form of **procedural** knowledge we don’t normally access on-line), while the latter affirms that knowledge of language is **declarative**, active and arrived at by a conscious will. Having said this, there seems to be some consensus brewing from both sides of the debate that, minimally, some form of innate *a priori* knowledge or mechanism is indeed required in order for a child to speculate on the range of possible hypotheses generated by the input. Current arguments today, often termed the **Nature of Nurture**, therefore may boil down to only the second component cited here—viz., of whether or not ‘learning’ is taking place or whether ‘parameter-setting’ more accurately describes the acquisition process. It seems now all but a very few accept the idea that some amount of an innate apparatus must already be realized by design in order to get the ball rolling. So, it is becoming more recognized that the cited first component which speaks to the mental/internal nature of language must be somehow given *a priori* if any feasible theory of language is to be offered—much to the credit of Chomsky and to the chagrin of the early behaviorists of the pre-Chomskyan era.

**Bell Shape Curve.** Bar charts showing a bell curve for post-critical second language learning (L2) and a ‘right-wall’ for pre-critical first language acquisition (L1). (Patkowski 1980, taken from Lightbown and Spada, p. 63).

### Right Wall: Pre-critical L1 language acquisition



### Bell Shape Curve: post-critical L2 language learning



Such data have been used in the literature to support not only claims for a critical period hypothesis for first language acquisition, but also in support of more general claims that L2 is on a par with declarative conscious learning and is fundamentally different from the procedural parameter setting of L1. Note that all learned activities follow the bell shape curve. (For a good discussion and relative history of the subject, see Herrnstein & Murray vs. Gould).

## 1.7 FUTURE RESEARCH AND DIRECTIONS: WHERE DO WE GO FROM HERE?

In addition to core questions as to what forms the bases of our grammar, other peripheral questions regarding the uniqueness of language, the biological basis of language, along with notions of a critical period and brain imaging of language related tasks, etc. will remain with us for a very long time to come. Ongoing, as we begin to understand the many complexities behind this brain-to-language relation— while keeping up with current pursuits for utilizing brain imaging devices—our continual aim is to sustain this *shift* in linguistics from being a mere typological, classificatory and historical discipline, a branch of humanities (though fruitful as it has been in its own right) to being a hard scientific discipline, on a par with biological studies.

The material as presented in this text squarely comes down on the nativism side of the debate. However, what is important to understand is that both connectionism and nativism have their own unique roles to play in determining language processing and grammar development—both are to certain degrees correct depending on what aspects of language one is talking about. For instance, it may very well be that vocabulary learning is associative-driven and sensitive to frequency. It seems though that the same arguments seemingly cannot be made for syntax, which relies more on a computational algorithm to detect hidden rules of grammar. As will unfold in the following pages and chapters of the text, the debate between associative vs. rule-based systems, or connectionism vs. nativism, will make itself known, so much so that the debate will actually infiltrate all aspects of our discussion of grammar.

As a final note, I firmly believe the greatest impact to be made on our future understanding of language and linguistics will be in how we come to partition specific regions of the brain which are responsible for specific language tasks. Our understanding of grammar, viewed in this way, will be informed as based upon our understanding of the brain-to-language relation.

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