Between biology and sociality: an evolutionary perspective on linguistic modularity

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A Thesis
entitled

Between Biology and Sociality: An Evolutionary Perspective on Linguistic Modularity

by

Matthew Cushing

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the Masters of Arts Degree in Philosophy

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The philosophy of language is often divided by methodological and discursive differences. This thesis joins a tradition that explains language through biological structures with one that focuses on the social aspects of language in order to provide an evolutionary linguistic framework that respects the intuitions of both traditions. After considering the shortcomings of the modular linguistic model offered by Noam Chomsky (1928- ), whose encapsulation of linguistic capabilities provides a robust account of syntax but not semantics, I argue that it is fruitful to return to the intuitions of Ferdinand de Saussure (1857-1913). In doing so, this work advances an evolutionary narrative that situates the constituent elements of linguistic practice (semantics, syntax, and pragmatics) in a biological narrative which accounts for the evolution of language over time. By considering those elements of modern human language that may be innate as well as the function and development of non-innate elements of language, it is possible to not only understand language’s history but also the mechanisms by which it will continue to evolve.

In Chapter 1, I introduce the study of language as a uniquely human phenomenon and show how this approach leads to a Chomskyan biological and modular model. While this account provides a practical definition of language, I also explore the
ways that the human biological conception is problematic insofar as it methodologically prohibits important data needed to describe language outside of its specifically human instantiation.

In Chapter 2, I analyze the strengths and weaknesses of a model which rests on a strongly encapsulated linguistic module like the one Chomsky offers. A biological account of linguistic traits is necessary to account for the relative uniqueness of human language compared to the communicative systems of other animals. It is also necessary to account for poverty of stimulus and critical period considerations. However, there is ample data suggesting that the parts of the brain that account for language capabilities are domain-dominant rather than domain-specific. In considering the ramifications of a domain-dominant model, I establish a need for including the social elements of language in any narrative that attempts to explain the brain structures that support its use. I further argue that including these social elements in our narratives provides a way of accounting for how innate linguistic structures came to evolve in the first place.

In Chapter 3, I introduce Saussurean linguistics as a means of accounting for the semantic and social aspects of human language. While Saussurean theory does not do an adequate job of explaining all aspects of modern human language, it provides useful insights into those aspects of language that are not accounted for by an innate and dedicated linguistic module. By placing Saussurean semiotics alongside more primitive cognitive tools, it is possible to theorize about the non-linguistic pressures towards grammaticalization that lead to devoted linguistic brain structures.

In Chapter 4, I elaborate on the mechanisms that bring a Saussurean social semantic system and a Chomskyan modular and biological system into a viable
synthesis. Accounting for the change by which an inherently open Saussurean
linguistics proceeds via pragmatics, I finalize my evolutionary account by placing
semiotic intuitions as key to semantic content. In this model, pragmatic and social
use of a sign system is the stimulus by which semantic content undergoes change
and development. As cultural use of a sign system advances, evolutionary pressures
resulting from this development cause syntactical intuitions to solidify into the
human cognitive toolkit in a way consistent with the biological and
domain-dominant model suggested in previous chapters.
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Preface

Chomsky’s ‘universal grammar’ answers developmental poverty of stimulus arguments by positing innate biological mechanisms that confer upon humans the ability to learn language in the face of minimal stimulus. While his universal grammar succeeds as an ontogeny of language acquisition, it necessarily fails as a phylogenetic account of how humans acquired the ability to use language in the first place. Chomsky argues that individuals acquire language because they possess an innate mental organ that helps to conceptualize language. While he acknowledges that this capacity results from evolutionary pressures he does not offer the kind of historical conjecture necessary to account for evolutionary processes by which these modules arose. To explain how language functions, linguistic meaning cannot be treated as if it has been the same throughout the evolution of the human species. Rather, it is important to view language as something that is constantly evolving alongside the humans that use it, stemming from the skills that preceded it. While Chomsky’s theory does not prohibit evolutionary narratives, taking the theory without supplementation offers barriers to understanding the capabilities of human language broadly. Specifically, this approach offers too narrow a definition of language which methodologically ignores elements of language that are part of the broader human cognitive toolkit. On its own, Chomsky’s account tempts us to view language as monolithic and as if it has evolved with some teleological purpose. Instead, I propose that it is more useful to view the emergence of language as a slow development based on exaptations from other human talents and traits. As such, it
is useful to think of language, or at least its many parts, as having many different origin stories that need be told to fully explain language’s genesis and, subsequently, its use. This path will be pursued by considering accounts of language that focus less on modularity a la Chomsky and more on the use of language as found in Saussurean and Derridean linguistic theory to help account for the parts of language learning that stem from non-modular brain function.

Broadly, this work is an effort towards rapprochement between a tradition which has often focused on explaining language skills through biological structure while neglecting social context and one which has focused on the social conditions and phenomenological effect of language while ignoring the part that neurological systems play in creating those conditions. By blending these traditions, I propose there is potential to better understand both the likely evolutionary path that language has taken and also to better understand the pressures by which language is likely to continue to evolve.
Chapter 1

The Language Module

1.1 What is Language?

One of the problems a linguist must overcome when dealing with linguistic theory is the fact that to describe language, the theorist must first use language. While the description offered may be stipulative, this kind of stipulation cannot be avoided. Indeed, the description offered here will rely on stipulation as well. The clearest way to delineate the kind of stipulation offered will be to elaborate the aims of the research explored here. While it will be impossible to avoid mention of the following considerations, I will not attempt to fully answer such broad questions as to the uniqueness of human language, where the boundary between thought and language falls, or more broadly, what language is in its entirety. Instead, I will start from a less abstract if subsequently less far reaching approach.

Broadly, I will attempt to identify the elements that will be most relevant in ascertaining language’s evolutionary history. More specifically, I will begin my work by examining the conceptions of language offered by Charles Hockett (1966). His work is especially useful due its lasting effect on the linguistic discipline. Many linguists focus their analysis around one or many of the universal human language traits that he posits.
Hockett starts with the conception that “it is hard to discern any clear difference between ‘the search for language universals’ and ‘the discovery of the place of human language in the universe’” (Hockett, Introduction). While particular examples of language use likely follow from rules of a language system, Hockett observes that these data points are only useful if they can speak to human language broadly. In this light, an example of language use that is only observed in a limited community or in the habits of an individual should not be thought to apply to the mechanisms of language broadly. These particular examples cannot point to language as such, only the way that some use language. If a particular example contradicts a supposedly universal linguistic rule, this is worth noting as it challenges the notion that the trait is central to language generally. However, if an example is unique but not contradictory, it is of little use. Here then, by finding the elements of language that occur in every instance of human language, by Hockett’s logic, we are then capable of positing the role and functioning of human language more broadly. Further, by finding language universals that do not apply to the communicative systems of other animals, Hockett thinks he can provide an avenue into the study of human language particularly. Following this, he provides a list of human language universals that he posits are not found in combination in any other animal communicative system (ibid, Section 2).

As will be seen, approaching language via human universals in this way is far from a perfect methodology, but it can serve as a relevant framing mechanism to allow discussion of human language. In effect, Hockett’s approach is especially notable in that it to yields a list of human language traits that are methodologically useful, such as semanticity, arbitrariness, discreteness, and productivity (ibid, Section 2).

While Hockett’s approach is fruitful in many ways, it is important to be aware of some of the limitations of such an approach. Following Kemeny (1959), Hockett himself explains that a methodological concern arises from searching for language universals. That is, when describing language as a story of universals it becomes too
easy to posit new (potentially) linguistic examples as having causes that are non-linguistic. If a method of communication does not exhibit a trait already thought to be a language universal, it is likely to be dismissed as a particularization most applicable to describing something other than language. As an example, Hockett’s positing that human language is produced vocally (ibid, section 2.1) does not leave room for something like sign-language to be considered as a human language system.

By default then, certain communicative systems would be outside of the context of linguistic study simply because of the definitions of language already on offer. While it seems likely that the oversight of not including sign-language would be corrected in a more contemporary setting, the most important thing to consider as an implication of this methodology is that other communicative mechanisms can be excluded from consideration as language by the same token. Here, things like gestures, or silent “self-talk” have potential to be labeled as without use for linguistic study because they are not thought to exhibit universal language traits. However, all it would take to include them in linguistic study would be to offer a broader definition of what language entails, allowing room for other new relevant universals. As such, “language universality of the particular features we have chosen is then tautologous” (ibid, Section 1.2).

Methodologically, we are confronted with the difficulty of needing to delimit what is relevant to language in order to then advance inquiry into the same question: what is relevant to language? There is a danger in this. Instances that might be considered animal language, or instances of human communication which do not seem to fit neatly into pre-delineated notions of language, can be dismissed on definition alone, barring useful contrasts by which to advance linguistic study. With this tautological danger in mind, Hockett offers a sort of stipulative solution. He describes that “of course, the list itself can be revised for each successive round of the search for universals” (ibid, Section 1.2). This answer has pragmatic and theoretical value but can only
succeed if the tautological nature of the system is kept in mind.

Another danger of approaching language through universals is that it might lead us to over-emphasize elements of language that are not actually essential to its functioning. Hockett describes that it is not always clear how to “distinguish between the ‘accidentally’ and the ‘essentially’ universal” (ibid, section 1.4). This is made especially clear in an offered thought experiment. Hockett writes,

Suppose that all the languages of the world except English were to become extinct. Thereafter, any assertion true of English would also assert a (synchronic) language universal. Since languages no longer spoken may have lacked features we believe universal or widespread, for those now spoken, frequency can hardly be a measure of importance (ibid, section 1.3).

While Hockett’s system looks to find the universals of language, aiming to define which traits are essential to language, there are practical limits to such an approach. However, considering that his proposed universals will be relevant in discussions of subsequent linguistic theory, his descriptions serve as an important reference point in the delineation of what is being discussed when studying language. Simply, while Hockett’s system has flaws, it has yielded a number of useful starting points in approaching language that are still extant in current linguistic study. For instance, Hockett notes that in contrast to the fact that “some animals have communication that is auditory but not vocal (e.g., crickets); some have systems with totally different channels (bee dancing is kinetic-tactile-chemical).” As discussed above, Hockett describes that human language is inherently from the “vocal-auditory channel” (ibid, section 2.1). This conception of language is relatively standard. Indeed, while it seems obvious to point out that there is written language, many follow the logic of Leonard Bloomfield (1933) who dismisses this point by suggesting that “writing is not language, but merely a way of recording language by visible marks” (Bloomfield, 21). I will reconsider this notion via Derridean linguistic theory, emphasizing iterability and context and the ontologically constitutive role that language plays in the human
experience. While the conception of this universal is problematic, it is in relation to Hockett’s proposal that such a linguistic dialogue can advance.

Hockett also describes that human language exhibits semanticity (Hockett, section 2.7), which I will link to the evolutionary pressures of language, and arbitrariness (ibid, section 2.8), which is often seen as one of the elements of language that most needs to be accounted for and the question which spawned Saussurean structural linguistics. Further, Hockett notes that human language allows transmitters and receivers to switch roles, a characteristic he describes as interchangeability (ibid, section 2.4), which can yield further insight into the pragmatic theory necessary for a complete account of differential networks of meaning.

While this research will undoubtedly concern itself with a number of the 13 features that Hockett describes as human language universals, it will most specifically focus on what Hockett describes as openness (often referred to as language’s productivity) (ibid, Section 2.11). Here, it is the ability of human language users to produce a seemingly infinite number of linguistic expressions that is most notable.

Indeed, it is through considerations of language’s productivity that it becomes useful to introduce one of the most influential psycho-linguists in recent history: Noam Chomsky. While I will argue that Chomsky’s model doesn’t go far enough in describing the use of semantic meaning in the world, the model that I propose will still accept Chomsky’s notion that syntax is the inherited and innate element of human language. Here then, questions regarding linguistic productivity will be central to the conception of language I advance as Chomsky’s model of generative grammar and the brain modularity upon which it rests are, essentially, means of answering this type of question. In one of Chomsky’s offered definitions of language, he writes that, “an essential property of language is that it provides the means for expressing indefinitely many thoughts and for reacting appropriately in an indefinite range of new situations” (Aspects, 16). Here then, while a number of Hockett’s universals will come up
in my discussion of language’s evolution, the exploration will primarily concern itself with the fact human language allows us to “transmit messages (produce sentences) that have never been transmitted before and be understood” (Hockett, Section 2.11, emphasis added).

1.2 Recursion

While human language productivity yields fruitful linguistic study, its descriptions of the pragmatic and changing elements of language, on the surface, seem too abstract to offer insight into psycholinguistic theory. This observation alone should be enough to give a contemporary thinker pause. It seems that describing a system which, in the eyes of some, leaves nothing unsayable or which yields infinite possibility for expression (Conlon, 386) would point to a source that it itself incomprehensible. When we begin to ask questions about language’s productivity through a causal or empirical approach, it is difficult to explain the ability to produce seemingly infinite results from finite means. Ultimately, many have found that Chomsky’s modularity and the subsequent generative grammar offer a useful account that can be relatively easily translated into an empirical methodology.

While I will move into a more detailed analysis of Chomsky’s modular and biological system, I find it most useful to begin with the trait of the human linguistic system that he thinks is key to its infinite productivity. Chomsky answers that this ability to express an exceptionally large number of conceptions by a comparatively smaller means results from the fact that human language is recursive (Aspects, 8). Chomsky finds that the productive possibility of language relies on the fact that its grammar allows a speaker to embed indefinitely, thus allowing a sort of merging of smaller linguistic units and conceptions into larger ones while maintaining intelligibility. The simplest way to think of embedding is by clause where, for example, someone can
describe that “Jill ran,” but they can also say more by embedding into the final sentence, “Jill, who was training for a marathon, ran.” James Conlon (2010) also offers a relatively light-hearted way to conceive of the limitless results of the embedding that occurs in recursion. He asks us to

consider the following verse from a traditional childhood song: ‘I know an old lady who swallowed a dog, to catch the cat, to catch the bird, to catch the spider - that wiggled and jiggled and tickled inside her.’ Certainly, part of the song’s delight is the way in which even children get caught up in the playful infinity of its recursive possibilities. The only way to stop the song is to have one of the old lady’s larger meals (usually a horse, of course) arbitrarily kill her off. Because of recursion, human language is a completely open-ended system (Conlon, 385).

In this way, to describe an ability to understand the place of the units that are merged into a longer recursive expression is also to describe the functioning of grammar. With recursion in mind then, even if there are a limited number of grammatical rules by which to express a meaning, the fact that human grammar allows embedding creates a theoretically infinite level of complexity for the semantic meaning communicated by sentences, thus accounting for language’s productivity.

1.3 Poverty of Stimulus

While the mechanism allowing productivity is described by Chomsky, accounting for the recursive traits of language is more difficult. Chomsky answers that grammar allows for embedding, but this then begs the question of how to account for grammar’s apparently universal existence in human language. Given the complex environment in which language learning occurs, it seems strange that all human language can function based on a relatively small number of predictable grammatical principles. Chomsky begins to explain the problem when he writes that:

It is clear that the language each person acquires is a rich and complex construction hopelessly underdetermined by the fragmentary evidence avail-
able. Nevertheless, individuals in a speech community have developed essentially the same language. This fact can be explained only on the assumption that these individuals employ highly restrictive principles that guide the construction of grammar (Reflections, 10-11).

Specifically then, this poverty of stimulus argument does not have problems with conceptions of language’s productivity or of tracing that productivity to recursion. Instead, it suggests that when a human child is learning language there is not enough stimulus to account for the fact that the child will learn a complete grammar. Seemingly, there must be some additional mechanism that helps the child to succeed in this task.

Chomsky is not the only thinker who finds this type of account convincing. For instance, Steven Pinker (1995), when describing an instance of a child learning where to place the suffix “-s” describes an instance where the child ‘could not have been simply imitating her parents, memorizing verbs with the -s’s pre-attached. Sarah sometimes uttered word forms that she could not possibly have heard from her parents” (Pinker, 45). Indeed, children are often seen creating awkward constructions when, for instance, a language conjugates a verb irregularly. Following these insights, grammatical intuitions are to be expected of any normally developing human. Pinker, like Chomsky, uses this, among other examples, to support claims that poverty of stimulus arguments suggest “that another basic aspect of grammar may be innate” (ibid, 147).

1.4 Language Learning in Spite of POS

Much like Pinker describes that language learning in the face of a poverty of stimulus suggests there is an innate component to the human ability to use language, Chomsky describes language as having a biological manifestation. He describes human language capabilities as having an “organic nature, on a par with the digestive
and immune systems, the system of visual interpretation and motor organization, and so on – as ‘an organ of the body’” (Explorations, 5). Here then, this conception posits that in the normally developed human brain, there is a mechanism which accounts for the way humans learn language.

In addition to poverty of stimulus arguments, another common argument for a biological element to language acquisition is to point to a critical period for language learning. Much of the initial research regarding the critical period “drew on findings pertaining to first language development in deaf children, feral children, or children with serious cognitive impairments” (Vanhove, 1) and concluded, generally, that there is an age after which language learners experience much more difficulty when learning a language. Admittedly, researchers haven’t been able to agree on clear age ranges for when the critical period ends (ibid, 2) but generally critical period research is taken as evidence that language learning relies on something other than just general learning mechanisms as general learning continues past this critical period.

In elaborating upon the innate element of language learning, Chomsky posits that as children are exposed to a language there is a language acquisition device which, by extrapolating from the language heard, activates one of a number of possible grammatical orderings that are available to the child via their biologically offered grammatical intuitions. Where some have theorized that learning language is something like learning a collection of sentences, Chomsky suggests that there are biological modules which allow humans to “develop certain principles (unconscious, of course) that determine the form and meaning of indefinitely many sentences” (Assumptions, 64). While there are unique qualities to particular languages, this conception argues that there are deep similarities between all of them that are based on a bodily intuition of certain rules. As a result of this biological language organ, children are described as approaching certain kinds of stimulus with some kind of expectation that it might be linguistic. Chomsky describes that when confronted with examples of language use,
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 was the case (Aspects, 27).

Considering that a Chomskyan conception of language learning is based on selecting which of a number of possible systems is applicable to a certain language, linguistic study then can “be undertaken seriously, by definition, only to the extent that some relatively firm conception of UG [Universal Grammar] is available – that is, a conception of what has evolved” (Explorations, 3). Here then, language has a biological and evolutionary element and this element is expressed via a part of the brain, or a module, that has developed to perform well at linguistic tasks.

It is worth noting that key aspects of Chomsky’s conception fit neatly within Hockett’s framework of looking for human language universals. In explaining the acquisition of language, Chomsky posits a module that is roughly the same for all people which then allows a kind of universality of grammatical intuitions. The elements of language studied in a Chomskyan conception are the ones that affect linguistic competence for all normally developing humans.

However, while modular thinkers like Chomsky hold a view that necessitates an organ for linguistic comprehension, they generally do not argue “that a module develops in the absence of any environmental input; for they claim that some kind of triggering stimulus is typically required during a critical period of development in order to bring a module on line” (Buller et al, 308-309). In this light, Chomsky’s comprehension is not to be interpreted as suggesting some kind of purely innate status for language. While there is an innate element to the human ability to use language, the language acquisition device relies on activation via a particular spoken language and, as such, relies on language having some prior existence in the world. With that said,
with the poverty of stimulus argument “that the environmental inputs that trigger development of a module always contain far less information than is present in the fully developed mechanism” (ibid, 308-309), there is a sense that the innate elements of language, stemming from modular brain development, have a more dominant role in the development of language skills than the environmental factors which activate them. Environmental language use is required for a person to learn language, but the innate mechanisms are what allow the person to understand these uses in the environment. Here then, a Chomskyan language module “contains ‘unlearned’ information and procedures about its problem domain, which it employs in its problem solving” (ibid, 308-309). By focusing predominantly on this unlearned information, Chomsky’s system focuses on the universals of language and leaves the description of the particular, more social aspects of language largely unexplained.

1.5 Characteristics of a Modular System

A supposition of modular brain structure can provide insights into which elements of a species’ behavioral characteristics can be considered innate. However, this type of classification has some important implications. In order for a brain to have modular elements the “properties and behavior of modules requires that each module is, to some degree, informationally encapsulated” (ibid, 309). This point should be taken largely definitionally. Simply, if a system is thought to be modular, it only makes sense to consider it as somewhat separate from other modules. Indeed, “a mind composed of ‘separate mechanisms’ that made use of the information available to all the other mechanisms would just be a general-purpose mind” (ibid, 309-310).

Here then, the positing of a modular brain is also necessarily the positing of a brain with encapsulation. Following this, brain modules as normally conceived are domain-specific. Chomsky’s language acquisition device, for instance, is a module
that is thought of as only being used for language processing, or, at minimum, almost exclusively for it. Here then, if Chomsky’s conceptions about linguistic behavior are correct, linguistic behavior should be shown to be largely distinct from other types of behavior.
Chapter 2

Problems with Modularity

2.1 Challenges to Linguistic Modularity

One of the strengths of Chomsky’s conception of linguistic functioning as modular is that it accounts for differences between human language and animal language. In fact, it provides an especially simple and effective answer as to why animals cannot talk: they lack the mental mechanisms required to do so. The problem with this answer, though, is that it does not provide an adequate evolutionary account of the origins of language. As often told, this narrative suggests that language comes about wholesale, where a being either has a capability for language, resting on an organ for language, or they do not. Even if it is hard to conceive of how the organ’s evolutionary development progressed, complex organs and mental mechanisms usually come about in smaller, incremental steps.

In this work, I will offer an evolutionary narrative of language’s development that acknowledges grammatical intuitions as innate but argues for a less encapsulated modularity. My goal is to account for language change over time, including the development of an innate linguistic module. I argue that including non-linguistically dedicated brain processes (such as those used for ordering and categorizing stimuli generally) in the account better explain language function and its pre-requisite need
for a social language system.

It is difficult to offer this kind of explanation with Chomsky’s account on its own. While it is possible to speculate about the language acquisition device developing through gradual changes, there are some conceptual problems with this account. For instance, Shane Glackin (2011) describes a common concern. He describes that “mutations in grammar cannot be beneficial, since a mutant’s peers could not understand him” (Glackin, 204). Also, it is often thought that categorical rules are incoherent in rudimentary and incomplete forms. ‘All-or-nothing’ phrase-structure rules like ‘if X, send the verb to the end’ are just that; they exist in their complete form, or they do not exist at all, and no intermediate forms of the rule will serve as an evolutionary bridge between the two states (ibid, 205).

Here then, as Chomsky does not offer a satisfactory account of how these mechanisms came to be, his conception should be approached with a certain skepticism.

In considering problems with accounts of modularity, it is also important to note the studies of Daniel Everett (2005). In his work on the Pirahã language, Everett argues that he has found an instance of a human language that does not exhibit some of the language universals posited by Hockett. Specifically, it is argued that “the Pirahã language challenges simplistic application of Hockett’s nearly universally accepted design features of human language by showing that some of these features (interchangeability, displacement, and productivity) may be culturally constrained” (Everett, 621). Everett describes Pirahã as a language that is notably different from any other that has been encountered. For instance, he claims that the language has no method of numeration (ibid, 621) and that it shows no traits of recursion (ibid, 634). He describes that this “ultimately derive[s] from a single cultural constraint in Pirahã, namely, the restriction of communication to the immediate experience of the interlocutors” (ibid, 622). While Everett levels his attack specifically against Hockett’s universals, he challenges the conception of recursion as the source of productivity in
human language. If Everett’s admittedly contentious theory about Pirahã is correct, then Chomsky’s theory has a new problem. If the mechanisms of language are indeed modular and biologically programmed, how can there be an instance of a human cultural group which does not exhibit the same linguistic tendencies while having the same suite of linguistic tools?

Further, normally tied to conceptions of linguistic modularity is the idea that the modules used in production of language will likely be found in predictable locations in the brain. As Chomsky’s language acquisition device is thought to be similar to an organ of the body, it is fair to expect that the organ that houses the language module will be in roughly the same location for each person, mirroring the expectation that stomachs will be in roughly the same place as well. If language were not an innate but a purely associative task with no essentially different functionalities than any other brain task, brain components used in language production would be based on the history of each individual and, as such, would be less predictable. Through studying brain lesions and aphasias certain parts of the brain have been identified that do seem imperative to language production. Indeed, it is seen that

in one of the best-known traditional neuropsychological models of language, the Wernicke-Geschwind model, language processes basically flow from the back of the left hemisphere to the front, with high-level planning and semantic processes towards the back, in what is called Wernicke’s area, and low-level sound retrieval and articulation towards the front, in what is called Broca’s area, with the two regions connected by a tract of fibres called the arcuate fasciculus (Harley, 14).

By studying people with brain lesions corresponding to a particular part of their brain, Broca’s area particularly, it became clear that damage to this part of the brain can cause symptoms including “problems with fluency, articulation, word-finding, repetition and producing and comprehending complex grammatical structures, both orally and in writing” (Dronkers et al, 1433).

Leaving the analysis at this point, it seems likely that modularity must be a
part of the account for linguistic production. However, it is important to question the method for determining which parts of the brain are responsible for what. For instance, Jesse Prinz (2012) argues that people who posit modularity use aphasia to argue for the conclusion that we have evolved brain structures that are dedicated to language. A closer look at aphasias tells a different story. While it’s certainly true that people with aphasia can retain a high level of intelligence, they usually have problems that go beyond language (Prinz, 159).

Specifically then, by Prinz’s account, Broca’s and Wernicke’s areas may have some impact on the way that speech is produced. However, based on the fact that people with these aphasias usually have other cognitive difficulties, it is unlikely that these areas of the brain are used for language processing alone. Further, where Broca’s work suggested that a very particular part of the brain was used in speech production, later data has found evidence that lesion in areas of the brain that were not “Broca’s area, but surrounding frontal cortex, underlying white matter, the insula, basal ganglia, and parts of the anterior superior gyrus” caused similar symptoms. As Dronkers and her colleagues (2007) write “this implies that other brain regions also participate in speech production besides Broca’s area” (Dronkers et al, 1434). The fact that cognitive difficulties go further than language and the fact that it incorrect to limit linguistic tendencies to just Broca’s and Wernicke’s areas points to the fact that language may be using parts of the brain that are thought to be responsible for largely non-linguistic tendencies. This seems a challenge to an argument that language processing is something that occurs in a largely encapsulated way. With this in mind, the case for linguistic modularity isn’t quite as strong. Indeed, if someone were to lose half of their brain (and somehow survive), undoubtedly they would then have problems with either speech production or speech comprehension. While it would be fair to assume that the half of the brain lost might then be responsible for language, it would not be safe to assume that the half of the brain lost was only responsible for language.
Lesions and aphasia studies can help us to understand the brain in important ways but it is important to also understand their limitations.

2.2 Nuerobiological Problems with Modularity

Generally

Further problematizing the idea that language is modular, there are those who find a modular approach to the brain more generally out of touch with contemporary neurobiological data. Much like the challenge to the conception of Broca’s and Wernicke’s areas as being distinctly for language, Buller and Hardcastle (2000) argue that

Brain plasticity belies the idea of encapsulated modularity, for our information-processing streams are not really separate streams at all. There is much informational overlap between what are normally thought of as distinct processing areas. In other words, whatever modules one might want to identify in the brain are not as distinct, or informationally encapsulated, as evolutionary psychologists typically imply (Buller et al, 311).

As one means of supporting this claim, they offer a 1983 study by Merzenich et al that shows that either losing or overstimulating a finger will stimulate growth or decay to the part of the brain responsible for that behavior. Here then, while they aren’t denying that certain parts of the brain seem to take on certain dominant roles for certain behaviors, they argue that these roles aren’t as fixed or determined as many currently portray. Instead, they argue that parts of the brain can take on new roles based upon the way that the body is used. Indeed, they describe that “by the time we are old, we use regions in our brains that are different from the ones we used as young adults to accomplish the same tasks” (ibid, 312-313). This leaves good reason to seriously reconsider how we conceive of modular features of the brain.
However, it is important to note that while the brain’s plasticity suggests that brain modularity is overstated, it is not “the case that everything is connected to everything else. It might be that our vestibular system is only connected to retinal error detection signals and nothing else” (ibid, 313). Here then, it isn’t that modularity should be thrown out entirely. Rather, there is reason to consider lessening the scope of claims about modules, especially that they are only capable of a relatively small suite of functions. Instead of a fully connected brain Buller and Hardcastle argue that

our brain systems are not domain specic; rather, they are domain dominant. One sort of processing in a brain region may be more prominent than others, but other processing is still occurring. Our ‘modules’ are not so specialized that they deal only with restricted domains. Instead, they deal mostly with particular domains, and do so only contingently; the dedication of a brain system to a particular task domain is subject to change as the inputs to that brain system change (ibid, 313).

As further stimulus towards lessening the conception of brain modules as strongly encapsulated and biologically innate, Buller and Hardcastle offer developmental claims. Where Chomsky relies only on something like a trigger to activate a module’s development, Buller and Hardcastle argue that the non-genetic element of development of brain function is more robust. As support for this claim, they offer the fact that the total number of genes in human DNA is “currently estimated at around 80,000. As much as 50% of these may be concerned with our brain, yet we have literally trillions of synaptic connections in our head. There is no way even 40,000 genes could code for that exactly” (ibid, 314). Rather than focus on the brain as having some sort of genetic plan, they posit that the brain’s development is more akin to something like the immune system.

While the immune system surely has elements that are largely innate, it is important to note that there are a number of meaningful ways in which immune responses are conditioned upon exposure. If, to describe the immune system, we were to use
a parallel conception like the one currently popular for brain modularity, Hardcastle and Buller suggest that we would be left with a flawed understanding of immunity. They write that, “like evolutionary psychologists, we could reason a priori that the immune system must have evolved separate ‘immuno-modules,’ each of which is specialized to solve the adaptive problem posed by a particular antigen (ibid, 317).” However, where it is easy to suppose a type of domain specificity for the success of the immune system, this is a mischaracterization. Rather than this domain specific approach, “the immune system has, in fact, hit upon a general solution to the multitude of specific problems posed by antigens. Through a single, elegant process B cells assemble antibodies in response to each invading antigen, without the benefit of a ‘gene for’ each different antibody” (ibid, 317). While there seem to be certain structures that are intrinsic to the human body, and indeed even the immune system is sure to have an innate element, the “‘structure’ within the antibody population of a mature adult has very little to do with genes, having instead been shaped by interaction between the B-cell antibody-assembly process and the antigenic environment to which that individual has been exposed” (ibid, 317). Here then, while many people will have the same immune responses, this pattern is not due solely to genetic dispositions. It is the domain-general elements of the immune system, coupled with a particular environment, that allow it to succeed at a multitude of tasks that seem very specific and which, a priori, would be easy to label as genetic predispositions.

Buller and Hardcastle suggest that there is a similar potential to mislabel the brain’s unique functions, like language function, as having primarily genetic causes. There are some genetic predispositions for brain development but it is important to note that much of the brain’s development isn’t determined by genetics but rather genetics coupled with the developmental environment. Following this characterization, if Buller and Hardcastle are correct, brain modules are going to have some genetic impulses encouraging their growth. However, these genetic foundations cannot func-
tion to promote relatively predictable human modularity alone. Instead, it is the relatively standard conditions coupled with the similar genetic predispositions that create rather uniform brain modularity. Here then, it is more adequate to suggest that there are some innate elements to human language capabilities but that much of the predictability comes not from genetics alone but genetics coupled with individuals being in similar language environments.

2.3 Alternatives to Chomskyan Modularity: Statistical Learning

With the preceding information in mind, it is clear that a thorough-going conception of the brain as modular has problems. This is, by extension, likely true of the innate elements of language as well. However, this leaves us with a certain ambiguity. There is likely some degree of modularity occurring in the human brain but it also seems like the brain is potentially less encapsulated then Chomsky’s system suggests. Following this, it is difficult to delineate what kind of modularity we are discussing when approaching the brain. Sure, we can argue that we need a “less modular” conception, but what does this look like?

One potential example, a rather extreme answer to the above question, can be found in Prinz’s Statistical Learning model. Where it seems fair to question just how modular the human brain is, Prinz’s model leaves little to no room for language encapsulation. In contrast with Chomsky’s system where language skills emerge from biologically programmed, modular brain structures, Jesse Prinz proposes an alternate model where linguistic rules are not intrinsic to the human using language. Instead, they “are just extrapolated from statistical regularities” (Prinz, 141). Here then, a child does not learn language via the activation of the language acquisition device being exposed to relevant grammars. Instead, the child learns language “by
unconsciously tabulating patterns in the sentences that they hear and using these to generalize to new cases” (ibid, 140).

Here then, the brain needs no particularized language functions in order to learn language; the process has no large difference with any other learning process. What is appealing about this account is that it posits no new mechanisms to account for language. For instance, Prinz writes that we “know that the nervous system is very adept at statistical learning. Neurons are linked together in layered networks, which obey a simple principle: if you fire together, wire together” (ibid, 140). Following from this advantage, the statistical learning model seems better at accounting for language development “as a gradual evolutionary outgrowth of simpler capacities” (ibid, 143), unlike Chomsky’s account which has problems accounting for the historical development of the language modules.

However, this account face considerable challenges as well. First, it provides little to no means to approach studying language in the brain. There is no mechanism to observe in action, there is no easily traceable behavior that we can describe as linguistic. This alone isn’t enough to dismiss the theory but it should be noted that it is likely to give many contemporary cognitive scientists pause. Adopting a statistical learning approach to language learning returns language learning, for the moment, to a relatively opaque science. In addition, statistical learning, as a model, rests on the foundation that poverty of stimulus arguments do not need to be addressed. There is a way in which statistical learning models are a simple rejection of poverty of stimulus arguments and an affirmation that all children can learn enough about language simply from observing it in the world. While, at the moment, there seems to be no way to provide too strong of support for or against poverty of stimulus arguments (how could we possibly track all the stimulus that a child hears while they are learning language?), it should be noted that anyone who supports POS arguments will necessarily be unsatisfied by a statistical learning approach.
Most importantly, however, if a non-modular proposal is to succeed, it faces a more serious challenge. Simply put, to dismiss Chomskyan, modular theory leaves a rather important hole in our descriptive account of language. If language does not rely on having specific brain structures but only having a brain capable of thinking and a vocal apparatus, there would be other examples of animals with complex grammars. If a system is to replace Chomsky’s then it must, at minimum, also account for differences between human and animal language. At it stands, statistical learning is not an adequate theory of language acquisition. That is not to say, however, that its considerations of how language is learned should be completely thrown out the window. Indeed, I will argue that something akin to statistical learning is necessary in accounting for earlier steps in the evolution of human language function.

While a robust, non-Chomskyan answer to the problem of animal language has not yet been fielded, Dwight Read’s work (2008) can help to supplement approaches like Prinz’s. Read agrees that a fundamental difference between human language use and that of other animals is our ability to use recursive language. However, he does not describe this capacity as being the result of a particularly human language module. Instead, he argues that “recursion fails to be part of the cognitive repertoire of non-human primates due to a limitation on the size of working memory in non-human primates such as chimpanzees” (Read, 2674). Basing his argument on data that suggests that many primates can usually hold 2, or at maximum 3, concepts in their working memory, he suggests memory limitations are more important to recursion than something particularly human. Indeed, he argues that Kanzi, a bonobo often studied for relatively advanced capabilities in expressing himself through lexigrams, “both uses syntactic rules and has semantic content for two-token combinations” (ibid, 2676). However, there seems to be very few examples of Kanzi using three token combinations. Read argues “this suggests that the three-token events were not easy for Kanzi to produce” (ibid, 2677). Specifically then, advanced grammar does
not appear in Kanzi’s language use, not because of the lack of a linguistic module, but instead because Kanzi cannot, at once, hold enough concepts in memory to necessitate a grammar to combine them effectively.

While this research is far from conclusive, it can serve as an important backbone for an empirical argument against elements of Chomsky’s theory. Here then, perhaps being able to learn generally is enough to learn language more particularly, once the animal has enough memory capacity to need grammar to combine symbols. This approach is appealing, especially when we consider that Chomskyan modularity essentially describes the syntactical elements of language as, simply, a thing that humans do. Further, even a being with an innate grammar system would face difficulties with using that grammar effectively if they could only remember two tokens at any given time! While this kind of research is relatively new, at the very least, this is the kind of research that must be explored to enrich and add nuance to the theory of language. While modularity adds a convenient language by which to account for some of language’s functioning, there is some potential to account for this functioning outside of innate biological modularity as well. That said, there isn’t quite enough evidence yet to suppose that there is not some element of language that is biological. These more extreme examples provide a necessary context by which further linguistic study must advance. Yet, unsatisfactory answers for poverty of stimulus arguments, animal communication systems, or even critical learning periods suggest that there is something about the human brain that is predisposed towards learning language. The question, then, is not whether the human brain has innate mechanisms that help it to perform linguistic tasks but rather just how encapsulated those mechanisms are. Especially problematic in such an attempt is distinguishing when traits that allow language functioning count as being part of a language module rather than being domain-general. For instance, does an animal’s memory capacity, when applied specifically to words and phrases, constitute something like modular encapsulation or
is it better to conceive of this linguistic capability as something rather secondary and emergent, that exhibits no modular tendencies? It is likely, though, that traits that could function as part of a modular description might actually have originally been useful for other cognitive tasks.

Regardless, in a narrative explaining how a language module came to be innate, it is necessary to include non-dedicated mechanisms in the evolutionary history. Indeed, unless language has stayed the same throughout the process of human evolution, the parts of the brain that have been used in communication have necessarily changed as we’ve grown and evolved. Here, processes that were not linguistic became exapted towards a domain-dominant language module. Surely, previous instantiations of communication were not as advanced as modern human language but these intermediate steps undoubtedly occurred. Following this, the fact that the language organ Chomsky proposes must still be sensitive to evolutionary pressures lessens the viability of a firmly encapsulated linguistic modularity. Our brains don’t have a module for language alone. Communication methods themselves don’t fit into a historically unchanging category. It seems strange to think that there is a part of the brain dedicated solely to such an abstraction of form. Simply, we have neuronal organizations that are useful for a number of tasks, some especially helpful in learning and producing language. However, while this neuronal organization appears to show innate language traits, it is necessary to emphasize that these traits are not just relevant to language. Anything usefully described as language modularity must be more loosely encapsulated than Chomsky suggests. The parts of the brain that process language do more than just process language.
2.4 Modularity as the Result of Baldwinian Evolution

While the data up to this point has shown reasons that Chomskyan modularity alone may not be adequate to describe the evolution of human language capabilities, it has also suggested descriptive strengths of Chomsky’s system that other systems have a hard time explaining. Through the work of Shane Glackin, inspired by Pinker and Paul Bloom, it is possible to lay out an evolutionary account that allows an innate language capacity but that explains modularity as resulting from something that is not yet modular, or, in other words, from something more like a statistical learning model. To account for language’s evolutionary development it is important to first consider how language’s relatively developed and seemingly innate capacities could have come about through the development of lesser developed traits. Any other account cannot work as an acceptable evolutionary account. Further, by placing linguistic modularity in such an evolutionary narrative, it is possible to, first, better understand how language might continue to evolve and, second, better understand the elements of language use that do not rely on a specific language module. This can lead to a better understanding not just of language’s universals but also its particulars.

In Glackin’s work, accounting for the non-biologically given elements of language acquisition can be accomplished by placing the Baldwin effect as the mechanism by which evolutionary pressures towards modularity occur. The Baldwin effect is described as “a much-discussed but little-observed biological phenomenon which can in certain circumstances approximate the effect of a Lamarckian mechanism of inheritance by assimilating and encoding acquired characteristics specically learned behaviour into the genome” (Glackin, 207). This conception is founded on the premise that there are situations where learning a behavior, “or learning it with greater speed and ease than one’s peersdoes convey a signicant reproductive advantage” (ibid, 207).
The Baldwin effect does not begin with mental organs. Instead, it begins with the neuronal and social conditions that facilitate learning. Here then, where behavior is thought to correspond to connections in the brain, an organism’s organization of neurons can be more or less like the arrangement of the target state attained by a certain kind of knowledge. From this starting point, organisms with initial states closer to the target state are likely to learn a behavior more quickly and with less effort. Importantly, this relies on that knowledge or that behavior having social benefit. When the target behavior is especially advantageous, as language can be, there will be selective pressures which encourage the reproduction of those whose initial neuronal structure is closest to the structure required for the target behavior, as they will learn the behavior more easily. With each generation of adaptation, “what was once ‘learned’ behaviour now becomes -to a large extent- instinctive” (ibid, 207). Further, as the “behaviour becomes instinctive, and ubiquitous, it may become yet more central to the population’s way of life, further intensifying the selective pressure” (ibid, 207-208). The Baldwin effect then, “by radically altering selection pressures according to cultural norms, can allow previously learned behaviour to enter and be progressively encoded in the genome” (ibid, 208).

While the Baldwin effect does rely on learning for its neuronal pre-conditions to be useful, the Baldwin effect isn’t just a restatement of the “fire together, wire together” mechanism that statistical learning relies upon so heavily. The kind of neuronal connection associated with neurons firing together and then wiring together would be the mechanism by which an animal moves from the initial state to the final learned state. Baldwinian evolution says more about the evolutionary pressures for an initial state than it does the way that an animal proceeds to a target state. Baldwinian evolution does not posit that any particular neurons will necessarily wire together, it just shifts the ease and likelihood of such a connection occurring. In other words, Baldwinian pressures will push parts of the brain to look more like a module with

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each generation of notable social pressure.

An advantage of this Baldwinian account is that it helps to explain why, with a seemingly uniform language acquisition device throughout the species, there are still many different languages rather than one specifically human language. Glackin suggests that

the difference between the invariant and the variable aspects of language may very well simply be that the former happen to be ‘hardwired’ in the brain, and the latter do not. Linguistic universals may stem from the UG [Universal Grammar], while other aspects of language may be acquired separately, and accordingly possess a degree of ‘latitude’ (ibid, 209).

Universal Grammar “can thus be understood as the subset of those rules which were fully hardwired; and the process of acquiring language as the child’s selection of consistent supplementary rules in lieu of those left wholly or partially unspecied by the UG” (ibid, 210). Here, neuronal organizations which have been adopted across the species serve as the backbone of human language generally, accounting for the universal traits of language, and individual learning that occurs in addition to the initial neuronal state can stand as the particulars of language.

Glackin takes the fact that even a modular language acquisition device relies on specific community information to succeed to show that “a successful account of language acquisition will have to take into account what Quine and other non-generative theorists have stressed is the essentially public nature of language” (ibid, 211). Specifically, language as it exists and is used in the world is the pressure by which modularization cements its place in the human toolkit. It is in this vein that Glackin suggests there is much to be gained by returning to Saussurean conceptions of language. I follow this suggestion. Chomsky’s notion of innate syntactical intuitions is necessary in accounting for a particularly human language. However, I will place Saussurean conceptions, which mirror elements of Statistical Learning theory, as the stimulus for Baldwinian evolution towards such modularity. In this account, I will
show that semantics and syntax are not as separate as Chomsky suggests. Rather, I propose that, historically, semantic cultural practice leads to the evolution of syntax. In modern language then, once syntax has been made innate, semantics and syntax come to interrelate, exerting pressures on each other.
Chapter 3

Saussurean Semiotics and Proto-language

3.1 Isn’t Saussurean Theory Outdated?

For those already versed in linguistic theory, it might seem strange to move from Chomskyan theory to Saussurean theory. By many accounts, Chomsky’s greatest success was replacing the kind of structuralist linguistics proposed by thinkers like Saussure. Where structuralist linguistics was, at a time seen as a major innovation, in practice it often approached linguistic study mostly through collecting corpuses of examples of language use and cataloging the phonemes, morphemes, and other components of speech to study their common relations. It is in this vein that Searle (1972) describes that prior to the 1957 publication of Chomsky’s *Syntactic Structures* many “linguists regarded the aim of their discipline as being the classification of the elements of human languages. Linguistics was to be a sort of verbal botany” (Searle, 1). Even Hockett described linguistics as “a classificatory science” (ibid, 1). This classificatory science alone has not been enough to understand many of the applications of language. The structuralist methods provided the means by which to better understand the constitutive parts of sentences but, in effect, these methods “do not
see able to account for all of the internal relations within sentences, or the relations that different sentences have to each other” (ibid, 2). Simply, relational networks tracing structure don’t successfully account for the numerous ways that a similar set of signs might be used. This classificatory linguistics is especially inadequate in handling “certain types of ambiguous sentences where the ambiguity derives not from the words in the sentence but from the syntactical structure,” such as “the shooting of the hunters is terrible” (ibid, 3). An ambiguous sentence with more than one potential meaning, on the surface, seems to have only one structural relationship. Following this kind of observation, “the entering wedge of [Chomsky’s] attack on structuralism was the claim that phrase structure rules alone could not account for the various sorts of cases such as ‘I like her cooking’ and ‘John is eager to please’” (ibid, 7).

Specifically, Chomsky pointed to sentences having an underlying meaning that goes deeper than phrase structure. Specifically, “in addition to phrase structure rules the grammar requires a second kind of rule, ‘transformational’ rules, which transform phrase markers into other phrase markers by moving elements around, by adding elements, and by deleting elements” (ibid, 7). When Chomsky describes that there are modular and biological elements which help a child learn language, it is the intuitions of transformational grammar that allow a child to reorganize the particular semantic meaning, sometimes referred to as “deep structure,” from one “surface structure” to another. Mirroring this, when Searle describes Chomsky’s work, he writes that “deep structures are the input to the semantic component, which describes their meaning. Surface structures are the input to the phonological component, which describes their sound. In short, deep structure determines meaning, surface structure determines sound” (ibid, 8-9). The deep structure is what is important to comprehension in this conception. Ambiguous sentences are just one potential surface structure of a clearer deep structure. Transforming to a parallel surface structure would correct the ambiguity. This allows a means of determining a “correct” reading for ambiguous
sentences that structural linguistics does not.

This description is empirically supportable as well. For instance, an experiment by M.A. Gernsbacher (1990) “demonstrated that comprehenders quickly forget the exact form of recently comprehended information” (Gernsbacher, 65). While her research focused on the comprehenders’ recollection of the orientation of a picture, rather than a purely linguistic task, there have been similar experiments that refer specifically to linguistic data. For instance, in a 1974 experiment John Anderson asked participants to read a story and later quizzed them on the sentences they had heard. When presented with a choice between sentences with factual differences, i.e., whether a painter shot a missionary or vice-versa, 98% of people answered correctly when asked immediately after the reading and 96% answered correctly after time had passed. Alternatively, when asked about which particular sentences were read, 99% answered correctly immediately after reading, but only 56% did after delay (Anderson, 1974). It is worth noting that Gernsbacher’s experiment, although applying to visual data, is often applied to linguistic theory. Gernsbacher herself does not find it problematic to extend the findings to language processing, as she believes that language processing is based on other cognitive abilities. One interpretation of this kind of data is to suggest that semantic content is stored in memory but syntactic content is not. This interpretation suggests, at least in practice, that semantic content is often transformed through different surface structures in human language, much like Chomsky suggests.

Following this, much of Chomsky’s linguistic contribution, outside of the biological and modular aspect which has spread through cognitive science more generally, has been syntactical. While much is said about the way that deep structures are translated into surface structures, little has been added about how semantic meaning itself is constituted. Searle mentions that Chomsky describes surface structure as something like “readings” of a deep structure. However, he also describes ways that this description is unsatisfactory. He writes:
The purely formal constraints placed on the semantic theory are not much help in telling us what the readings are. They tell us only that a sentence that is ambiguous in three ways must have three readings, a nonsense sentence no readings, two synonymous sentences must have the same readings, and so on. But so far as these requirements go, the readings need not be composed of words but could be composed of any formally specifiable set of objects. They could be numerals, piles of stones, old cars, strings of symbols, anything whatever. Suppose we decide to interpret the readings as piles of stones. Then for a three-ways ambiguous sentence the theory will give us three piles of stones, for a nonsense sentence, no piles of stones, for an analytic sentence the arrangement of stones in the predicate pile will be duplicated in the subject pile, and so on. There is nothing in the formal properties of the semantic component to prevent us from interpreting it in this way. But clearly this will not do because now instead of explaining the relationships between sound and meaning the theory has produced an unexplained relationship between sounds and stones (Searle, 16-17).

Returning to the intuitions of Saussure can be most useful when addressing this challenge of meaning. I do not posit that Saussure’s work is a wholly adequate linguistic theory. To do so would be out of touch with the discipline broadly. Again, there are many types of ambiguity which this system does not account for and it provides no account for the uniqueness of human language. However, in Saussure there are important insights into “meaning” more broadly construed. I will argue that Saussure’s semiotics can provide insights into general learning which can then support language learning.

While Saussure’s theory is undoubtedly an incomplete tale of the constitution of semantic meaning, there is much to be reintroduced into the conversation by considering Saussure’s handling of semiotics. Here then, I will focus on Saussurean semiotics as a tool to approaching semantic theory rather than focusing on Saussurean linguistic theory more broadly construed. In doing progress can be made in describing the constitution of social meaning. Further, coupling Saussure with an evolutionary narrative then allows a description of the kinds of social pressures that could have provided a Baldwinian impetus towards linguistic modularity. An analysis of
semantics itself, rather than the largely syntactical analysis offered by Chomsky, will also yield insights into syntax that are missed by subscribing to a myopic transformational reading of linguistics. Indeed, even Chomsky himself “now concedes that surface structures determine at least part of meaning” (ibid, 9). Saussure, I argue, can help us understand the way that semantics itself shapes language.

3.2 Approaching Semiotic Meaning

While there are a number of differences between the thinkers, there are commonalities between Saussure and Chomsky’s conceptions of language. For instance, Saussure describes that “what is natural to mankind is not oral speech but the faculty of constructing a language” (Saussure, 10). Further, there is an implication that part of the innate human skill set is carrying some deeper meaning or “idea” into a formalized system of signs. This “translation” could easily be read as similar to Chomsky’s ‘i-language’ or deep structure manifesting through ‘e-language’ or surface structure. However, the elaborations on how this pairing functions are not the kind offered by Chomsky.

Often people are drawn to the common-sense appeal of a referential theory of language which pairs words/ideas to objects. Saussure’s description moves in a slightly different direction. He describes that such a conception is open to criticism at several points. It assumes that ready-made ideas exist before words; it does not tell us whether a name is vocal or psychological in nature (arbor, for instance, can be considered from either viewpoint); finally, it lets us assume that the linking of a name and a thing is a very simple operation – an assumption that is anything but true. But this rather naive approach can bring us near the truth by showing us that the linguistic unit is a double entity, one formed by the associating of two terms (ibid, 65).

In a more complex construction than idea/object, Saussure offers instead that “the linguistic sign unites, not a thing and a name, but a concept and a sound-image.
The latter is not the material sound, a purely physical thing, but the psychological imprint of the sound, the impression that it makes on our senses” (ibid, 66). This description of the sign as having a bipartite constitution, specifically the relation of sound-image and concept, is the foundation by which semiotic theory can advance. For this reason, Saussure declares that, “a science that studies the life of signs within society is conceivable; it would be a part of a social psychology and consequently of general psychology; I shall call it semiology” (ibid, 16).

Following this, when I describe that semiotic theory is relevant to semantics, I suggest that semantic theory explains something of the relation of the psychological experience of a sign to a signifier. While, at first, this appeal to psychological or phenomenological experience is too abstract to be useful, elaboration will show how it provides a stimulus to move past the descriptive limitations of the Chomskyan pairing of deep and surface structure. By examining the functioning of semiotic pairing, it is possible to imagine a semantic theory that is more useful than a theory which describes semantics largely through quantity, like Searle describes Chomsky’s system to be.

### 3.3 Proto-language

Saussure offered insights into the way that signs are constituted, more recent theory provides further insights into the way that the psychological experience of the sound-image might be constituted. Importantly, this research also has relevance to the broader dialogue centering around brain modularity as well. As discussed previously, it is likely that language is not as distinct from other human capabilities as is it has been described to be by a Chomskyan conception. This is especially likely when we consider that there is growing evidence that “our brains simply don’t segregate speech from non-speech information” (Buller et al, 320). Further, in Gernsbacher’s
conception “many of the cognitive processes and mechanisms involved in language comprehension are general cognitive processes and mechanisms; they are not specific to language” (Gernsbacher, 65). Here then, it is important to clarify in which ways linguistic and seemingly non-linguistic traits are related. This linkage can also provide useful insights into the abstract psychological positing that Saussure uses in constituting one part of the sign. Here, where language and other functions share a border, there is a way to approach the constitution of meaning that doesn’t suggest that semanticity exists in language alone. With this in mind, it is useful to turn to the work of C.B. Martin (1987) and his notion of proto-language.

Martin’s work is founded on the observation that “some non-linguistic activity at its more sophisticated and structured levels has a remarkable pattern of parallels to that of linguistic activity” (Martin, 277). Here, the goal of Martin’s research is to look for patterns in human thought processes similar to linguistic patterns but that do not exhibit the same advanced grammatical rules or that are explicitly communicative. For the research I am presenting here there is a two-fold benefit to such an approach. First, finding these patterns helps to point to the psychological experience of language. Second, in a brain where a language module processes more than language alone, finding non-linguistic traits with language-like mechanisms helps illuminate aspects of the evolutionary narrative towards language modularity. By finding these traits it is possible to find potential routes of exaptation towards language.

While similarities between proto-language and language itself may be posited, it is important to note that there are many ways that proto-language is not language. Rather than suggesting that language simply arises from proto-language or that proto-language is all that is needed for language, the goal is to point out what elements of language are similar to other cognitive functions. From this, the goal is to establish that there “is a structured, rule governed network of semantic, procedural activity prior to and basic to linguistic activity” (ibid, 278). While language is more complex
than proto-language, and this leaves room for the development of a language module, the implication is that when using “a language, we do not and cannot abandon the use of proto-language” (ibid, 278).

While proto-language does not have a developed grammar, the key to its ability to serve as central to the development of a language system is that in it “there is a rough parallel to subject-predicate that can yield a parallel to satisfaction of a predicate” (ibid, 279). Martin’s analysis centers around the observation that there is a directedness to our experience. This is to say, there is a sense in which each of our observations of the world have a focus. Further, we can shift our focus so that it is aimed at different subjects. This conception meshes well with phenomenological descriptions of intentionality. It is unsurprising then that proto-language can fit in the narrative that I propose involving Saussure and, later, Derrida.

Of this ability to focus and discern intentional objects, Martin describes that ”the direction in which one is looking or the position of one’s hand in touching and direction of one’s attention to what is within the region. This works roughly as the ‘subject’” (ibid, 280). The most notable implication of this directed focus is that “by the selective, comparative, abstractive, contrastive, projective use of sensory input one performs procedurally discerning representational activity about what has been represented in the spatio-temporal region” (ibid, 280). In this sense, it is the fact that humans focus attention on things in the world and make observations about them which allows us to attribute a subject-predicate style relationship to our stimulus. Here then, by focusing on a rabbit running, for instance, we can then make content or semantic observations about that rabbit and its behavior. This content then provides the material, and at least some part of the semantic meaning (specifically the psychological element of the sound-image), by which we can make linguistic statements. Importantly, this directed focus should be available to a species that is non-linguistic and it provides the material that a sort of primitive language has need
to signify.

While this conception of proto-language is useful on its own, indeed it provides a way to bridge between language and parts of the brain that are not specifically linguistic, there are other important implications. Most notably, there is the implication that proto-language and language both have non-communicative elements. Proto-language, through attribution of semiotic meaning, can be used for interpersonal communication but this kind of communication is not required of it. Supporting this, Martin points out that much of our “procedural activity that is directed successfully or unsuccessfully to an outcome is not learned from or, especially in its many inventive forms, is not merely a socialised result of, interaction with others and it is not a shared activity” (ibid, 284). Following this, it is especially important to note what occurs in silent verbalisations in the head and talking to ourselves, or notes written only for one’s own eye. It is the most common mode of representation for our assessments, wonderings, plans, projects, reflections and hypothesising. Such activity deserves full status as linguistic utterance. It is not a kind of rehearsal for the ‘real’ thing - it is the real thing. It is not something ‘behind’ utterance - it is utterance (ibid, 283-284).

Here, attaching significance and signification to a psychological or phenomenological experience is itself the source of a type of semantic meaning.

There is a way in which this conception of proto-language can be read as suggesting simply that thought broadly construed is all that is necessary for a stimulus towards language development. This is too simple a reading. The fact that some kind of conceptions can exist before language through a kind of semiotic attribution is only part of the story. Proto-language can help explain the psychological import that is to be labeled in the sign and it might provide an explanation of the stimulus towards utterance, but it does not describe the constitution of the sign itself or its social nature. Without a social system of concepts to delineate between psychological imprints, linguistic meaning cannot occur. Regardless, proto-language can establish a
prerequisite for language development that relies on no suppositions of a compartmentalized or universal kind of human language for that development. This is especially important when attempting to develop a narrative of language’s evolution. Language, as it currently exists, can be usefully described in uniquely human ways. On the way to human language though, something like proto-language must have helped to pave the way.

3.4 Temporality of ‘La Langue’

While there is much to be gained by including proto-language in the discussion of linguistics, stopping there would leave a good number of questions unanswered. While proto-language provides a means of making a small step away from a solely phenomenological foundation and towards describing semanticity as having bodily situation, this element of semantics alone isn’t enough to track both elements that are relevant to the constitution of the sign. Indeed, proto-language can only serve as a type of stand-in for the sound-image. That is to say, it can only serve as the imprinted meaning to be transmitted. However, this says very little about the signifying side of the pairing that Saussure posits.

A useful avenue into explaining this element of signification is to examine the ways that a sign can change. As a particularly useful description of the kind of change that can occur to the linguistic sign, Saussure cautions

let there be no mistake about that meaning that we attach to the word change. One might think that it deals especially with phonetic changes undergone by the signifier, or perhaps changes in meaning which affect the signified concept. That view would be inadequate. Regardless of what the forces of change are, whether in isolation or in combination, they always result in a shift in the relationship between the signified and the signifier (Saussure, 75).

It is worth noting that Saussure sometimes refers to the semiotic pair in differing
terms. Where previously, Saussure talks of the sound-image and the concept, here
he talks about the signified and the signifier. This discussion is part of a broader
move where Saussure proposes to “retain the word ‘sign’ to designate the whole and
to replace concept and sound-image respectively by signified and signifier” (ibid, 67).
Roughly, the sound-image will be the thing signified. As an example, the psychological
experience someone when hearing using the word “tree” will be the sound-image
signified. Potentially this could be a mental picture of a tree, but it could be a whole
collection of other psychological impressions. The concept used, in this case the actual
word “tree,” will be the signifier. The signified does not contain anything outside of
psychology or phenomenological experience, the signifier is the symbol that points to
such an experience.

However, this preference for signified/signifier is not systematically enforced in the
work. While Saussure more often refers to the sign as being a pair of signifier/signified,
the sound-image and concept do appear occasionally throughout the work. This might
be unsurprising considering that the *Course in General Linguistics* is a compilation
of students’ notes but it is worth attention here.

As the signifier seems to be the element doing the pointing, this reading seems
to leave the concept/signifier as roughly equivalent to the conventional use of “sign.”
This is an incorrect reading. Rather, the sign consists in the relationship between the
concept that does the signifying and the sound-image that is being signified. Here
then, when the signifier changes, the sign changes. However, when only a signified
changes this will also count as a changed sign. It is not just the word that references
a psychological impression that changes then, rather the sign itself is in constant flux,
where changes in either or both the signified and the signifier are the source of that
change.

The fluctuant nature of semiotic meaning provides an immediate challenge if lan-
guage is to remain a useful tool. Saussure explains that for language to be effective
at the tasks for which it is employed, i.e., for language to be meaningful at a particular point in time, words are often used as if they are nothing more than part of an unchanging naming system. Saussure addresses this intuition as follows:

The signifier, though to all appearances freely chosen with respect to the idea that it represents, is fixed, not free, with respect to the linguistic community that uses it. The masses have no voice in the matter, and the signifier chosen by language could be replaced by no other. This fact, which seems to embody a contradiction, might be called colloquially ‘the stacked deck.’ We say to language ‘choose!’ but we add ‘it must be this sign and no other.’ No individual, even if he willed it, could modify in any way at all the choice that has been made; and what is more, the community itself cannot control so much as a single word; it is bound to the existing language (ibid, 71).

However, it is important to note that language only acts like this at a particular moment in time. In Saussure’s vocabulary, it acts this way synchronically. Using Saussure’s vocabulary again, language also has a diachronic element. In contrast to the stacked deck described in the synchronic approach to language, in diachronic linguistics Saussure reminds us that,

each of the elements united in the sign maintain its own life to a degree unknown elsewhere, and that language changes, or rather evolves, under all the forces which can affect either sounds or meanings. The evolution is inevitable; there is no example of a single language that resists it. After a certain period of time, some obvious shifts can always be recorded (ibid, 76).

Here then, while a language as it is spoken broadly (la langue) is treated in speech (la parole) as if it is stable, this can never override the fact that in actuality the broader language is itself constantly in a state of change.

As a result of parole occurring synchronously, when speakers use a language the meaning that they are intending to communicate is often distinct from the diachronic origin of the phrase itself. In other words, while often the etymology will help to predict the ways that a word may be used, the meaning of the word is not necessarily
determined by etymology. Rarely will a word escape historical context but there are
times, for instance when a “misuse” of a word becomes standardized, that etymology
fails to predict the synchronic meaning of a word at any given time.

There is a tremendously important implication that comes alongside the notion
that both elements of the sign are in constant flux. Saussure writes that

in contrast to the false notion that we readily fashion for ourselves about
it, language is not a mechanism created and arranged with a view to the
concepts to be expressed. We see on the contrary that the state which
resulted from the change was not destined to signal the meaning with
which it was impregnated (ibid, 85).

This notion, that there is no pre-delimited meaning (ibid, 104) to be assigned to any
sign, might, at first seem at odds with the argument that I am putting forth here.
Indeed, proto-language can serve as some kind of pre-delimited meaning itself. While
there are things that are experienced before language, it is important to remember
that proto-language only stands in as one of the two constantly shifting elements
of the sign. Proto-language might be helpful to understanding the “psychological
imprint” element of Saussure’s semiotics in a historical context but it does not track
the development or effect of the sign as it takes on a social element. Here, new
meanings and new delimitations can be made from signs that started more simply.
A signifier does not just point to one signified and there is no eternal relationship
between any one thing signified and any one signifier. In fact, the notion that there
is such a thing as “one thing signified” is somewhat misleading when referring to
the kind of psychological experience Saussure founds semiotics upon. Indeed, one
particular signified, the exact psychological experience, is unlikely to be discreetly
referenced and recalled in its precise form. This fits with Saussure’s intuition that

Psychologically our thought – apart from its expression in words – is only
a shapeless and indistinct mass. Philosophers and linguists have always
agreed in recognizing that without the help of signs we would be unable
to make a clear-cut, consistent distinction between two ideas. Without
language, thought is a vague, uncharted nebula. There are no pre-existing ideas, and nothing is distinct before the appearance of language. Against the floating realm of thought, would sounds themselves yield pre-delimited entities? No more so than ideas (ibid, 111-112).

Here, imposing signs is what makes thought manageable and discrete, rather than thought itself. Importantly, where Saussure allows semiotic meaning and, subsequently, language to shape thought, with the development of language modules, this can be argued to be true in a less abstract and more physical and evolutionary way.

As Chomsky suggests that humans have biological intuitions towards language, it is unavoidable that the social pressures which cemented those modules into the brain have then shaped the way that humans think. Indeed, there is a way in which Heidegger’s already useful phenomenological notion that language helps to create worlds (Heidegger, 26) can be made more tangible. Surely, Heidegger’s point wasn’t intended as an evolutionary perspective, but the argument I am presenting here provides a way to imagine phenomenological experience providing evolutionary pressure that, over time, reaches into inherited structures as well.

3.5 Relational Meaning as a Solution to the Problem of Diachronics

Where Saussure’s theory has a number of elements that can help to describe language as it is currently used, it is important to focus on how Saussurean linguistics can help to account for pre-modular language use. The fact that Saussure traces out the two fluctuant components of a sign might be interesting linguistically but without evolutionary context, it seems irrelevant to a context focusing largely on brain modularity. Thus far, I’ve accounted for the way that the psychological element of the sign might be accounted for through proto-language. However, with this alone the fluctuant nature of the sign makes it difficult to account for the development of stable
social systems of signification that can then provide an evolutionary pressure. While I’ve earlier questioned the viability of a statistical learning model to account for the current biological state of human language acquisition devices, it does seem likely that at an earlier state of language acquisition would rely more heavily on something like a simple “fire together, wire together” mechanism. Here then, before something like a transformational grammar stemming from modularity became entrenched in human communication systems, Saussure’s structuralist notion that linguistic meaning can be made comprehensible solely through relational networks can be reintroduced to the conversation as a means of comprehending purely associative semantic meaning. While this structuralist conception has been previously dismissed as incomplete in describing a modern linguistic system, it can shed light onto potential pre-modular language use.

Saussure argues that when choosing a phrase to speak aloud or when hearing a phrase spoken by another, sense can be made of the phrase through contrast and relational meaning. In this light, a signifier is meaningful because it has been used in other situations previously, some kind of psychological imprint has then been associated with that signifier, and a semiotic relationship has been established for it. Or, in the instance that the word is novel, meaning is assumed in relation to the other signs surrounding that novel word, with a more general psychological imprint for the longer construction suggesting something of the potential relations for that new word. In describing language’s relational and contrastive elements, Saussure writes that we speak of the identity of two ‘8:25 p.m. Geneva-to-Paris’ trains that leave at 24 hour intervals. We feel that it is the same train every day, yet everything – the locomotive, coaches, personnel – is probably different. Or if a street is demolished, then rebuilt, we say that it is the same street even though in a material sense, perhaps nothing of the old one remains. Why can a street be completely rebuilt and still be the same? Because it does not constitute a purely material entity; it is based on certain conditions that are distinct from the materials that fit the conditions, e.g. its location with respect to other streets linguistic identity is not that of the garment;
it is that of the train and the street (Saussure, 108-109).

While the relation between signifier and signified is constantly in a state of flux, statistical memory of relational networks can serve as the means by which semiotics moves from an unstable psychologically driven system towards a community-wide system of signification. As signs are expressed to others, the psychological imprint communicated via the sign begins to merge socially. Surely, it is impossible to ascertain which signs were first used socially without unsupported speculation, but it seems viable that certain useful signs, potentially something paralleling the calls of animals, perhaps to signal danger or allow some kind of teamwork in gathering food, or even something similar to the communication systems that certain primates have been able to learn, might have functioned as the early semiotic pairings which then provided relational context for later novel pairings. A full exploration of the kinds of relational pairing offered by Saussure can add depth to this picture.

First, Saussure describes associative relationships. He writes that relationships “formed outside discourse are not supported by linearity. Their seat is in the brain; they are a part of the inner storehouse that makes up the language of the speaker. They are associative relations” (ibid, 123). As an example of associative relation, Saussure describes that “for instance, the French word enseignement ‘teaching’ will unconsciously call to mind a host of other words (enseigner ‘teach,’ renseigner ‘acquaint,’ etc; or armement ‘armament,’ changement ‘amendment,’ etc, or education ‘education,’ apprentissage ‘apprenticeship,’ etc.)” (ibid, 123). While Saussure specifically describes associative relationships that are clearly linguistic, there is room for associative relationships to be formed prior to linguistic use. Indeed by placing these relationships “in the brain” and suggesting that they make up the language of the speaker, there is room left to parallel some of the elements of associative meaning alongside the psychological elements that constitute the signified. While examples like “teaching” will call to mind “teach,” and this seems potentially a primarily lin-
guistic association, more abstract connections like “teaching” and “education” or “teaching” and “apprenticeship” are pairings that clearly do not have their source in similar linguistic form. Rather, there is something similar about the psychological impressions that these signs have that lead to them being associated in the minds of speakers. While the way that associations themselves are formed is left largely unelaborated in Saussure, approaching signs through a Saussurean conception of value can provide a method of unpacking how associations are structured. Here, Saussure describes that

Even outside language all values are apparently governed by the same paradoxical principal. They are always composed: (1) of a dissimilar thing that can be exchanged for the thing of which the value is to be determined; and (2) of similar things that can be compared with the thing of which the value is to be determined. Both factors are necessary for the existence of a value. To determine what a five-franc piece is worth one must therefore know: (1) that it can be exchanged for a fixed quantity of a different thing, e.g. bread, and (2) that it can be compared with a similar value of the same system, e.g. a one-franc piece, or with coins of another system (ibid, 115).

Following this, there is a basic way to establish values for things that are non-linguistic but, like proto-language is implicated in language use, non-linguistic value is likely implicated in linguistic value as well. Regardless, value is the means by which associations can be made, which then allows primitive, personal semiotic systems to have relational value with social ramifications.

Also, there seems to be something about associative relationships that has support in other linguistic study. For instance, Robert Weisberg (1969) showed study participants the sentence, “Children who are slow eat bread that is cold.” After exposure, participants then took part in a free association exercise. While the word slow is closer in the sentence to the word bread, than it is to children, participants regularly associated slow with children rather than bread (Weisberg). While this could be used to argue a number of things, for instance that there is a constituent grammar
underlying linguistic expression, it also seems to suggest that associations are key to the understanding of sentences. In a linguistics that firmly divides between modules and pre-modular linguistics, these two interpretations are at odds and a side must be taken. In a system that attempts to blend the two, this boundary is less problematic and is, in fact, expected.

Returning directly to associative meaning and the sign system it can help to establish, once a relatively robust sign system is in place, pairings of signs can start to become meaningful in a different sense. Saussure describes this sense through his conception of syntagmatic meaning. He describes that

In discourse, on the one hand, words acquire relations based on the linear nature of the language because they are chained together. This rules out the possibility of pronouncing two elements simultaneously. The elements are arranged in sequences on the chain of speaking. Combinations supported by linearity are syntagms. The syntagm is always composed of two or more consecutive units in the syntagm a terms acquires its value only because it stands in opposition to everything that precedes or follows it, or to both (Saussure, 123).

Modern syntagmatic meaning then is ordered, temporal, and usually based on the construction of an individual sentence. Each part of the sentence helps to prime and create meaning for each other part of the sentence. While it is easiest to think of syntagmatic meaning in relation to complex structures like the sentence or even more basic units like the word, Saussure applies his syntagmatic analysis to smaller units as well. This is the implication that will be most useful in creating a historical narrative that accounts for the way that language might have developed. An illustrative example can be seen when he discusses suffixes. When describing the word “painful,” he writes that the

subunits are not two independent parts that are simply lumped together (pain+ful). The unit is a product, a combination of two interdependent elements that acquire value only through their reciprocal action in a higher unit (pain X ful). The suffix is nonexistent when considered independently (ibid, 128). 46
Specifically, the place of particular signs in an utterance in relation to the other signs helps to create the broader meaning of the syntagm in a way that is more than just a meshing of parts. Interestingly, the associative element of linguistic meaning plays part in this discussion as well. The suffix “ful” is not a sign that has a clear value on its own. However, when the addition of the suffix “ful” begins to be applied to other signs, the suffix uses associational meaning to allow novel syntagmatic meaning. Specifically, “the suffix is nonexistent when considered independently; what gives it a place in the language is a series of common terms like delight-ful, fright-ful, etc” (ibid, 128). Here, adding a new signifier after the end of another signals syntagmatically to a speaker that a modification of value is taking place. Association with other words with similar endings allows a sense of what this new value could be. Once the suffix is in use socially, its associative meaning is developed through using the new signifier in new constructions until it becomes more clearly delineated as its own valuable unit.

An important implication of Saussure’s description of associative and syntagmatic meaning pointing to parts of speech smaller than words is that it suggests that the smaller units of meaning go through fluctuation as well. Simply, a sign and a word are not synonymous. Tremendously important to placing Saussure’s notions as a useful descriptor of pre-modular human language is considering the conception that signs can go through a process of agglutination. Saussure describes that

Agglutination is the welding together of two or more originally distinct terms that frequently occur as a syntagm within the sentence into one unit which is absolute or hard to analyze. Such is the agglutination process. It is a process, not a procedure, for the latter word implies will or intention, and the absence of will is what characterizes agglutination (ibid, 176)

Specifically, this means that the associations traced in a string of signs can change to the point where, for instance, a number of signs begin to merge into one longer sign and the smaller “meanings” that constituted that longer sign get lost in the process. There are ways that this will sound similar to Chomskyan recursion; but
where Chomsky allows the embedding of smaller parts into longer strings, Saussure points out how smaller units can get lost in longer strings. Here then, in agglutination, a long phrase can be used often enough without useful contrasts that it begins to function as its own word. This conception of agglutination could describe how a longer phrase such as “how are you?” essentially comes to have only the value of “hello” in certain contexts. Etymologically of course, this string of sounds used to signify a broader range of conceptions. However, with time, a larger signifier begins to point to a kind of collapsed signified. This same kind of change, Saussure notes, happens regularly in the use of language. Indeed, he describes that, for example, “It is quite likely that vert jus, tous jours, etc. became simple words because they were grasped as a single idea” (ibid, 177). While knowing a language conditions a hearer to notice discernable breaks between words, the concept of agglutination suggests that these boundaries aren’t as clear as they seem and that value and relational association point more to breaks in conception rather than breaks exhibited purely via linguistic structure. This will seem particularly unsurprising to someone who has listened to a speaker of another language. Listening to a speaker of another language, it is often hard to discern between regular pauses and the pauses that exist within words.

Importantly, the progress of agglutination can provide the means by which new parts of speech emerge from strings of signifiers. Again, a suffix can gain meaning via a process that begins with syntagmatic contrast, then solidifies into a word via agglutination, and then through associative contrast other words begin to take that suffix as well.

Importantly, once certain semiotic concepts have become agglutinated into something akin to new parts of speech, these new relationships affect the whole system of meaning. Indeed, this can be seen through a metaphor Saussure uses. He describes that “If I use ivory chessmen instead of wooden ones, the change has no effect on the system; but if I decrease the number of chessmen, this must have a profound
effect on the ‘grammar’ of the game” (ibid, 22-23). Here, while the association of a particular signifier to a particular signified is still thought of as arbitrary (as is the material of the chessmen), the introduction of new signs, either stemming from new signifiers, new signifieds, or the process of agglutination which creates something new out of those elements, immediately changes the whole set of possible associative and syntagmatic relationships available to a speaker. This creates a situation where it is possible to conceive of a system that did not have grammar quickly taking on primitive grammatical rules based on adoption of new relationships and subsequent cultural expectations. Saussure provides a conception where grammars derive from pragmatic and social usage. While his system has been labeled incomplete in a modular language setting, for a pre-modular setting his conception is much more useful. Following Saussure’s conception then, it is possible to theorize about the beginnings of grammaticalization, which, once present socially, can serve as the stimulus for a Baldwinian pressure towards language modularity. Following this, it is then possible to imagine semantic meaning as being the evolutionary pre-requisite for the development of language. Further, it is possible to theorize about the ways that Semantics will continue to influence syntax and, as such, the innate language processes in the human brain.
Chapter 4

Pragmatics as the Stimulus for Semantic Change

4.1 From Baldwin to Saussurean Theory - ‘La Langue’ and ‘La Parole’

Thus far, I’ve explored the strengths of Chomskyan theory in accounting for a language system with a developed transformational grammar and I’ve proposed Saussurean semiotics as a viable descriptive tool for how a system without modularity might advance. From here, it is useful to return to Glackin’s notion that Baldwinian evolutionary mechanisms are the boundary between the two. In doing so, it is possible to provide a more coherent evolutionary narrative than offered by a solely Chomskyan linguistics and it is also possible to begin to address any potential concerns that may exist with such an account. There are a number of reasons that such an account is useful. Most specifically, it provides a potential historical element to our understanding of language and helps enrich our current understanding of language use as well. If Chomsky’s linguistics can explain the biologically human elements of language, but cannot provide an adequate evolutionary narrative, then Chomskyan linguistics potentially misses out on an important part of the current narrative about language as
well. Simply, by focusing on only the universal traits of human language and not how it changes or grows, Chomskyan linguistics fails to account for the social elements of language use that help to cause those changes.

For example, Glackin points out a problem with Chomsky’s theory. While Glackin doesn’t dismiss Chomskyan modularity broadly, he does have some problems with the way that Chomskyan descriptive tools have come to replace some Saussurean descriptive elements in the linguistic community. Specifically, he writes that “Chomsky’s distinction between competence and performance or, later, between E-language and I-language though hugely useful, has tended to be adopted in place of, rather than in addition to, the older Saussurean distinction between langue and parole” (Glackin, 211).

Glackin proposes that parole is “somewhat analogous to Chomsky’s performance; the language as it was spoken and heard by the individual speaker” but that “by locating competence within the individual brain, Chomsky was able in turn to locate linguistics within the disciplines of cognitive science, psychology, and philosophy of mind” (ibid, 212). Undoubtedly, this move, and most notably the resulting modular theory, has yielded profound results in linguistic theory that should not be entirely dismissed. However, placing language as an entirely internal process also avoids any adequate descriptions of the external forces which shape it. Competence then, which is entirely internal, differs from la langue which is “both a social product of the faculty of speech and a collection of necessary conventions that have been adopted by a social body to permit individuals to exercise that faculty” (Saussure, 9). In other words, Saussure’s notion of parole is somewhat similar to Chomsky’s performance in that it tracks the way that an individual uses speech. In contrast, la langue is almost entirely external, without an analogue in Chomsky’s system. La langue points to something like the ways that language is used in a society. When Saussure talks about “the stacked deck” which prohibits a speaker from using whichever arbitrary signifier that
they want to represent a signified, this is an example of la langue informing parole.

Glackin proposes that

Chomsky and the generativists have... tended to neglect the concurrent existence of langue - language as a shared public enterprise - and the child’s dependence upon it, in conjunction with the LAD [Language Acquisition Device], in acquiring that competence (Glackin, 212).

Simply, if Glackin’s account is successful, and something akin to the mechanisms of Saussurean linguistics stand as Baldwinian pressures towards modularity, there is an important need to reemphasize the importance of the social aspects of language when accounting for language use and language acquisition. While Chomskyan modular theory does not deny a need of activation for the Language Acquisition Device, this minor reference to external language conditions is not enough to enrich the theory in a way that is necessary. Reintroducing la langue into the conversation, however, can help to remedy this deficiency.

4.2 Including Context in the Account of Semiotic Association

However, as stated before there are a number of elements of linguistic theory that Saussure’s theory is missing as well. I argue that Saussurean semiotics and the social language which informs it need stronger representation in current linguistic theory, notably to enrich our conception of language’s evolution. Even so, I do not intend to suggest that placing Saussurean linguistics alongside Chomskyan theory is enough to fully understand the mechanisms of language. For this reason, it is worthwhile to turn to the work of Jacques Derrida (1930-2004). While Derrida’s semiotic work often has ontological implications, that is not where I will be focusing my analysis of his work. Some mentions of notions like différance will come up but they will not be central. I
do expect that there is room to enrich Derridean ontological narratives through the account of language that I offer here but this project, while worthwhile, would build upon rather than help provide the evolutionary narrative I propose. Instead, I will focus on the ways in which Derrida enriches Saussurean semiotics by emphasizing the need to account for context in addition to structure.

Where I would argue that Saussure’s sense of association implies a need for contextuality, this implication is not an explicit and elaborate element of his work. While there are other thinkers who have emphasized something similar to a need for contextuality in addressing language concerns, Derrida rather directly takes cues from Saussurean linguistics and, as such, provides not only a useful but also a particularly relevant account of context. The similarities between thinkers that allows such comparisons is suggested in Robert Strozier’s claim (1988) that, “Saussure’s notion of a negative, differential system of terms is used by Derrida to constitute his idea of an originless system, a structure governed by freeplay, circulation, exchange – i.e., without a center” (Strozier, 206). Where Saussure proposes a system which derives meaning through structural contrast, he does not provide much elaboration on the way that the social elements can cause the kinds of semiotic change that he allows. For Saussure, semiotic change is inevitable but explication of this social reality could be more robust. Derrida offers some elaboration on this topic that is useful and expressed in a similar system.

Where Saussure describes that there is relational meaning to be interpreted in a syntagm, Derrida emphasizes the fact that a syntagm, once iterated, can itself be infinitely productive. He situates this productivity by writing that

the possibility of repeating and thus of identifying the marks is implicit in every code, making it into a network[une grille] that is communicable, transmittable, decipherable for a third, and hence for every possible user in general. To be what it is, all writing must, therefore, be capable of functioning in the radical absence of every empirically determined receiver in general (Signature, 8).
This conception is markedly similar to Hockett’s conception that a trait of human language is its interchangeability, except Derrida emphasizes the fact that not only can speaker and hearer switch position but also that language is still meaningful without a present hearer. This communicability in the absence of a present speaker means that, if a listener were to find a recording of speech, there would be structural contrasts and differences from which they could find meaning, even if they did not know the meaning intended by the original orator. This is to say, there is openness intrinsic to la langue itself. Indeed, it is seen that “unlike Chomsky, Derrida does not view the infinity of language as a mere potency, but as something already present in any actual use of language” (Conlon, 388). In this vein, in Derrida’s system even sets of signs that lack grammatical sense can be cited and useful in language. He writes, for example, that “as ‘the green is either’ or ‘abracadabra’ do not constitute their context by themselves, nothing prevents them from functioning in another context as signifying marks” (Signature, 12). The fact that these tokens have just been used in the previous phrases to provide a meaningful sentence further emphasizes the point!

While Derrida uses this kind of claim to point out a sort of ontologically constitutive différence, there are more directly linguistic ways of interpreting this openness. For instance, this observation can have a similar effect as Searle’s claim that structural linguistics does not adequately address ambiguity in sentences. Here, there is a structure that exists in a syntagm that carries its own sense of relational meaning. However, following both Derrida and Searle, this structural reading isn’t quite enough to fully elaborate the meaning intended in a particular use of language. Even a grammatically correct sentence, by this conception, leaves a certain room for interpretation of its meaning. Indeed, Derrida describes this problem and provides a certain kind of solution. He writes

> every sign, linguistic or nonlinguistic, spoken or written (in the current sense of this opposition), in a small or large unit, can be cited, put between quotation marks; in doing so it can break with every given context,
engendering an infinity of new contexts in a manner which is absolutely illimitable. This does not imply that the mark is valid outside of a context, but on the contrary that there are only contexts without any center or absolute anchorage [ancrage] (ibid, 12).

Essentially, he points out that signs are only made meaningful in a given context. However, complicating this conception, he emphasizes that contexts themselves have semiotic value and that contexts themselves must proceed from an earlier context. This kind of claim leads to a notion that there is no discernable beginning or center to a semiotic system. This uncentered constitutive element of context, *différance*, is where Derrida focuses much of his work. Again, this claim is interesting and useful but it goes beyond the scope of providing an evolutionary narrative for modularity. However, that fact that structural semiotic relationships are profoundly ambiguous without context is useful to this narrative. Semantic systems, such as the one proposed by Saussure, are constantly changing. Following Derrida, it can be understood that there is an inherent openness to semantic meaning which allows signs to be used in novel ways. By introducing Derrida to the narrative it is possible to better understand the way that sign systems, and as such semantics, goes through change.

Semiotic relationships will have an important constitutive element for social meaning but the fact that signs themselves change suggest that there is something outside of structural relationships that causes that change. Some change will surely come from simple articulatory pressures and other physical changes in signifiers but this kind of analysis, which is roughly what Saussure offers, doesn’t seem enough. Changes in the psychological element of the sign require a more robust and social pressure. Here the fact that Saussure’s psychological realm is a messy, non-pre-delimited field has relevance for the system Derrida proposes. Derrida writes, “the signified concept is never present in itself, in an adequate presence that would refer only to itself” (*Différence*, 559). Just as a Saussurean semiotic system suggests that it is unlikely to refer to “one thing” signified, such an implication is in Derrida’s work as well. It
is context that allows a somewhat more restricted pointing. The fact that a sign is understood in a context, and contexts are often socially constituted, allows words themselves to be used in a relatively loose but useful way. Indeed, it is via this conception that Derrida talks of “play” when he describes that he is discussing “language or the employment of any code which implies a play of forms” (ibid, 562). Much like a Wittgensteinian language game (Investigations, 1953) then, it is often the openness of a sign that allows it to be useful in communication; this unique kind of productivity provides new contexts by which the sign is to be understood. Here then, structural relationship are surely meaningful to a Derridean system but there is necessarily a contextual system which helped to constitute those relationships. Indeed, following the Saussurean notion that both signifier and signified are in constant flux, Derrida describes that

Every concept is necessarily and essentially inscribed in a chain or a system, within which it refers to another and to other concepts, by the systematic play of differences. Such a play, then – différance – is no longer simply a concept, is not a mere word; that is, it is not what we represent to ourselves as the calm and present self-referential unity of a concept and sound (Différance, 559).

Most importantly, through the play of différance la langue itself moves forward and continues to change as signs are continually re-appropriated through context. Following this re-appropriation, semiotic meaning can provide a narrative of how primitive language came to be social and context can provide part of the narrative for why semiotic change, such as the kind necessary for the development of parts of speech, has occurred.

Where Saussure system doesn’t adequately discuss context, but leaves room for it, Chomsky’s system does an even poorer job of accounting for context. Indeed, he writes “the meaning of a linguistic expression (hence synonymy) cannot be characterized in terms of conditions of use or effects on hearers, in general. It is crucial to distinguish langue from parole, competence from performance” (Assumptions, 65). While
it is difficult to separate context entirely from conceptions of performance, this isn’t the element of linguistic study most important to Chomsky. His study of grammar places competence in a much more dominant role than performance. If competence is knowledge of how to create grammatical sentences in a language, performance, which sounds potentially contextual, has more to do with whether an utterance is made without error than it does with whether the utterance is contextually fitting. Indeed, in a clarificatory discussion on the place of E-language in his theory, Chomsky describes that e-concepts were “intended to identify no coherent object or study. Furthermore, utterances and behavior are no more or less a concern of I-linguistics than of studies of language that might be called (misleadingly, I think) varieties of E-linguistics” (Derivation, 49). While alone there is room to critique Chomsky’s system as not adequately involving context, by combining Chomskyan theory with Saussurean theory and placing Derridean context as a further elaboration for the pressures that change la langue, a relatively robust theory of language and its evolution can be articulated.

### 4.3 Grice’s Maxims

While Derrida’s philosophy can be read as emphasizing the relevance of context to a Saussurean semiotics, there have been a number of thinkers who have emphasized the role of pragmatics in language usage in a way that has many similar implications. It is worth noting, without delving too far into the differences, that some of these pragmatic thinkers and Derrida have had differences of opinion as to how effective it is to view language as primarily pragmatic. There are times when Derrida is rather explicit in his dismissal of the notion that speech-acts are primarily functional, such as in his discussion of J.L. Austin in *Signature, Event, Context* and in his subsequent disagreements with Searle (Limited, 1988). While I would also suggest that
pragmatic theory cannot tell the whole tale of language (especially the phenomenological elements), and I have offered proto-language as having non-communicative and psychologically personal (and even potentially ontological) effect, thinkers who have viewed language as largely pragmatic can further enrich the narrative on contextuality that Derrida advances. While there are important differences between Derrida and these more traditionally pragmatic linguistic thinkers, there is enough overlap between Derrida’s contextuality and the thought of the pragmatic linguists to group them in arguing the need for introducing situation into the narrative of language use. It is worth noting though, that there is significant difference between these thinkers. Simply, clarifying these differences would be historically accurate but not relevant to the argument I am advancing here. While I will treat Derrida and linguistic pragmatists similarly here, it is important to remember that amongst their similarities, there are also many differences.

Where Derrida’s work is often read ontologically, some of these other thinkers spend much more of their time focusing on purely linguistic concerns and offer a robust vocabulary that is useful to the evolutionary linguistic narrative I advance. H.P. Grice (1989) is a thinker who is especially known for his work in pragmatics and whose conceptions can also add to this narrative. His approach can help to fill in the gaps that are left in Saussure’s theory in a way that is more readily applicable to an evolutionary or biological perspective on language than Derrida’s more abstract language.

Grice’s work centers on the conception of conversational implicatures. Essentially, stemming from his cooperative principle which suggests that communication is predominantly a cooperative act, Grice traces out a number of maxims which, when used in conversation, allow statements to be interpreted as implying a certain meaning rather than stating it outright. Here, structural meaning is inadequate in capturing implication. The cooperative principle is stated as “make your contribution such as is
required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged” (Grice, 27). It manifests through 4 maxims. The maxim of Quality focuses on the truth of a statement (ibid, 27). The maxim of relation manifests as a suggestion to “be relevant” (ibid, 27). The maxim of quantity suggests that a contribution should have no more or less information than is required (ibid, 26). Finally, the Maxim of Manner suggests that a contribution should be made in a way that is clear (ibid, 27).

By both a speaker and a hearer following the maxims, there is room for a statement to be interpreted as meaning something other than what the structure suggests. Here, for instance, if someone says something like “the hummus is delicious” while looking at a menu while in a restaurant with friends, it can be understood that they are not just declaring that the restaurant’s hummus is delicious. Such a statement would not follow the maxim of quantity, it would offer more information than is necessary, and it would also not follow the maxim of relation as it would be irrelevant to the situation at hand. By following the maxims, and expecting that the statement will be both relevant and provide the correct amount of information, the hearer should pick up on the fact that the speaker is implying that someone else should order the hummus for themselves or that they would like to split an order with the table. By adopting these maxims, language can be made useful in a way that, structurally, it is not.

While Grice himself posited the maxims largely as principles to be followed in speech, Stephen Levinson (2000) argues that there is reason to interpret the “maxims as heuristics” (Levinson, 27). Following studies that suggest that the mental processes that occur before articulation occur at three to four times the rate of articulation (Wheeldon and Levelt, 1995) and that comprehension rates occur at a similar rate (Mehler et al, 1993), Levinson argues that speech is the bottleneck in the human communication network. As such, there is a computational pressure for language to
communicate more data than can be articulated at any given point. Following this, “to increase the informativeness of a coded message which itself rules out some number of states, and thus to overcome the limit on the rate of encoding, all we need are some heuristics that will serve to rule out some further possible states” (Levinson, 31). It is here that Grice’s maxims are most useful. By placing the maxims as heuristics the data flow problem described above can be mitigated. For the project of describing evolutionary pressures towards language modularity, adding the implicative elements of language usage into the picture allows further elaboration on how pressures towards structural language change might manifest. Following Levinson’s analysis though, there is also room for pragmatic theory to help us understand semantic meaning more generally as well. This is in line with the Derridean and Saussurean conceptions offered above. Levinson writes what “is important here is the claim that meaning is not homogeneous” instead we may “distinguish numerous different genera and species of meaning” (ibid, 13). Semantic and structural meaning surely plays an important part in language, as does syntax and pragmatics. Overall, our focus should be to better understand how these elements interact. Considering the aim of this research is to provide a better evolutionary narrative in accounting for linguistic modularity, emphasizing a relationship between all three of these dimensions of language leads to an account of how some of the pressures for language modularity might have developed from other elements of the human meaning system.

4.4 Re-envisioning Chomskyan Linguistics:

Syntax Alongside a Diachronic Sign System

In Grice’s conversational implicatures and Derrida’s contextual analysis there is a suggestion that words alone are not what communicate meaning; rather, meaning is found in words communicated in a particular context. While Chomsky describes
that there are a number of ways of pointing to the same meaning, pragmatic thinkers remind us that “two ways of ‘saying the same thing’ might be unequal in their conversational import” (ibid, 24). Here then, it is clear that “what is conversationally implicated is not coded but rather inferred on the basis of some basic assumptions about the rational nature of conversational activity, as stated in the cooperative principle and its constituent maxims of conversation” (ibid, 14). Accordingly, studying language via studying la langue or by studying syntactical transformation in isolation much of the story of what language is and how it develops over time. Syntax is a part of human language, most likely the innate element of human language, but more processing is going on that syntactical processing when language is used. A social language system, along with the contexts in which it is used, leads to the evolution of this grammatical intuition.

There are some, such as Victor Yngve (1996), who take the observations of pragmatic linguistic theory and use it as the foundation for their study of linguistics. Yngve writes, for instance, that

Sound waves do not carry their interpretations from a speaker to a bearer as ancient theory would have it. To speak of sounds in a scientific context as carrying meanings is to invite continuing confusion and error. We must thus conclude that the common conception of utterances as having grammatical structure and carrying meaning conceals false assumptions from the tradition that will not stand up to even elementary scientific examination and are in fact incorrect. We find in nature only the physical sound waves; their interpretation is entirely in the heads of the speakers and hearers. A scientific analysis must include, besides the study of the physical sounds themselves; a careful and detailed study of the people who produce and interpret the sounds and of what they are doing at the time (Yngve, 4).

Yngve’s work can, in many ways, be seen as a rebellion against traditional linguistics in that it focuses on people in the world rather than language as object. Indeed, the system proposed by Yngve purports to not study grammar at all! For Yngve, the arbitrariness of language provides good reason to deemphasize language itself as the
object of study. As an example, he describes that “different noises may be interpreted in the same way there are also clear cases of similar noises being interpreted in different ways” (ibid, 3-4) and also describes that “go” can be interpreted as a command or as the name of a game. For this reason, studying language as a system itself, in Yngve’s eyes, misses the point.

I will not take such a strong stance, indeed to do so describes language as only a communicative system and one that is largely pragmatic, which I would argue ignores the semiotic and psychological personal elements of language. My dismissal of Yngve’s system then is in some ways similar to the disagreements between Derrida and Searle. I argue that language is not only practical and communicative but that it relies on other personal non-linguistic processes.

Further, there seems to be good reason to study grammar as there is a well-established history of research which suggests that syntax does affect the way that humans order sounds. For instance, D.J. Boomer’s (1965) analysis of spontaneous speech patterns found that the pause time between major phrases averaged 1.03 seconds and the pause time between sounds in the phrases was only 0.75 seconds (Boomer). This seems to suggest that syntactic patterns are indeed part of how humans structure their language planning. Further, in M.F. Garrett’s (1975) analysis of speech errors, he found that the pattern “is a syntactic one: the interacting elements of a [speech error] exchange, with very rare exception, are both members of the same surface clause” (Garrett, 145). Here, when people made speech errors, such as switching a sound from one word to another, Garrett found that these errors usually occur within the same phrase. This again seems to point to something like a grammar having an important psychological reality in human language processing.

While a non-grammatical language system might be appealing to a statistical learning theorist, such an approach goes a step too far. With that said, there is something of merit in proposing a linguistic system that accounts for language as it
is used in the world rather than simply language or grammar abstractly. Neither one of these approaches, taken in the abstract, can succeed. Ygnve’s system is not the answer but there are important impulses in it that should be adopted.

Rather, I propose a system where the social and structural elements of language are studied in conjunction with pragmatic theory and also with modular theory. In such a system, a particular expression might be especially notable because, although it contains the same words as a previous iteration, it is clearly being used in a different way than in a previous utterance. This would account for instances of polysemous or ambiguous phrasing. Grammar helps to defeat structural ambiguity but so does context. In this situation, the meaning of a phrase has something to do with the words selected and the structural network which supports them; yet, it also has much to do with the contrast between instances. In this system, there are likely modular structures which help explain human language’s status as a unique example of a comparatively advanced language system. Further, via syntactical intuitions these modules explain how humans learn language. However, by viewing the functioning of language mechanisms as something more than the elements of language processing that are uniquely human, a more robust understanding of language can be advanced that also affords an improved evolutionary narrative.

In this narrative, the boundaries between syntax, semantic, and pragmatics are porous. Previously, I’ve described ways in which semantics influences syntax. Also, syntax is a tool which, once acquired, allows larger syntagmatic chains to be introduced, influencing the descriptive power of semantics. This of course, again adds new pressures to the syntactical elements of language. Finally, pragmatic or contextual concerns provide the stimulus by which semantics changes and by which new syntactical rules come forth. This leaves pragmatics as further influencing both semantics and syntax.

In many ways, all of these systems, syntax, semantics, and pragmatics, must rely
on one another. Where modular grammar can provide one account of productivity it cannot account for productivity before grammar systems developed, which historically must be prior. Saussurean semiotic theory can explain the ways that such a pre-grammatical language system might still have a sense of value and meaning, but it cannot address certain problems of ambiguity or poverty of stimulus or critical period arguments. Pragmatic theory can help provide a sense of how language systems are used and how their intrinsic sign systems change but, without a conception of something like la langue, there is no semantic content to be used pragmatically. Placing all of these systems together though yields an important result. Chomsky’s modular structures account for our relatively advanced grammar systems and help to explain why no other animal that we are aware of has as complex a language capability. Chomsky’s system explains what has evolved and made human language unique. Semiotics, coupled with pragmatics, placed as a Baldwinian mechanism, explains how such a system developed and, importantly, it adds an emphasis as to how such a system is likely to still be developing. Semantics and the pragmatics by which semantic change occurs provide the stimulus by which the evolution towards language occurred. This kind of insight is lacking if Chomsky’s system is taken on its own accord. While structuralist linguistics fails at accounting for some of the intricacies of a modular and highly grammatical human language, it can succeed at accounting for the semiotics of less advanced communicative systems and such analysis is necessary for a complete conception of language. Indeed, as Saussure reminds, “language is necessary if speaking is to be intelligible and produce all its effects; but speaking is necessary for the establishment of language, and historically its actuality always comes first” (Saussure, 18). Of course, semantics is not simply left behind as syntactical intuitions become cemented. Instead, modern language use relies on the processing of both to function. Here then, Hockett’s notion that language can be understood by looking for what humans do with language universally is useful in finding mechanisms like Chomsky’s
modules, but it fails at understanding the underpinnings of language that allow those more universal traits to develop and to succeed. Both Hockett and Chomsky have added something to the discipline of linguistics and these contributions should not be discarded. However, looking only at universal human traits is less than adequate for understanding the way that people create semantic content. Importantly, an analysis which looks outside of this universal approach doesn’t contradict the findings of such universal systems. Rather, it adds an important context and provides a way to understand not only the evolutionary history of language but also the mechanisms which are likely to influence its continued growth.
References


