TRANSFORMATIONAL GRAMMAR
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Preface

These are the always evolving notes from an introductory course on syntactic theory taught at the University of Massachusetts at Amherst. Its target audience is first-year graduate students. No background exposure to syntax is presupposed.
Linguistic theory, and so syntactic theory, has been very heavily influenced by learnability considerations in the last fifty-some years, thanks largely to the writings of Noam Chomsky. If we decide that syntactic theory is charged with the duty of modeling our knowledge of language, then we can make some initial deductions about what this knowledge, and therefore our model of it, should look like from some simple observations. This knowledge must interact efficiently with the cognitive mechanisms involved in producing and comprehending speech, for instance. It must also be acquirable by any normal infant exposed to speakers of the language over six or so years. A number of considerations combine to make the task of acquiring knowledge of a language look very difficult indeed: the complexity of the acquired grammar, the amount of information that needs to be acquired, the attenuated nature of the information available to the child, etc. It is made even more puzzling by the fact that children appear to complete this task with relative ease in a comparatively short period of time and that the course of acquisition appears to go through a set schedule of stages. There is clearly a problem: If languages are as complex as we think they are, then how can these impossibly complex objects possibly be learned?

Linguistics as learning theory

It is Chomsky's proposal that Syntactic Theory itself should contribute to solving this dilemma. The classical formulation of this idea (see Aspects and The Sound Pattern of English) characterizes the situation as follows. Think of a grammar of L (G_L) (this is what Chomsky (1986b) calls "I-Language") as a set of rules that generates structural descriptions of the strings of the language L (Chomsky (1986b)'s E-language). Our model of this grammar is descriptively adequate if it assigns the same structural descriptions to the strings of L that G_L does. We can think of the learning process as involving a selection from the Universe of Gs the very one that generates these structured strings of the L to be acquired.

The learning problem can now be stated in the following terms: how is it that the learning procedure is able to find G_L when the universe of Gs is so huge and the evidence steering the device so meager.
One step towards solving this problem would be to hypothesize that the universe of Gs has a structure that enables convergence on $G_L$ given the sort of information that the child is exposed to. This is Chomsky's proposal. It amounts to the claim that there are features of Gs which are built-in: certain properties which distinguish the natural class of Gs from the rest. There is a kind of meta-grammar of the Gs, then, which is sometimes referred to with the label Universal Grammar. Chomsky further hypothesizes that these properties are biologically given: that it is something about the construction of the human brain/mind that is responsible for the fact that the class of Gs are the way they are. This argument, the one that leads from the observation that $G_L$s have features that are too complex to be learned to the conclusion that the universe of Gs is constrained is often called “The Poverty of the Stimulus” argument. It is a classic from Epistemology, imported with specific force by Chomsky into linguistics.

This way of setting up the problem, note, allows for the Universe of Gs to be larger than the learnable Gs. There could, for instance, be constraints imposed by the parsing and production procedures which limit the set of Gs that can be attained. And it’s conceivable that there are properties of the learning procedure itself — properties that are independent of the structure of Gs imposed by Universal Grammar — that could place a limit on the learnable Gs. Universal Grammar places an outside bound on the learnable grammars, but it needn’t be solely responsible for fitting the actual outlines of that boundary. It’s therefore a little misleading to say that the set of “learnable Gs” are those characterized by Universal Grammar, since there may be these other factors involved in determining whether a grammar is learnable or not. I should probably say that Universal Grammar carves out the “available Gs,” or something similar. But I will instead be misleading, and describe Universal Grammar as fixing the set of learnable Gs, always leaving tacit that this is just grammar’s contribution to the learnability question.

Chomsky proposes, then, that a goal of syntactic theory should be to contribute towards structuring the universe of Gs. He makes some specific proposals about how to envision this in *Aspects of The Theory of Syntax*. He suggests that syntactic theory should include an evaluation metric which “ranks” Gs. A syntactic theory that has this feature he calls explanatory. Thus “explanatory theory” has a specific, technical, sense in linguistic theory. A theory is explanatory if and only if it encapsulates the features that ranks Gs in such a way that it contributes to the learnability problem, distinguish the learnable Gs from the unlearnable ones. This criterion can help the syntactician decide whether the model of $G_L$ he or she has proposed corresponds exactly to $G_L$. In particular, the many descriptively adequate models of $G_L$ can be distinguished on this basis: we should select only those that are ranked highly by the evaluation metric. These grammars meet the criterion of explanatory adequacy.
A very important role, therefore, is played by the evaluation metric. At the time of *Aspects*, the learning procedure was conceived of as a process very much like that which the linguist goes through. The child builds a battery of rules which generate the strings of L. The evaluation metric steering this process was thought to have essentially two parts: a simplicity metric, which guides the procedure in its search through the space of grammars, and inviolable constraints, which partitions the set of Gs into the learnable ones and the unlearnable ones. Thus, for example, we might imagine that rules which used fewer symbols could be defined as "simpler" than ones that used a greater number of symbols. Inviolable constraints might be those, for example, expressed as part of the principles which place constraints on the way that strings can be partitioned into groups, and therefore simply removes from the universe of Gs a great many possible Gs. Let's call these models of Gs "rule based," because the simplicity metric is defined as a procedure that constructs rules, and the companion picture of the acquisition process the "Little Linguist" model.

To take a concrete example, imagine that the principles which limit how words are strung into groups — one particular version of which goes by the name “X Theory” — imposes the following constraints.

\[
\begin{align*}
XP & \rightarrow \{(ZP), \alpha\} \\
\alpha & \rightarrow \{\alpha, (YP)\} \\
\alpha & \rightarrow \{\alpha, (WP)\}
\end{align*}
\]

Understand “\(\{\alpha, \beta\}\)” to signify that \(\alpha\) and \(\beta\) are sisters, and “\((\alpha)\)” to indicate that \(\alpha\) is optional. Let W, X, Y and Z range over kinds of lexical items (e.g., "noun," "verb," "preposition," and so on). And, finally, let “\(\rightarrow\)” mean: "consists of." The groups here, known as phrases, are the XP and \(\alpha\) in the formulas. These constraints, then, leave to the learner only the matter of filling in the variables W, X, Y and Z, and discovering their linear order. As the child goes from step to step in matching the grammar he or she is constructing with the information coming in, these are the only decisions that have to be made. If we imagine that this set of options were to be operationalized into a concrete decision tree, then we could see this as constituting a kind of “simplicity metric.” It would constitute a procedure for searching through the space of learnable grammars that imposes an order on the grammars, enabling a deterministic method for converging at a particular grammar when exposed to a particular linguistic environment. Additionally, X Theory provides an absolute cap on the possible phrases and, in this respect, constitutes an inviolable constraint as well. If every language learner is equipped with this \(X\) Theory, then they will converge more or less on the same \(G_L\) when presented with the information that being in the environment of speakers of L provides. If there are differences in the \(G_L\)’s that learners converge on, these will trace back to different decisions these learners have made about the identity of W, X, Y and Z, or how their linear order is determined. If the rest of a model that incorpo-
rates these constraints is correct, then, it should allow any language learner to pick out a \( G_L \) very close to the \( G_L \) giving shape to the speech in that learner's environment.

Let's consider another example involving transformational rules, one that Chomsky often points to. Transformational rules map one syntactic representation, D-structure, to another, S-structure, typically by way of moving constituents. Interestingly, it appears that all such rules are “structure dependent.” That is, they make reference to the relative structural positions of the moved thing and the position it is moved to. They don’t, for example, make reference to points in a string on the basis of their position relative to some numerical count of formatives. Thus “Wh-Movement” moves maximal projections that meet certain criteria to particular positions in a phrase marker. And this operation is governed by a set of constraints that make reference to the relation between these points solely in terms of structure. There is no rule, for example, like Wh-Movement but which affects terms based on how far apart they are numerically. Thus, the learning procedure will never have to entertain the hypothesis that \( G_L \) should contain such rules.

In both cases, the classic argument for distinguishing the inviolable constraint from the simplicity metric follows very closely the logic of the poverty of stimulus argument. Because it is difficult to see (maybe even provably impossible) how such things as \( X \)-Theory or structure dependence could be learned, they must belong to the features that define the universe of Gs. And because they are overarching properties of the rules in some \( G_L \), they also have the right form to be inviolable constraints.

There is another argument towards the same end which has gained increasing influence in the last couple decades, and this one comes to us through the narrowly linguistic study of language typology, and only tangentially from learnability considerations. I will call it “Humboldt’s argument,” though it no doubt has an earlier champion. Humboldt’s argument is based on the observation that there are certain properties that appear to hold true of all \( G_L \)'s. This can be explained, Humboldt argues, only if the universe of Gs is constrained to just those which have the relevant, universal, properties. Like Chomsky, Humboldt relates this to the construction of the mind, and uses the language of learnability in his account. He puts it this way:

Since the natural inclination to language is universal to man, and since all men must carry the key to the understanding of all languages in their minds, it follows automatically that the form of all languages must be fundamentally identical and must always achieve a common objective. The variety among languages can lie only in the media and the limits permitted the attainment of the objective.

(von Humboldt 1836)

(One might read the last sentence of this passage as making the distinction, touched on above, between aspects of Universal Grammar (“the media”) and the limits our cognition places on exploiting UG (“the limits permitted the
attainment of the objective”).) So, like Chomsky, he supposes that there is a Universal Grammar, a feature of the mind, which constrains the form that languages may have. But his perspective is different from Chomsky’s. He expresses the notion of Universal Grammar not in terms of learning theory, or through the glass of the Poverty of the Stimulus argument, but from the perspective of language variability. He links limits on language variability to a universal ability he sees in human psychology to acquire a language.

Humboldt’s goal is an explanation for the observed limits in variability of the grammars of extant languages. One might imagine that there are explanations for these limits that do not involve, as Humboldt proposes, constraints imposed by human psychology. Similarities in extant languages might reflect their common ancestry: if all languages descend from a common one, then features that are shared among them could simply be vestiges of the ancestral language that historical change has left untouched. This is the thesis of monogenesis. I think it’s possible to read Sapir as advancing this alternative. Sapir is commonly associated with the position exactly opposite to Humboldt’s; in Sapir’s words:

Speech is a human activity that varies without assignable limit as we pass from social group to social group, because it is a purely historical heritage of the group, the product of long-continued social usage.

(Sapir, 1921, p. 4)

But, perhaps because of his vagueness, it’s possible to credit Sapir with a more sophisticated view. One that assigns the universal properties of languages to the detritus of historical change:

For it must be obvious to any one who has thought about the question at all or who has felt something of the spirit of a foreign language that there is such a thing as a basic plan, a certain cut, to each language. …Moreover, the historical study of language has proven to us beyond all doubt that a language changes not only gradually but consistently, that it moves unconsciously from one type towards another, and that analogous trends are observable in remote quarters of the globe.

(Sapir, 1921, pp. 120-121)

Perhaps the common properties of extant (and known) languages are a function of two facts: all languages descend from a common language, and the forces that cause languages to change are not fully random — they preserve certain features and change others only according to some “basic plan.” If historical relatedness is to explain the common traits that extant languages have, some limit must be placed on how languages change and diverge. Otherwise, language change would act as a kind of randomizer that, over time, would destroy the limits in variability that we observe. Mongenesis needs to be coupled, then, with a theory of diachrony that characterizes the limits it imposes on change. Could it be, then, that the similarities in languages are all due to these laws of diachrony?
This seems to me to be a coherent account for language variability. But it may be just a disguised version of the Chomsky/Humboldt hypothesis that the limits of human cognition are responsible for the constraints on linguistic variation. The thesis of monogenesis entails that language variation is solely the product of historical change, as Sapir’s quotes makes clear. So we expect that languages vary in features which historical change can affect, but will remain similar in those ways that are immutable. Which of the features appear as language universals, then, is determined by the internal mechanisms of historical change, and the limits thereon. What are the internal mechanisms of historical change? The only proposal I know of is that historical change is a by-product of language acquisition. It is the accumulation of the small mismatches in $G_L$ that successive generations of language acquirers select. Language acquisition, the poverty of the stimulus argument tells us, is guided by Universal Grammar. So even granting the diachronic argument for language universals, we see that as historical change weeds out the mutable properties from the immutable ones, the properties it leaves are those that characterize Universal Grammar. The antidote for the argument I have blamed on Sapir, then, involves bringing the poverty of the stimulus argument into play. I don’t know if Humboldt’s argument can stand against this alternative unaided.

But even if it can’t, it provides us with another way of viewing how to factor out the components of the evaluation metric. Following the logic of Humboldt’s argument, what we expect is that language comparison should give us a means of separating inviolable constraints from the evaluation metric. The inviolable constraints will be (among) those things found in all languages; the differences in languages are to be credited to the evaluation metric. Put somewhat differently, an explanatory theory is to give us both how languages cannot be constructed, and how their construction can vary. The data it must fit, then, emerges only once languages are compared: for not only does this allow the universals to be clearly discerned, but it is only through this means that the particulars of language variation are known.

When this method of factoring out the universals in $G$ is followed in earnest, a rather different picture of various $G_L$’s emerges; and a very different conception of the language acquisition procedure becomes available. This course is meant to illustrate these emerging pictures in detail.

*The evidential basis of syntactic theory*

If linguistics is one part of the study of human cognition, in the sense just described, then syntax can be described as that subdiscipline of linguistics which seeks to discover what speakers know about how to arrange the words of their language into meaningful sentences. Because speakers are not conscious of the principles that characterize this knowledge, the syntactician must make recourse to indirect means of determining these principles. The syntactician’s first task, then, is to determine how to find evidence that reflects the nature of this knowledge.
One plausible source of relevant information comes from observing how speakers put this knowledge to use. We could, for instance, collect the utterances from some speaker and look for generalizations in these utterances from which evidence about the underlying knowledge-base can be gleaned. This is rarely done, however, as there are few instances of such collections that arise naturally, and to assemble them from scratch is onerous enough to have been avoided. With the exception of studies of prodigious literary figures, there are vanishingly few attempts at linguistic studies that go this route.

More common is to study the linguistic utterances of a group of speakers. This is standardly done by using the dictionary maker’s device of combing texts and newspapers for examples. There are several excellent “parsed” corpora of this sort,¹ and even corpora of spoken utterances² can be found. With the advent of the World Wide Web, it has become possible to search a very large collection of sentences, and more and more linguists are availing themselves of this resource. This technique has the unique advantage of allowing one to determine frequencies as well. It is possible, for example, to judge how rare some particular arrangement of words is relative to some other, or to find statistically significant correlations between, say, the position of an argument relative to its predicate and the person or number marked on that argument. Some linguistic theories are specifically designed to model these sorts of frequency data.

There are some serious pitfalls to using group corpora, however. One is simply that it obliterates differences among speakers and treats the data as if it were all manufactured by the same grammatical system. Since nothing is known about the producers of these sentences—they may include speakers of different dialects and speakers for whom the language in question is non-native or has been influenced by another language, for instance—this could be a serious source of error. Without some measure of the heterogeneity of the speakers who produced the corpus, it is very difficult to judge how faithfully it represents the syntactic knowledge of any one of those speakers.

Another shortcoming is that linguistic behavior, even of one individual, is not a faithful projection of the knowledge that that individual has of his or her language. People say sentences whose syntactic form is at odds with what they would otherwise deem well-formed. A significant proportion of any corpus could be made up of such “mistakes,” and indeed it would be prudent to assume so, given the degree to which misshapen sentences populate the utterances of such well-placed contributors to corpora as George W. Bush. There is a distinction between a speaker’s linguistic “performance” and his or her linguistic “competence,” to use the names Chomsky gives to this distinction. Corpora level this distinction.

For these reasons, then, group corpora contain an unknown amount of data that should be weeded out. They contain examples of sentences that are produced by speakers whose grammatical systems differ, and they contain sentences that are not representative of any grammatical system. But group

¹ See Marcus et al. (1993), for example.
² See Godfrey et al. (1992).
corpora are not only noisy with error, they are also mute about certain kinds of information.

One important piece of evidence that corpora cannot provide concerns where speakers draw the line between impossible and possible forms in their language. This distinction is easiest to elicit in linguistic domains where there are a comparatively small number of relevant forms. For example, the morphological and phonological inventories of any one speaker at any one time is reasonably small and it is therefore salient when a novel morphological or phonological form is introduced. For many such novel forms, speakers are capable of distinguishing those that are admissible members to their languages and those that are not. Most English speakers I have asked, for instance, can tell that \( \text{blick} ([\text{blI}k]) \) is an admissible addition to their lexicon but that \( \text{bnick} ([\text{bnI}k]) \) is not. Presumably this ability to distinguish admissible from inadmissible forms is due to the knowledge speakers have of their language, and so it is an important piece of information about how that knowledge is constituted. A typical way of characterizing this distinction goes as follows. The phonology of a language permits many forms that are not exploited by the lexicon of that language (e.g., \([\text{blI}k]\)). Which of these forms are used and which are not is completely extragrammatical. By contrast, because the phonology of a language limits the forms that are available to that language (e.g., English prevents the onset cluster \([\text{b}n]\)) these forms (e.g., \([\text{bnI}k]\) in English) will be blocked from its lexicon. The absence of these forms is determined by the grammar; they are said to be “ungrammatical,” and when they are cited, they are prefixed with the diacritic “*” to indicate their status.

The same distinction can be elicited for sentences, although because of the larger number of forms involved it is more difficult to recognize a novel sentence. Consider, by way of illustration, the pair of sentences in (1).

(1) a. Whenever the earth revolves around its equator, the moon begins to rotate about its axis.
   b. Whenever the earth revolves around its equator, the moon begins itself to rotate about its axis.

I judge (1b) to be an impossible English sentence, and (1a) to be a possible one. Because I read very little science fiction, I think it’s likely that both sentences are novel for me, but I do not have the certainty about this that I have about \( \text{blick} \) and \( \text{bnick} \). I recognize that there are considerably more sentences that I have encountered than there are words I’ve encountered, and consequently I also recognize that it is likelier that I will mistake a sentence as novel than it is that I will mistake a word as novel. Nonetheless, most linguists would agree that the contrast in (1) is of the same kind that distinguishes \( \text{blick} \) from \( \text{bnick} \). It does seem unlikely that the distinction could be reduced to one of novelty. After all, I am roughly as certain of the novelty of (1a) as I am of the novelty of (1b) and yet this does not affect the strength of my judgement concerning their Englishness. It seems probable that my ability to judge the
difference between (1a) and (1b) traces back to an ability my syntactic knowledge gives me to judge well-formedness.

This distinction between grammatical and ungrammatical forms is important because it seems to tap directly into a speaker’s linguistic knowledge. Studying corpora cannot provide what is needed to see this distinction; corpora conflate ungrammatical and grammatical but non-occurring forms. For this reason, and because of its noisiness, I will not use data from corpora in these lectures. But do not forget that corpus studies, and so far as I know only corpus studies, can provide statistical data, for this might be an important resource in forming a complete model.

Instead, the central piece of evidence used in these lectures will be elicited grammaticality judgments. This has become the standard tool for syntactic analysis, and much of the literature relies on it. Elicited grammaticality judgments have their own shortcomings. There are special problems attendant with grammaticality judgments of sentences. Because sentences are very complex objects, and are frequently longer than the small memory buffer that our on-line processors are equipped with, there are failures of sentence processing that might easily be mistaken for judgments of ill-formedness. A famous example meant to be illustrative of this distinction comes from strings that are ambiguous with respect to the placement of some late occurring phrase. The pair of sentences in (2) illustrates.

(2) a. I decided to marry on Tuesday.
   b. I decided that my daughter should marry on Tuesday.

Upon reflection, most speakers will recognize that (2a) has two meanings. It can assert that the time of my decision to marry was Tuesday, or it can assert that what my decision was was to marry on Tuesday. As we will see, this ambiguity reflects the fact that (2) maps onto two sentences, whose difference in syntactic structure is responsible for the two meanings. The first meaning corresponds to a structure which groups the words as sketched in (3a), whereas the second interpretation corresponds to the syntactic structure shown in (3b).

(3) a. S
   P
   I VP NP decided to marry
   VP PP on Tuesday

   b. S
   NP VP I decided
   VP PP to marry on Tuesday

Unlike (2a), (2b) seems to have only the second of these two meanings. It can assert that my decision was for my daughter to marry on Tuesday, but it does not seem to say that the time of my decision was Tuesday. At present, this difference in (2a) and (2b) is thought to be due to constraints of sentence
processing, and not the well-formedness conditions of sentences. The relevant difference between these examples is the number of formative between the word \textit{decided} and the prepositional phrase \textit{on Tuesday}. As that number grows beyond what can be held in working memory, the processor is forced to start making decisions about how to parse the initial portions of the string. These decisions favor a parse in which later material is made part of more deeply embedded phrases. Thus, in the case of (2b) it favors the structure in (4b) over that in (4a).

\begin{enumerate}
\item a. S
  \begin{itemize}
  \item NP
  \begin{itemize}
  \item I
  \begin{itemize}
  \item VP
  \begin{itemize}
  \item V
  \begin{itemize}
  \item S
  \begin{itemize}
  \item decided
  \end{itemize}
  \item that my daughter
  \end{itemize}
  \item marry
  \end{itemize}
  \item On Tuesday
  \end{itemize}
  \end{itemize}
  \end{itemize}
  \end{itemize}
\item b. S
  \begin{itemize}
  \item NP
  \begin{itemize}
  \item I
  \begin{itemize}
  \item VP
  \begin{itemize}
  \item V
  \begin{itemize}
  \item S
  \begin{itemize}
  \item decided
  \end{itemize}
  \item that my daughter
  \end{itemize}
  \item marry on Tuesday
  \end{itemize}
  \end{itemize}
  \end{itemize}
  \end{itemize}
\end{enumerate}

On this account, then, it is not that there is a difference in the syntactic well-formedness conditions which causes speakers' differing judgments about (2a) and (2b). Instead, because of the relative difficulty that (2b) presents to the on-line processor, one of the syntactic representations associated with this string (i.e., (4a)) becomes difficult to perceive. This effect of the on-line processor is what Kimball called “right association.”

In general, judgments of well-formedness will not be able to distinguish those sentences that do not conform to the constraints of the grammar from those that do conform to those constraints but present problems for the on-line processor. ⁴ There is no simple way of distinguishing these cases; they can be separated only through analysis. In the case of (2), the decision that the effect is not grammatical but, instead, the result of the processor comes partly from finding no good grammatical way of distinguishing the cases and partly from finding that manipulating factors relevant for the processor determines whether the effect materializes.

Another similar difficulty involves the fact that the meanings which sentences convey are typically bound to the context of a larger discourse. In-
evitably, then, grammaticality judgments are going to be confounded with whether or not there is a discourse in which that sentence could function. Suppose, for instance, that you are trying to determine the distribution of a process called “VP Ellipsis,” which allows a sentence to go without a normally required verb phrase. VP Ellipsis is responsible for allowing the bracketed sentence in (5) to go without a verb phrase in the position marked “Δ.”

(5) Jerry annoyed everyone that [5 Sean did ∆].

If you expose English speakers to the examples of VP Ellipsis in (6), you may find that they judge them ungrammatical.

(6) a. * Whomever she did ∆ got better.
    b. * Everything for her to ∆ was hard.

One might be tempted by these examples to the hypothesis that VP Ellipsis is blocked within subjects. But if the examples in (6) are embedded into an appropriate discourse, English speakers will find (6a) well-formed while (6b) remains ungrammatical.

(7) a. Whomever Sally didn’t tutor got worse but whomever she did ∆ got better.
    b. * Everything for him to do was easy and everything for her to ∆ was hard.

The problem with (6a) is that recovering the meaning of the elided VP cannot be done without a larger context, and the grammaticality of sentences with VP Ellipsis in them depends in part on recovering the meaning of the elided VP. There is nothing syntactically ill-formed with the VP Ellipsis in (6a), however, as we see when this context is provided. By contrast, neither the context in (7b) (nor any other that I have found) improves the goodness of (6b). There is something ill-formed about the syntax of this example.

These two problems are similar. In both, the difficulty is in distinguishing judgments of ungrammaticality from other types of ill-formedness. The effect of these difficulties can be lessened if the following two practices are used in eliciting judgments.

First, embed the sentences whose well-formedness you wish to determine in discourse contexts that make the meaning these sentences should have available and salient. This helps remove the second problem.

Second, for every sentence you suspect to be ungrammatical, present your informant with a matching sentence which you suspect to be grammatical. These two sentences – the suspected grammatical and the suspected ungrammatical one – should differ minimally. Your aim should be to remove all differences between these two sentences except for the factor that you suspect is responsible for the ungrammaticality. This will help mitigate processing effects, as the two sentences will end up matched in length and close to matched in complexity. It will also help remove any other confounds which might be responsible for the ungrammaticality of the sentence you wish to test.
These practices are rarely used, unfortunately. As a result, the history of syntactic research is littered with dead ends and wrong turns that have resulted from errors in the empirical base. Don't fall victim to these errors. Wherever you can, follow the Two Laws of Elicitation.

(8) Two Laws of Elicitation
   a. The sentences for which you elicit a grammaticality judgement should be embedded in a discourse that makes the meaning that sentence would have salient.
   b. Every suspected ungrammatical sentence should be part of a minimal pair, the other member of which is grammatical.

In these lectures, I will sometimes violate (8a) whenever I haven't found a context that improves an ill-formedness judgement. In these cases, my guess is that the ungrammaticality of the sentence is not tied to its information content. Similarly, I will occasionally fail to give a minimal pair when I feel that the ungrammaticality of the sentence involved is dramatic enough to be obvious. For instance, examples such as (9) are so clearly violations of English sentence structure, that I cannot imagine a discourse context that could improve them, nor would minimally contrasting grammatical examples help remove the possibility of a processing effect.

(9)   a. * Many happy the puppies barked.
   b. * She talked people to.
   c. * He ate should apples.

I do this partly because it will make the exposition cleaner, but obviously also because I am lazy. It would be wise to maintain a healthy skepticism about the data I present when I've taken these shortcuts.

There is one last danger in relying on elicited grammaticality judgments, and it is the mundane and familiar one of introducing bias. It is a commonplace among experimental psychologists that eliciting psychological data can involve very subtle ways of introducing bias. Whenever the judgments are less clear than obvious cases like (9), the syntactician should clearly not rely on her or his own judgments. In these cases only judgments elicited from naive informants will do. And in eliciting those judgments, the syntactician should adopt some of the techniques developed by experimental psychologists. Produce a survey of examples that include the sentences you wish to find judgments for but include irrelevant "fillers" as well. Those sentences should be crafted in accordance with the Two Laws of Elicitation.

Then present this survey to a number of speakers native in the relevant language, controlling as best as possible for dialect variation. Finally, present the items in the survey in a randomized order, mitigating any bias that the order of presentation might introduce. When reporting data, you should also report the number of informants you have used, and make a note of any variation in the judgments you have encountered. While these safeguards wouldn't satisfy
the rigorous numerical criteria of the experimental psychologist, they will go a long way towards removing error and making the data you report comparable to the data someone else gathers.

Grammaticality judgments, then, will be the central evidence used here in uncovering the principles that constitute a speaker's syntactic knowledge.