REVIEW ARTICLE

Syntactic Structures: a radical appreciation

ROBERT FREIDIN

Princeton University

Norbert Hornstein, Howard Lasnik, Pritty Patel-Grosz & Charles Yang (eds.), *Syntactic Structures after 60 years* (Studies in Generative Grammar **129**). Berlin: De Gruyter Mouton, 2018, Pp. 459.

This article examines the major concepts and signature analyses of *Syntactic Structures* along with their treatment in the seventeen commentaries written to commemorate the sixtieth anniversary of Noam Chomsky's first monograph. §1 discusses the scientific nature of the enterprise that *SS* founded; §2, the notion of grammaticality as an external criterion of adequacy for grammars; §3, the concept of the autonomy of syntax, which in §3.1 leads to another criterion of adequacy involving the syntax/semantics interface in cases of constructional homonymity. §4 reviews the formal machinery in the second appendix of *SS* to show how almost all of it has been superseded in the evolution of syntactic theory that followed, and as a result many of the famous analyses involving passive sentences and the English verbal system are no longer viable. Nonetheless, the general issues raised in *SS* remain at the forefront of current research, and the evolution of syntactic theory continues to demonstrate the robust nature of the scientific enterprise that *SS* launched in 1957.

syntax, grammar, phrase structure rule, transformation, constructional homonymity, autonomy of syntax, Merge, science

§1.0 *SYNTACTIC STRUCTURES*'S SCIENTIFIC REVOLUTION

The revolution for the study of language that *Syntactic Structures* launched in 1957 arrives in the first sentence of the first chapter (p. 11): *Syntax is the study of the principles and processes by which sentences are constructed in particular languages*. Out of this clear and simple definition, almost all of the major topics that have engaged and defined the field since then (as discussed in the seventeen commentaries that accompany the original 1957 text in this 60th anniversary edition) unfold.

The radical nature of this definition is revealed by comparing it with definitions of *syntax* prior to *Syntactic Structures*. Leonard Bloomfield's influential textbook *Language* (1933) characterizes syntax as follows:

> Taxemes of selection play a large part in the syntax of most languages; syntax consists largely in defining them — in stating, for instance, under what circumstances (with what accompanying forms or, if the accompanying forms are the same, with what difference of meaning) various form-classes (as, say, indicative and subjunctive verbs, or dative and accusative nouns, and so on) appear in syntactic constructions. We have seen that the selective taxemes delimit form-classes.

—which is as close to a definition of syntax as the book gets. Basically, all this says is that syntax is concerned with the specification of the contexts in which

lexical items occur. Eighteen years later, Zellig Harris's *Methods in Structural Linguistics* (1951), the manuscript of which served as Chomsky's "formal introduction to the field of linguistics" in 1947 (1975 introduction to *LSLT*, page 25), identifies *syntax* in a similar fashion, as "morphemic relations within whole utterance environment[s] (syntax)" (p. 299). And two years before the publication of *Syntactic Structures*, H. A. Gleason's 1955 textbook *An Introduction to Descriptive Linguistics* offers the following definition (p. 128).

> Syntax may be roughly defined as the principles of arrangement of the constructions formed by the process of derivation and inflection (words) into longer constructions of various kinds.

Although this mentions the morphological process of affixation (derivational and inflectional), it actually defines syntax as "the principles of arrangement" of words "into longer constructions of various kinds." Exactly what these "principles of arrangement" are is not specified. The only other passage in the book that uses the term relates it to "the fixed order of morphemes in certain constructions" and their "definable degree of freedom", saying that this expresses "the systematic structure which is the real essence of speech" (p. 57).

> The fixed order of morphemes in certain constructions, and the definable degree of freedom, are basic to language. They are expressions of the systematic structure which is the real essence of speech. It is the business of linguistic science to describe these principles of arrangement in the most comprehensive and concise way possible. Such a description is the **grammar** of the language.

In essence then, these principles of arrangement are nothing more than "comprehensive and concise" descriptions of the linear order of morphemes in linguistic expressions. The focus of syntactic research is overt linguistic phenomena.

Even Chomsky's definition in *The Logical Structure of Linguistic Theory* (1955, henceforth *LSLT*), the manuscript that served as the basis for *SS*, which occurs in the first paragraph of the Preface (*Syntax is the study of linguistic form*), attends to phenomena—though the text itself is centrally concerned with underlying principles and processes. This central concern is mentioned in the same paragraph when Chomsky formulates the goal of syntactic investigation:

> …to show that the complexity of natural languages, which appears superficially to be so formidable, can be analyzed into simple components; that is, that this complexity is the result of repeated application of principles of sentence construction that are in themselves quite simple. (p. 57)

Nonetheless, at the end of this paragraph *LSLT* names "syntactic structure" as "the subject of investigation" in the following pages.

In contrast, the definition of syntax in *Syntactic Structures* focuses not on linguistic phenomena (e.g. the order of morphemes in the sentences of particular languages or linguistic form more generally), but rather on covert properties of language, "the principles and processes" that underlie these phenomena. This shift of focus creates the revolution in linguistics. Moreover, this was a scientific

revolution in the field precisely because, for the first time, it aligns linguistics in a fundamental way with the natural sciences, which seek to understand the hidden principles and processes that animate the physical world. This alignment has been a major project of the generative enterprise from its inception over sixty years ago.[1]

In *SS* this project is mentioned explicitly in a discussion of "the problem of justification of grammars", described as "a fundamental concern throughout". The solution in *SS* involves interpreting a grammar of a language to be a theory of that language—that is, a scientific theory. *SS* justifies this equation in the following passage on page 49 (the first sentence of which is cited in the commentary by Jeffrey Lidz (titled "The explanatory power of linguistic theory")):

> Any scientific theory is based on a finite number of observations, and it seeks to relate the observed phenomena and to predict new phenomena by

[1] As noted explicitly in the opening paragraph of Chomsky 1987. Identifying the sciences with the search for underlying principles occurs explicitly in Chomsky's brief retrospective comments, which refer to the argument against Phrase Structure Grammar based on "deficiencies of strong generative capacity (generating the right structures)" as well as deficiencies in "accounting for the properties of language in ways that meet the norms of the sciences, which seek deeper principles that explain what is observed" (identified as explanatory adequacy). Regrettably, there is no elaboration on what deeper principles are involved.

> constructing general laws in terms of hypothetical constructs such as (in physics, for example) "mass" and "electron." Similarly, a grammar of English is based on a finite corpus of utterances (observations), and it will contain certain grammatical rules (laws) stated in terms of the particular phonemes, phrases, etc., of English (hypothetical constructs).

And if a grammar is a scientific theory, then it follows that a general theory of linguistic structure (about "the general nature of Language" (*SS*, p. 14)), a theory of grammars, would also be a scientific theory—which is implied, but not stated, in *SS*.[2]

---

[2] As noted in the Berwick commentary, this point is made explicitly in the Robert Lees review of *SS* (1957). Berwick's commentary utilizes the following quotation from Feynman 1989 (reprinted from Feynman et. al. 1963) to illustrate how physics and linguistics are similar [the portion in italics is what Berwick quotes].

> Curiosity demands that we ask questions, that we try to put things together and try *to understand this multitude of aspects as perhaps resulting from the action of a relatively small number of elemental things and forces acting in an infinite variety of combinations*. (p. 53).

Although Berwick comments "one couldn't ask for a neater definition of what's now called the Minimalist Program", we might consider that Chomsky's comment in *LSLT* about the goal of syntactic investigation cited above (and which predates Feynman by several years) is actually a neater definition of not just the minimalist program, but of the whole enterprise from the beginning, and one that remains at the core of a more sharply focused minimalist program for linguistic theory. See Freidin & Lasnik 2011 for a discussion of how this program is rooted

in the linguistic theory that precedes it. For additional commentary on points of correspondence between linguistics under the minimalist program and theoretical physics, see Freidin & Vergnaud 2001.

The term *science* is mentioned twice more in *SS* (pp. 52-3) in a discussion of the relation between linguistic theory and grammars. *SS* adopts the view "that it is unreasonable to demand of linguistic theory that it provide anything more than a practical evaluation procedure for grammars," but cautions that "there are few areas of science in which one would seriously consider the possibility of developing a general, practical, mechanical method for choosing among several theories, each compatible with the available data." In the following paragraph *SS* notes that the qualification *practical* "is crucial for an empirical science."

Whether there are any areas of science (linguistics aside) that attempt to formulate evaluation procedures is not clear, but apparently physics is not one of these areas given Feynman's comments about alternative theories:

> …every theoretical physicist who is any good knows six or seven different theoretical representations for exactly the same physics. He knows that they are all equivalent, and that nobody is ever going to be able to decide which one is right at that level, but he keeps them in his head, hoping that they will give him different ideas for guessing. (Feynman 1965 (p. 168)).

This bears out the comment in *LSLT* that the requirement for an evaluation procedure is "much stronger than those imposed in natural sciences, where no one would seriously consider the possibility of a general, practical, mechanical method for deciding between two theories, each compatible with the available evidence" (p. 79).

SS addresses the justification problem by formulating "the criteria for selecting the correct grammar for each language, that is, the correct theory of this language", identifying two distinct kinds of selectional criteria for all grammars. One involves *external conditions of adequacy*: for example, "the sentences generated will have to be acceptable to the native speaker"[3]—a major part of the theory's empirical basis. The other constitutes a *condition of generality* requiring "that the grammar of a given language be constructed in accordance with a specific theory of linguistic structure in which such terms as "phoneme" and "phrase" are defined independently of any particular language." The two together provide both "a very strong test of adequacy for a general theory of linguistic structure and the set of grammars that it provides for particular languages" as well as a way to choose among the large number of grammars that would be compatible with a given corpus (p. 50).

The general theory of linguistic structure is what *SS* identifies as the ultimate goal of syntactic investigation, which is characterized in the first

---

[3] The quotation is from page 49, repeating the same point on page 13. There is, of course, much more to say about this criterion, which is the focus of Jon Sprouse's commentary (see below for further discussion). Jeffrey Lidz's commentary seems to limit external conditions of adequacy to predicted new phenomena, missing the point *SS* makes about acceptability for the native speaker, which would apply to both observed phenomena as well as predicted new phenomena.

paragraph of the first chapter as one "in which descriptive devices utilized in particular grammars are presented and studied abstractly, with no specific reference to particular languages".[4] Formulated in this way, the ultimate goal of syntactic research is a general theory of the principles and processes by which sentences are constructed, which follows naturally from the definition of *syntax* in *SS*.

None of the commentaries mentions the revolutionary definition of syntax that opens *SS*.[5] None of the reviews of *SS* when it was published did, either. Nor does any of the standard works on the history of modern linguistics (e.g. Newmeyer 1986; Matthews 1993, 2001) or the general surveys of Chomsky's work (e.g. McGilvray 2014; Smith & Allott 2016).

Only a few commentaries make substantive comments about the scientific nature of the generative enterprise, including those by Chomsky, Lasnik, and Berwick, and also the introduction by Norbert Hornstein, Howard Lasnik, Pritty Patel-Grosz, & Charles Yang.

---

[4] This important point is also cited at the beginning of Martina Wiltschko's commentary on syntactic variation (p. 429).

[5] Robert Berwick's commentary comes close in the last sentence, which states that generative grammar is the revolutionary new idea in *SS*. The Lidz commentary suggests that the introduction of transformations is "the most important analytic proposal in *Syntactic Structures*" (p. 237).

The Lasnik commentary (titled "*Syntactic Structures*: formal foundations") begins with the following statement: "Chomsky's 1955 *The Logical Structure of Linguistic Theory* laid out in great detail the formal foundations for a new way of looking at language scientifically"--noting in next sentence that "this awesome achievement was announced to the world in *Syntactic Structures*". This achievement as presented in *Syntactic Structures* excludes the formal foundations, but nonetheless does introduce "a new way of looking at language scientifically." That is, this new scientific approach to language is to some extent independent of specifying any formal foundations. As Chomsky notes in *LSLT* (p. 77):

> A grammar of a particular language can be considered, in what seems to me a perfectly good sense, to be a complete scientific theory of a particular subject matter, and if given in precise enough form, a formalized theory.

However, like any scientific theory, a grammar must be formulated with some precision, which *SS* justifies in the preface with the following comment (p. 5):

> The search for rigorous formulation in linguistics has a much more serious motivation than mere concern for logical niceties or the desire to purify well-established methods of linguistic analysis. Precisely constructed models for linguistic structure can play an important role, both negative and positive, in the process of discovery itself. By pushing a precise but inadequate formulation to an unacceptable conclusion, we can often expose the exact source of this inadequacy and, consequently, gain a deeper understanding of the linguistic data.

And as the preface goes on to point out, the results reported informally in *SS* are a product of the systematic application of "the method of rigorously stating a proposed theory and applying it strictly to linguistic material with no attempt to avoid unacceptable conclusions by *ad hoc* adjustments or loose formulation" (p. 5). Thus, the new way of looking at language scientifically involves the rigorous formulation of "the principles and processes by which sentences are constructed in particular languages".

The Berwick commentary (titled "Revolutionary new ideas appear infrequently") discusses the scientific nature of the enterprise set forth in *SS* in terms of the alignment of linguistics with the physical sciences.

> As with other physical sciences, SS sets out a primary object of inquiry, the Fundamental Question preoccupying generative grammar ever since: to demarcate and explain the shape of the space of possible human grammars, "since we are interested not only in particular languages, but also in the general nature of Language"—here deliberately with a capital "L", p. 14. (p. 177)

It goes on to identify "two big 'Fundamental Facts'": that a language user "can produce and understand an indefinite number of distinct sentences with different meanings" and that to do this, language users are projecting the infinite language from a finite corpus of utterances of their experience.

> Taken together, the Fundamental Question and explanations for the two corresponding "big facts" make up the scientific Big Game that transformational generative grammar hunts to this day, just like physics"

> search for a theory that will account for why we see this particular array of fundamental particles and not some other, "the actual nature of the system, not just its external manifestations" (Chomsky 2015:92). (pp. 177-178)

This characterization of the "Fundamental Question" misrepresents the discussion in *SS*, where there is no mention of possible grammars.[6] Rather, at the end of chapter 5 (The Limitations of Phrase Structure Description), *SS* constructs an analogy between a grammar and a chemical theory, where the latter is "concerned with the structurally possible compounds" whereas the former concerns "all grammatically "possible utterances" (p. 48).

The commentary by Hornstein et. al. concludes its discussion of the scientific nature of linguistics as developed in *SS* with the following comment: "so, perhaps the most important contribution of SS is that it launched the modern science of linguistics by arguing against discovery procedures (i.e.

---

[6] Note that linguistic theory formulated as an evaluation procedure selects a grammar from a group of candidate grammars (see the diagram on page 51 of *SS*), not a choice among all "possible" grammars. This does not preclude the possibility that the group of candidate grammars being evaluated excludes the correct grammar. In this regard, an evaluation procedure is significantly weaker than discovery or decision procedures. The notion *possible grammar* first occurs in *Aspects*. Given the enormous volume of Chomsky's work over the past six decades it is all too easy to conflate discussions that occur in later work with what is actually discussed in the earlier work.

methodological dualism)" (p. 127). Unfortunately, the statement is wrong on several levels.

First, equating discovery procedures with methodological dualism does not occur in *SS* because the monograph never mentions methodological dualism, which is defined in Chomsky 2000 (p. 76) as

> the view that we must abandon scientific rationality when we study humans "above the neck" (metaphorically speaking), becoming mystics in this unique domain, imposing arbitrary stipulations and a priori demands of a sort that would never be contemplated in the sciences, or in other ways departing from normal canons of inquiry.

Moreover, none of Chomsky's writings which mention methodological dualism (e.g. Chomsky 2000) also mention discovery procedures, let alone equate them.

Next, *SS* does not argue against discovery procedures—that is, against "a practical and mechanical method for actually constructing the grammar, given a corpus of utterances" (*SS*, pp. 50-51)—on the grounds that they are unscientific. The *SS* argument about discovery procedures is simply that they should not be the focus of linguistic theory. In footnote 8 on page 55, *SS* says this clearly and unequivocally.

> We are not, incidentally, denying the usefulness of even partially adequate discovery procedures. They may provide valuable hints to the practicing linguist or they may lead to a small set of grammars that can then be evaluated. Our main point is that a linguistic theory should not be identified

> with a manual of useful procedures, nor should it be expected to provide mechanical procedures for the discovery of grammars.

Furthermore, on page 59 *SS* states that the linguistic theory developed in its pages does not preclude the possibility of formulating "a practical discovery procedure":[7]

> We are not actually forced to give up hope of finding a practical discovery procedure by adopting either the view that levels are interdependent, or the conception of linguistic levels as abstract systems of representation related only by general rules. Nevertheless, I think it is unquestionable that opposition to mixing levels, as well as the idea that each level is literally constructed out of lower level elements, has its origin in the attempt to develop a discovery procedure for grammars. If we renounce this goal and if we distinguish clearly between a manual of suggestive and helpful procedures

---

[7] This point is reiterated in the summary chapter (p. 106):

> The theory of linguistic structure must be distinguished clearly from a manual of helpful procedures for the discovery of grammars, although such a manual will no doubt draw upon the results of linguistic theory, and the attempt to develop such a manual will probably (as it has in the past) contribute substantially to the formation of linguistic theory.

(Wiltschko's commentary quotes this sentence on page 429, but later on page 437 comes close to dismissing it by claiming that the shift in focus from discovery to evaluation procedures "means that we cannot use structuralist procedures".) Furthermore, *SS* acknowledges that there could be a mutually beneficial relationship between linguistic theory and discovery procedures where each contributes to the other.

> and a theory of linguistic structure, then there is little reason for maintaining either of these rather dubious positions.

So one argument against discovery procedures is that previous work where they were the sole focus of linguistic theory led to some demonstrably bad ideas like the prohibition against mixing levels of analysis. Even so, these ideas do not necessarily follow from pursuing the formulation of discovery procedures. Another argument against such procedures is formulated as a suspicion that any attempt to limit linguistic theory to them would "lead into a maze of more and more elaborate and complex analytic procedures that will fail to provide answers for many important questions about the nature of linguistic structure" (*SS* p. 52), which is a stronger argument to the extent that it can be substantiated. The strongest argument against them is simply the theory of grammar developed and elucidated in *SS*, which does not rely on them.

A further issue with the claim that the argument against discovery procedures is *SS*'s most important contribution to linguistic theory is that in *SS* no specific procedures are mentioned. The first mention of specific discovery procedures, identified as such in Chomsky's work, occurs in (Chomsky 1964), citing *segmentation and classification*, which are designated in Harris's *Methods Structural Linguistics* (1951), §20.22 (Operations of Analysis) as "the basic

operations".[8] Moreover, segmentation and classification are basic operations for syntactic analysis in generative grammar as well—just imagine investigating the syntax of any language without them. Recall that *SS* takes the position that discovery procedures should not be the focus of linguistic theory (see the first quotation in the previous paragraph), not that they are illegitimate and therefore must be dispensed with.

The commentary by Hornstein et. al. takes the abandonment of discovery procedures for grammars in favor of evaluation metrics for grammars to be an argument for "the legitimacy of theoretical linguistics", which it equates with "the legitimacy of normal scientific inquiry into language without methodological constrictions that would cripple physics were it applied" (p. 125). However, *SS* is clear that an approach based on discovery procedures is still a linguistic theory, hence theoretical linguistics (see again the quotation from the 1975 introduction to *LSLT* in footnote 8).

The "methodological restrictions" that Hornstein et. al.'s commentary is referring to concern the practice in structural linguistics of defining higher level

---

[8] The 1975 introduction to *LSLT* expands the list by referring to "a system of taxonomic procedures that can be applied to a corpus of data to determine a grammar, a system that incorporates principles of segmentation, substitution, classification, generalization, and analogy", which in "theories of structural linguistics" is provided by the linguist's methods (p. 12).

categories in terms of generalizations over lower level ones, e.g. phonemes in terms of phones, morphemes in terms of phonemes, and words in terms of morphemes. Such a practice is based on a theoretical principle which stands as a hypothesis about how languages are constructed (how linguistic form is organized). To some extent it seems pretty obvious that phonemes are defined in terms of the properties of phones; the phonetic form of morphemes, in terms of phonemes; and words, in terms of morphemes. What *SS* rejects about this practice is that with respect to the analysis of syntax, "there is little motivation for the objection to mixing levels, for the conception of higher-level elements as being literally constructed out of lower-level elements, or for the feeling that syntactic work is premature until all problems of phonemics or morphology are solved" (p. 106). In any case, how these (or analogous) restrictions would cripple physics is far from obvious.

The denunciation of discovery procedures in by Hornstein et. al.'s commentary misrepresents *SS* (and elsewhere in Chomsky's writings). The discussion of such procedures in *SS* is both interesting and important, but it is far from an outright repudiation or "the most important contribution of *SS*".[9] On the

[9] Note, however, that Mark Aronoff's commentary on English verbs in *SS* aligns with the commentary by Hornstein et. al. when it claims (in the final section) that "Chomsky's most lasting innovation in *SS* was to cast off the shackles by which Harris had so tightly bound distribution to discovery" (p. 395), clearly the result

contrary, a decade after the publication of *SS*, in lectures delivered at the University of California at Berkeley in 1967, Chomsky states unequivocally that the discussions of discovery procedures in structuralist linguistics were a major (perhaps the major) contribution to structuralist linguistics, among its other significant contributions.

> Structural linguistics has enormously broadened the scope of information available to us and has extended immeasurably the reliability of such data. It has shown that there are structural relations in language that can be studied abstractly. It has raised the precision of discourse about language to entirely new levels. But I think that its major contribution may prove to be one for which, paradoxically, it has been very severely criticized. I refer to the careful and serious attempt to construct "discovery procedures," those techniques of segmentation and classification to which Saussure referred. This attempt was a failure--I think that is now generally understood. It was a failure because such techniques are at best limited to the phenomena of surface structure and cannot, therefore, reveal the mechanisms that underlie the creative aspect of language use and the expression of semantic content. But what remains of fundamental

---

of the shift in focus to principles and processes. That is, the repudiation of discovery procedures as a focus for linguistic theory is a consequence of formulating what is arguably a better alternative.

> importance is that this attempt was directed to the basic question in the study of language, which was for the first time formulated in a clear and intelligible way. (*Language and Mind*, p. 22)

And furthermore, a quarter century later, the first formulation of a minimalist program for linguistic theory (Chomsky 1992) raises the possibility that the relation between data from a language, the theory of grammar, and a grammar of that language might in fact most resemble a discovery procedure. (See Freidin 1994 for discussion.)

§2.0 GRAMMAR AND GRAMMATICALITY

From the narrow perspective of a single language, these principles and processes as presented in *SS* constitute the grammar of the language, what is now understood to be the computational system that intersects with the lexicon of the language to generate the utterances of the language.[10] And from the narrower perspective of the utterances generated, *SS* proposes on page 13 the following (also quoted in the commentaries by Sprouse and Preminger):

> The fundamental aim in the linguistic analysis of a language L is to separate the *grammatical* sequences which are the sentences of L from the *ungrammatical* sequences which are not sentences of L and to study the structure of the grammatical sequences. The grammar of L will thus be a

[10] Note that in *SS* and *LSLT*, which preceded it, the lexicon was incorporated in the phrase structure rules of the grammar. This changes in Chomsky 1965, where the lexicon is separated from the phrase structure rule component.

> device that generates all of the grammatical sequences of L and none of the ungrammatical ones.

To avoid circularity in this definition of the grammar, *SS* imposes external conditions of adequacy, the one offered as an example in chapter 6 being "the sentences generated will have to be acceptable to the native speaker." Exactly how speaker acceptability operates as a proxy for grammaticality is complicated, as Jon Sprouse's thoughtful and thought-provoking commentary (titled "Acceptability judgements and grammaticality, prospects and challenges") demonstrates. Moreover, how the distinction between the two is understood has been fundamental to the thinking and practice of linguists (as illustrated in *SS* and the commentaries in this volume) precisely because it bears on the formulation of grammars. Based on extensive experimental work on acceptability judgments (much of it his own), Sprouse's commentary supports the conclusion that "the past 60 years have demonstrated that acceptability judgments are a robust, replicable, and reliable data type that appears to reveal deep information about the theory of grammar; but there is still much work to be done when it comes to using acceptability judgments (and any other relevant data types from psycholinguistics) to answer higher-level questions about the theory of grammar" (p. 196).

As Chomsky notes in his retrospective comments (titled "*Syntactic Structures*. Some retrospective comments"), the definition of a grammar as a

device that generates all and only the grammatical sentences of a language follows from defining a language as a set of sentences. However, the empirical question of what is a grammatical sentence is complicated by the issue of "levels of grammaticalness" mentioned in *SS* (p. 16, footnote 2) and discussed in more detail in *LSLT* and again in chapter 4, §1.1 of Chomsky 1965 (henceforth *Aspects*). Yet even before this footnote, the position taken in *SS* on pages 13-14 regarding the determination of grammatical sentences qualifies the external criterion of adequacy based on speaker acceptability.

> Notice that in order to set the aims of grammar significantly it is sufficient to assume partial knowledge of sentences and non-sentences. That is, we may assume for this discussion that certain sequences of phonemes are definitely sentences, and that certain other sequences are definitely non-sentences. In many intermediate cases we shall be prepared to let the grammar itself decide, when the grammar is set up in the simplest way so that it includes the clear sentences and excludes the clear non-sentences.[11]

Thus, a grammar is a device that generates the clear cases of sentences and none of the clear cases of non-sentences. Letting the grammar decide the intermediate cases introduces the Galilean style of the natural sciences into modern linguistics (see Chomsky 1980b, pp. 8-9 for discussion), where the formulation of a theory with a high degree of simplicity and clear empirical support is taken more

---

[11] The crucial last sentence of this quotation is also cited in Sprouse's commentary (§3.4).

seriously than mere observation statements about acceptability (see below for further discussion).

Chomsky's retrospective comments, which focus on "a good deal of misunderstanding of *SS*, from the outset," concern the issue of "grammaticalness" (a term invented for *SS* to indicate "a new technical concept"—see his footnote 8). What Chomsky says here (p. 133) essentially refutes the idea that a grammar is a device for generating only grammatical sentences:

> The considerations developed in *LSLT* imply that every expression, even word salad, can be assigned some interpretation, including deviant expressions.

Interpretations of linguistic expressions are assigned to a significant extent on the basis of their syntactic structure, and thus a grammar must be able to assign structure (and thus an interpretation) to deviant as well as nondeviant expressions. *Aspects* states this explicitly in the second footnote to chapter 4 on page 242: "A descriptively adequate grammar must assign to each string a structural description that indicates the manner of its deviation from strict well-formedness (if any)." Thus the fundamental aim of linguistic analysis of a language L is to assign syntactic structure to linguistic expressions in L, deviant as well as nondeviant, and to provide an explicit basis for this distinction to the extent that this is possible.

From this perspective, the basis for the nondeviant/deviant distinction cannot be "nongeneration" of deviant linguistic expressions. Therefore, Preminger's retrograde commentary (exuberantly titled "*Back to the future*: non-generation, filtration, and the heartbreak of interface-driven minimalism"), which argues for nongeneration and against conditions on representations (called "filtration"), is a nonstarter. Under the flag of nongeneration, Preminger cites the Ross island constraints (Ross 1967) as conditions on derivations that block the generation of deviant expressions. However, what is important about these island constraints (and Chomsky's subsequent Subjacency Condition, which unifies some of them) is the fact that they identify specific properties of syntactic structure that are ill-formed. Moreover, given a grammar "set up in the simplest way" (see the quotation from *SS* above)—that is, based on Merge, where displacement creates a single syntactic object with multiple contexts, conditions on derivations involving displacement are essentially equivalent to conditions on representations (filters).[12]

---

[12] See Freidin 1978, which demonstrates how the interpretation of Subjacency as a condition on representations contributes to deriving the empirical effects of the Strict Cycle Condition (Chomsky 1973) and thus subsuming a central condition on derivations under several independently motivated conditions on representations. See Freidin 2017 for an updated discussion.

Preminger presents his thesis in the following two sentences, which form the introduction to the commentary:

> This paper argues that the filtration-based approach to syntactic competence adopted in the context of minimalist syntax (Chomsky 1995[a], 2000, 2001), where freely-assembled syntactic outputs are filtered at the interfaces with the sensorimotor (SM) and conceptual-intentional (C-I) systems, is empirically wrong. The solution, I argue, is a return to a non-generation alternative, of the kind put forth in *Syntactic Structures* (Chomsky 1957).

Setting aside the problem with a non-generation approach discussed above, there is a further difficulty with the contention that a general approach to syntactic theory "is empirically wrong" based on the description of a few examples from unfamiliar languages. Consider in this regard Chomsky's comments on refutation in "On binding" (1980a, p. 2):

> The task for linguistic theory is to discover the true nature of the biological endowment that specifies the general structure of the language faculty. It is a good research strategy to try to design a linguistic theory that permits a close approach to the absolute limit set by obvious idiosyncrasies; for example, a linguistic theory that permits the particular grammar of English to stipulate only that *each other* is a reciprocal phrase, that *want+to* undergoes optional contraction, etc. Such a strategy may overshoot the mark by underestimating the idiosyncrasy of particular languages. Investigation of a variety of languages offers a corrective; in principle, there are others, but limitations on human experimentation make them difficult to pursue. But it must be kept in mind that superficial study of a language is rarely informative, and becomes less so as linguistic theory begins to achieve a degree of deductive structure

> and abstractness. It has often been found in the better-studied languages that apparent idiosyncrasies or exceptions to proposed general principles disappear upon deeper investigation. Furthermore, linguistic principles of any real significance generally deal with properties of rule systems, not observed phenomena, and can thus be confirmed or refuted only indirectly through the construction of grammars, a task that goes well beyond even substantial accumulation and organization of observations.

In Preminger's commentary, the phenomena cited involve verb agreement phenomena in K"ichean and accusative Case marking in Sakha. One possibility, given Chomsky's comments, is that these phenomena involve idiosyncrasies which therefore must be stipulated. The other would be that the investigation is at a superficial level. Preminger's argument against filters is that these phenomena cannot be accounted for under a strong minimalist thesis where they would have to be explained in terms of interface conditions external to grammar. But even granting Preminger's skepticism about the formulation of such conditions (see also Freidin 2016a), at best the evidence shows that filters do not account for it—not that conditions on representations are "empirically wrong".

The continuation of the passage from "On binding" also applies to Preminger's commentary.

> If some remarkable flash of insight were suddenly to yield the absolutely true theory of universal grammar (or English, etc.), there is no doubt that it would at once be "refuted" by innumerable observations from a wide range of languages. One reason is that we have little a priori insight into the

> demarcation of relevant facts—that is, into the question of which phenomena bear specifically on the structure of the language faculty in its initial or mature state as distinct from other faculties of mind or external factors that interact with grammar (in the broadest sense) to produce the data directly presented to the investigator. For another reason, the particular data may be misconstrued in the context of inadequate grammars.

Putting aside the question of whether Preminger's phenomena are indeed "relevant facts" bearing on the language faculty, consider the other possibility that the data have been misconstrued.

Preminger cites the following as the crucial evidence that a minimalist approach based on interface conditions "is empirically inadequate" (p. 370, his numbering).

(23) a. *Sardaana **Aisen**–***(y)** beqehee* [*bügün* **t** *kel-er dien*] *ihit-te*
Sardaana Aisen yesterday today come–AOR Comp hear–PAST.3
'sardaana heard yesterday that Aisen is coming today.'

b. *Sardaana beqehee* [*bügün **Aisen**–**(*y)** kel-er dien*] *ihit-te*
'sardaana heard yesterday that Aisen is coming today.'

(23a) is described as showing obligatory accusative case on the raised subject of a subordinate clause. (23b) establishes that the subordinate clause subject cannot be marked for accusative case in the subordinate clause, as would be expected. Given that the two examples have the same interpretation, it appears that this instance of raising is optional (unlike the displacement phenomena that are

usually attributed to the Case Filter or its successors in minimalist analyses)—which suggests that this phenomenon is simply orthogonal to the Case Filter (for some background see Freidin 2016b), including the further examples Preminger cites showing that even in single clauses the accusative affix is obligatory when the object of verb is adjacent to the subject, but not when another constituent intervenes. These further examples demonstrate that what is being called accusative case in Sakha does not behave like accusative case in more familiar case languages like Russian, raising the possibility that what is being called the accusative case affix either constitutes an idiosyncrasy of Sakha or is something other than a case affix. Further evidence of idiosyncrasy comes from Preminger's formulation of the conditions under which accusative case can be assigned: the nominal/DP must be marked accusative when it occurs in a local domain with a c-commanding caseless nominal/DP. The caseless requirement on the c-commanding element is distinctly odd. Perhaps an alternative where the nominal/DP follows one marked nominative would be less peculiar.

Preminger does not present a precise analysis of the syntactic structure of these examples or how these structures are derived by the principles and processes of Sakha grammar. His informal analysis of the Sakha data is based on unstated theoretical assumptions. His argument against the Case Filter doesn't address the obvious question: if the Case Filter is discarded, what is the analysis of the phenomena that it appeared to explain? Preminger's answer would seem to be to

formulate language specific rules that generate only the "grammatical" expressions of the language. One problem for this solution is that the notion "grammatical"—even in the context of *SS*—is complicated (see the previous discussion and below), making nongeneration a problematic solution. Another is that such a solution would require reintroducing the optional/obligatory distinction in the formulation of rules, thereby complicating the theory.

Apropos of Preminger's commentary, the comments on refutation in "On binding" continue with the following good advice,:

> In short, linguistics would perhaps profit by taking to heart a familiar lesson of the natural sciences. Apparent counterexamples and unexplained phenomena should be carefully noted, but it is often rational to put them aside pending further study when principles of a certain degree of explanatory power are at stake. How to make such judgments is not at all obvious; there are no clear criteria for doing so. But as the subject progresses there will come a time—perhaps it has already come—when such moves are quite reasonable. Just as in the sciences that are incomparably more advanced, we can expect with confidence that any theory that will be conceived in the foreseeable future will at best account for some subdomain of phenomena, for reasons that will be unexplained pending further insights. It is a near certainty that any theoretical framework for particular or universal grammar that can be advanced today, or for a long time to come, will be wrong at least in part, or perhaps entirely misdirected. This is true of any effort that goes beyond taxonomy. But this contingency of rational inquiry should be no more disturbing in the study of language than it is in the natural sciences.

The empirical evidence Preminger cites is described informally and partially, but not explained as following from general principles. And whether it constitutes a counterexample to the Case Filter is questionable. Therefore, the interpretation of this evidence as an empirical refutation of conditions on representations is neither plausible nor convincing.

Nonetheless, Preminger's morphosyntactic investigations in the commentary and especially his 2014 monograph raise important questions about how such phenomena fit into a general theory of linguistic structure. And despite the failure of empirical arguments against conditions on representations based on these phenomena, it could turn out that best account is reduced to statements of language particular obligatory morphosyntactic operations of the sort Preminger proposes.

Even within the context of *SS*, nongeneration is clearly a more complicated issue than whether any given linguistic expression is generated by the phrase structure rules and transformations of the grammar. Taken at face value, nongeneration only tells us <u>that</u> some expression (string of words) is not generated by the grammar—in which case, all such expressions are equally deviant. This interpretation is ruled out in *SS* with the notion "levels of grammaticalness", which Chomsky exemplifies in his commentary with the distinction between ECP and Subjacency violations. It's also ruled out if the source of deviance in expressions not generated by the grammar is identified as a violation of specific

rules—rules assigning syntactic structure to these expressions, in which case the problem is with the syntactic structure (representation) of deviant expressions, not that some string of lexical items of the language is not generated by the grammar.

SS (p. 16, footnote 2) exemplifies levels of grammaticalness by comparing (1), the most famous sentence of the monograph (perhaps the entire literature of generative grammar, as noted in the first paragraph of Berwick's commentary), with (2), the words of (1) in reverse order.

(1) Colorless green ideas sleep furiously.

(2) Furiously sleep ideas green colorless.

SS claims that the two "are equally nonsensical, but any speaker of English will recognize that only the former is grammatical" (p. 15).[13] Chomsky's commentary recapitulates the analysis in *LSLT* (p. 146, and also cited in Berwick's commentary) that the grammaticalness of (1) as opposed to (2) is based on "the category sequence AANVD (D = adverb)" for which there are "many grammatical instantiations", for example *revolutionary new ideas occur infrequently* (Berwick's title). Consider also (retaining the verb *sleep*) *colorful*

---

[13] Heidi Harley's commentary "Kernel sentences, phrase structure grammars, and theta roles" quotes this passage from *SS* and appends the comment "and thence follows, ultimately, the autonomy of grammar" (p. 243). See below for a detailed interpretation of "autonomy" and what "ultimately" means in this context.

green parrots sleep fitfully, or (retaining the adverb *furiously*) *colorful green parrots squawk furiously*.

The grammaticalness of (1) derives not only from the fact that its category sequence is identical with other unquestionably grammatical sentences of English, but also from the fact that its hierarchical structure matches that of those other sentences. Thus *colorless green ideas* is understood as a syntactic unit that combines with another syntactic unit *sleep furiously* to form a sentence in which the former constitutes the subject of *sleep* and the latter, the predicate of the sentence in which the manner adverb *furiously* modifies the verb—regardless of the clear infelicities between subject/verb (*ideas sleep*) and verb/adverb (*sleep furiously*). Therefore, (1) is understood in the same way those unquestionably grammatical sentences are.[14]

In contrast, the sequence of categories in (2) does not appear to match other unquestionably grammatical sentences of English. However, if the mechanism

---

[14] *SS* illustrates this notion with the following pair on page 86, pointing out that while they are distinct on the phonemic and morphemic levels, they share the identical representation on the level of phrase structure:
(1) John played tennis.
(2) My friend likes music.
Having the same phrase structure representation explains why "it is evident in some sense that they are similarly understood." This demonstrates the importance of hierarchical structure as a basis for understanding sentences.

that generates hierarchical structure is distinct from the one that creates linear order (as assumed in current syntactic theorizing), then (1) and (2) could have the same hierarchical structure prior to linearization (as will any pair of sentences where one contains the same words in the reverse order). Nonetheless, (1) and (2) are not understood in the same way, demonstrating that linear order plays a crucial role in understanding sentences. Yet in the case of *furiously sleep* in contrast to *sleep furiously*, both sequences are possible in verb phrases so that the first two words could be understood/read as a verb phrase—contradicting the claim in *SS* (and repeated in Berwick's commentary) that (2) will be read with falling intonation on each word.[15]

SS introduces the pair (1) and (2) to demonstrate "the independence of grammar", the title of the chapter. The issue under discussion is the basis for the distinction between grammatical and ungrammatical sentences, and thus the definition of the notion *grammatical*. *SS* uses the contrast between (1) and (2) to argue that *grammatical* "cannot be identified with "meaningful" or "significant" in any semantic sense" (p. 15), nor the notion "grammatical in English" with "the

---

[15] As for the postposed subject *ideas green colorless*, one could imagine the two adjectives as asyndetically coordinated in a reduced relative clause (~~*which are*~~ *green, colorless*)—farfetched but still possible.

notion "high order of statistical approximation to English"" (p. 16).[16] Berwick's commentary, which goes into great detail about the statistical/probabilistic analysis of the two sentences on which the *SS* conclusion is based, concludes that the best a statistical analysis of (1) vs. (2) can provide is that English speakers are 200,000 times more likely to say (1) than (2)—"But that's it, and it's not nearly enough" (p. 190). The problem with statistical analyses, as the commentary concludes, is that they do not address the underlying capacity for human language. The reason for this, which Berwick's commentary doesn't mention, is that statistical analyses of language say nothing about the syntactic structure of the sentences whose probabilities of occurrence they calculate.

§3.0 THE AUTONOMY OF SYNTAX

The distinction between (1) and (2) provides evidence that the grammatical status of an expression cannot be defined in terms of either "order of statistical approximation to texts" or "a semantic property of "meaningfulness"" (Chomsky's commentary, p. 131). From this follows the suggestion that grammar is somehow autonomous. The final sentence on page 17 in the chapter on the

---

[16] Chomsky's commentary cites this latter quotation as the source of one misunderstanding about *SS* that it "rejects statistical/probabilistic approaches to the study of language", a claim that ignores the acknowledgement in *SS* (p.17) of "the undeniable interest and importance of semantic and statistical studies of language".

independence of grammar (which introduces (1-2)) is the only one in *SS* that contains the word *autonomous*:

> I think that we are forced to conclude that grammar is autonomous and independent of meaning, and that probabilistic models give no particular insight into some of the basic problems of syntactic structure. [footnote omitted]

On page 100, *SS* makes another important related comment:

> It is, of course, impossible to prove that semantic notions are of no use in grammar, just as it is impossible to prove the irrelevance of any other given set of notions. Investigation of such proposals, however, invariably seems to lead to the conclusion that only a purely formal basis can provide a firm and productive foundation for the construction of grammatical theory.

The first quotation is the source of what became known as "the autonomy of syntax", the subject and title of David Adger's commentary, in which he discusses some of the details involving the analysis of (1-2). This notion is mentioned also in the commentaries by Hornstein et. al., Heidi Harley (titled "Kernel sentences, phrase structure grammars, and theta roles") and Gillian Ramchand (titled "Grammatical vs. lexical formatives"), but these statements from *SS* are neither quoted nor cited in any of them. There is only one paper in which Chomsky

formulates a thesis of the autonomy of syntax, "Questions of Form and Interpretation" (1975b), again which none of the commentaries reference.[17]

Chomsky (1975b) formulates a thesis of "absolute autonomy of formal grammar" in which the representations of "all linguistic levels apart from semantics" are formulated on the basis of formal as opposed to semantic concepts, where "such notions as 'synonymous' 'denotes' 'satisfies' 'refers to concrete objects'" are identified as "core notions of semantics" (p. 91)). Thus formal grammar includes phonology and morphology as well as syntax, and therefore the interfaces between them. As elaborated in Chomsky (1982, p. 114), this includes syntactic representations of "logical form" generated by "completely formal rules" like quantifier movement and binding conditions.

In conversation with the French linguist Mitsou Ronat (Chomsky 1977, English translation 1979), Chomsky remarks:

> I think, in fact, that the thesis of the autonomy of syntax, in the form proposed in the fifties and since then, is probably correct. However, I have always explicitly denied and rejected a totally different position which has often been attributed to me: namely, that the study of meaning and reference

---

[17] Inexplicably in the case of Adger's commentary, because he obviously was aware of the paper when he mentioned it in response to a blogpost by Norbert Hornstein on January 27, 2017 (http://facultyoflanguage.blogspot.com/2017/01/on-syntactic-structures.html), a preliminary version of the introduction that appears in this volume.

> and of the use of language should be excluded from the field of linguistics. (p. 139)[18]

The autonomy thesis is actually the null hypothesis for a formal grammar: the principles and processes that are the focus of the study of syntax (broadly construed to include phonology and morphology as the grammar developed in *SS* illustrates) are formulated without reference to core notions of semantics or statistics—which has been true of Chomsky's work from the beginning.

This interpretation is implicit in *SS*, never explicitly stated because the focus of the discussion about the independence of grammar is on what looks like a purely empirical issue (hence an external condition of adequacy for grammars), the distinction between grammatical and ungrammatical sentences as reflected by speaker judgments about acceptability. It becomes the obvious interpretation when we shift our attention to the major topic of *SS*, the syntactic structure of language (as the title of the monograph announces), about which a grammar and the theory of grammar provide some insight and understanding.

Both Adger's and Ramchand's commentaries claim that "the autonomy of syntax" has been misunderstood. Ironically, this seems to be true for three of the four commentaries that mention the thesis (see also footnote 13 above).

---

[18] The comment goes on to talk about how "the problem of semantic interpretation of formal systems" plays a central role in both *SS* and *LSLT*. See below for further discussion.

Adger's commentary on the topic states in the second paragraph (p. 153):

> This idea of the autonomy of syntax is fundamental to the generative perspective on language, but is often misunderstood. It does not entail that grammaticality is cut off from either probability or meaning. Rather it says that syntax cannot be reduced to either of these.[19]

What *SS* argues is that grammaticalness cannot be explained on the basis of meaning or probability of occurrence. *SS* never entertains the totally implausible idea (especially in the context of the monograph) that "syntax" could somehow be reduced to semantics or statistics. This issue is whether either of these must be

---

[19] §2 of Adger's commentary on grammaticality and probability reprises the discussion from *SS* and incorporates discussion of more recent work that attempts to incorporate probabilistic models in syntactic analysis (e.g. Pereira (2000), and Lappin & Schieber (2007))—also discussed in Berwick's commentary, concluding that sequences of words augmented with probabilistic information cannot provide a basis for determining grammaticalness. §3 of the commentary on grammaticality and meaning, aside from reviewing the commentary in *SS*, is more about the semantic interpretation of syntactic structures, which the autonomy thesis (on Adger's interpretation or the one developed in this article) says nothing about. The fourth and final section of Adger's commentary, titled "(Some) semantics supervenes on syntax", purports to formulate a 'second autonomy thesis" concerning "co-optable concepts" (p. 172), thus engaging the relation between language and thought and therefore having virtually no connection with the autonomy thesis introduced in *SS* and discussed by Chomsky in subsequent work, including the Minimalist Program.

incorporated into the principles and processes by which sentences are constructed in particular languages. The grammar of English developed in chapters 4–8 demonstrates that neither is a necessary ingredient. Adger refers to this as a further argument for the autonomy thesis "based on analytic success"; it constitutes an empirical demonstration that supports the thesis of autonomy of formal grammar discussed above.

The introductory commentary by the editors of the volume attempts to link the autonomy of syntax thesis with the rejection of discovery procedures in the following passage:

> … if discovery procedures fail methodologically, then this strongly suggests that they will also fail as theories of linguistic mental structures. Syntax, for example, is not *reducible* to properties of sound and/or meaning despite its having observable consequences for both. In other words, the Autonomy of Syntax thesis is just a step away from the rejection of discovery procedures.

Like Adger's commentary, this passage interprets the thesis as a denial of a possible reduction of syntax to meaning (whatever this is supposed to mean), a possibility that is never mentioned in *SS*. Adding the reduction of syntax to "properties of sound" to the denial is new, possibly unique, to the discussion of the thesis, but again not a topic raised in *SS* (or any of Chomsky's writings). In spite of the claim in the final sentence, it is not clear how the rejection of discovery procedures leads to the autonomy thesis (or vice versa, given that "a step away" doesn't specify in which direction).

Gillian Ramchand's commentary about a distinction between "Grammatical vs. Lexical Formatives" (the title) begins with both the observation that such a distinction is absent in *SS* and the claim that to understand the *SS* position, which "is a serious candidate for actually being right", "it is necessary to understand Chomsky's position on the autonomy of syntax and on the relationship between syntax and semantics, both of which I would claim have been misunderstood in various ways, both by adherents and detractors" (p. 284). §2.2, titled "Meaning and Autonomy of Syntax", interprets the position on "meaning" in *SS* "as a claim about external signification" (p. 286), defined as "one kind of meaning that involves a conventional association to some aspect of the world, or our cognitive reality" (p. 285). "External signification" is contrasted with a second kind of meaning, "relational signification", defined as providing "the interpretational glue between signs" (p. 285). With this distinction, the autonomy syntax thesis is stated as "external signification simply does not bear on the functioning of the grammar *qua* system" (p. 286). Given the discussion of autonomy in *SS*, Chomsky (1975b), and the paragraphs above, it is Ramchand's interpretation that seriously misunderstands the thesis.

§3.1 *The syntax/semantics interface: constructional homonymity*

Under the interpretation of the autonomy of syntax thesis as a limitation on the formulation of the principles and processes that define syntax, the interface between syntax and semantics remains an open question and an important area of

research in linguistics. That is, the autonomy thesis does not, and never has, denied the obvious connection between syntax and semantics. Consider, the final sentences of the final summary chapter of *SS* (part of which are also quoted in the Adger commentary on page 167):

> In other words, one result of the formal study of grammatical structure is that a syntactic framework is brought to light which can support semantic analysis. Description of meaning can profitably refer to this underlying syntactic framework, although systematic semantic considerations are apparently not helpful in determining it in the first place. The notion of "structural meaning" as opposed to "lexical meaning", however, appears to be quite suspect, and it is questionable that the grammatical devices available in language are used consistently enough so that meaning can be assigned to them directly. Nevertheless, we do find many important correlations quite naturally, between syntactic structure and meaning; or, to put it differently, we find that the grammatical devices are used quite systematically. These correlations could form part of the subject matter for a more general theory of language concerned with syntax and semantics and their points of connection. (p. 108)

In *SS* semantic interpretation provides an important external condition of adequacy for grammars (one that may be more straightforward and less problematic than native speaker judgments about grammaticalness). This is first mentioned in *LSLT* (p. 101) and articulated in Chomsky 1956 (p. 118):

> One way to test the adequacy of a grammar is by determining whether or not the cases of constructional homonymity are actually cases of semantic ambiguity …

to which *SS* adds (p. 86):

> and each case of the proper kind of ambiguity is actually a case of constructional homonymity

with a footnote that discounts "the referential ambiguity of "son"-"sun", "light" (in color, weight), etc." (where the phonetic form of a lexical item has multiple interpretations)—i.e. lexical ambiguity.

The term *constructional homonymity*, which was introduced in *LSLT* and disappeared from use after *SS* (but is now resurrected in three of the commentaries (Hornstein et. al., Lidz, and Pietroski), names a linguistic phenomenon where "a certain phoneme sequence is analyzed in more than one way on some level [of analysis]" (*SS*, p. 86). The first example cited (on the previous page) concerns the dual representation of the sequence /əneym/ on the morphological level as either *an aim* or *a name* (the analysis quoted in the Pietroski commentary (titled "Meanings via *Syntactic Structures*") and recapitulated in the Lidz commentary). This example is interpreted in *SS* as an argument for establishing a level of morphology.[20] Two pages later, *SS* cites *old men and women* and *they are flying planes* as examples that

---

[20] In fact, this example can be interpreted as an argument for a level of syllable structure (without reference to morphology), where if the alveolar nasal /n/ functions as the coda of the first syllable we have unambiguously *an*, and if it functions as the onset of the second syllable then we have *name*.

motivate “a level of phrase structure”, an analysis that *SS* later drops (see footnote 23 below).

The first paragraph of the Lidz commentary offers (3) as examples of constructional homonymity at the phrase structure level, apparently crediting *SS* (improperly because neither example occurs in Chomsky’s monograph nor in his other two works that use the term).

(3) a. I saw the man with the telescope.

b. I hiked with the snowshoes.

(3a-b), however, are not examples of constructional homonymity according to footnote 1 on page 86 of *SS*. When the PP *with the telescope* in (3a) merges with *man*, forming a NP, *with* is interpreted as indicating possession; whereas when the PP merges with the VP *saw the man*, it modifies the verb *saw* and can only be interpreted as indicating instrumentality.[21] In §2, titled “Constructional

---

[21] A variant (*The boy saw the man with binoculars*) shows up in Berwick, Pietroski, Yankama, & Chomsky (2011), an article cited in the commentaries by Hornstein et. al. and Pietroski, where the ambiguity of *with* is noted, but the term *constructional homonymity* is not used. The Pietroski commentary, however, cites— incorrectly—similar examples (*referred to a star with a name* and *saw a teacher with a telescope*) as examples of constructional homonymity. The commentary by Hornstein et. al. claims that the Berwick et. al. article demonstrates that “facts about constructional homonymity are still relevant to “debates” about structure dependence and the poverty of the stimulus”—

homonymity and the poverty of the stimulus" the commentary tries to link the two topics in terms of the distribution of reflexive pronouns in English using the contrast between (4) and (5).

(4) a. Norbert remembered that Ellen painted a picture of herself.

b. *Norbert remembered that Ellen painted a picture of himself.

(5) a. Norbert remembered which picture of herself Ellen painted.

b. Norbert remembered which picture of himself Ellen painted.

The claim is that the sentences in (5) "have one phonological, morphological, and phrase structure analysis yet we have two interpretations" (p. 227)—which is simply false because one sentence contains *herself* where the other contains *himself*. Change *Norbert* to *Susan* and the quotation would apply. However, neither (5a) nor (5b) is a case of constructional homonymity, although the contrast between the deviant (4b) and the non-deviant (4a) and (5a-b) constitutes a poverty of the stimulus puzzle. The remainder of the commentary discusses a solution to the puzzle based on the predicate internal subject hypothesis (Huang 1993), linking the discussion more broadly to the issue of language acquisition.

---

incorrectly, given that there are no examples of constructional homonymity cited in that article.

SS employs constructional homonymity to motivate transformational analysis on the basis of the following three examples (discussed in the commentaries by Hornstein et. al., Lidz, and Harley):

(6) the shooting of the hunters

(7) the growling of lions

(8) the raising of flowers

(6) has two possible interpretations, corresponding to the clause *the hunters shoot* or the predicate *shoot the hunters*. In contrast, (7) and (8) have only one interpretation each, (7) corresponding to the clause *lions growl* and (8) corresponding to the predicate *raise flowers*. Significantly, (7) does not have an interpretation corresponding to the predicate *growl lions* and (8) does not have an interpretation corresponding to the clause *flowers raise* ostensibly because both of these corresponding linguistic expressions are semantically anomalous.

SS claims that because all of the phrases in (6-8) have the same representation at the level of phrase structure, given as (9)[22]

(9) *the – V + ing – of + NP*,

---

[22] In *LSLT*, *of + NP* is identified as a PP, but *SS* does not specify the hierarchical structure of this string.

(6) exemplifies an "ambiguity with a transformational origin" (p. 88).[23] The transformational analysis of (6-8) depends not only on the existence of

[23] In footnote 2 on page 87, *SS* suggests that *they are flying planes* is actually "an example of transformational ambiguity", claiming "in fact, it is not clear that there are any cases of constructional homonymity purely within the level of phrase structure once a transformational grammar is developed." While no details are provided, the general outline of the analysis is clear. On one interpretation, *flying planes* is a VP; on the other, it is a NP (as noted in *LSLT*, p. 101). Thus *flying* is either the main verb of a clause that takes *planes* as its object or the modifier of the noun *planes*. The NP interpretation can also be expressed with a relative clause, *planes which are flying*, where *flying* is an intransitive main verb (which raises a question of whether the ambiguity involved is lexical rather than strictly syntactic). If the NP *flying planes* is derived transformationally from *planes which are flying*, then the derivation involves a generalized transformation that embeds *planes are flying* as a relative clause modifying *planes* in *they are planes*. Thus *they are flying planes* can have two different transformational derivations, which presumably accounts for the ambiguity. A similar argument can be made for *old men and women*, the other case cited in the discussion, if all coordinate structures are derived via generalized transformations (see §4). However, while it is true that the phrase structure rules of the grammar will not, under this analysis, provide distinct phrase structure representations for these cases, nonetheless it seems reasonable to assume that the grammar will ultimately provide phrase structure representations for the output of transformations—representations that capture constructional homonymity in terms of phrase structure. See §4 for further comments on derived constituent structure.

transformations that generate these expressions, but also on the impossibility of generating them with only phrase structure rules. The second requirement is satisfied in early transformational grammar by the division of sentences of a language into two classes: *kernel sentences* that are generated by the phrase structure rules along with the *obligatory* transformations of the grammar versus *nonkernel sentences* that are generated by the application of additional *optional* transformations (discussed in the commentaries by Hornstein et.al., Adger, Lidz,

---

SS attempts to construct a further motivation for a level of transformational structure on the basis of the difference in interpretation between the two sentences *the picture was painted by a new technique* vs. *the picture was painted by a real artist* ((113) in *SS*, p. 89). The claim is that at the level of phrase structure both sentences have the same representation whereas they have distinct transformational histories which then account for their different interpretations. In this case, both undergo the passive transformation. Where they differ is that the first also undergoes a transformation that deletes the passive *by*-phrase created by the passive transformation. There is perhaps a simpler approach to the difference in interpretation: the lexical ambiguity of *by*. In *by a real artist*, *by* is agentive (its object is interpreted as the agent of the verb). In contrast, this interpretation is not possible in *by a new technique* as demonstrated by the anomaly of *#a new technique painted the picture*. The preposition *by* in this case is interpreted as "by means of" along the lines of instrumentality. *SS* cites *John was frightened by the new methods* as an example where *the new methods* can be interpreted ambiguously as either an agent or an instrument. See the Pietroski commentary for further discussion of this particular example.

Harley, Pietroski, and Artemis Alexiadou, Elena Anagnostopoulou & Florian Schäfer (titled "Passive"). *SS* claims that removing (6-8) from the kernel results in a simplification of the grammar of English. Whether this is true really depends on the details of the transformational analysis, only sketched in *SS* (but see *LSLT* for a more detailed presentation).

The analysis of these phrases in *SS* assumes two distinct transformations, "the first of these will carry "lions growl" into "the growling of lions," and the second will carry "John raises flowers" into "the raising of flowers"". Because *hunters* can occur as either the subject or object of *shoot*, there will be two different transformational derivations for (6), one that parallels (7) and another that parallels (8). These transformational derivations are expressed as "transformation markers" (T-markers) on a par with a phrase-marker, which specifies the phrase structure of a sentence (or more precisely, the phrase structure of a sentence that is generated by the phrase structure rules of the grammar). Thus at the level of transformations, (6) can have two different T-markers—thus a case of constructional homonymity at the level of transformations.

Whether this analysis of (6-8) actually simplifies the grammar of English seems questionable.[24] The transformational analysis itself is complicated. While *SS* states that these transformations "will be designed in such a way that the result is an

---

[24] See footnote 26 below for an alternative analysis of the ambiguity of (6).

NP" (p. 88), the footnote to this comment points out that this transformational operation is actually a subpart of a *generalized* transformation, which essentially combines two distinct kernel sentences. For example, *lions growl* and *it scares us* would be transformed into *the growling of lions scares us*. Thus, this grammatical transformation which produces (6-8) not only maps a clause onto a NP, but also in the same operation substitutes this NP for an NP in another clause.

The transformational analysis of (6-8), which is motivated primarily in terms of meaning, confronts the famous warning in *SS*, the first two sentences of the second paragraph of chapter 9 "Syntax and Semantics":

> In proposing that syntactic structure can provide a certain insight into problems of meaning and understanding we have entered onto dangerous ground. There is no aspect of linguistic study more subject to confusion and more in need of clear and careful formulation than that which deals with the points of connection between syntax and semantics. (p. 92)

The solution to this situation that *SS* proposes is to focus on "the real question that should be asked", namely "How are the syntactic devices available in a given language put to work in the actual use of this language?". The *SS* analysis of (6) as an example of constructional homonymity at the transformational level is an attempt to answer this question where a similarity in meaning between two expressions (e.g. *lions growl* and *the growling of lions*) could be accounted for with a transformation that linked one to the other derivationally—an answer that has not survived. Nonetheless, the suggestion at the end of the introductory

chapter in *SS* "that this purely formal investigation of the structure of language has certain interesting implications for semantic studies" (p. 12) has been and continues to be borne out as the commentaries by Lidz, Adger, Ramchand, and Pietroski demonstrate.

At the end of chapter 8, *SS* attempts to motivate transformational analysis on the basis of "sentences which are understood in a similar manner" even though they have different phrase structure and phonetic representations. The issue under discussion is the relation between sentence types: declarative vs. interrogative (*yes*/*no* question vs. *wh*-question), which *SS* exemplifies with the following four sentences.

(10) a. John ate an apple

b. did John eat an apple

c. what did John eat

d. who ate an apple

The transformational analysis of *SS* accounts for the relation between these sentences, and thus the similar manner in which they are understood, by deriving (b-d) from the underlying structure of (a).

SS summarizes the motivation for a transformational level of representation based on considerations of meaning and understanding at the beginning of chapter 9 (Syntax and Semantics):

> We have now found cases of sentences that are understood in more than one way and are ambiguously represented on the transformational level (though not on other levels) and cases of sentences that are understood in a similar manner and are similarly represented on the transformational level alone. This gives an independent justification and motivation for description of language in terms of transformational structure, and for the establishment of transformational representation as a linguistic level with the same fundamental character as other levels. Furthermore it adds force to the suggestion that the process of "understanding a sentence" can be explained in part in terms of the notion of linguistic level. (p. 91)

Unfortunately, none of this is built on solid ground, as subsequent developments in syntactic theory have demonstrated.

The concept of a transformational level of analysis is eliminated from syntactic theory in *Aspects*, which removes the somewhat arbitrary restriction against clausal recursion in phrase structure rules and imposes the cyclic application of transformations in derivations.[25] With clausal recursion in phrase

---

[25] As Lasnik notes in his commentary (p. 140):

> Chomsky (1965) claimed, contrary to his position in LSLT, that the theory of transformational grammar is simplified by allowing recursion in the Σ, F component, the simplification being that the notion "generalized transformation" is eliminated entirely, at no apparent cost.

See Freidin 2017 for a detailed analysis of the cyclic principle and its history. As noted in that article, the cycle in syntax is essentially a generalization of the cyclic principle for phonology proposed in Chomsky, Halle & Lukoff 1956.

structure rules, the motivation for both generalized transformations (which combine kernel sentences to form complex sentences and coordinate constructions) and T-markers collapses—along with the distinction between kernel and nonkernel sentences. These changes, which *Aspects* designated as a simplification of the theory, undermine the *SS* analysis of (6-8) as a case of constructional homonymity.[26] And to the extent that all cases of constructional homonymity are instances of "transformational ambiguity", the concept of constructional homonymity can no longer be formulated (which might account for why it disappears from the discussion around 1964).

And like the notion of "transformational ambiguity", the transformational relatedness of sentence types has also vanished in current syntactic theory. For instance, *wh*-interrogatives and their declarative counterparts (e.g. (10c-d) versus (10a)) no longer share a single underlying phrase-marker. Thus the notion of

---

[26] Lexical ambiguity might also account (6-8), where the gerund *growling* corresponds to the intransitive verb *growl* and the gerund *raising* corresponds to the transitive verb *raise*. The ambiguity of *shooting* is anchored in the lexical ambiguity of *shoot* as either a transitive verb or an intransitive verb. Thus (6) is a case of lexical ambiguity, not constructional homonymity. The same transitive/intransitive difference holds for the progressive participle *flying* cited in footnote 23. Given that the transformational analysis of (6-8) in *SS* is no longer compatible with current syntactic theory, the lexical ambiguity analysis may be the most plausible.

"understood in a similar manner" is no longer expressible in terms of transformational derivations from a single source, a situation that has existed for over half a century (since *Aspects*).

§4.0 PRINCIPLES AND PROCESSES

Although the definition of syntax in *SS* includes principles as well as processes, the book does not discuss *principles* in the familiar sense of general constraints on derivations or on the syntactic structures that they produce. Instead, the term occurs once in the following passage on page 83:[27]

> I think it is fair to say that a significant number of the basic criteria for determining constituent structure are actually transformational. The general principle is this: if we have a transformation that simplifies the grammar and leads from sentences to sentences in a large number of cases (i.e., a transformation under which the set of grammatical sentences is very nearly closed), then we attempt to assign constituent structure to sentences in such a way that this transformation always leads to grammatical sentences, thus simplifying the grammar even further.

Perhaps ironically, this principle seems a lot closer to a discovery procedure than the contemporary usage of the term within the Principles and Parameters framework. This principle, which applies to derived constituent structure (though

---

[27] The paragraph following addresses the appearance of "a certain circularity or even apparent inconsistency" in this approach, responding that "if the argument is traced carefully in each case it will be clear that there is no circularity or inconsistency."

without explicit details), connects with "one of the general conditions on derived constituent structure" (formulated in (77) on page 73—see discussion below) that analyzes *by + NP* in the output of the passive transformation as a PP (see below for further discussion).

As Lasnik writes at the conclusion of his commentary on the formal foundations of *SS*:

> The theoretical edifice built on the LSLT/SS foundation has undergone extensive revision over the years. Some of that edifice is hardly recognizable anymore. But much of it remains. (p. 150)

In fact, some of that edifice is simply gone. The commentaries, on the whole, attempt to demonstrate the continuing relevance of *SS* for the current context.[28]

---

[28] What may be an extreme case is Wiltchko's commentary (titled "Discovering syntactic variation"), which begins the concluding section:

> SS has changed the way we think about language and therefore it also changed the way we think about how languages vary. (p. 455)

The problem with this statement is that *SS* is exclusively about English, and, as much of Wiltschko's discussion shows, about a general theory of linguistic structure, where again language variation does not figure. However, the commentary contends that core innovations of *SS* paved the way for the discoveries about syntactic variation under the Principles & Parameters framework, naming "the decomposition of syntax into more abstract structures" and "the introduction of transformations" (p. 437). (Wiltschko's figure 1 on page 428 shows that the decomposition of syntax refers to a subdivision into three

'structures": phrase structure, transformational structure, and morphophonemics.) This contention about core innovations seems somewhat at odds with Chomsky's assessment of the generative enterprise under the P&P framework.

> This approach sought to eliminate the format framework entirely, and with it, the traditional conception of rules and constructions that had been pretty much taken over into generative grammar. That much is familiar, as is the fact that the new P&P framework led to an explosion of inquiry into languages of the most varied typology, yielding new problems previously not envisioned, sometimes answers, and the reinvigoration of neighboring disciplines concerned with acquisition and processing, their guiding questions reframed in terms of parameter setting within a fixed system of principles of UG with at least visible contours. (Chomsky 2005, p. 8)

Yes, *SS* led ultimately to a new understanding of language variation, but indirectly and only by abandoning some of its core analyses.

The other commentary in the volume that is somewhat disconnected from the text of *SS* is van Riemsdijk's "Constructions", which acknowledges at the outset that the term *construction* as used in the commentary "is not frequently used" in *SS* and further that "on the whole, Chomsky does not seem to be using a uniform terminology to refer to what we now call constructions" (p. 317). While the commentary contends that "in current usage, the term "construction" plays an important role in the way linguists organize grammatical knowledge" (p. 318), it is clear in the quotation from Chomsky 2005 above that concept of "a construction" is at best a taxonomic artifact, having no status in the theory of grammar. Thus the properties of the 'split Topicalization Construction" discussed in the commentary are of interest because they connect with the principles and processes of linguistic theory, but the theory itself does not identify an entity

And perhaps for this reason, they do not discuss how the principles and processes currently under investigation affect the discussion *SS* presents to motivate its signature analyses, involving the English verbal system and which include a passive transformation, verbal affix "hopping" and a separate transformation that inserts auxiliary *do*.

As a prelude to considering the current relevance of the *SS* analyses, we might compare the summary of rules in the second appendix of *SS* with what remains in current theory. The appendix is divided into three sections: phrase structure, transformational structure, and morphophonemic structure. It is safe to say that none of the rules given for these structures is still in use today, with possibly one or two exceptions.

---

designated as such or even a process "topicalization". Van Riemsdijk's claim that "a solid understanding of such lowly matters as constructions and their properties is, at least for the time being, an inescapable necessity" gives too much credit to a taxonomy constructed from observation statements, which are always based on unstated theoretical assumptions (see Hanson 1958) and at best only loosely connected to the formal theory under investigation. As an antidote to this kind of empiricism, consider again the comment from Chomsky 1980a: "Apparent counterexamples and unexplained phenomena should be carefully noted, but it is often rational to put them aside pending further study when principles of a certain degree of explanatory power are at stake."

The rules for phrase structure in *SS* are formulated as rewrite rules which apply to phrasal categories (Sentence, NP, VP, $NP_{singular}$, NP_{plural}, Verb, Aux) and lexical categories (T, N, V, M). A lexical category rule rewrites the category as a lexical item, performing lexical insertion; a phrasal category rule expands the category as a string of phrasal categories (VP $\rightarrow$ Verb + NP), or a string of lexical categories (NP_{pl} $\rightarrow$ T+N+S, where S represents the plural morpheme), or in the case of the rule for Aux,

(11) *Aux* $\rightarrow$ *C* (*M*) (*have* + *en*) (*be* + *ing*)

in what appears to be a combination of a lexical category *M* plus morphemes, where *C* stands for the English tense morpheme ("present" or "past"—spelled out under the Number Transformation ((15) on page 112).

In the derivation of a sentence, the output of the phrase structure rules in *SS* constitutes a set of strings, starting with the initial symbol *Sentence* and ending with a string of lexical items, the terminal string. This set is called a phrase-marker, which represents the phrase structure of the sentence derived. Given that phrase structure rules apply to a single category, the phrase-marker expresses the hierarchical (phrase) structure of the terminal string, which can be clearly represented as a tree diagram (see Lasnik's commentary for a detailed explication).

Unlike the phrase structure rules in *LSLT* and Chomsky (1958) where some phrase structure rules are context-sensitive, all the rules in *SS* are context-free, a

simplification presumably for expository purposes. Thus the phrase structure rules of *SS* will generate *colorless green ideas sleep furiously* as a grammatical sentence. And, as the Harley commentary points out, these context-free rules will also generate *sincerity admires John* (cited in *SS* (footnote 7 on page 42) as an illustration of degrees of grammaticalness), which, if such examples are equivalent grammatically, suggests that the infelicity they embody should, as Harley comments, be ascribed "to some other source than the grammar" (p. 244).

The elimination of phrase structure rules in the history of syntactic theory occurs in stages. First, in *Aspects* all lexical rules are replaced by a transformational operation that substitutes a lexical item for a lexical category. Removing lexical insertion from the phrase structure rule component makes it possible to limit the format of these rules to context-free, a simplification of the grammatical rules. Under the transformational treatment of lexical insertion, the inherent context-sensitivity of lexical items, where for example an intransitive verb (e.g. *sleep*) cannot occur in VP that contains an NP object, is expressed as a contextual feature of the lexical item (in this case a subcategorization feature). The lexical insertion transformation substitutes a lexical item for a partially specified terminal symbol in the phrase-marker that is nondistinct from the lexical

item.[29] Next, the remaining phrase structure rules are recast as phrase structure rule schema under X-bar theory (Chomsky 1970). And under the Principles and Parameters framework, according to Chomsky (1981, p. 136): "Base rules are virtually eliminated", which is reiterated ten years later in Chomsky & Lasnik (1993, reprinted in Chomsky 1995b, p. 25) as: "As for phrase structure rules, it appears that they may be completely superfluous". This is finally realized in the formulation of Merge in Chomsky (1995a), an operation that combines lexical items to form syntactic objects having a hierarchical syntactic structure (and perhaps only this because the linear order and labeling of these structures are assigned by other functions). Merge is thus a structure-building operation that, when it applies to lexical items, also performs lexical insertion. It is simply the simplest generalization of the phrase structure rules in *SS*, some details aside.

---

[29] At a bare minimum, a noun in the lexicon will substitute for the terminal symbol N, etc. As formulated in *Aspects*, lexical insertion is also sensitive to the interpretive content. Thus a transitive verb *frighten*, which requires an NP object, also requires that the head of the NP have specific interpretive properties (a *selectional* restriction)—for example, this N cannot be inanimate, as in **John frightened the book* as opposed to *John frightened the book's publisher*. This analysis provides a more formal account for the degrees of grammaticalness proposed in *SS* with regard to sentences like *colorless green ideas sleep furiously* and *sincerity admires John*.

The second appendix of *SS* defines transformations as follows: "A transformation is defined by the structural analysis of the strings to which it applies and the structural change that it effects on these strings" (p. 111). Technically, a transformation is an operation that maps a phrase-marker (a set of strings) onto another phrase-marker. The appendix divides transformations into two types, those that apply to a single phrase-marker (called *singulary* in *Aspects*), and *generalized* transformations, which map a pair of phrase-markers onto a single phrase-marker. The appendix lists eleven singulary transformations followed by five generalized transformations.

As discussed in Lasnik's commentary, generalized transformations in *SS* are motivated by a restriction on recursion in phrase structure rules, a restriction that is dropped in *Aspects* and work that follows—thereby eliminating the motivation for such transformations. In *SS* every generalized transformation applies to two separate clauses (sentences), combining them into a single phrase-marker for a single sentence—see for example the discussion of *the growling of lions* above. The first two, identified as Conjunction and T_{so}, where the latter is designated as "actually a compound with the conjunction transformation", result in the generation of coordinate structures. However, since *Aspects* (see in particular footnote 7 of chapter 3) such rules no longer figure in the analysis of these structures. Each of the latter three generalized transformations is designated as a "Nominalizing Transformation", labeled T_{to}, T_{ing}, and T_{Adj} respectively. T_{to} and

T_{ing} have the same structural analysis and structural change, except that where T_{to} inserts the infinitival *to*, T_{ing} inserts the gerundive *–ing*. Neither figures in current analyses of infinitival clauses or noun phrases headed by gerunds. T_{Adj} turns a predicate adjective (for example, in *that book is interesting*) into a prenominal adjective (*that interesting book*), deleting the present tense copula and substituting the noun phrase produced for a noun phrase in a second clause. Thus T_{Adj} blends two independent clauses (for example, *that book is interesting* and *we read that book*) into a single clause (*we read that interesting book*). But again, such a complex operation is no longer utilized in the analysis of prenominal adjectives.

The first singulary transformation in the appendix appears as (12), labeled *Passive* and referencing (34) on page 43.[30]

---

[30] (12) states a relationship between syntactic structures. In contrast, (34) states a relationship between sentences, which technically is not what any single transformation in the appendix does.

(34) If S_1 is a grammatical sentence of the form

$NP_1 – Aux – V – NP_2$,

Then the corresponding string of the form

$NP_2 – Aux + be+en – V – by + NP_1$

is also a grammatical sentence.

The commentaries of both Saito and Alexiadou et. al., which discuss the passive transformation, only cite (34) from *SS*, which is somewhat misleading given the actual formulation of the transformation.

(12) *Passive* – optional:

Structural analysis: $NP - Aux - V - NP$

Structural change: $X_1 - X_2 - X_3 - X_4 \rightarrow X_4 - X_2 + be + en - X_3 - by + X_1$

As formulated in (12), the passive transformation maps a phrase marker containing a string with the form given in the structural analysis onto a string given on the right side of the arrow in the structural change. This transformation inserts two pieces of lexical material (*be*+*en* and *by*) and inverts the positions of the two NPs in the structural analysis. One argument for (12) is that stating restrictions on the occurrence of both the passive auxiliary and the passive *by* using phrase structure rules complicates the grammar. However (12) itself does not specify the derived phrase structure of the resulting string—none of the transformations in *SS* do.

SS supplies only one general condition on the derived constituent structure that results from the application of transformations. (13) (given as (77) on page 73) is invoked to account for the PP status of the passive *by* + NP:

(13) If *X* is a *Z* in the phrase structure grammar, and a string *Y* formed by a transformation is of the same structural form as *X*, then *Y* is also a *Z*.

Alexiadou et. al. cites this principle and attempts to justify the PP analysis of the passive *by*-phrase on the grounds that this plays a role in an "elliptical" transformation mentioned (but not formulated) in footnote 7 on page 81 of *SS*, which accounts for passives created by (12) but lacking *by*+NP. The commentary

also cites the displacement of *by*+NP in interrogatives and topicalization as motivation for the analysis.[31] However, the utility of (13) is undermined in *Aspects*, where the passive *by* is generated in a phrase structure rule of the base—which begins the great unraveling of the passive transformation (12) as single complex rule of grammar.

This unraveling also occurs in stages, continuing with Chomsky (1970), which divides the passive transformation into two separate operations (Agent Postposing that moves an underlying subject to the object position of a *by*-phrase and NP Preposing that moves an underlying object into the (vacated) subject position), operations which generalize to derived nominalizations, where they apply independently, as illustrated in (14).

(14) a. the enemy's destruction of the city

b. the city's destruction by the enemy

c. the destruction of the city by the enemy

In (14b) both operations apply, while in (14c) only Agent Postposing applies (or alternatively, the agentive *by*-phrase is generated by a phrase structure rule—in which case there is no rule of Agent Postposing). From this point on, the transformational analysis of passives no longer includes the insertion of the

---

[31] This is based on the unstated assumption that displacement can only affect a single constituent. See also their discussion of the analysis in Collins (2005), which rejects the PP status of *by*+NP.

passive auxiliary *be+en*, and therefore, the special restrictions on this auxiliary no longer serve as a motivation for a passive transformation and must be handled independently. The next short step generalizes the two transformational operations for generating passives as Move NP (Chomsky 1976) and then Move α (Chomsky 1980), both formulated as substitution operations that apply to some sort of phrase-marker. The final stage comes with the realization that Merge subsumes movement operations because, without stipulating the contrary, it will automatically apply to a syntactic object and another contained in it, creating displacement (see Chomsky 2004).[32] With Merge, there is no longer a single grammatical transformation that creates "a passive construction", thus no passive rule. (See §4 of the Saito commentary "Transformations in the quest for a simpler, more elegant theory" for some discussion of this evolution; also Freidin 1994 for a detailed history of the transformational analysis of passive constructions.)

---

[32] In spite of this, the commentary by Alexiadou et. al., which discusses analyses in terms of Merge, suggests in §3 that "rule" (34) (see footnote 29 above) "could be seen as [a] rule of UG instead of just a rule of the English grammar" (p. 417), inexplicably ignoring both the history of the passive transformation and in particular the consequences of Merge for the analysis of passives—not to mention the English specific elements mentioned in (34).

SS provides a second argument for (12) based on the statement of selectional restrictions, noting on page 43 (cited in the Harley commentary and mentioned in Alexiadou et. al.) that "selectional dependencies" for ac transformation tives will have to be restated in the reverse order for passives if *be+en* is generated by a phrase structure rule. *SS* formulates the argument for a passive transformation as follows: "This inelegant duplication, as well as the special restrictions involving the element *be+en*, can be avoided only if we deliberately exclude passives from the grammar of phrase structure, and reintroduce them by a rule." Therefore the passive auxiliary *be+en* is dropped from the phrase structure rule for *Aux* in (28.iii), and (34) (see footnote 30 above) is added as a rule of grammar. Alexiadou et. al. claim the rule (34) "expresses the fundamental insight that the selectional restrictions in active and passive sentences are two sides of the same lexical-semantic coin; the argument NPs of a passive sentence are the very same arguments that we find in the active sentence, which surface, however, in the opposite order in English" (p. 406).

This argument makes perfect sense given the theoretical assumptions of *SS*. However, under current assumptions about the principles and processes that define the study of syntax today, it is not obvious that this argument survives.[33]

---

[33] This includes the Collins (2005) 'smuggling" analysis of passives, which attempts to incorporate the *SS* analysis, where the selectional dependencies in an

The argument is based on two assumptions: that selectional dependencies involving verbs and their arguments are stated in terms of a linear string, and that this same linear string occurs in the derivation of both an active sentence and its corresponding passive. Yet if Merge produces only hierarchical structure, then there is a question about how and when in a derivation linearization, which would produce such a string, occurs. And further, given that linearization only applies to what is overt in PF, then the syntactic subject of a passive will never be linearized in the object position of a passive verb, nor will the object of passive *by* be linearized in a covert subject position. The assumption that the selectional dependencies between a verb and its arguments must be stated in terms of a linear string, as suggested in *SS* and elsewhere, appears to be in conflict with current fundamental assumptions about linearization in the computational system. One solution to this dilemma might be to adopt Harley's suggestion that the source of selectional infelicities that occur in *sincerity admires John* and *John is admired by sincerity* fall outside the grammar.

The next two transformations in the appendix of *SS* are based on the assumption that certain verbs form a constituent with a following particle (preposition). This is expressed as a phrase structure rule (84), $V \rightarrow V_1 + Prt$,

---

active sentence and its corresponding passive are expressed in the same (linear) structure.

which applies in the derivation of *the police brought in the criminal* (82i). The derivation of *the police brought the criminal in* (82ii) requires a transformation that moves the particle to the right of the object, creating a discontinuous constituent that "cannot be handled readily within the phrase structure grammar" (*SS*, p. 75). This transformation, labeled T_{sep}, presumably for "separation", is designated as optional because whether it applies or not yields a grammatical result. In contrast, when the NP object is a pronoun, the transformation must apply given that *the police brought him in* (82iii) is a sentence of English and *the police brought in him* (83) is not. For this, *SS* formulates separate obligatory T_{sep} that applies when the object NP is a pronoun. *SS* proposes that this obligatory rule also applies in the derivation of *everyone in the lab considers John incompetent*, claiming that *considers incompetent* forms an underlying constituent—an assumption that no longer applies in current analyses of such examples. This leaves particle movement, which could be handled with Merge Accounting for obligatory displacement of the particle when the object NP of the verb is a pronoun remains a desideratum.

The fourth singulary transformation in the appendix, the obligatory "Number Transformation" specifies the morphophonemic structure of a finite verbal element. In effect, it replaces C in the phrase structure rule (11) above with the present tense singular suffix -*s* when C occurs after a singular NP, and with the present tense plural suffix -ø following a plural NP, or with a suffix

designated *past* "in any context". This transformation not only inserts inflectional morphology for a finite verbal element (main verb or auxiliary), but also assigns tense. Crucially, it assumes an analysis of the lexicon in which finite verbal elements are not inflected with agreement features or tense.

The Number Transformation is one of four obligatory transformations in *SS* that specifically affect word formation, including the Auxiliary Transformation (aka Affix-Hopping), the Word Boundary Transformation, and the *do* Transformation (aka *do*-Support, which depends on the prior application of the Word Boundary Transformation).[34] This analysis rests on the crucial assumption that verbal elements in the lexicon are not inflected for tense or agreement (number and person). Instead, verbal inflection is determined by a syntactic transformation, making one aspect of word formation a part of syntax. See the commentaries by Lasnik, Saito, and Aronoff for further discussion.

What is perhaps odd about the formulation of the Number Transformation is that the underlying phrase structure representations (designated in *Aspects* as

---

[34] Wiltschko's commentary is the only one that mentions the Number Transformation. The other three transformations are discussed the commentaries by Lasnik, Saito, and Aronoff. Affix-Hopping and *do*-Support are, in addition, discussed in the commentary by Bjorkman. Only Affix-Hopping is mentioned in the Harley commentary, and only *do*-Support is mentioned in the commentaries by Adger and Pietroski. For discussion of the formal details of the *SS* analysis, see the commentaries by Lasnik and by Saito.

"deep structures") to which it applies will simply not represent present or past tense, and therefore will not distinguish between them. As a result, the Number Transformation changes the interpretation of the resulting structure by inserting a meaning bearing element just as the optional T_{not} does by inserting the negative affix *–n't*.[35] Of course, this is not a necessity; C in (11) above could be rewritten as either *present* or *past*, thereby restricting the Number Transformation to the insertion of number and person features on verbal elements.

Alternatively, finite verbs and auxiliaries are fully inflected in the lexicon, as assumed in Chomsky's initial formulation of the minimalist program (Chomsky (1992); reprinted as chapter 3 of Chomsky (1995b)) where this analysis is designated as "lexicalist".[36] This lexicalist assumption eliminates the

---

[35] Note that such interpretation-changing transformations are prohibited under the Katz-Postal hypothesis (see Katz and Postal 1964), which is adopted with some hesitation in *Aspects*—see chapter 3, footnote 9, referring to the difference in interpretation between *everyone in the room knows at least two languages* and its passive counterpart *at least two languages are known by everyone in the room*, examples that are also discussed in *SS* (pp. 100-101). In any case, current formulations of transformations do not include such transformations as T_{not}.

[36] The only other reference to *lexicalist* occurs in Chomsky 1991, which states: "assuming something like the earliest version of the lexicalist hypothesis" (p. 133)—that is, Chomsky 1970. It is worth noting that that paper adopts a lexicalist analysis for derived nominals (e.g. (14) above), but retains a transformational

need for the Number Transformation and weakens the motivation for the *do*-Support transformation as formulated in *SS* (see discussion below). The lexicalist analysis of finite verbs and auxiliaries also undermines the Affix-Hopping transformation, which is dependent on the phrase structure rule (11) above where the aspectual auxiliaries are syntactically linked to affixes that they don't combine with in morphological/phonetic form.

The argument for a transformational analysis of the English verbal system is based on the claim that auxiliary verbs and the affix on the following verbal element constitute "discontinuous elements", which *SS* claims "cannot be handled within [Σ, F] grammars" [i.e. phrase structure grammars] (p. 41). The footnote attached to this quotation (number 6 in chapter 5) elaborates on the statement in terms of simplicity, ending with the following:

> It appears to be the case that the notions of phrase structure are quite adequate for a small part of the language and that the rest of the language can be derived by repeated application of a rather simple set of transformations to the strings given by the phrase structure grammar. If we were to attempt to extend phrase structure grammar to cover the entire language directly, we would lose the simplicity of the limited phrase structure grammar and of the transformational development. This approach would miss the main point of level construction (cf. first paragraph of §3.1), namely, to rebuild the vast complexity of the actual language more elegantly and systematically by

---

analysis for gerundive nominals. Bjorkman's commentary designates this position as "*weak* lexicalism".

> extracting the contribution to this complexity of several linguistic levels, each of which is simple in itself.

But while this holds for the particular formulation of grammar in *SS*, where the rules of grammar are formulated to generate all and only the grammatical sentences of the language, and the phrase structure rules that introduce verbal auxiliaries and verbs into a derivation are context-free, it is not obvious that the simplicity claim holds for analyses of the English verbal system after *SS*, especially once selectional restrictions are introduced to handle the context sensitivity associated with lexical items (starting with *Aspects*).

The *SS* phrase structure rule that introduces auxiliaries (given in (11) above) produces a string with no internal hierarchical structure and stipulates the linear order of these elements, where the perfective auxiliary *have*+*en* precedes the progressive *be*+*ing*. But by incorporating a natural hierarchical analysis for the string *modal-perfective-progressive* where, for example, *progressive*+VP constitutes a syntactic object headed by *progressive* which forms a larger phrase headed by *perfective*, etc., the linear order of auxiliaries follows from the head-parameter for English (however that is instantiated) and selectional restrictions on auxiliaries and verbs. For example, in *she has been investigating that topic for several months* there is a selectional relation between the progressive participle form of the main verb *investigating* and the progressive auxiliary *been*—and similarly, between the perfective participle form of the progressive *been* and the

perfective auxiliary *has*. Putting the sentence together via Merge (from the bottom up), it is tempting to consider that the progressive participle selects some form of the progressive auxiliary (*been* in this case), instead of the other way round. Either way, the asymmetry of the selectional relation plus the head parameter predicts the linear order of the English verbal system and the morphological form of lexical items. See Freidin (2004) for details.

The conclusion to Bjorkman's commentary (titled "*Syntactic Structures* and morphology"), which discusses the contrast between the syntactic derivational approach to word formation/morphology initiated in *SS* (and in more contemporary work designated as *realizational*) and the lexicalist alternative, makes some important points worth repeating.

> The goal here has been to illustrate that the interleaving of word and sentence formation that lies at the heart of the transformational framework developed in *Syntactic Structures* has been carried forward in the descriptive understanding of morphological phenomena in generative syntax. And so even as the theoretical gravitational centre of the field has shifted, first towards lexicalism and more recently back towards realization, the way phenomena were first described there has continued to define how they are perceived, and so how they are analyzed.
>
> The fact that a particular description of facts has persisted is not an argument that that description is correct. But the fact that the descriptions of Affix Hopping, Do-support, and participle and gerund formation have remained influential, through a period where they were fundamentally at odds

> with the dominant understanding of how syntax and morphology interact, is a testament to the insight behind their original formulation. (pp. 313-314)

In particular, the descriptions of phenomena in *SS* have persisted into the present (as illustrated by these commentaries themselves—see the discussion above), thereby determining their formal analysis. Yet, as Bjorkman notes, the persistence of a particular description is not an argument (or evidence) that this description (or the analysis based on it) is correct.

In contrast, Mark Aronoff's commentary (titled "English verbs in *Syntactic Structures*), which, like Saito's commentary, praises the analyses in *SS* on the grounds of simplicity and elegance, designates the statement in *SS* on page 41 that "in the auxiliary verb phrase we really have discontinuous elements" (quoted twice) as "a claim about truth, not about simplicity or complexity" (p. 397). In the previous section on "Method", Aronoff quotes an abbreviated version of the last paragraph of §6.1 in *SS* (p. 56) regarding the analysis of the verbal system in §5.3 (the following gives the last two sentences in full):

> We are thus interested in describing the form of grammars (equivalently, the nature of linguistic structure) and investigating the empirical consequences of adopting a certain model for linguistic structure, rather than in showing how, in principle, one might have arrived at the grammar of a language.

To which Aronoff adds the following comment (p. 395):

> This stance, more than any technical or analytical innovations, was revolutionary. Combined with the absence of either a practical simplicity

> measure or any ties to semantics, it freed the analyst to posit whatever structures lay hidden within the language. The primary justification left for defending these structures was beauty. The analysis of the verb phrase in §5.3 is beautiful.

Aside from the highly suspect claims that the *SS* analysis is justified because it it true and beautiful, Aronoff's commentary overlooks the fact that under contemporary syntactic theory based on Merge, where there are no phrase structure rules, the analysis of the verbal system as presented in the *SS* phrase structure rule (11) above is no longer possible—and it remains to be seen whether some part of it can or must be recast as part of the contemporary theory. See Freidin (2004), which reviews Lasnik (2000), for an analysis of the verbal system without Affix Hopping or *do*-Support. This is not to deny that the analysis in *SS* is *neat* (in both senses). But how much of it, if anything at all, is correct remains to be determined, without appeals to beauty and truth.

The discontinuous constituent analysis of verbal auxiliaries is based on theoretical assumptions that may not be correct, especially if a selectional relation account mentioned above is viable. With regard to simplicity, a selectional analysis is prima facie simpler than one which posits morphophonemic forms for auxiliaries that never occur in phonetic form and therefore requires a special transformation—with properties beyond internal Merge (see Bjorkman's commentary for discussion)—to produce the morphophonemic forms of auxiliaries that do occur in phonetic form. The persistence of the *SS* description

of the English verbal system in spite of radical changes in our understanding of principles and processes illustrates how descriptions of phenomena can be misleading.

Of the remaining four singulary transformations in Appendix II of *SS*, three are optional and have the same structural description, where the first term is *NP*, the second is a disjunction {*C* (if *V* is the first element of the third term), or {*C* + *M*, *C* + *have*, or *C* + *be*} (in which case the third term is given as a variable "…"). Both T_{not} and T_A insert an element (the negative affix *–n't* or *A*, a "morpheme of heavy stress" (page 65)), which when it separates *C* and *V*, blocks Affix Hopping, setting the stage for the application of *do*-Support.[37] The third transformation T_q inverts the first two terms of the structural description, yielding the subject-verb inversion typical of direct questions in English. Again, when the second term is only *C* the result blocks Affix Hopping, forcing the application of the Word Boundary transformation followed by *do*-Support. Both T_{not} and T_A have disappeared from contemporary analysis. T_q has been subsumed as an instance of internal Merge applied to a head.

This leaves the fourth optional transformation T_w, a two-part transformation in which part one applies to a string *X* – *NP* – *Y*, where *X* and *Y* are variables,

---

[37] Technically, this separation of *C* and *V* triggers the application of the obligatory Word Boundary transformation, which inserts a word boundary that then triggers the obligatory *do*-Support transformation.

inverting the first two terms to *NP – X*, and part two converts the shifted NP to an interrogative pronoun (details aside). This second part disappears given that interrogative pronouns are part of the lexicon. The first part is, like T_q, subsumed under Merge. *SS* formulates T_w as "optional and conditional on T_q", to account for questions like (10c). However, if T_{w1} is, like T_q, subsumed under Merge, then there is no obvious way to stipulate how one application of Merge can be dependent on another prior application.

Given that none of the grammatical rules proposed in *SS* survives in its original formulation, the enduring value of *SS* must be as a model for how formal syntactic analysis can inform our understanding of linguistic structure and language more generally. *SS* remains a clear demonstration of how the focus on the principles and processes by which sentences are constructed provides insight into the particular phenomena of English and the more general organization of linguistic structure.

In this regard, Lasnik's commentary is exemplary in its careful attention to how the formal apparatus of *SS* applies to the details of English syntax. The commentary raises a fascinating problem with the *SS* analysis, one that *SS* glosses over and that isn't mentioned in Lasnik's *Syntactic Structures Revisited* (his extensive discussion of the history of the analysis of the English verbal system from *SS* to the turn of the century).

The problem concerns the derivation of (10d) above, *who ate an apple*. *SS* gives the terminal string underlying (10d) as (15) (=*SS* (61)).

(15) *John – C – eat + an + apple* (*NP – C – V* …),

"where the dashes indicate the [structural] analysis imposed by T_q" (p. 70). The derivation of (10d) is given as the following steps, where the dashes again indicate the structural analysis imposed the transformation named in the following line.

(16) a. *John – past – eat + an + apple* (via the Number Transformation)

b. *past – John – eat + an + apple* (via T_q)

c. *John – past + eat + an + apple* (via T_{w1})

d. *who – past – eat – an + apple* (via T_{w2})

e. *who – eat – past# – an + apple* (via the Auxiliary Transformation)

To be precise, *SS* says that (16b) is derived via the application of the phrase structure rule (29i) (which is recast in the second appendix as the Number Transformation—see discussion above) and T_q. (16d) would then be mapped onto (17) by seven applications of the World Boundary Transformation.

(17) *#who# #eat + past# #an# #apple#*

SS assumes that while the movement of *past* in (16b)—actually *C* containing *past* given the formulation of T_q—separates the verb *eat* from the affix. This would trigger *do*-Support if T_{w1} did not apply to *John* (yielding (16c)). The movement of the subject NP *John* re-establishes the adjacency of *past* and *eat* so that the

Auxiliary Transformation applies, yielding *ate* via a morphophonemic rule (*eat* + *past* → /eyt/). Lasnik observes that this ignores the fact the phrase structure underlying (15) also involves *Aux*, which dominates *C* and is not moved via T_q. So the problem with the derivation is that the movement of *C* leaves behind *Aux* which would, technically, separate *past* and *eat* even when *John*/*who* is moved to the front of the clause in front of the fronted *past*.

Lasnik's solution (credited to Max Papillion) utilizes four technical details of the formal apparatus. First, the output of the phrase structure component is literally a set of strings (a phrase-marker), not a graph-theoretic tree representation as is usually given. While the initial phrase-marker can be converted to a tree representation by comparing the strings in it to see where a single symbol in one corresponds to a substring of symbols in another, assuming that the single symbol dominates the substring. In terms of the technical details, it appears that the hierarchical relationships expressed in the phrase structure rules themselves are not preserved in their output—which is crucial to Lasnik's solution. Second, the output of a transformation, an operation that technically maps a string in a phrase marker onto another string, does not by itself produce another phrase-marker (that is, "once a transformation has applied, we no longer have a phrase marker" (Lasnik, p. 149)). As noted in Chomsky (1956):

> To complete the development of transformational grammar it is necessary to show how a transformation automatically assigns a derived phrase marker to

> each transform and to generalize to transformations on sets of strings. (p. 122)

Third, "there is a general principle of transformational operation in LSLT that when a symbol is mentioned in a T, anything affecting that symbol will affect everything it dominates", which Lasnik notes "is generally so obvious that it hardly bears mentioning" (p. 148). Fourth, based on the observation in Lasnik and Kupin (1976) that in the case of what translates as unary branching in hierarchical structure, there is no way to determine the dominance relation between two symbols X and Y, and therefore either X dominating Y or Y dominating X is possible.

Applying this to the derivation of (10d), where *Aux* rewrites as *C*, which is then converted to *past* by the Number Transformation yields one possible derived phrase marker in which *C* dominates both *Aux* and *past*. In this case, the movement of *C* by T_q would include *Aux* so that when T_{w1} moves the subject NP to the front of the clause *past* and *V* will again be adjacent in the derived phrase-marker, allowing the Auxiliary Transformation to apply. This is not, however, the complete solution to the problem unless *Aux* dominating *C* is ruled out; otherwise *Aux* would block the Auxiliary Transformation, triggering *do*-Support and yielding (18), which should be excluded where *did* is not emphatically stressed.

(18) who did eat the apple

This problem is tied to the assumption in phrase structure rule (11) that *C* and the auxiliary verbs form a single constituent, an assumption that has been dropped in contemporary analyses of the English verbal system.

Lasnik continues the discussion of transformations in *SS* (and *LSLT*) with the observation that derivations "generally have a strongly Markovian character, in that the applicability of a given transformation depends only on the current (derived) phrase marker" (p. 150). The exception involves the *SS* formulation of T_w as "conditional on T_q", an exception that is necessary to rule out (19) (cf. (10c)) as a direct question.

(19) *what John ate

Yet, as Lasnik notes, the kind of "globality" involved in such a condition is "very seldom called upon." Regarding sentences like (19), he concludes that "interestingly, six decades later, I"m not sure there is a really satisfying analysis…" (p. 150). Perhaps one reason for this is that the condition blocks the derivation of indirect *wh*-questions, where (19) could occur as a subordinate clause in (20).

(20) they are wondering what John ate

Removing the restriction about the prior application of T_q as with the Merge analysis generalizes the application of *wh*-movement to subordinate clauses, including indirect *wh*-questions and relative clauses. What accounts for the

necessary application of T_q in direct *wh*-questions remains unexplained, even in current analyses of English.

At the end of his commentary, Lasnik comments on how in *SS* the distribution of auxiliary *do* is accounted for by a group of transformations whose formulations "can be kept relatively simple", capturing "a huge generalization": "whenever Affix-Hopping is blocked, supportive *do* appears" (p.150). There is, however, a simpler way of stating the distribution of auxiliary *do* without relying on derivations involving Affix-Hopping. Simply, auxiliary *do*, like modal auxiliaries and infinitival *to* must occur with an uninflected bare verbal element. Given the complementary distribution of *to*, modals, and auxiliary *do*, it is plausible that they are instances of the same category (T). Thus when V is a bare form, auxiliary *do* can be merged with VP to form TP (see Freidin (2004) for discussion). What remains to be explained is why a finite main verb cannot occur with *not*, as in (21a), in contrast to (21b), and why auxiliary *do* cannot occur with the bare forms of the aspectual auxiliaries, as in (22).

(21) a. *John not ate an apple

b. John didn't eat an apple

(22) a. *John did have eaten an apple

b. *John did be eating an apple

The *SS* Affix-Hopping analysis accounts for (22) by postulating *C* adjacent to either *have* or *be* and formulating transformations so that none insert material

between them. Another way of capturing (22) is via selectional relations whereby bare aspectual auxiliaries can occur with either modals or infinitival *to*, but not auxiliary *do*.[38] Regarding (21), no rule in *SS* generates a free-standing negative *not*. T_{not} inserts a negative affix *–n't*, which cannot inflect a finite main verb, but instead must inflect a finite auxiliary (including modals)—as formulated in the transformation. The equally deviant result of substituting *–n't* for *not* in (21) follows from Lasnik's general constraint against free-standing affixes (Lasnik (1981)). The question that remains is whether the Affix-Hopping apparatus of *SS* is still required in some form to account for the properties of the English verbal system, especially for the distribution of auxiliary *do*.

The fact that this question is still in play over 60 years later demonstrates not only the lasting value of the kind of analysis developed in *SS*, focusing as it does on the underlying principles and processes that determine linguistic structure, but also the continuing importance of the particular analysis *SS* presents. That most of the technical apparatus of *SS* has been replaced by simpler

---

[38] The reason for this might involve a principle of morphological economy where the expression of a grammatical concept in a single lexical item blocks the expression of the same grammatical concept in two. Thus *has eaten* blocks *did have eaten*. Similarly, *ate* in *ate the apple* will block *did eat*, unless *did* bears emphatic stress—see again Freidin 2004. However, this doesn't account for the deviance of (22) when *did* receives emphatic stress (Laura Kalin, p. c.).

and more general processes that are constrained by general principles of linguistic structure and/or computational efficiency is a testament to the robust program of research that *SS* launched. This also demonstrates that the empirical issues *SS* addresses are not trivial—and therefore it is not surprising that the first attempt at a formal account may not have gotten everything right. Not only does *SS* show how a simplified version of formal foundations for a linguistic theory elucidates aspects of the linguistic structure of English, but it discusses this analysis within the wider context of the goals of linguistic theory, including the question of explanation, which itself involves questions of interpretation and therefore the connection between syntax and semantics. To reiterate the concluding comment in Lasnik's commentary, there is much to gain by investigating the foundations from which the generative enterprise was launched in the mid 1950s. And given the scope and depth of *SS* in such a small number of pages, (re)reading *SS* is still enlightening—especially for understanding of the evolution of those foundations into the present.

REFERENCES

Berwick, Robert C., Paul Pietroski, Beracah Yankama & Noam Chomsky. 2011. Poverty of the stimulus revisited. *Cognitive Science* 35, 1207-1242.

Bloomfield, Leonard. 1933. *Language*. New York: Holt, Rinehart and Winston.

Chomsky, Noam 1955. *The logical structure of linguistic theory* [published 1975. New York: Plenum].

Chomsky, Noam. 1956. Three models for the description of language. *IRE Transactions on Information Theory* 2, 113-124. Reprinted in *Readings in mathematical psychology*.

Chomsky, Noam. 1957. *Syntactic structures*. The Hague: Mouton.

Chomsky, Noam. 1962. A transformational approach to syntax. In *Proceedings of the Third Texas Conference on Problems of Linguistic Analysis in English, May 9–12, 1958*. Edited by Archibald A. Hill, 124–148. Austin: University of Texas Press.

Chomsky, Noam 1964. *Current issues in linguistic theory*. The Hague: Mouton.

Chomsky, Noam 1965. *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.

Chomsky, Noam 1970. Remarks on nominalization. In Roderick Jacobs & Peter Rosenbaum (eds.), *Readings in English transformational grammar*. 184-221. Waltham, MA: Ginn & Co.

Chomsky, Noam. 1972. *Language and Mind*. Enlarged edition. Harcourt Brace Jovanovitch.

Chomsky, Noam 1973. Conditions on transformations. In Stephen R. Anderson & Paul Kiparsky (eds.), *A festschrift for Morris Halle*, 232-286. New York: Holt, Rinehart and Winston.

Chomsky, Noam. 1975. Questions on form and interpretation. *Linguistic Analysis* 1, 75-109.

Chomsky, Noam 1976. Conditions on rules of grammar. *Linguistic Analysis* 2, 303–351.

Chomsky, Noam 1977. On wh-movement. In Peter Culicover, Thomas Wasow & Adrian Akmajian (eds.), *Formal syntax*. 71-132. New York, NY: Academic

Press.

Chomsky, Noam. 1979. *Language and responsibility: Based on conversations with Mitsou Ronat*. (translated from the French by John Viertel). New York, NY: Pantheon.

Chomsky, Noam 1980a. On binding. *Linguistic Inquiry* 11, 1–46.

Chomsky, Noam 1980b. *Rules and Representations*. New York: Columbia University Press.

Chomsky, Noam 1981. *Lectures on government and binding*. Dordrecht: Foris.

Chomsky, Noam. 1987. *Generative grammar: Its basis, development, and prospects*. In *Studies in English Linguistics and Literature* (Special Issue), Kyoto University of Foreign Studies.

Chomsky, Noam 1991. Some notes on economy of derivation and representation. In Robert Freidin, (ed.), *Principles and parameters in comparative grammar*. 417-454. Cambridge, MA: MIT Press. [reprinted in Chomsky 1995b].

Chomsky, Noam 1993. A minimalist program for linguistic theory. In: Kenneth Hale, K. & Samuel Jay Keyser (eds.), *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*. 1-52. Cambridge, MA: MIT Press. [reprinted in Chomsky (1995b)].

Chomsky, Noam 1995a. Bare phrase structure. In Héctor Campos & Paula Kempchinsky (eds.), *Evolution and revolution in linguistic theory*. 51-109. Washington, D.C.: Georgetown University Press.

Chomsky, Noam. 1995b. *The minimalist program*, Cambridge, MA: MIT Press.

Chomsky, Noam. 2000a. Minimalist inquiries: the framework. In Roger Martin, David Michaels, & Juan Uriagereka, (eds.), *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, 89–155. Cambridge, MA: MIT Press.

Chomsky, Noam 2000b. *New horizons in the study of language and mind*. New

York: Cambridge University Press.

Chomsky, Noam. 2004. Beyond explanatory adequacy. In Adriana Belletti (ed.), *Structures and beyond*, 104–31. Oxford: Oxford University Press.

Chomsky, Noam 2005. Three factors in language design. *Linguistic Inquiry* 36, 1–22.

Chomsky, Noam. 2015. Problems of projection: Extensions, structures, strategies and beyond. In Elisa Di Domenico, Cornelia Hamann, & Simona Matteini, (eds.). *Studies in honour of Adriana Belletti*, 1–16. Amsterdam: John Benjamins.

Chomsky, Noam, Morris Halle & Fred Lukoff. 1956. On accent and juncture in English. In Morris Halle, Horace G. Lunt, Hugh McLean & Cornelius H. van Schooneveld (eds.), *For Roman Jakobson: Essays on the occasions of his sixtieth birthday*. 65-80. The Hague: Mouton.

Chomsky, Noam & Howard Lasnik. 1993. The theory of principles and parameters. In Joachim Jacobs, Arnim van Stechow, Wolfgang Sternefeld & Theo Vennemann (eds.), *Syntax: An international handbook of contemporary research*. 506-569. Berlin: Walter de Gruyter. [reprinted in Chomsky 1995b].

Collins, Chris. 2005. A smuggling approach to the passive in English. *Syntax* 8, 81–120

Feynman, Richard P. 1965. *The character of physical law*. Cambridge, MA: MIT Press.

Feynman, Richard P. 1989. *Six easy pieces*. New York, NY: Basic Books.

Feynman, Richard P., Robert B. Leighton & Matthew Sands. 1963. *The Feynman lectures on physics*. Reading, MA: Addison-Wesley Publishing Co.

Freidin, Robert. 1978. Cyclicity and the theory of grammar. *Linguistic Inquiry* 9, 519-549.

Freidin, Robert. 1994. Conceptual shifts in the science of grammar: 1951-1992*.

In Carlos Otero (ed.), *Noam Chomsky: Critical assessments.* vol. 1, tome 2, 653-690. London: Routledge.

Freidin, Robert. 2016a. Goals of the generative enterprise. *Language* 92. 671-723.

Freidin, Robert 2016b. The Galilean style in linguistics: the case of Jean-Roger Vergnaud. *Inference* 2.4 (https://inference-review.com/letter/on-the-other-hand).

Freidin, Robert. 2017. Cyclicity in syntax. In Mark Aronoff (ed.), *Oxford research encyclopedia of linguistics*. 30 pp. Oxford: Oxford University Press. http://linguistics.oxfordre.com/.

Freidin, Robert & Howard Lasnik. 2011. Some roots of the minimalist program. In C. Boeckx (ed.) *Handbook of Linguistic Minimalism*, Oxford University Press, pp. 1-26.

Freidin, Robert & Jean-Roger Vergnaud. 2001. Exquisite connections: Some remarks on the evolution of linguistic theory. *Lingua* 111**,** 639-666.

Gleason, Henry A. 1955. *An introduction to descriptive linguistics*. New York: Henry Holt & Co.

Hanson, Norwood Russell. 1958. *Patterns of discovery: An inquiry into the conceptual foundations of science*. Cambridge: Cambridge University Press.

Harris, Zellig S. 1951. *Methods in structural linguistics*. Chicago: University of Chicago Press.

Hornstein, Norbert. 2017. On *Syntactic Structures*. http://facultyoflanguage.blogspot.com/2017/01/on-syntactic-structures.html.

Huang, James C.T. 1993. Reconstruction and the structure of VP: some theoretical consequences. *Linguistic Inquiry* 24, 103-138.

Katz, Jerrold & Paul Postal. 1964. *An integrated theory of linguistic expressions*. Cambridge, MA: MIT Press.

Lappin, Shalom, & Stuart M. Shieber. 2007. Machine learning theory and practice as a source of insight into universal grammar. *Journal of Linguistics* 43,

393–427.

Lasnik, Howard. 1981. Restricting the theory of transformations. In Nobert Hornstein & David Lightfoot (eds.). *Explanation in linguistics*. 152-173. London: Longmans.

Lasnik, Howard. 2000. *Syntactic Structures revisited*. Cambridge, MA: M.I.T. Press.

Lasnik, Howard & Joseph Kupin. 1977. A restrictive theory of transformational grammar. *Theoretical Linguis*tics 4. 173–196.

Lees, Robert B. 1957. Review of Chomsky (1957). *Language* 33, 375-408

Matthews, Peter H. 1993. *Grammatical theory in the United States from Bloomfield to Chomsky*. Cambridge: Cambridge University Press.

Matthews, Peter H. 2001. *A short history of structural linguistics*. Cambridge: Cambridge University Press.

McGilvray, James. 2nd edn. 2014. *Chomsky: Language, mind, and politics*. Cambridge: Polity Press.

Newmeyer, Frederick 1986. *Linguistic theory in America: The first quarter-century of transformational generative grammar*. New York, Academic Press.

Pereira, Fernando. 2000. Formal grammar and information theory: together again? *Philosophical Transactions of the Royal Society of London A: Mathematical Physical and Engineering Sciences* 358, 1239–1253.

Ross, John Robert 1967. *Constraints on variables in syntax*. Cambridge MA: MIT dissertation.

Smith, Neil & Nick Allott. 3rd edn. 2016. *Chomsky: Ideas and ideals*. Cambridge, England: Cambridge University Press.