

A Survey of Syntax*

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INTRODUCTION

In the following pages we survey the major results and current research topics in the field of syntax, with an eye to those that might be of relevance to bilingual education. We have deliberately chosen to think about "relevance" in a very broad sense, deeming both direct and indirect, immediate and longer-term, applications to be of interest. It is also true that we come to the topic as theoreticians in linguistics exploring new territory, rather than as practitioners in education, but we hope that our approach will help readers to see familiar topics from a new direction or in a fresh light and to think about some unfamiliar topics that might be of use in the design and implementation of multilingual programs.

THE FIELD OF SYNTAX

The Nature of Syntax

Basics. The field of syntax, in its broadest sense, concerns the ways in which *meaningful elements are combined in language*. All languages associate *sounds with meanings* in units that have characteristic *uses* (by particular people in particular situations). There are branches of linguistics that treat each of these aspects of language: *phonology*, the study of the way sounds are used in languages; *semantics*, the study of the meanings conveyed by these sounds; and *pragmatics*, the study of the uses of specific sound-meaning combinations.

But it would be wrong to conceive of a language as a gigantic list of stretches of sound, each combination conveying a specific meaning and appropriate for use in certain situations. Such a "language" would be far too inflexible for the number and variety of things that people want to do by speaking: it would be enormously burdensome to produce and perceive, since speaking and understanding it would require memorizing vast numbers of long stretches of sound, with their accompanying meanings and uses. And such a language would fail to take advantage of the creativity of speakers and listeners--their ability to concoct and understand novel combinations of a limited number of elements.

In fact, languages are organized into units at several levels, and at each level units are combined according to general principles rather than idiosyncratically. As a result, new combinations can be made and understood. For instance, there are general principles of word formation in English that allow us to form, and understand, the plural of a word even when we have had no previous experience with this plural. I can talk about persimmons, and you will understand me, even if our previous experience with the English language does not happen to have involved the word persimmons; it is enough that we know the word persimmon and the general principles for making plurals.

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Levels of structure. It is customary to distinguish three major levels of organization of meaningful units in languages. The smallest meaningful units, *morphemes*, are combinations of sounds like the un, happy, ness, and es in the word unhappinesses. Morphemes combine to form *words*, according to principles peculiar to each language. Only certain *combinations* are possible--happy can be joined with ness but not with es--and even then the morphemes must be combined in a specific *order*, happiness, not *nesshappy.¹ Finally, the principles of combination often refer to whole *classes* of morphemes, rather than to specific morphemes: once you know that straightforward is an adjective meaning so-and-so, you can form, and understand, the noun straightforwardness. The general principle concerning words with ness in English can be summarized (leaving out a few details) in a formula:

Adjective + ness = Noun

The principles of word structure, then, taken together, are known technically as the *morphology* of a language.

The second major level of organization is *syntax* proper, the organization of words into larger units, i.e. *sentences*. Again, only certain combinations are possible--Weeds flourished, but not *Weeds of--and even when a combination is possible, it must usually be made in a certain *order*--Weeds flourished, not *Flourished weeds. Again, the principles of combination often refer to classes of words rather than to specific words; once you know that cinquefoils is a noun meaning so-and-so and that thrived is a verb meaning so-and-so, then you can form, and understand, the sentence Cinquefoils thrived.²

Finally, sentences can be assembled into still larger units, *discourses*, again according to general principles. For instance, Once upon a time there was a very happy king is one way to begin a certain type of discourse in English, but not to end one, and this sentence could be followed by He ruled with a firm hand but not by She ruled with a firm hand. The principles of organization at this level are known as the *discourse structure* of the language. Discourse structure, like morphology and syntax, shows restrictions on combination and order, and makes reference to general classes of units.

Although the three levels of organization seem in many ways to be governed by general principles of distinct types, there are many important interrelationships and parallels among levels. For instance, the same or similar meaning can be expressed either morphologically or syntactically--likelier or more likely, visited or used to visit, Roger's or of Roger; the same or similar meaning can be expressed by a sentence or by a sentence fragment--What did you see? (I saw) A dog with a pink bow around its neck;³ and the same or similar meaning can be expressed in one sentence or several--Arriving home, we noticed a peculiar smell or We arrived home. We noticed a smell. It was peculiar. A parallel between levels can be seen in the fact that morphological classes typically play a role at all three levels; thus, the Noun-Verb-Adjective-Adverb distinction in English will be referred to in the principles that have to do with morphology, syntax, and discourse structure. Because of such interrelationships and parallels, our discussion below touches on all three areas, though the focus is on syntax proper.

Syntactic research. Linguists approach the field of syntax in a number of different ways. We distinguish here three major lines of approach; the first two are of special interest to bilingual education.

Analysis of specific languages or language varieties. Much effort is directed toward describing the syntax of English, French, Mandarin, Navajo, and so on, the aim being to unearth the general principles at work in each language, to provide a detailed account of the way the language works, and to do this efficiently and insightfully. These studies may concern a regional or social variety other than the literary standard (if there is a literary standard), or they may concern informal rather than formal styles; each variety and style has a system of its own. Very often language-specific studies suggest hypotheses about linguistic universals or theoretical proposals (these notions will be discussed below), and very often the direction of research on a specific language variety is suggested by crosslinguistic studies or by theoretical hypotheses.

Crosslinguistic studies. Another very fruitful line of research compares parallel structures in a wide variety of languages, with the goals of establishing *linguistic universals* (propositions that are true for all languages) and discovering useful *typologies* (groupings of languages into a few types or classes on the basis of salient features). For instance, the systems of personal pronouns can be compared, or the ways of asking questions, or the ordering of verb, subject, and direct object. Almost invariably it turns out that the systems that occur are not all the logically possible ones, and such limitations lead investigators to propose universals and typologies. These hypotheses in turn motivate the search for confirmation and counterexamples in other languages and suggest revisions of theory.

Theory construction. Theoretical studies in linguistics are aimed at specifying, precisely and in detail, what the form of language is, and at explaining, insofar as is possible, why a language should have the form it does. Syntactic theory provides terminology and formalism for the description of syntactic structure, as well as many hypotheses about the sorts of syntactic structures that are possible. The theoretical framework an investigator uses guides him towards certain phenomena (and away from others). Our interest in theory, here, comes from the fact that theoretical proposals may suggest unexpected connections between different aspects of a language or between aspects of different languages.

Relevance of Syntactic Theory to Bilingual Education

There are various ways in which more theoretical, or abstract, studies can have relevance to more practical, or applied, matters. Possible applications sometimes directly motivate certain lines of research; at other times applications spring indirectly, even in totally unexpected ways, from research carried on for other purposes or, perhaps, simply for its own sake. In looking at the relevance of syntactic research to bilingual education, it is easy to see that some sorts of research have fairly direct relevance, while others can be applied only indirectly. A study of the syntax of a local variety of a language, for example, might be used quite directly by someone writing classroom materials. On the other hand, research on the general nature of syntactic variation can reasonably be expected to have only more indirect use--perhaps providing insight into some aspect of language use in the classroom that could help increase the sensitivity of those involved in bilingual education to linguistic factors in the situation. Such indirect application is, we feel, more significant than it might sound, since nonspecialists often seriously underestimate both the complexity of language structure and its regularity; this misunderstanding of the nature of language itself can confound practical problem-solving and even mask the existence of genuine problems.

It is also true that there is no such thing as relevance in the abstract: what is relevant is relevant to someone, for some purpose. In considering bilingual education, we see at least seven groups with differing potential interests in the fruits of linguistic research: (a) the parents of the children concerned; (b) teachers (other than language teachers) and teacher aides in a bilingual setting; (c) teachers of a language as a subject; (d) curriculum planners; (e) designers of classroom materials; (f) testers and evaluators; (g) teachers of those in groups (b) and (c) above. We have not tried systematically to label our comments as being of special interest to one or more of these groups, though we have given some suggestions.

With these preliminaries out of the way, we turn now to a general statement about some ways in which syntactic research might be relevant to bilingual education; the final section of this article presents a more specific discussion.

Language influence. The primary relevance of syntactic research to bilingual education is in the analysis of the influence of the student's first language (L₁) on the next language(s) (L₂) he learns, and of the second on the first. This influence can range from extensive, but essentially innocuous, *borrowings* (individual words phonologically adapted, translations of idiomatic phrases) all the way to the total overwhelming of one language by another. We are concerned here with the intermediate degrees of influence that can be expected in a bilingual setting. The most obvious form of influence is *interference*, the carrying-over of patterns from one language into another--as when a Spanish-English bilingual says Aquí están

unos trapos 'Here there are some rags,' (with estar 'to be'), instead of the standard Aquí hay unos trapos (with haber 'to have'), presumably because English uses be rather than have in such a construction (Cohen 1975:191); or says Another one is sitting in the wall instead of the standard on the wall, presumably because Spanish en corresponds to both in and on in English (Cohen 1975:200-1).

A more complex form of influence between languages is *simplification*, in which contact between languages results in a system that is simpler than that of either of the contributing languages. Lehiste (1965:66-8) examines a very striking case of syntactic simplification: contact between Estonian, with 28 distinct forms for every noun, and Baltic German, with eight distinct forms for every noun, resulted in some speakers having only two distinct noun forms in their "mixed" variety.

Notice that it will sometimes be hard to tell the difference between interference and simplification. This will be so, for example, when interference would naturally reduce a system, as when English, with two forms for each noun, is in contact with a language with more, like German or Russian. The extent of simplification, then, in situations where bilingualism has been or is being established could easily be underestimated and interpreted simply as interference.

In addition, Cohen (1975:Ch. 8) points out that interference must be distinguished from at least two other sorts of deviations from "school" grammar. Certain "errors" may be attributable to the fact that a child passes through predictable stages in *language acquisition*. Moreover, if the student is still developing competence in his mother tongue, the task of learning a second language simultaneously may be made more complex. Other "errors" may actually be forms characteristic of *nonstandard dialects* of the L₂ spoken by the student's peers. To this list we must add *hypercorrect* forms (like Cohen's example The cat are going to stay, with incorrect are presumably brought about by too much effort, conscious or unconscious, to use are in the right places) and genuine *speech errors* of the sort that even competent adult monolinguals make from time to time (as in Take off your chair and pull up a coat).

Finally, first and second language learners will sometimes simply (and often unconsciously) avoid troublesome words or constructions. Thus, speakers of French or Italian might avoid using actual in English because French actuel and Italian attuale mean 'current, recent' rather than 'real, true.' Learners of English tend to avoid relative clause constructions in favor of conjunction with and: instead of I noticed a book that I wanted to buy, they will use the syntactically simpler I noticed a book, and I wanted to buy it. Indeed, avoidance may well be an important factor in syntactic simplification: learners will avoid more complex constructions, because they are likely to sound inept and "foreign," in favor of simpler, safer constructions.

One linguistic goal of bilingual education might be that the students have command of two coexistent language systems which do not influence each other. However, interference and simplification, and perhaps avoidance, in both of the speaker's languages are inevitable, especially in the early stages of second language learning. We would like to be able to do the following: (a) To predict the nature of this influence, given the structures of the two languages involved and the strategies used in second language learning both before and after the "critical age." (b) To assess the significance of specific instances of influence: How much do they retard communication? Will they pass away spontaneously in a short time? Are there strong attitudes towards some of these aspects of L₁ and L₂? (c) To determine whether particular effects of influence can be alleviated by direct or indirect help from a teacher, and if so, what the best strategy for help would be. Syntactic research bears especially on points (a) and (c).

There is a substantial literature on the subject of interference in second language learning based on contrastive analysis (Lado 1957) and, more recently, based on error analysis (Dulay and Burt 1972; Burt and Kiparsky 1972). But much research remains to be done, especially on language learning in the relatively natural settings of bilingual classrooms. It seems to us that this research is important regardless of the instructional approach being used to establish skills in two languages (see Engle 1975 on the direct and native language approaches).

Styles and varieties of language. It is important that not only language teachers but all classroom teachers involved in bilingual education appreciate the complexity of the language learning task confronting their students: the L₂ spoken by fellow students will be an informal style, probably of a regional and social

variety different from the literary standard, but the L₂ the students are expected to read and write will probably be a formal style of a variety approaching the literary standard. The students are then faced with a double task--learning to speak and understand one version of L₂, but learning to read and write another. If the students are being taught by the native language approach, they have a triple task--learning to read and write "standard" L₁, learning to speak and understand "colloquial" L₂, and learning to read and write "standard" L₂. On a purely practical level, it might be sensible to cut down on the number of different tasks imposed on the students at least at first, through the use of materials in colloquial varieties of both L₁ and L₂, and through forbearance on the part of the teacher towards the use of colloquial L₂ in the classroom.

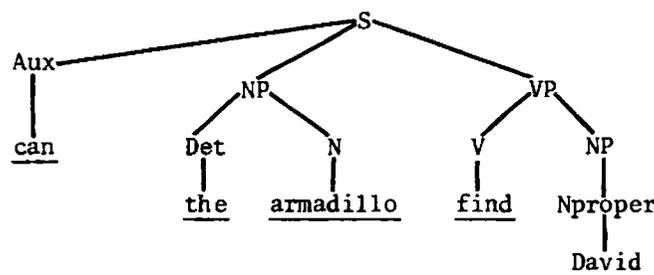
Studies of interference phenomena will need to be based on the styles and varieties of the languages actually used, not on an abstract standard with which the student has little or no contact. Although the syntax of various regional and social varieties of English, and some other languages has been described in some detail, many varieties have scarcely been touched. In addition, the study of the syntax of informal styles⁴ has barely begun (see Silva and Zwicky 1975 for some examples). Both areas are relevant to bilingual education and need further study.

General implications of theoretically oriented work. It is obviously advantageous to someone examining any sort of learning to understand the nature of the thing being learned. And different conceptions of what is being learned--for example, language--lead to quite different conceptions of the learning process and of the most effective teaching strategies.

In the case of syntax, it was believed for many years that an adequate description of the syntactic structure of a language would take the form of a list of all the types of phrases in the language. For English such a list might include principles like the following:⁵

- | | | |
|--------|---------------------|--------------------------------------|
| (i) | NP + Aux + VP = S | (declarative pattern) |
| (ii) | Aux + NP + VP = S | (pattern for yes-no questions) |
| (iii) | VP = S | (imperative pattern) |
| (iv) | V + NP = VP | (transitive verbs) |
| (v) | V = VP | (intransitive verbs) |
| (vi) | <u>be</u> + NP = VP | (predicate nominals) |
| (vii) | <u>be</u> + AP = VP | (predicate adjectives) |
| (viii) | <u>Det</u> + N = NP | (phrases like <u>the armadillo</u>) |
| (ix) | Pro = NP | (pronouns) |
| (x) | Nproper = NP | (proper nouns) |

A sentence like Can the armadillo find David? would be seen as involving principles (ii), (iv), (viii), and (x), and the *phrase structure* of the sentence could be displayed as in the diagram below:



From this point of view it might be assumed that the learning of syntax is largely a matter of learning the patterns expressed by principles like (i)-(x). Second language texts based on this theoretical framework focused on differences in the patterns displayed by different languages.

However, theoretical studies during the last 20 years indicate that a much more complex approach is required. First, it has been suggested that the syntactic description of a language should be *transformational*, in the sense used by Chomsky (1957): certain phrase structures are assumed to be basic and others are derived

from these by a series of *transformations*--operations that insert material, delete elements, or rearrange the existing elements. In the example above, the phrase structure for Can the armadillo find David? will be derived from a structure much like the one for The armadillo can find David by a rule that interchanges the subject NP (the armadillo, in this example) and the Aux (can, in this example).

Second, there should be a tightly constrained theory about what sorts of phrase structures and transformations languages can have. Such a theory should incorporate findings on linguistic universals and typologies. For instance, the theory should incorporate the observation that while some languages, including English, form yes-no questions by means of a transformation interchanging the subject NP and the Aux (as in the "armadillo" example above), no language has been observed to form yes-no questions by interchanging the subject NP and the direct object NP.

Third, systematic variation--for instance, regularly occurring differences between the syntax of formal and informal styles--should be understood as part of the structure of the language, to be described in as much detail and with as much attention to general principles as any other aspect. For instance, the fact that sentences with missing initial elements, like You want to go or Want to go for Do you want to go are informal in style and are derived by a deletion transformation conditioned by the stylistic level chosen by the speaker, as well as by the syntactic categories of the elements involved.

These three changes in the way syntax has been viewed utterly transform the way learning is seen by linguists, and future advances in theoretical matters will doubtless have a similar impact on practical enterprises. Hence, even theoretical work of a highly abstract variety must be seen as possibly relevant to activities like bilingual education.

CURRENT RESEARCH IN SYNTAX OF INTEREST TO BILINGUAL EDUCATION

Syntactic studies of interest to those in bilingual education fall into a number of categories: (a) Studies concerned with language typology and universals; (b) those examining functional considerations in language structure and use; (c) those dealing with the three interface areas (between syntax and morphology, between morphology/syntax and semantics, and between syntax and pragmatics); (d) those concerned with syntactic variation; and (e) those studying syntactic change. In the sections that follow we discuss current research in each of the categories and comment on its relevance to bilingual education.

Typology and Universals

Typology. Languages can be sorted into types using such varying criteria as *genetic relationship*, as when we speak of Germanic or Romance languages; *geographic relationship*, as when we speak of Baltic languages or American Indian languages in the U.S.; or --and most pertinent to our discussion--*shared properties of the linguistic systems* themselves. Such groupings are called *typologies*, and these usually divide the languages of the world into only a few major groups. The concern relevant to bilingual education is: Will a language learner, speaking a language of one typological class, have more difficulty learning a language of another class than learning one of the same class? And if so, what kinds of difficulty?

One often-discussed typological classification is that of the *order of major sentence constituents*--subject (S), verb (V), and direct object (O). Greenberg (1963b) notes that in the vast majority of languages the dominant word order is SVO, SOV, or VSO. He proposes a number of universal implications based on these order types, among them: "Languages with dominant VSO order are always prepositional....With overwhelmingly greater than chance frequency, languages with normal SOV order are postpositional (Greenberg 1963:61)." For instance, Thai, a VSO language, has prepositional phrases, such as bon tól (literally 'on table') 'on the table,' whereas Navajo, a SOV language, has postpositions, for example, tsi-yi' (literally 'woods in') 'in the woods.'

Vennemann (1974:366) cites Hoenigswald's suggestion that sentence accent patterns characteristically differ according to whether the language is verb-final (SOV) or

not. In languages that are, the assignment of stress is *primary-secondary* (as in English White House). For languages that are consistently verb-nonfinal, the accent pattern is *secondary-primary* (as in English white house). According to Vennemann, this difference causes "a major difficulty in learning a language of the opposite type of one's native language..." Such observations are well worthy of more investigation by those concerned with second language learning.

Lehmann (1973) finds that the placement of function words like articles, prepositions, and conjunctions, as well as the type of morphology that a language displays,⁶ are related to word order type.

Word order typology may be overlain, or at least modified, by another style of sentence organization, according to recent work by Li and Thompson (1976). They argue that the notion *topic* plays a role in the syntactic organization of sentences in some languages of the world, including, for example, the Sino-Tibetan languages Chinese, Lahu, and Lisu. Such languages are best described as having a basic sentence structure as in



where NP₁, the topic, has a number of properties not possessed by subjects. A striking example is the Lisu sentence

<u>lâma</u>	<u>nya</u>	<u>ânâ</u>	<u>kyû</u>	- <u>a</u>
'tiger'	(topic marker)	'dog'	'bite' -	(declarative marker)

which apparently is perfectly ambiguous between the readings 'tigers (topic), they bite dogs' and 'tigers (topic), dogs bite them.' Discourse context will determine which meaning is intended. Li and Thompson claim that the notion of *subject* of a sentence is not a universal of language and that the underlying form of the basic propositional types of certain languages may be quite different. This difference between subject prominence and topic prominence may be of crucial importance for the teaching of a language of one type to speakers of a language of a different type.

Perlmutter (1971) suggests another typological differentiation on the basis of whether or not a language requires a *surface subject*.⁷ Compare Italian sono or io sono 'I am' with French je suis but not *suis 'I am.' This distinction appears in a variety of contexts in which a subject must appear, not only in simple sentences but in constructions like relative clauses and complements. It would be useful to catalog further typological distinctions of phenomena of such prominence as subjects within a language.

Universals of language. Typically underlying typologies, such as the word order typology discussed above, are *language universals*, properties of language which are realized in all languages of the world. Thus, the word order typology is established under the assumption that all languages have subjects, objects, and verbs. Similarly, we can say that all languages have nouns. While this universal is obvious to anyone who has studied languages, some useful applications follow from it. For example, we can proceed to contrast the noun systems of languages of the world to see what more specific and insightful statements we can make about them. This universal also allows us to exploit a speaker's (largely unconscious) knowledge of the noun system of his language, to bring it to consciousness, and to contrast it with the noun systems in languages he is attempting to learn.

Linguists have only begun to discover the many language universals which surely exist, but some findings already display their potential usefulness to bilingual education. We present below a few of the morphological and syntactic phenomena that are known to be universal, with comments about how they might be applied to that field. Some of the relevant source materials are also noted.⁸

Propositional types. An almost uncontroversial universal is that all languages have *propositional types* expressing certain meanings. For example:

Equational: Percy is a policeman.
Existential: There was once a king.
Transactional: Helen gave the pencil to Irene.

Each language expresses these propositional types according to its own syntactic means, and an inventory of these types and their syntactic realizations in each language would be useful for predicting interference problems and for developing a language curriculum.

An excellent source for discussion of propositional types is the *Stanford Working Papers on Language Universals*, including works by Clark (1970) treating universals of and relationships between existential, locative, and possessive constructions; Blansitt (1973) on transactional clauses; and Bhat (1975) on the syntactic distinctions between existential and equational sentences. Dowty (1972) presents an enlightening view of the difference between verbs describing activities and those describing states.

Sentence types. It is also an unrestricted universal that all languages have *sentence types*--distinct syntactic constructions which have characteristic uses. Probably all languages distinguish at least three sentence types:

Declarative: Penguins cannot fly.
Interrogative: Can penguins fly?
 Which birds cannot fly?
Imperative: Fly away, you penguins!

The *Suggestion* type (Let's go fishing. Why not have another fish cake?) and the *Exclamation* type (How tall you've gotten! What a triumph that was!) are common but perhaps not universal. For any given sentence *use* (requesting, informing, commanding, suggesting, etc.) the range of sentence *types* found in languages is quite small; there is only a handful of ways to ask yes-no questions, for instance. Such facts about sentence types and their uses could be fruitfully exploited in language teaching in a bilingual setting. Published studies include Moravcsik (1971b) on yes-no questions, Elliott (1971) on exclamatory sentences, and Pope (1973) on answers to questions.

Nouns and noun modifiers. All languages have nouns. However, the syntactic and semantic features associated with nouns and the types of modifiers (and their syntactic realizations) associated with nouns may again differ greatly from language to language. For example, features like case, number, and gender may be totally absent in a language or may be present to varying degrees. Students whose languages lack the features found in English will be particularly prone to under-differentiate those English features; for instance, a student whose language does not have an overt marker for the plural will frequently fail to add the s to English nouns.

Types of noun modifiers will also differ. Considerable time will have to be spent, for example, teaching the different uses of the English definite and indefinite articles to students whose native language has none.

On the other hand, any similarities between languages should be exploited. We expect languages to show adjectival modifications, numerals, genitive (possessive) relationships, and so on. The syntactic realizations of many of these features are well described in the literature, and awareness of them should be useful to language teachers, curriculum planners, and those designing classroom materials.

Moravcsik (1969) treats the observation that the notion of definiteness is realized in some languages by word order and in others by such noun modifiers as articles (and in some languages by tone!). Ultan (1970) presents a typology of possessive constructions. Moravcsik (1971a) characterizes agreement features and treats in particular gender, number, person, and definiteness. Greenberg (1972) treats the properties of numeral phrases modifying nouns.

Function words. Languages differ greatly in their inventories of the "minor" or *function word* categories, for example whether or not they have prepositions, postpositions, articles, classifiers, intensifiers, copulas, verb auxiliaries, negation markers, and coordinating conjunctions. Further, meanings associated with function word categories in one language may be associated with "major" or *content*

word categories in another: in some languages, meanings like 'with' and 'for,' and even 'not' and 'and,' are expressed by words with the syntactic properties of verbs. Function words in English (as well as all other languages) are frequent in speech and writing, and their improper use immediately marks a speaker as foreign or uneducated. Comparative syntactic research into the distribution and uses of function words could provide much useful material for curriculum development and materials design.

Relationship of nouns to verbs. The ways nouns are related to verbs--as subjects, direct objects, indirect objects, and so on--differ greatly from language to language, and even within a language from verb to verb. Since these differences in *case systems* can be a major source of interference, contrastive and error analyses will be very important.

Fillmore (1968) presents an analysis of the syntactic reflexes of a semantic notion of case, an analysis which has served as a model for many language descriptions. Traditional grammars of individual languages typically contain sections on the various uses of grammatical case. Lees (1970) shows how noun-noun compounds in English systematically reflect the relationships of nouns to verbs.

Complements: a case of relationship between syntax and semantics. We saw above that each language has its own syntactic means of expressing propositional types. Similarly, languages have different ways of expressing relations between propositions, or modifications of propositions.

We find, for example, that verbs fall into semantic classes which constrain syntactic operations; these classifications have to do with the *complements* (clauses acting as subject or object) of the verbs. Thus, verbs have been semantically classified by Kiparsky and Kiparsky (1970) as being *factive*--those whose complements are presumed to be true; for instance, realize in

- (1) Lisa realizes that ostriches cannot fly.

or *nonfactive*--the complements of which are not presumed true; for instance hint in

- (2) Leroy hinted that New York was about to default.

Hooper (1975) finds that these factive and nonfactive verbs are cross-cut semantically by another semantic distinction--*assertive* versus *nonassertive*. Assertive verbs like hint or realize indicate in one manner or another that the speaker or the subject of the sentence has an affirmative opinion regarding the truth value of the complement [as in (1) and (2) above], while nonassertive verbs comment on or deny this truth value: be possible (nonfactive) and regret (factive) in (3) and (4) are nonassertive:

- (3) It is possible that Harry has thrown out the leftover squid soufflé.
 (4) I regret that your monkey has caught cold.

These semantic distinctions turn out to have syntactic reflexes: we find that a nonassertive factive can contain the phrase the fact that, while an assertive factive cannot.

- (5) Bill regretted the fact that Sue had won the Pulitzer Prize.
 (6) *Bill realized the fact that Sue had won the Pulitzer Prize.

Objects of assertive verbs can be preposed (moved to the front of the sentence), whereas objects of nonassertive verbs cannot be.

- (7) Mary is lost, Bill hinted.
 (8) *Mary is lost, it's unlikely.
 (9) Mary was lost, John realized.
 (10) *Mary was lost, John regretted.

These are just two semantic distinctions with syntactic correlates. We believe that such classes as factive, nonfactive, assertive, nonassertive, and others

are universal. If the language learner is made conscious of such classes, language learning might begin to seem less random and idiosyncratic.

A wealth of information on the syntax of subordinate clauses in many languages is contained in Corum et al. (1973). Zwicky (1974) surveys work done on direct and indirect discourse, syntactic realizations of which may differ dramatically.

Adverbial connectives. All languages have syntactic devices for relating two propositions with respect to

<i>Time, precedence, simultaneity:</i>	<u>After/Before/When John left, Sue showed up.</u>
<i>Concession:</i>	<u>Although John's not here I think you can go ahead without his signature.</u>
<i>Reason:</i>	<u>I did it because I wanted to.</u>
<i>Purpose:</i>	<u>I'm doing this now so that I can leave later.</u>

and more. All languages will express these relationships syntactically but in different manners.

Quirk et al. (1972) present a breakdown of English adverbial connectives, as well as most of the major syntactic constructions in English. Geis (1970) provides syntactic analyses of English time adverbial clauses, and also (1973) gives analyses of if and unless clauses. Rutherford (1970) distinguishes two types of reason clauses--those modifying the speech act, as in Dory's here, because I can hear him, and those that are part of the main proposition, as in Dory's here because he wants to be here. Speech act concessives, as in I hate to bother you, but your zipper is open, are analyzed by Baker (1975) and Kantor (1975b).

Other universals. The discussion above presents only some of the syntactic universals that linguists have studied. There appear to be, in fact, very few language-particular phenomena if one probes deeply enough.

*Functional Considerations*⁹

In our opening discussion of syntax, we argued that a "language" that associated stretches of sound directly to meanings would be too inflexible for use in human activities, and that this *functional* consideration explained the multi-level organization of languages. In particular, we noted that the burden on perception and production was lightened by the existence of meaningful units smaller than a whole discourse--sentences, words, and morphemes. The organization of sentences into *phrases* of various sizes can also be seen as motivated by functional considerations: these are meaningful units intermediate in size between the word and the sentence.

The need for processable "chunks" of language elements of various sizes explains why there are meaningful units smaller than a whole discourse; it does not, of course, explain why languages have particular units. If we ask why languages have transformations, we can again reply with functional arguments--and again, these will explain why transformations of various sorts exist, but not why languages have the particular transformations they do. McNeill (1966:62), for example, examining children's acquisition of negation in English, hypothesizes that the development of transformational rules for the placement of the negative comes about because "the child needs to process sentences in short intervals of time; presumably it takes less time and a child tends to forget less when the placement of the negative is done by transformational rules rather than by independent [phrase structure] rules," but must appeal to specific linguistic universals to explain why the acquisitional sequence takes the shape it does. We must keep in mind, then, that functional considerations help explain many universal properties of language, but not all of these properties, and none of them completely.

With this caution, we now turn to six ends served by transformations: (a) the marking of sentence types, (b) the marking of relationships in discourse, (c) pronounceability, (d) perceptibility, (e) brevity, and (f) variety. It should be remembered that these functions of transformations are unrestricted universals of language. That is, we expect all languages have these same functional needs, though they are satisfied by language-particular transformations and conditions on transformations.

Marking of sentence types. Every language must provide some systematic indication of sentence use. This may be done by characteristic pitch patterns associated with particular uses, like the rising final pitch of questions in English, as in You're going now? and Are you going now?; by special morphemes or words associated with particular uses, as in the use of how come to indicate a question and let's to indicate a suggestion; by deletion transformations, as in the *test question* The discoverer of the mudpack treatment for arthritis was...? and in the *imperative* Get me a beer!; by transformations changing word order, as in the *yes-no question* Will the penguin bite me? and the *wh-question* Who will the penguin bite?; by transformations copying parts of sentences, as in the *tag question* You're happy, aren't you? and the *tag request* Give me a metric wrench, would you?; or by combinations of several of these devices, as in some of the examples already given.

In addition to these direct indications of sentence use, every language has a number of conventionalized indirect forms, like the English Do you have any roasting chickens?, which has the form of a question but is conventionally used as a request for a shopkeeper to get roasting chickens for you (if he has any). We return to these indirect forms in our discussions below of the relationships of morphology, syntax, and semantics. Here we should remark that such utterances can fairly be called *speech act idioms* (Sadock 1972)--entire sentences whose function in speech is different from the use normally associated with their sentence type--and like other idioms, they do not translate easily into another language. So just as by and large cannot be translated into *por y grande in Spanish, *par et grand in French, or *von und gross in German, so a literal translation of Do you have any roasting chickens into Hebrew does not appear to yield the expected response from Hebrew-speaking storekeepers, and none of the following (from Sadock 1974a:93) counts as a normal request to open the door in English, though each does in the original language:

- Swedish: *Tänk om Ni skulle öppna dörren.*
'Think whether you should open the door.'
- Hebrew: *atá muxán liftoáx et hadélet?*
'Are you ready to open the door?'
- Greenlandic Eskimo: *matumik angmarniarit.*
'May you try to open the door!'

In such idioms we have a rich potential source of misunderstanding between speakers of different languages.

Marking of discourse relationships. A sentence in a discourse must bear meaningful relationship to what preceded it; it must fit semantically and pragmatically. But we find also that sentences in context are syntactically constrained. For example, it is often said that active and passive sentences have the same meaning, yet in a discourse, one form may be clearly preferable,¹⁰ as in the example:

- (11) Bill was touring Columbus. *The whole city was seen by him in a day.

Here the passive sentence sounds somewhat odd. On the other hand, a passive sentence is appropriate in a context like the following:

- (12) Guess what happened to Jim. He was just given the Congressional Medal of Dishonor by a group of anti-war activists.

Why should a passive sentence be preferable in one context and not in another? Firbas (1971) maintains that all languages have mechanisms whereby information that is old to the discourse or known to the hearer will come first in a sentence, and newer information will come towards the end. Different languages will accomplish this information distribution in different ways. A language like Czech, with an extensive set of morphemes attached to nouns indicating their relationship to the verb, may simply rearrange word order, while a language like English must use different syntactic structures, such as the passive.

Other linguists also maintain that linguistic elements and structures reflect *communicative functions*. Kantor (1977), for example, has suggested that a speaker of

a language has a special knowledge of the communicative abilities of his addressee, and on the basis of this knowledge, he decides the application of rules for pronominalization, definite reference, use of various connective devices such as conjunctions and adverbs, and so on. Kuno (1972) categorizes four types of declarative sentences, each with different discourse functions and concomitant syntactic constraints (see also Chafe 1976 and Freedle 1977).

Teachers of composition must frequently grapple with questions like the following: How do you emphasize something? How do you make a smooth transition from one topic to another? How do you indicate the beginnings and ends of sections? Different languages accomplish these functions in different ways, and a great deal of research remains to be done on what communicative functions there are and on the syntactic means by which they are accomplished.

Pronounceability. It is the function of phonological rules of assimilation and neutralization to make sequences of sound more pronounceable. In morphology and syntax, pronounceability is served in at least two ways--by principles imposing order on elements and by principles avoiding certain difficult combinations of elements.

Ordering. A recurrent proposal in syntactic studies (beginning with Staal 1967 and including Vennemann 1973) is that the constituents of a phrase in basic phrase structure are not ordered with respect to one another, but are placed in their appropriate linear order by transformations. According to this proposal, English and Japanese would have the same phrase structure rules with the same meanings, for instance:

$$\begin{aligned} \{NP, VP\} &= S \\ \{V, NP\} &= VP \end{aligned}$$

In both English and Japanese, the constituents of S would be ordered NP, VP, but in Japanese a transformation would order NP before V within VP, while in English a transformation would order V before NP within VP. One function of such transformations is literally to make sentences utterable. As Miller and Chomsky (1963:483) put it: "Subjectively, we seem to grasp meanings as integrated wholes, yet it is not often that we can express a whole thought by a single sound or a single word. Before they can be communicated, ideas must be analyzed and represented by sequences of symbols." [Emphasis added.]

Whether or not we assume that basic phrase structures lack linear order, there will still be transformations providing alternative orders for certain constituents. All of these transformations primarily provide variety (see the discussion of variety below), though they serve other functions as well. Three examples: the rule of Particle Movement, which derives (14) from something like (13);

- (13) I gave up meat for Lent.
(14) I gave meat up for Lent.

the rule of Cleft Sentence Formation, which derives (16) from something like (15);

- (15) Jack noticed a penguin.
(16) It was a penguin that Jack noticed.

the rule of Negative Lowering, which derives (18) from something like (17).

- (17) It is not so that pigs can fly.
(18) Pigs cannot fly.

Cleft Sentence Formation also serves a discourse function, since it focuses on one constituent in a sentence. And Negative Lowering also works for brevity, since it reduces a two-clause structure to a single clause.

Finally, it seems that not all ordering is accomplished by phrase structure rules and transformations. Beginning with Ross (1967) and Perlmutter (1970, 1971), a great many *surface structure constraints* (SSCs) have been proposed, among them a number concerned with the ordering of elements within words and sentences. SSCs are (static) *conditions* on structures, rather than (dynamic) transformations. Perlmutter

argues that the ordering of pronouns before the verb in Spanish (first se, then second-person pronouns like te, followed by first-person pronouns like me, then third-person pronouns like le) should be stated as a SSC rather than the outcome of a set of ordering transformations.

A possible example from English (though the arguments for a SSC here have not been laid out anywhere) is the ordering of elements in the verbal auxiliary: first a modal, then the perfect have, then the progressive be, then the passive be (all together in the awkward They might have been being beaten).

The distinction between ordering accomplished by transformations and order conditions expressed by SSCs might have important implications for second language learning, since the former relates to universal characteristics, while the SSCs appear to be idiosyncratic and language-particular. We might then expect learning of SSCs to be more difficult and to result in interference or avoidance.

Difficult combinations. One striking type of syntactic combination that causes difficulties in production¹¹ is the repetition of morphemes with identical or near-identical pronunciations, as in the English sentence I was surprised that that man came, or in examples with two verb -ing forms in sequence (Ross 1972c), like *He has been trying washing every car that came his way. There is no universal constraint against such sequences, since they are often tolerated--notice the two dos in Do do something quick! However, they tend to be disfavored, especially when one or both of the morphemes lack stress.¹²

Languages adopt several strategies for avoiding such difficult combinations. One strategy is simply to prohibit them, by means of a SSC, as in the case of double -ing constructions in English. Note, however, that there is an alternative construction for conveying the meaning: He has been trying to wash every car that came his way.

A second strategy is to use a transformation that reduces the two offending elements to one. Radford (1977) gives examples in Japanese, English, Swedish, Hindi, Mandarin, and Polish, as well as the following French illustration: *Je préfère que tu restes, plutôt que que tu t'en ailles 'I prefer that you remain than that you go away' becomes Je préfère que tu restes, plutôt que tu t'en ailles, with the deletion of que 'that.'

A third strategy is to use a transformation that converts the offending sequence to one with different elements. Radford gives examples in Serbo-Croatian and French, and the following German case: *Goethe ist bekannter als Schriftsteller als als Naturwissenschaftler 'Goethe is better known as a writer than as a natural scientist' becomes Goethe ist bekannter als Schriftsteller denn als Naturwissenschaftler, with denn replacing als 'than' (although it cannot replace als elsewhere).

We can expect such constructions to present difficulty to the language learner, since he has no way of knowing which sequences are offensive in L₂ or how the offense is treated--whether the sequence is simply prohibited, so that an alternative construction must be found, or whether it is reduced, or whether a special substitution is made for one element.

Perceptibility. We have already noted that the chunking of language material, into words, phrases, sentences, and discourses, aids perception (and production as well). Pauses, pitches, and other phonological phenomena that "demarcate" boundaries (Trubetzkoy 1969) make these units even clearer. Some transformations also aid perception by encoding larger units as smaller ones, much as encoding a binary number like 1001110 into an octal number, 116, makes it easier to perceive and recall; transformations of this sort are treated in the discussion of brevity below.

There are at least two other ways in which transformations, or conditions on transformations, serve perceptibility: some transformations provide redundancy to sentences, and some transformations and conditions on them prevent perceptual complexity. We give some examples in the following two subsections.

Redundancy. In the technical sense, *redundancy* is not a bad thing; it refers to those elements in communication that could be eliminated without loss of information but which are present to help ensure comprehension. Numerous writers (for instance, Chao 1968:205-6) have pointed out that both written and spoken language need considerable redundancy, since the conditions of communication by language are never perfect (there are background noises, speakers make slips of the tongue or

speak with their mouths full of food, listeners are inattentive or hard of hearing). Any extra information provided in language helps listeners to perceive correctly under these less-than-perfect conditions. Transformations of two types supply redundancy: *government rules* and *agreement rules*.

Government rules require that a word take a special form when it occurs in a specific construction. For example:

(a) Object pronouns in English undergo transformation resulting in special forms, so that in We admire her, the fact that the subject is we and the object is she is indicated both by the ordering of the words in the sentence and also by the special form for objects, her.

(b) Verbs following the perfect auxiliary have take the past participial ending, so that in They have seen everything, the fact that the sentence has perfect aspect is indicated both by the auxiliary have and by the special form for past participles, seen.

(c) A NP preceding and modifying a noun takes the possessive ending 's, so that in your father's mustache, the fact that the NP your father modifies mustache is indicated both by its ordering before mustache and by the ending 's.

Agreement rules ensure that the form of one word agrees with some property of another word. Some English examples:

(a) A verb in the present tense takes the third-person singular ending s when its subject is a third-person singular NP, so that in He admires them, the fact that the subject is he and the object is they is indicated in three ways: ordering, the object form them, and the s ending agreeing with the subject but not the object.

(b) The modifiers this and that agree in number with the nouns they modify, so that in these monkeys, the fact that monkeys is plural is indicated in two ways: by the ending s and by the form these instead of this.

(c) In some dialects, indefinite pronouns agree in negativity with a preceding not, so that in They didn't see nobody nowhere, the negativity of the sentence is indicated in three places: by n't, by nobody instead of anybody, and by nowhere instead of anywhere.

Avoiding perceptual complexity. Yngve (1960, 1961) suggested that one motivation for the existence of certain transformations is that they reduce the degree of what we might call "heaviness on the left:" they move wordy constructions from positions relatively early in the sentence to the end of the sentence, thereby reducing the processing load on the listener, since the rest of the sentence will have been processed. The idea is developed further in Langendoen (1970). Among the English transformations with this effect are the following:

Extraposition: That he was a spy for the Ruritians surprised us all. ⇒ It surprised us all that he was a spy for the Ruritians.

Extraposition from NP: A man who was wearing a penguin suit came in. ⇒ A man came in who was wearing a penguin suit.

Heavy NP Shift: They gave the two proposals that they all felt were the best of the lot to Sharon. ⇒ They gave to Sharon the two proposals that they all felt were the best of the lot.

Passive: Every single person who had ever had the experience of passing through the Department of Anaerobic Bacteria hated Professor Smurd. ⇒ Professor Smurd was hated by every single person who had ever had the experience of passing through the Department of Anaerobic Bacteria.

(Notice that perceptibility is the primary function of Extraposition and Heavy NP

Shift, while Passive is primarily motivated by discourse considerations.)

In some cases, perceptual complexity is averted by a condition on a transformation. For instance, Particle Movement is blocked from applying where there is a complicated direct object; compare:

- (19) I gave up all foods that contained more than 0.1% animal fat.
 (20) *I gave all foods that contained more than 0.1% animal fat up.

The matter of perceptual complexity has also been explored in detail by Grosu (1972), building on the work of Bever (1970). Grosu discusses four sorts of difficulties that are alleviated by transformations or averted by conditions on them: erroneous closure, interrupted behavior, perceptual conflict, and unacceptable ambiguity. We now take these up briefly in turn.

Erroneous closure, or "being led up the garden path," occurs when it is possible to understand the beginning of a sentence as a complete sentence; the listener then "closes off" too soon and is puzzled by the remainder of the sentence. Erroneous closure explains why the That-Deletion transformation (I believed that the earth was flat \Rightarrow I believed the earth was flat) does not apply to subject clauses; if applied to a sentence like That Tom dislikes koala bears is odd, the result, *Tom dislikes koala bears is odd, leads the hearer up the garden path, since Tom dislikes koala bears is a sentence in itself. Similarly, erroneous closure can be used to explain why the transformation Relative Pronoun Deletion (A man whom I don't like complained about the proposal \Rightarrow A man I don't like complained about the proposal) does not delete relative pronouns representing the subject of the relative clause, as in A man who got up complained about the proposal: the result, *A man got up complained about the proposal, begins with a complete sentence, A man got up.¹³

Interrupted behavior occurs when the processing of one unit is broken up in order to allow processing of another unit of the same sort. Interruption is very burdensome perceptually, and this undesirable complexity explains why, for example, there is a limit to the number of relative clauses which can be nested one within another.

- (21)a The school fired the teacher.
 b The teacher the school fired flunked the girl.
 c ?The girl the teacher the school fired flunked cried about her grades.
 d *The grades the girl the teacher the school fired flunked cried about were abysmal.

Perceptual conflict occurs when the conditions on two transformations cannot be reconciled. It can be illustrated by the example *Diana was stabbed by herself, which attempts to apply both the Passive and Reflexivization transformations. However, as Grosu (1972) argues, the Passive transformation changes the focus of a sentence, but Reflexivization can apply only when two NPs refer to the same thing. How, then, could Passive change the focus of the example in which the subject and object refer to the same person?

A final matter of perceptual complexity is *unacceptable ambiguity*¹⁴ referring to ambiguities that are in some sense intolerable to speakers of the language. To illustrate, consider the fact that the transformation Pronominalization is blocked from applying in the sentence (22) below and in the discourse (23):

- (22) Gerald and Nelson strode into the room, and
 { Gerald }
 { Nelson } began berating the reporters.
 {*he }
- (23) Has Margaret spoken to Mildred about the impending bankruptcy?
 Yes, and { Margaret's }
 { Mildred's } mother was most upset.
 {*her }

The result of the transformation is ungrammatical, presumably because it is impossible to tell who he and her refer to. Other examples of unacceptable ambiguity are a bit more subtle. In (25) below, the relative clause who was pregnant modifies girl. Since this straightforward interpretation is available, (25) cannot be understood as having who was pregnant modify a woman, an interpretation that would be possible if the transformation Extraposition from NP could move the relative clause in (24) to the end of the sentence.

- (24) A woman who was pregnant hit a girl.
 (25) A woman hit a girl who was pregnant.

Examples of this sort have been treated in detail by Hankamer (1973) and Ruwet (1973), each proposing a universal constraint against particular kinds of ambiguities.

In connection with unacceptable ambiguity, we must emphasize that most ambiguity is acceptable, in the sense that having more than one meaning does not in general cause sentences to be judged ungrammatical or impossible. Indeed, practically all sentences have more than one meaning, out of context, if only because so many words have more than one meaning: in the sentence the pen is hot, pen has at least three meanings ('writing implement,' 'enclosure for animals,' 'penitentiary') and hot at least two ('high in temperature,' 'stolen'), so that out of context the sentence has at least six distinct meanings. Even ambiguities introduced by transformations are usually innocuous: I like Sam better than Harry has two meanings ('I like Sam better than I like Harry,' 'I like Sam better than Harry likes Sam'), but the sentence is not impossible, as sentences (22) and (23) above are.

Since languages have considerably different morphologies and rather different sets of transformations (as well as varying ambiguities in individual words), the effect of (even universal) constraints against ambiguity will not be the same in all languages. Other sorts of perceptual motivations for rules and conditions will also have different manifestations in different languages. Moreover, some languages seem more willing to accept perceptual complexity in particular parts of their grammar than other languages.

Brevity. A further functional consideration in human communication is that it must take place on a time scale suited to human beings, that is, a very wide range of complex messages should be communicable in no more than a few seconds. Nothing we have said so far would guarantee this. The requirements that language be pronounceable and perceptible and that sentence types and discourse relationships be marked could be satisfied by giving a unique phonological realization to each piece of semantic and pragmatic structure.¹⁵ But the result would not be a usable language. Phonological deletions and coalescences would reduce the length of discourses somewhat, but they would still be far too long. Three sorts of transformations abbreviate discourses so as to make them usable: Deletions and Pro-ings, transformations reducing clause structure, and the insertion of lexical items. We take these up one by one in the subsections that follow.

Deletions and pro-ings under identity. Some transformations abbreviate sentences and discourses by eliminating repeated references or descriptions (by Deletion under identity) or by replacing them by fixed short forms (by Pro-ing).

Some examples of deletion transformations in English are Conjunction Reduction, which derives (27) from (26)

- (26) Apples are red and apples are juicy.
 (27) Apples are red and juicy.

Gapping, which derives (29) from (28)

- (28) George ate a bagel and Chuck ate some sushi.
 (29) George ate a bagel and Chuck some sushi.

and several other rules illustrated in the previous sections--Comparative Deletion, in I like Sam better than Harry, That-Deletion, and Relative Pronoun Deletion. Deletion rules in discourse yield sentence fragments like those discussed by Morgan (1973):

- (30) What do you think Janet uses that butter for?
I suppose (Janet uses that butter) for greasing pigs.

Pro-ing transformations in English include two rules illustrated in the previous section, Pronominalization and Reflexivization, plus transformations yielding instances of one, do so, and so plus auxiliary:

- (31) Barbara observed a blue Egyptian cross-hatched bullbat, and Brutus noticed a red Egyptian cross-hatched bullbat. \Rightarrow Barbara observed a blue Egyptian cross-hatched bullbat, and Brutus noticed a red one.
 (32) I completely consumed a bucket of oysters in two minutes, and Max completely consumed a bucket of oysters in two minutes, too. \Rightarrow I completely consumed a bucket of oysters in two minutes, and Max did so, too.
 (33) My wife is going to Vienna next year, and I am going to Vienna next year. \Rightarrow My wife is going to Vienna next year, and so am I.

Reduction of clause structure. Other transformations compact two clauses into one. Negative Lowering is one such rule. Also in this set in English are transformations reducing clauses to phrases, like the rules of Raising, Equi-NP Deletion, Gerundive Nominalization, and Abstract Nominalization, illustrated in (34)-(37) respectively:

- (34) I believe that she is a spy. \Rightarrow I believe her to be a spy.
 (35) I expect that I will break the bank at Monte Carlo. \Rightarrow I expect to break the bank at Monte Carlo.
 (36) That Max eats so much vichyssoise amazes me. \Rightarrow Max's eating so much vichyssoise amazes me.
 (37) For Zelda to transform Hugh into a toad took six hours. \Rightarrow Zelda's transformation of Hugh into a toad took six hours.

An important effect of clause reduction rules is that they may result in ambiguous phrases, because clauses of many distinct structures are compacted into a few phrase types. Simple illustrations of this compacting can be seen in ambiguous sentences like He saw her duck, where her duck can be either a basic NP or a basic clause, she ducked, reduced to a NP her duck.

Other interesting examples of the effect of clause reduction rules come from what might be called the *favorite phrase structures* in particular languages (also known as *syntactic targets*, as in Haiman 1974). At the level of the word, English is especially rich in noun-noun compounds like snowman, iceman, graph paper, rag paper, horse thief, kiddy car, girl friend; these represent a large variety of semantic relationships, discussed in detail by Lees (1960). Chinese is rich in subject-predicate compounds, illustrated by combinations translatable as "day brightens" for 'dawn,' "the sea screams" for 'tidal wave,' "the breath pants" for 'asthma,' and 'male fades' for 'impotence' (Chao 1968:Sec. 6.2). At the sentence level, English has numerous VP constructions of the form V NP Adj, among them the following (from Green 1970):

- (38) I found him dead.
 (39) She painted the house red.
 (40) She painted it sober.
 (41) They buried her alive.¹⁶

Insertion of lexical items. A complete description of the syntax of a language must include not only a list of the smallest units, the morphemes, and a set of principles for combining units at each level into units at the next, but a list of words like redcap, throughout, dog-eared, bagpipe, and once-over, whose meanings are not composed from the meanings of their constituent morphemes by general principles of the language. It must also include a list of phrases like by and large, give up, rain cats and dogs, on the sly, be about to, yours truly, and you can say that again, whose meanings are not composed from the meanings of their constituent words and phrases by general principles of the language. Such items are termed *idioms*, and these, coupled with individual morphemes, are sometimes called *lexical items*. An

easy, but important, part of language learning is the learning of its lexical items, from the morphemes on up to idiomatic sentences.

We assume here the view of the *generative semanticists* (see the section on compositional semantics below) that lexical items replace more complex structures, by a special sort of transformation. In any case, lexical items can stand for quite elaborate meanings--that is, a few morphemes can represent a good deal more.

Variety. Yet another function of transformations is to provide alternative forms for sentences. We have already given numerous examples of transformations which allow the same or similar meaning to be presented in syntactically different forms: the transformations Passive, Particle Movement, Cleft Sentence Formation, Negative Lowering, Extraposition, Extraposition from NP, Pronominalization, That-Deletion, Relative Pronoun Deletion, Raising, Equi-NP Deletion, Conjunction Reduction, Gapping, and others. It is also true that languages abound in lexical items with the same or nearly the same meaning: die, expire, pass away, kick the bucket; huge, gigantic, enormous, great; and many other sets. There seems to be a marked tendency towards a profusion of ways to convey the same meaning--towards variety for its own sake. In some areas of the vocabulary, this profusion is enormous--Wentworth and Flexner (1967:652-4) take up nearly two pages listing synonyms for drunk in English--and the variety of paraphrases provided by transformations is great.

The tendency towards variety is opposed by another tendency in language that there be "no distinction without a difference." Pure variety is unstable: differences in form tend to be seen as corresponding to differences in meaning, or at least (like differences in pronunciation) to be understood as conveying differences in stylistic level or regional or social dialect. Because of this tendency towards differentiation, some linguists (for instance, Chafe 1970:86-90 and Bolinger 1975) have maintained that identity of meaning is much rarer than scholars have generally supposed.

The semantic and social differentiation of distinct forms presents special problems in language learning and language teaching. The teacher obviously must be aware of whatever differentiations in cognitive and social meanings are present in the student's first language. Furthermore, studies of syntactic variation show considerable variability within a language group from person to person, and the same is true for lexical items. One has only to question a group of Americans about what sofas, couches, and davenports are to realize how much individual variation there can be in the meanings assigned to particular words. Teachers should be aware of instances when syntactic constructions or lexical items might show this sort of individual differentiation, and should probably not attempt to legislate invariant usages for such items.

The Relationship between Syntax and Morphology

We have already pointed out that the same or similar content can sometimes be expressed syntactically and sometimes morphologically--sometimes *analytically*, through the juxtaposition of words and use of auxiliary verbs, for example, and sometimes *synthetically*, using inflectional prefixes and suffixes. Languages differ considerably in how they exercise these options. Thus, where English uses the modal auxiliary will or the construction be going to to indicate future tense (and has no morphological form for the future), French has special verb forms like (il) chantera 'he will sing,' as well as the syntactic construction in (il) va chanter 'he is going to sing.' And where some other languages have *dubitative* and *reportive* forms of verbs, English must use syntactic constructions--the adverb maybe or perhaps in combination with the verb for the dubitative, and a two-clause construction with I hear that..., Someone told me that..., or something of the sort for the reportive. Differences of this sort between languages cause interference in language learning, and lead to the use of simplified forms, often with analytic constructions replacing synthetic ones.

An important area of current research concerns language elements on the borderline between syntax and morphology--*clitic* (literally 'leaning') elements, like the Spanish pronouns te, me, le mentioned above in connection with surface structure constraints, or the English contracted auxiliary verbs 's, 'd, 've, 'll, 'm, 're. Clitics are subordinated in stress to other words and usually show phonological reductions, often of an idiosyncratic sort.

Of special interest to us here is that clitics show many syntactic peculiarities. The ordering of a clitic with respect to the word to which it is attached may be different from the ordering of a related nonclitic form; in French, object NPs follow the verb, but clitic pronoun objects come before the verb (Je vois Jean 'I see John,' but Je le vois 'I see him'). Clitics may be attached to whatever word happens to be next to them, whether that word is semantically or syntactically related to the clitic word, as in the case of the English clitic auxiliaries. Or the clitics may all move to one place in the sentence, the most common locations being with the verb, at the end of the sentence, or after the first word of the sentence.¹⁷ Finally, there are extremely complex conditions on when elements must, may, or cannot become clitics. One such condition on the contraction of auxiliaries in English is discussed by King (1970), who attacks the problem of why contraction is permitted in sentences like The concert's in Royce Hall tonight, but not (for many speakers) in sentences like *Tell me where the concert's tonight. Further conditions on contraction of auxiliaries are treated by Zwicky (1970) and Labov (1972).¹⁸

In any event, the conditions on cliticization and the principles governing the placement of clitics are likely to be stumbling blocks in language learning. Interference and avoidance may well be most extreme when the languages in question have similar, but not identical, patterns of cliticization and clitic placement (as in the case of French, Italian, and Spanish). Also, there are often considerable dialect differences in the placement of clitics, and teachers may need to be aware of them.

The Relationship between Morphology/Syntax and Semantics

Form and function. It has long been realized that the connection between *form* and *function* in language is exceedingly complex.¹⁹ To begin with, even the smallest meaningful units, the morphemes, have more than one phonological form; the English plural morpheme, for instance, has one pronunciation in cats, another in dogs, another in churches, another in men, another in oxen, and so on. This is only the beginning of the complexity, since a single morpheme can be used to convey a number of distinct (though related) bits of meaning, and the same meaning can be conveyed by a number of distinct morphemes. For example, the English past tense morpheme has among its functions reference to past time, but it can also refer to the present time in "unreal" situations, as in I wish I knew. And it can refer to future time, as in It's time you went to bed. On the other hand, the past tense morpheme is not the only way to signal past time in English. This can be accomplished by using a perfect form--I have seen Austria; or a present form, in the so-called historical present of colloquial English--So he says to me...; or the modal would--I would often see him walking across campus; or with the used to construction--She used to be fretful.

This disparity between form and function can be found at every level of grammar, from the morphological on up. It can be seen, for example, in the meanings associated with the syntactic classes Noun, Verb, Adjective--many nouns are the "names of persons, places, or things," but some are not; in They took a walk and We avoided his grasp, the nouns walk and grasp describe acts; in rural policeman and solar battery the adjectives rural and solar do not describe states but name a place and a thing, respectively. At the level of the whole sentence, we observe that declarative sentences are not invariably used to make statements, interrogative sentences to ask questions, or imperative sentences to request or command: the interrogative sentence Would you pass the salt? makes a request, as does the declarative sentence I'd like the salt, while the imperative sentence Add salt, and the solution will turn blue makes a statement, not a request.

For each of these examples we should point out that there are certain standard or normal associations between form and function: the normal use of the past tense is for past time reference (which is why the tense is called *past* and not, say, *recent*); the normal use of nouns is to refer to persons, places, and things (which is why the class is called *noun*, from Latin *nomen* 'name,' and not, say, *state*);²¹ and the normal use of imperative sentences is to make requests and commands (which is why the sentence type is called *imperative*, from Latin *imperare* 'to order, command,' and not, say, *declarative*). These standard associations can be exploited in language learning in an obvious way, as can some of the exceptional associations which recur in language after language (the historical present, for instance, and the use of a declaration of wish or desire to convey a request). The learner has no assurance, however, that the language he is learning has these exceptional associations; many are quite arbitrary and therefore constitute learning difficulties.

Compositional semantics. The previous section concerned the way in which meanings are associated with individual elements at various levels of linguistic structure. But an account of the relationship between morphology/syntax and semantics requires not only an association of elements with meanings but also an account of how the meanings of larger units are composed of the meanings of their parts. This apparently simple-sounding issue has led to what is undoubtedly the hottest current controversy in syntactic theory and has generated an enormous amount of literature, some concerned with polemics, some with theory construction, and some with language description.

In our opening discussion of syntax, we suggested that the great diversity of constructions that occur in a language is derived from a much smaller set of structures (the basic phrase structures for that language) by means of transformations. Now, when we ask how meanings of larger structures are composed of the meanings of smaller ones, we have to decide which structures we are talking about--the *actual* (or *surface*) phrase structures of sentences, or the *basic* (or *deep*) phrase structures, some intermediate creatures, or some combination of these. The position of Chomsky (1965) was that semantic interpretation works only on basic structures. Indeed, one argument for positing such basic structures in the first place was that they made more clear the semantic relationships among the parts of sentences. Exactly the opposite assumption was made by the philosopher Montague (see the papers collected in Montague 1974, and Thomason's introduction to the volume); from this point of view the principles of compositional semantics are seen as working with the surface phrase structures, and transformational analysis is not necessary. A mixed approach has also been advocated (Chomsky 1970): both surface and basic structures figure in semantic interpretation. A detailed presentation of a mixed system is given in Jackendoff (1972).

Note that linguists' approaches to semantic interpretation all use basic structures in some way. It is, then, natural to ask what the difference is between basic structures and representations of meaning, since basic structures are in many ways closer to the semantic relationships in sentences than surface structures are. The proposal that basic structures are the representations of semantics has come to be known as *generative semantics* (see, for example, the expositions in Lakoff 1971a and McCawley 1973), while the proposal that the basic structures are different from the representations of semantics has come to be called *interpre(ta)tive semantics* (Chomsky 1970). These issues have been hotly debated, largely on technical matters of little interest to our present discussion. However, there is at least one topic of importance here--the semantic basis of syntactic phenomena, a topic we have noted several times already.

Many transformations, like the rule of Raising, apply only to certain forms--We believed Adolf to be a spy, but not *We thought Adolf to be a spy, although both We believed that Adolf was a spy and We thought that Adolf was a spy are possible. Is this purely a matter of syntax, or is there a semantic basis for the difference in behavior between believe and think? Interpretive semanticists are inclined to see syntactic structure as largely independent of semantics, while generative semanticists see syntactic structure as following from semantics. There are clear implications for language learning in this debate. If the interpretive semanticists are right, the learner is faced with the task of mastering two parallel systems and the principles governing their interrelationship. If the generative semanticists are right, the learner must master one basic system (semantics) plus the principles realizing this system syntactically (the transformations). A very interesting exploration of the generative semanticists' proposal in this regard is made in a work by Green (1974). Here, an all-out effort is made to find a semantic characterization of the verbs permitting one transformation in English (Dative Movement, which relates I gave the chart to her and I gave her the chart). Green succeeds, but only by characterizing a number of distinct classes of verbs permitting the rule; she concludes that there are several transformations working towards what we called a favorite phrase structure. We cannot predict from general principles exactly which classes of verbs permit the rule: Green does not demonstrate that there is any intrinsic connection between the semantics of these verbs and the fact that they can undergo Dative Movement. Further, there is variation from speaker to speaker as to which verbs permit the rule. But her results suggest that more use could be made of semantic properties in teaching the grammar of a second language along the lines of statements like "verbs of desire take both ut and the infinitive" in traditional grammars, though not necessarily as rules to be learned by the students.

The Relationship between Syntax and Pragmatics

The performative analysis. In early transformational grammars, sentence type was not specifically represented in basic structures, so that imperative and interrogative sentences were derived by transformations from declarative sentences. In slightly later work, abstract markers like *Q* (for *question*) and *I* (for *imperative*) triggered the relevant transformations. Ross (1970) and Sadock (1969) proposed still later that every sentence has a basic structure in which the surface content of the sentence is the object in a structure of the form I VERB (to) you _____. That is, the declarative sentence She is tall would have a basic structure roughly like I declare to you that she is tall, while the interrogative sentence What is life would have a basic structure roughly like I ask you what life is. This analysis has been called the *performative analysis*, because it takes as basic certain sentences like those Austin (1962) termed *performative*. Such sentences "perform" an action rather than make a statement that could be judged as true or false; I hereby pronounce you man and wife is a paradigm performative sentence. The analysis has been the subject of some controversy.

The major line of support for the performative analysis comes from parallels between the syntax of a particular sentence type and the syntax of clauses subordinate to verbs of speaking appropriate to that sentence type. In the case of imperatives, for instance, the similarities are between main imperative sentences like Please move your camels and clauses subordinate to verbs of requesting or commanding, as in I request you to please move your camels. Crosslinguistic aspects of these similarities are surveyed in Farwell (1972). In general, it can be said that the parallels are considerable.

Indirect speech acts. The analysis of a sentence whose use is not directly related to its form has been a matter of much discussion; several of the contending proposals are surveyed in Sadock (1974: Ch. 4). The central issue is whether the indirect uses of sentences can be predicted in a general way from their direct uses. We might, for instance, argue that since it is reasonable to request someone to do something only if he is able to do it, we can suggest that he do it by asking if he is able to. By such a chain of argument we could conclude that, in general, it is possible to get the effect of requesting someone to do something by asking him if he is able, so that Can you move closer gets the effect of Please move closer. Reasoning like this explains why sentences can get the effects they do, but it does not explain why certain indirect forms seem to succeed without any particular calculation on the part of the speaker or hearer (Would you pass the butter is simply one way of requesting the butter in English). We suggested above that such forms have become idioms and therefore must be memorized in learning a language.

Linguistic theory and pragmatics. Morgan (1975) argues for a view of language, in contrast to the views of generative and interpretive semantics, in which the language learner is faced with the task of mastering the communicative function of linguistic elements. That is, for example, one should not speak of the semantics or truth conditions of the definite article the. Rather, the definite determiner is seen as signalling something about the real world of the speaker (hence *pragmatics*)--the speaker's intention that the hearer pick out an intended referent or make inferences about the speaker's beliefs concerning the intended referent. The language learner, then, must acquire the functions of certain lexical items and syntactic rules and constraints, rather than their meanings.

Variation Studies

Individual variation. Recent studies in syntax have shown the existence of dialects --systematic variations of syntactic features among groups of speakers. These groups of speakers are not always bound by geographical location or social or ethnic identifications. Indeed, we may find that members of the same household vary in their language use with respect to some syntactic/semantic feature.

For example, Carden (1970) finds that there are three major dialects with respect to the interpretation of sentences like (42).

(42) All the boys didn't leave.

Some speakers of English interpret sentence (42) as meaning only

(43)a [Not all] the boys left.

That is, the word not is interpreted as negating the quantifier all as shown by the brackets in (43a). This dialect is known as the NEG-Q dialect. However, there are other speakers of English who understand (42) as meaning only (43b).

(43)b All of the boys [didn't leave.] = (None of the boys left.) = (All of the boys stayed.)

Here, the negative element is associated with the verb. Speakers who understand sentence (42) in this way are said to speak the NEG-V dialect. Yet a third group of speakers find sentence (42) to be ambiguous; both (43a) and (43b) are possible interpretations. Such speakers are said to speak the AMB dialect. If a teacher, then, says to the class,

(44) All of you aren't behaving.

how will an individual student interpret this statement--as a chastisement of himself, or of others in the class who are misbehaving? There are, in addition, many potential instances when a teacher might correct a student's language use when in fact the student and teacher have conflicting dialects with respect to a particular syntactic feature.

Implicational relationships. Ross, in a number of articles (1972b, 1973a, 1973b), tackles the interesting problem of what it means for an element to belong to a syntactic category or class. One of the great virtues of transformational grammar has been its ability to characterize higher-order constituents, that is, to show that not only is a proper noun like John a noun phrase (NP), but so also is something as complex as a relative clause, as in the boy who gave me the book, or nominals like John's breathing too deeply, or even for-to complements like for John to leave. Note that all of these NPs can be used as the subject of a sentence:

- (45)a Max upset Jim.
 b The boy who gave me the book upset Jim.
 c Max's breathing too deeply upset Jim.
 d For Max to leave upset Jim.

Note, however, that in another syntactic frame only some of these NPs yield grammatical sentences:

- (46)a I believe Max to have upset Jim.
 b I believe the boy who gave me the book to have upset Jim.
 c ?I believe Max's breathing too deeply to have upset Jim.
 d *I believe for Max to leave to have upset Jim.

The reader may find sentence (46c) here to be perfectly grammatical. In fact, according to Ross, individual speakers will vary in their judgments of the grammaticality of an individual sentence. However, any time a speaker accepts as grammatical a sentence like (46d), in which a for-to phrase functions as an NP, he will accept all nominals of the type in (46c). There is an *implicational relationship* in English that says proper nouns, as in (45a), are more "noun phrasiness" than nominals, which in turn are more noun phrasiness than for-to complements. Speakers of a language will not violate the noun-phrasiness hierarchy, although they may differ individually about a cut-off point for any particular syntactic frame. These *squishes*, as Ross calls his hierarchies, have been shown to exist for a wide range of syntactic categories and syntactic frames, and indeed can explain why the grammaticality of some sentences may be disputed by two speakers of the same language.

Keenan and Comrie (1977) discuss another kind of implicational relationship, one which they posit as a universal. They set up a case hierarchy

SUBJECT > DIRECT OBJECT > INDIRECT OBJECT > OBLIQUE > GENITIVE > OBJECT OF COMPARISON

and assert that if a language can form a relative clause on a noun in one position, it can form a relative clause on nouns in all positions above that one. Thus, English can form relatives on genitives, as in the boy whose mother I saw, and, by the implicational universal, on oblique objects (the man from whom I received a letter), and so on up the hierarchy to subjects (the girl who hit Bill). Other languages may be able to form relatives only on subjects and on no other position. Interestingly, this case hierarchy has been shown by Keenan (1975) to reflect differences between syntactically simple literary style and more complex style: authors judged to use a simple style--George Orwell, for example--relativize much more heavily on subjects, while authors like Virginia Woolf, who are judged to use syntactically more complex sentences, have a greater percentage of non-subject relative clauses. Hierarchies such as the one shown here might be useful, then, both for predicting interference problems in second language learning and for evaluating the level of acquisition of different syntactic structures.

Patching. Morgan (1972:285) notes that the rule of subject-verb agreement in English is learned "as a relatively simple principle, but fails to extend to complex cases." Consider, for example:

(47) (Either) Harry or his parents {is } coming.

Some speakers will accept only is, some accept only are, some accept either, some reject both, and others cannot make any kind of judgment. Morgan suggests that different speakers will treat such constructions by adding new subsidiary principles to their grammars in an idiosyncratic fashion. He believes that, faced with a construction like (47), a speaker will *patch* his grammar in some way, or sometimes fail to patch and decide that the sentence cannot be said. It would be useful for a teacher to know where the rules of a language fall through in this way. Appeals to "logic," translations from other languages, textbook rules, or the teacher's own speech are likely to be unconvincing to the students in such instances; teachers should probably simply tolerate alternative usages.

Specific styles. In addition to variation from person to person, dialect to dialect, and language to language, there is variation from situation to situation. The analysis of specific styles, with examples from conversation, newspaper writing, legal documents, and other sources, is considered in some detail by Crystal and Davy (1969). Other specific styles are easily isolated--the style of scientific writing, the style of recipes and labels (Sadock 1974a), the style of newspaper headlines, the style of children's rhymes and taunts, and others. School children, in both monolingual and bilingual environments, are expected to become facile users of a number of specific styles, although the task is often not presented to them in this light. Teachers should be aware, at least in a general way, of their own stylistic repertoires, their students' repertoires, and the styles they want the students to use in various school situations. Since there are substantial syntactic differences between styles, teachers should also understand the nature of these differences.

Syntactic Change

Typically, when languages come into contact, they will influence one another. We might even expect to find differences in language use within an age group, depending upon how much contact any particular child has had with a second language while learning his native language. While we have already noted the importance of examining the dialects of the languages spoken, it is important to note further that languages and dialects may be (and almost certainly are) changing. As one example, consider the changes in English in the placement of an object in relation to the verb. In the thirteenth century, the object followed the verb only half of the time; by 1500 A.D. the object almost always followed the verb (Fries 1940).

There are usually reasons for such changes, often related to the functional considerations we sketched above. Further, some linguists believe we can identify *drift*, the tendency of a language to change in specific directions (Vennemann 1975), and predict some of the changes. It would, of course, be useful for educators to be alert to language change and the direction of that change in order to keep materials for language teaching and other classroom uses up to date.

Fasold (1975) notes that we must be alert to instances of language shift, in which speech communities may be abandoning their native languages. In some communities, the movement is toward *language maintenance*, the continued use of a minority language, or *language revival*, the reintroduction of a language whose use has declined. In developing bilingual education programs for such communities, a certain amount of prescriptivism and active decision making about features of the language will be needed, especially in the preparation of instructional materials, and a good deal of combined sociolinguistic and syntactic study will be called for to determine how best to implement such programs.

PROPOSED RESEARCH IN SYNTAX

From our survey of research in syntax above, and from the general discussion of the relevance of this sort of research to bilingual education, we can now extract some specific proposals for research programs. Some of these proposals call for theoretical research, others for more obviously practical investigations.

A Guide to Language Analysis

In view of the fact that linguists will not be available to study all language varieties, and realizing that any language (such as the Indian languages of Mexico) may someday be part of a bilingual education program, we propose that a guide to language description be developed. Such a guide (which would be based on the sort of research on universals and typology outlined above) would tell an investigator what to look for in a language and how to examine language use in a systematic way. The guide should be addressed to field workers who are not linguists and to teachers who might encounter a student or students with dialect features previously unknown to them.

Development of Course Materials in Linguistics

Two sorts of programs for people involved in bilingual education need to be established:

(a) Short courses in linguistics for curriculum planners, materials designers, evaluators, and test designers, covering the sort of topics we have outlined in this paper. The point of such courses would be to alert these people to the complexity, variety, and regularity of language (ideally, with special reference to the particular languages they deal with).

(b) Short courses in applied linguistics for teachers involved in bilingual programs, making use of the guide to language analysis described above. The point of these courses would be to alert teachers to important differences in languages and varieties, to counsel tolerance of differences when this is appropriate, and to suggest ways in which teachers can approach specific problem areas. (Again, special reference should be made to the particular languages with which the teachers deal.)

Contrastive Analysis and Error Analysis

In order to identify structural similarities and differences, contrastive analyses between English and the various mother tongues of children in bilingual programs (and possibly between other language pairs) are called for. Analyses of interference and other second language learning errors are also helpful, since

predictable influence can often be prevented from altering the first language or from slowing the rate of second language acquisition by bringing special attention to the structures involved. And if the influence is likely to occur only in a brief transitional stage of language learning, it would be useful to know that special attention is not needed.

Variation Studies

For any particular program in bilingual education, the dialects and styles of speech used, both of the native language and of English, must be adequately described and made known to those concerned with the program.

Language Contact Studies

The bilingual classroom is only one of a number of situations in which language contact and interaction take place; other contact situations result in the development of trade languages, pidgins and creoles, "accented" varieties, "mixed languages," "foreigner talk," mutual borrowing, and so on. From study of these situations, we can hope to learn about the types of constructions that are most easily learned in situations of informal contact between speakers. This information can then be utilized in the design of instructional materials.

Language Acquisition Studies

Studies of second language acquisition of children in the 6-12 age group are much needed. The problems such children will encounter will be quite different from those of the well-studied five-and-under age group, who seem to learn second languages in much the same way they learn their first language.

Surveys of Classroom Problems

A very direct and practical attack on problems in the bilingual classrooms would be to survey what teachers see as difficulties involving grammar and to ask what kinds of information and materials they need. Such a survey, coupled with direct analysis of problems and needs, could provide useful information. Observation and experimentation in bilingual classrooms (along the lines of Cohen 1975) would also be valuable.

Theoretical Research

Even "pure" research can have educational implications. Syntactic theories have contributed to education already (though perhaps not to the extent some writers have claimed), and we can expect further contributions as theories are advanced and developed.²²

FOOTNOTES

¹The asterisk indicates either an impossible combination, an awkward combination, a sentence that does not communicate a well-formed meaning, or one that does not communicate the meaning intended by the speaker. A question mark is used to indicate items which might be acceptable to some speakers or in specific contexts.

²This discussion of syntax leaves out several important complexities, to be dealt with in our discussion of discourse relationships.

³Parentheses are used by linguists to indicate optional or deletable elements; any linguistic example with a portion in parentheses should be read as two examples, one with and one without the elements enclosed in parentheses.

⁴For general discussions of the phonology of casual speech, see Zwicky (1972) and Dressler (1975). Dressler particularly stresses the importance of casual speech studies for language learning.

⁵NP stands for *noun phrase*, Aux for *auxiliary*, VP for *verb phrase*, S for *sentence*, V for *verb*, N for *noun*, *be* for the various forms of the copula, Det for *determiner*, Pro for *pronoun*, and Nproper for *proper noun*.

⁶See the section on the relationship of morphology/syntax and semantics (19-21) and Lyons (1968:Ch. 7).

⁷*Surface subject* refers to the subject of the sentence as that sentence is written or uttered. The *logical subject* or *deep structure subject* refers to the sentence subject on an underlying or abstract level. For instance, the surface subject of the sentence The city was surrounded by the enemy is the city, but its logical or deep structure subject is the enemy, whereas in The enemy surrounded the city, the enemy is both the underlying and the surface subject.

⁸The organization of this section and many of our comments owe much to the "Language Typology and Syntactic Field Work" project of the Center for Applied Linguistics.

⁹The material in this section follows, in part, the arguments of Hass (1970) and Fraser (1972) though it is not directly based on either. An earlier version of parts of this section was presented by Zwicky in 1973, at the Washington (D.C.) Linguistic Circle and the Graduate Center at the City University of New York.

¹⁰The general interchangeability of active and passive sentences (and similar pairs) in discourse was one of the motivations which first led Harris to posit transformations. See Harris (1952) and later works from the Transformations and Discourse Analysis Project at the University of Pennsylvania.

¹¹Combinations causing difficulty in perception are treated in the next section.

¹²This section summarizes the material on the Like Form Constraint in Radford (1977). Radford notes the distinction between the sequences of elements covered by this constraint and the common linguistic phenomenon of *reduplication*, in which the repetition of some element conveys a specific meaning in itself.

¹³This example, and its history, is treated at considerable length by Bever and Langendoen (1971).

¹⁴The term seems to be due to Lakoff (1973).

¹⁵Similar proposals were made by the universal grammarians of the 17th and 18th centuries and by the artificial language constructors of the 19th and 20th.

¹⁶Hunt (1973) notes that command of deletion and reduction transformations characterizes writing skill. Sophisticated writers will include more subordinate clauses in sentences. And, of course, the more subordinate clauses added, the greater the length of the sentence. Only through the use of deletion and reduction transformations can a writer "pack" more information into a readable unit. Children's writing skills and development, Hunt maintains, can, in fact, be measured by calculating the degree of subordination and clause reduction in a sentence.

¹⁷For a bibliography on languages placing clitics in "second position," see Hale (1973:320).

¹⁸Seikirk (1972) surveys the literature on this cliticization and a number of others in English and French. Kayne (1975) gives a very detailed treatment of the syntax of the French clitics. A summary of dialect differences in the treatment of the English auxiliaries can be found in Wolfram and Christian (1975, 1976).

¹⁹The introductory discussion in this section is an adaptation of material in Jespersen (1924:Ch. 3).

²⁰The English perfect is then misnamed, since its normal use in modern English is not for perfected, or completed, action.

²¹See the proposal in Lyons (1966).

²²Functionalist theories, for instance the Cognitive Grammar of Lakoff and Thompson (1975b), are promising in this respect.