

The authors wish to express their thanks to the editorial staff of CAL's Communication & Publications Division for overseeing the final production phases of this volume. They also wish to express their special appreciation to Rosemary Tripp, formerly of the Center staff, for her exceptional job on the final content editing of the articles by Zwicky and Kantor and Lawler.

Library of Congress Catalog Card No.: 79-57530
ISBN: 87281-111-5

January 1980
Copyright © 1980
By the Center for Applied Linguistics
1611 North Kent Street
Arlington, Virginia 22209

Printed in the U.S.A.

Contents

Introduction	v
A Survey of Syntax <i>Arnold M. Zwicky & Robert N. Kantor, Ohio State University</i>	1
Semantics <i>John M. Lawler, University of Michigan</i>	27
The First Few Years: Language Development Prior to Public School <i>Deborah Keller-Cohen, University of Michigan</i>	52
Bibliography	75

Semantics

John M. Lawler

INTRODUCTION

Semantics is the area of linguistics which deals with meaning. This simple definition, while true as far as it goes, is in need of some expansion, for in at least one sense it claims that all of linguistics is semantics. The first task of this review will be to discuss *meaning* to arrive at some sense of the term which will allow us to survey the field called semantics. The interrelationships of semantics with syntax and pragmatics can then be discussed, and finally we can begin to consider topics in semantics in terms of their relevance to applications in bilingual education.

Let us first consider a narrow sense of the word *meaning*, one in which only words (or, more technically, *morphemes*¹) can be said to have meaning. This leads to a view of semantics as *lexicography*, the linguistic discipline involved in making dictionaries. This view has held sway in various circles at various times. In lexicographical terms, we can speak of the meaning of a word, but not the meaning of a sentence as distinct from the sum of the meanings of its constituents. Unfortunately, this view is too narrow, since linguists need to be able to talk about the meanings of sentences (or utterances) independently of the meanings of the words comprising them. And in a sense it is silly to speak of the meaning of a word outside of an utterance, since, in human behavior, words seldom appear outside a context. Consider, for instance, the a sentences in (1) and (2). They contain the same words as their respective b sentences, and the ordering is the same in each case:

- (1)a It's not apparent that he will arrive on time.
b It's apparent that he will not arrive on time.
- (2)a It's not likely that he will arrive on time.
b It's likely that he will not arrive on time.
- (3)a He got sick today.
b He got the package today.
c He got married today.
d He got the idea today.
e He got the storm windows up today.

We would like to be able to say, however, that (1a) does not have the same meaning as (1b), while (2a) and (2b) are much closer to having the same meaning; clearly, an approach which "adds up" the meanings of words will not help explain this difference. (3) raises the question of just how many meanings we must assign to the word got (or, alternatively, just how many words got there are in English) in order to account for the various uses manifested.

But the view that words have meaning only in the context of utterances also is too restrictive, since utterances themselves occur in contexts--in a speech situation which can affect the meaning of these utterances considerably. Consider, for example:

- (4) Mary should be home by 12.
- (5) This is Frank Smith.
- (6) He didn't.
- (7) Bill thinks on the kitchen table.

(4) can have at least two meanings, depending on the context: if it is uttered by Mary's mother to Mary and her escort as they leave the house, it has one meaning; if uttered by Mary's husband over the telephone to someone calling Mary, it has a different meaning. (5), which seems straightforward, has a different sense when uttered on the telephone as an identification, as opposed to when it is used to point out a picture in a photo album. Only the context can tell us who he is in (6), and what he didn't do. Finally, the rather bizarre image conjured up by (7) dissolves when the sentence is put into context as an answer to (8).

(8) Where did you leave the checkbook?

One can, of course, go further in defining meaning. Speakers of English do not hesitate to use the word to refer not only to the meaning of a word or sentence in context but to the sense of the context as well:

- (9) What's the meaning of this intrusion?
- (10) That's not what I meant to say.
- (11) Running out of gas on a lonely road means a long walk into town.
- (12) The meaning of the Treaty of Brest-Litovsk is hard to assess.

Obviously, these and other uses of the term *meaning* take us far beyond the realm of linguistics, strictly speaking. Still, if semantics is defined as the study of meaning, then the meaning of *meaning* should be significant to it and to those who would understand it. Close paraphrases of (9)-(12) are:

- (9') What is the purpose of this intrusion?
- (10') That's not what I intended to say.
- (11') Running out of gas on a lonely road is associated with a long walk into town.
- (12') The consequences of the Treaty of Brest-Litovsk are hard to assess.

We see that the word *meaning* is correlated with concepts of (mental) association, intention, purpose, and cause/effect. These all have to do with thought processes, and thus semantics necessarily comes to be viewed as the study of human thought. The discipline of semantics, then, would be especially useful if it would permit a precise description of people's thoughts so that one person would know exactly what another was thinking. But we know that every individual is unique, and that each person's thoughts and experiences are intrinsically and necessarily private, so that even the most exhaustive analysis cannot come close to exactness. Nevertheless, we all try to understand and be understood from time to time, despite the odds against success, and one way we do this is to use language as a medium. Sometimes we succeed in this way (or think we do), and it is the semanticist's task to study human thought as it is expressed in language and as it is conditioned by the social conventions of language use.

To study human thought, semanticists typically restrict their theories (and therefore their realm of interest) to the relationship of various concepts to one another, and to the linguistic signs used to represent these concepts. In some cases semanticists restrict their studies to still smaller domains, such as words or sentences. The rigor and mathematical nature of semantic theories are the result of this narrowing of focus. It is not claimed that such formulations represent basic laws of human thought. When confronted with the complexities of actual language use, the semantic boundaries tend to get very fuzzy. The discipline, at its most productive and useful, formulates new questions about meaning, but provides few clear answers without overlapping into the areas of concern of syntax and pragmatics.

The Relationship of Semantics to Syntax and Pragmatics

The three fields--semantics, syntax, and pragmatics--all examine a single phenomenon: human language and its use. Thus, considerable overlapping between the fields is to be expected. In fact, many linguists (including this author) maintain that the three are, in principle, inseparable, and that a unified approach to the study of language

is necessary. Perhaps a metaphor will do the best job of placing semantics in this broader perspective. Syntax, semantics, and pragmatics can be conceived of as lights shining from different directions on a tangled skein of phenomena called "language." If we consider only the light from a single source, some phenomena will be highlighted and others obscured in shadow.

In order to see the whole picture, however, we need all the illumination we can get. The light that is shed, then, by these sources is analogous to the methods and objects of investigation inherent in the disciplines: syntax deals with structures and constituents, semantics with the interactions of meaningful elements, and pragmatics with human interactions and communication. All have empirical bases, and all make use of intuitions--syntax deals in grammaticality judgments, for example, while semantics uses intuitions about synonymy and paraphrase and pragmatics about acceptability and conveyed message in context.

American linguistics is currently moving away from its 20-year preoccupation with syntactic research. This work, known as *generative linguistics*, has produced an unbelievable amount of theory construction and controversy, and, most importantly, sound results and generalizations useful in all areas of linguistics. Semantics and, to a lesser degree, pragmatics have benefited enormously from these developments, and linguists of all persuasions are now trying to integrate the ongoing research of several schools. The lights have never shone brighter, so much so that it is sometimes possible to get lost in the glare. It is the purpose of this review to look at some of the things that have been illuminated from the viewpoint of the semanticist.

Semantics and Bilingual Education

A further purpose of this paper is to suggest applications of semantics to bilingual education. There are certain areas of inquiry in semantics, for example model theory and Montague grammar, which are so abstruse and theoretical that it is virtually impossible to conceive of their being applicable to a practical concern like education of any kind. Hence, I will simply not mention a number of areas of current interest. While today much more effort in semantic research is being addressed to topics of more practical concern, the current state of theory construction does not, in general, provide ideal candidates for practical application. I can, then, only point to topics and findings of semantic research which might, when the theories are more developed, be applicable to bilingual education.

With these reservations in mind, I will suggest some areas of research which, I think, are at the intersection of the interests of semanticists and educators in bilingual programs. These areas are those which will:

- reveal the most, and the most unpredictable, variation from one language and culture to another.
- relate most closely to the culture and unspoken values of the speakers of the language(s).
- deal with the non-overt thoughts of speakers--their intentions, beliefs, and desires.
- determine those characteristics shared by all languages and cultures which can help people from different backgrounds understand each other, if only minimally.

Categories of Semantic Study

Since semantics encompasses a vast network of relationships among meanings of different types, I have somewhat arbitrarily divided the topics I will discuss into five categories, according to the purposes and methods of research. These, in turn, affect the applicability of the results of the research. Naturally, there is considerable overlap, and it is hard to categorize many studies definitively.

The first category is *cultural studies*. These involve attempts to determine the role of language as the vehicle of the culture and of culture as the vehicle of language. Such studies tend to use methods derived from anthropology and sociology. *Lexical studies* attempt to characterize and classify words according to their meanings. Combinatorial methods of some type are often used in such studies.

Structural studies seek to integrate types of meaning with the structures that express them. Syntactic methods are often involved in these studies. *Epistemological studies* attempt to explain the role of knowledge and beliefs in expressing and understanding meanings. Methods developed in the study of philosophy and literature are often employed. Finally, *logical studies* seek to discover and exploit the natural logic of human thought. Mathematical logical methods have been borrowed for such studies. The relationships of semantics to the fields of syntax and pragmatics, particularly in the categories of culture, structural, and epistemic studies (which overlap considerably), should be clear from this categorization.

It should be noted that these categories are not presented in any order of importance to the field of semantics. Logical and lexical studies can, in fact, be considered "core" semantics; cultural topics are a nascent concern of linguists. However, as it is one goal of this paper to deal with applicability to practical matters, I will treat the topics in an order of more obvious relevance.

Many topics can be (and have been) profitably investigated from a number of these viewpoints. To take only one example, *modals* (e.g. can, may, must, possible, enough) constitute the subject matter of one form of logic (*modal logic*), but other studies have been made as well of their lexical, epistemological, structural, and cultural aspects. Our knowledge of modals is the result of all of these types of studies.

One further classificatory scheme cuts across this five-part categorization. Linguists are interested both in facts about individual languages and in facts common to all languages. These latter, which are loosely termed *universals*, have great relevance to linguistic theory at all levels. For example, all languages have consonants and vowels, and all languages have nouns and verbs. However, just which vowels and consonants languages have varies enormously, subject to very subtle and not-at-all apparent universal constraints, and just which word in a language is a noun and which is a verb is not always easy to determine. The notion of universals, then, provides a common basis for comparing and contrasting languages as to the manner in which the universals are manifested. I will mention a number of phenomena which are universal in the abstract, but language-particular in practice, and which give rise to crosslinguistic differences which we could expect to be troublesome in situations like bilingual education, where more than one language comes into play.

Two final notes of caution. First, this survey of topics in semantics represents only the tip of an iceberg. Further, at least in my view, the field is in a somewhat chaotic state at present--a state as frustrating as it is exciting. Second, semantics is by no means the exclusive property of linguistics. Anthropologists, philosophers, psychologists, psychiatrists, sociologists, literary critics, educators, and many others have all studied aspects of semantics from their various perspectives. This work will not be touched on here except as it has affected linguistic semantics.

CULTURAL STUDIES

This area of investigation deals with those semantic facts that are influenced by and reflect the culture of the speakers of a given language. Naturally, one language may be spoken by people in a number of different cultures--English is a good example--and there will be an enormous range of variation resulting from social, economic, and geographical factors. But this is the subject matter of such other disciplines as sociolinguistics and the ethnography of communication (Fasold 1975 and Scherzer 1975). We will concern ourselves with certain topics more directly in the area of semantics.

Research Overview

Linguistic taboos and euphemisms. The concept of *salience*, which we will treat in detail in the discussion of epistemological topics below, is also useful in speaking about cultural matters in semantics. In the U.S., to take a nonlinguistic example, it is irrelevant which hand a person uses to perform most actions unless some physical asymmetry interferes with a convention, such as shaking hands or using scissors. In Muslim cultures, however, it is extremely important which hand

is used for performing certain actions. It is rude, even insulting, for instance, to give a person anything with the left hand. Such cultural phenomena have linguistic analogs.

A good example is the matter of taboo. English, like all languages, contains a number of words and phrases which have meanings that are banned, or at least avoided, in certain situations; there are taboo words in English dealing with death, elimination of body wastes, sexual activity, and religion, for instance. Americans tend to think of these as *the* taboo areas, but many cultures have no taboos on these areas, but rather on others--personal names, eating, ritual objects, various animals, or natural phenomena. When learning a new language, people do not automatically absorb native speakers' attitudes toward taboos. They may regard language usage in these areas as silly, since it often tends to euphemisms.

The phenomenon of euphemism itself needs explication. R. Lakoff (1973) distinguishes two types of euphemism, each confined either to technical (formal) contexts or to informal contexts. These can perhaps best be illustrated by examples of their use *outside* their appropriate context:

- (13) Making number two is generally expedited by the use of large banana leaves.
(in an anthropological journal)
- (14) Excuse me, I have to defecate. (at a cocktail party)

There is a special class of informal euphemisms suitable for children, and a larger class used in informal conversation with non-intimates (with intimates, the taboo terms are often allowed); the formal euphemisms are suitable for technical discussions or in a formal exchange with non-intimates. In all cases, euphemism is used to distance the speaker from the taboo term, and thus from the taboo concept.

Taboo terms are among the most tenacious in the language (a fact which proves that they must be used or they would not have been learned). Euphemisms, in contrast, have a short life, since, if they are successful, they will be used often. They will gradually acquire closer reference to the taboo area and will become taboo themselves. What we now call a toilet, for instance, was known previously by a number of other names. These became tabooed and necessitated the introduction of the word toilet, which used to mean a washing-up; toilet now appears to be tabooed by some, as indicated by the use by advertising copywriters, at least, of the term bathroom bowl.

Obviously, knowledge of American taboo areas and taboo linguistic items, a firm command of euphemisms, and of the occasions appropriate for their use are necessities for people attempting to assimilate to American culture and to learn accepted language use.

Politeness. The converse of taboo is politeness, a topic which has had relatively little study. R. Lakoff (1973) has developed general principles for politeness in language, applicable to all cultures, which has the effect of making them somewhat contradictory. The contradictions are resolved in different ways in different languages and cultures. She notes, for example, is that while must reports an obligation or order, and is therefore less polite than may, which expresses possibility or permission, (15) in English usage is more polite than (16) when uttered by a hostess to her guest:

- (15) You must try some of this cake.
- (16) You may try some of this cake.

The reason is that (15) pretends that the cake would not be taken without "orders" to do so, since it is not desirable. (16), on the other hand, assumes that the guest would want some cake; the hostess exploits her position of quasi-authority to give permission, thus elevating both the hostess and the cake and demoting the guest. (15), while it elevates the hostess, demotes the cake (and thereby indirectly the hostess, who is responsible for it), and thus elevates the guest in esteem, relative to the hostess. Such complicated make-believe is typical of politeness in all cultures, but the ways in which it is manifested linguistically vary widely. Japanese, for example, accomplishes exactly what (15) does by means

of overt honorific and de-honorific markers attached to the appropriate nouns, and of different word choices (see also R. Lakoff 1972a).

Language and sociocultural boundaries. Another area in which cultural attitudes are reflected linguistically is in the languages used by and about members of groups subject to discrimination. R. Lakoff (1975) has carried out an extremely interesting study of women's language, and has found, not too surprisingly, that English is a male chauvinist language. She finds that:

•Women are property, linguistically--even when their possessor is dead. One can say (17) but not (18).²

- (17) Mary is Sam's widow.
 (18) *Sam is Mary's widower.

•Lexical pairs of male/female terms are asymmetric. The female term is often derogatory in some way: bachelor/spinster; professional [doctor, lawyer, academic--male]/professional [prostitute--female]; working man (*boy)/working girl (?woman); to father a child [=to impregnate a woman]/to mother a child [=to provide a child with nurturance, often to a suffocating degree].

•Women who express themselves clearly and forcefully are characterized as "mannish," "unfeminine," and "pushy"; women who do not do so are "flighty," "feminine," and "scatterbrained."

One way to establish and maintain in-group membership, behaviors central to discrimination, is to speak in codes that people outside the group cannot understand or cannot imitate. These codes may be real languages, dialects, argots, or just an exaggerated use of slang. This strategy works just as well for small, temporary groups as it does for larger, socially defined ones. In smaller groups, irony can also function as a vehicle for in-group solidarity and out-group exclusion (Myers 1974, 1977, 1978).

Cognitive maps. Another approach to explicating the mutual relationship of language and culture is the notion of a *cognitive map*. Basic to this approach is the assumption that linguistic differences correlate with cognitive differences, so that in understanding the organization of a language, we can gain insight into the way its speakers think. The relationship between language and thought is not, however, seen as deterministic; widely varying world views are often evidenced among speakers of the same mother tongue (Becker, in press, Becker and Oka 1974, and Adams and Conklin 1973). Adams et al. (1975) have studied Southeast Asian languages from this perspective, using classifier systems and other data, and have succeeded in making some very important contributions. Becker and Oka's research on person in Kawi, for example, shows that, in addition to a first-second-third person distinction, Kawi has two sets of pronouns, distinguishing between close and more distant interpersonal relations, rather than between singular and plural, for example, and that there seems to be "a recurring structural contrast between close and distant, involved and detached, now and then, head and blood, mountain and sea --all of which seem basic to Kawi grammar (246-7)." Matisoff (1973, 1975) has studied similar matters in several languages. Lawler (1973a) discusses cultural premises about work and the use of occupational generics in English. Finally, there is an extremely interesting study on American cultural values by Cooper and Ross (1975). Focusing a very thorough study on a relatively unimportant English phenomenon (what the authors call *freezes*, like here and there/*there and here), the authors discuss American culture as it has influenced the language. They also make serious suggestions for the study of cultural semantic universals. This led in turn to the implications discussed in Ross and Oehrle (1977) about the semantics of target structures and in Ross (1975) about the structure of the lexicon. Such topics of what I term *nondiscrete* linguistics may prove to be fascinating and productive areas of research (see also Ross 1974).

Relevance of Cultural Studies to Bilingual Education

Cultural topics in semantics should play an important part in education, particularly in those programs designed to deal expressly with language or to open students'

eyes to other cultures. Educators would benefit, for example, from a knowledge of the differences in cognitive mapping, politeness, taboos, and euphemisms, and linguistic means to differentiate subgroups in the students' mother tongues. Contrastive studies in these areas of cultural semantics would be helpful in pin-pointing expressions or topics which students are likely to misunderstand or which might cause offense.

Much less research has been done by linguists in this area than in other areas we will discuss. Anthropologists and sociologists have done considerable work, but the linguistic sophistication of such research is sometimes open to question, as is the nature of the conclusions, which seldom have to do with language as such. Clearly, more research is called for and would provide useful insights for education.

LEXICAL STUDIES

Research Overview

This area of investigation (which, I repeat, overlaps considerably with the others) is primarily concerned with the semantics of words. The lexicon is the place *par excellence* where languages differ from one another; we can then expect to find many accounts of such differences in lexical studies, and also some attempts to relate the meanings of words within language and, by means of semantic principles, to other lexicons. Educational applications should not be difficult to find.

Componential approaches to word meaning. Probably the most important single principle in lexical studies is that meanings of words are not units; they can be "decomposed" in a number of ways. Several theories of semantics have ideas about how to carry out the decomposition and about what the semantic units are which the words are composed of. The theory of *lexical decomposition* (McCawley 1968a and b), for example, posits basic units called *atomic predicates*--atomic because they are assumed to be undecomposable, and predicates because they are combined by the principle of the logical relation of predication. There are, according to this theory, a relatively small number of such predicates (perhaps one thousand or fewer), but their combinations can encompass a vast number of possible lexical items. Other theories employ functionally analogous concepts, like *semantic features*. (We will hereafter use the term feature to refer to any partial specification of meaning, e.g., the English word *man* has the feature "human.") Such features are collected in bundles according to principles of combination to specify the meaning of an item.

Given that there are components to meanings, an immediate problem is to determine what these components are in a given instance, and, less obviously, to choose the correct one from among the possible specifications. To take a crude example, suppose I defined mayonnaise as "that awful stuff some boor put on my chopped liver last week." While this may be a true definition (and may even represent the way I think about mayonnaise), it would not be very useful unless you had been with me on that particular occasion. A more useful definition would refer to the contents of the sauce, the manner in which it is prepared, and possibly the way it is used. That is to say, words are used to communicate with others in a society, and therefore must have reference to concepts which others know--idiosyncratic referents are useful only to the extent that the addressee is familiar with the speaker. Therefore, meanings tend to be expressed, and to be expressible, in terms of other, more basic meanings. In the best of all possible worlds, human languages would have a relatively small number of semantic building blocks, obvious to all, from which each language (or speaker) could construct whatever edifices it chose, limited only by the ways the blocks could fit together. Unfortunately, there are problems with this model in this imperfect but interesting world.

The problem of semantically insulated spaces. To begin with, there is the problem of what I will call *semantically insulated spaces*. There appear to be sets of words, referring to concepts common to all human languages, which are defined largely or even only in terms of one another. Such sets constitute closed systems,

and are not readily susceptible to lexical (dictionary) definition. Examples are the sets of words denoting *deixis* discussed by Fillmore (1971a), or the Atsugewi motion terms discussed by Talmy (1975). Fillmore's work on deixis has far-reaching implications for semantics, since he is interested in determining how much information (contextual or noncontextual) an utterance conveys to a listener, and what information is necessary on the part of the listener to understand it. For example, the terms right and left cannot be satisfactorily defined in independent terms, although it is clear that one is the opposite of the other. The use of deictic expressions of place, person, time, and social usage shows that there is much information, from our culture or from our knowledge of the real world, that enters into lexical meanings; a strictly lexical definition is often not sufficient.

Another case, also discussed by Fillmore (1974a), is the set of words denoting nonvisible feelings. While a cut or a bruise can be pointed to, how do we know what heartburn means if we've never experienced it? Fillmore suggests that the closest we can come is "how you feel after you've had three raw onions and a large Coke"; obviously, this is not a straightforward componential definition. Note, however, that it does have a lot in common with the facetious definition of mayonnaise given earlier. There are many such insulated spaces in the lexicon of any language, and while many of them are susceptible to common-sense definitions, like Fillmore's, which appeal to universal (or near-universal) human experiences, many of them are culturally bound and inaccessible to those who are not members of the culture. Language learners must, then, "learn the culture" as well as the language itself, at least to the extent (if not beyond) where such words begin to make sense.

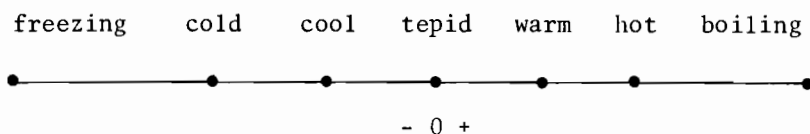
Culture-specificity of feature salience. Even where a word may be lucidly defined, the *salient features* of the definition may seem curious, especially in languages other than one's own. Each language has a number of ways of combining features, most using particularly pertinent features to distinguish large sets of words. For instance, sex is a fact of all human existence, and all human languages have sets of words denoting males and females. Likewise, there are kinship terms in all languages, but the features selected as salient vary widely--Norwegian distinguishes between maternal uncle (morbror) and paternal uncle (farbror), Puget Salish between older and younger siblings. Some kinship systems, notably in Australia, are elaborated to an extent which is hard for Americans to believe (let alone understand); the features defining relationships are salient in those cultures but not in ours. The Puget Salish word /šəg^w1/ translates to the English words 'road' and 'door.' This does not mean, however, that /šəg^w1/ means 'road or door'; it is a unified concept having to do with movement, particularly of human beings--people pass along a road and through a door. The context specifies which, if necessary, and Puget Salish speakers feel no more need for a special word for 'door' than English speakers do for a special word for 'end of a hallway.' In contrast, English does not distinguish the two verbs 'drop by accident' and 'drop on purpose,' which are carefully kept separate in Puget Salish: if we rely on linguistic evidence, the features of responsibility and volitionality are very salient in this culture, but not in English-speaking cultures.

Synonymy and antonymy. A componential approach to meaning allows one to talk about synonymy and antonymy: there are words that seem to be the same in meaning, and there are, likewise, words that everyone knows are "opposites." Once again, however, things are not as simple as they seem. While it is fairly simple to find the opposite of good or soft, is there an opposite for cigarette, or smoke, or red? Antonymy is also a matter of salience; good and bad differ in the value of one feature only--something that is good has a "plus" value for this feature, and something bad has a "minus." This feature is the salient one for a contrast using good. There is no obvious candidate for such a salient feature in the case of, say, red. (There are contexts in which the salience is supplied, and therefore opposites exist--in checkers, for instance, the opposite of red is obviously black--but note that the choice of the salient feature is not intrinsic to the meaning of red.) A similar but far more elaborated system of antonymy has been described by Hale (1971) in the Walbiri language of Australia. It is possible to find an antonym of *every* word in the language by systematic exploitation of the principles of cultural and semantic salience. Several other Australian languages have also been studied to determine the salient and basic aspects of the semantic features in the lexicon

(see Dixon 1971 and Hale 1974).

The principle of salience in antonymy also helps explain how we understand some cases of irony. Here, the speaker utters a phrase or sentence, but we have some clue (from intonation, facial expression, or context) that he means the opposite of the literal meaning of his utterance. In casting around for a meaning, we find that the closest thing in meaning to a given word or sentence is its opposite, since it differs in only one feature--the salient one in that discussion (see Myers 1977 for discussion).

Semantic scales also raise interesting points with reference to antonymy. Hot is opposed to cold, warm to cool, boiling to freezing, but what is the opposite of tepid or lukewarm? In fact, these words are all part of a scale of temperature, with freezing at one end and boiling at the other; the other terms lie at intermediate points, and their opposites occupy corresponding points on the other side.



Tepid has no opposite because it is the neutral point, on neither the positive nor negative side.

There are many words associated with scales of various sorts, and these scalar relationships impose semantic and syntactic restrictions on sentences. Note the strangeness of (19):

(19) ??She's beautiful, if not pretty.

The word absolute(ly) is used to modify words at the extremes of scales; thus it is odd in (20) but fine in (21):

(20) ?*It's absolutely warm in here.

(21) It's absolutely boiling in here.

Similarly, the word mad in English has two meanings, the first, 'angry,' is not at the end of a scale, but the second, 'insane,' is, so the use of absolutely will disambiguate (22):

(22) He's mad about that. (can mean 'angry')

(23) He's absolutely mad about that. (can't mean 'angry')

In principle, we can refer to any point on a scale and find there are words which let us reach points for which there are not special words: thus, very warm is intermediate between warm and hot. This mobility in meaning is very useful, since it allows us to be both more and less precise at the same time; saying (24)

(24) The room was reasonably warm.

lets us pin down the temperature of the room as exactly as we need to, without having to give a thermometer reading. Studies of such scales and of semantic *fuzziness* have been made by G. Lakoff (1972a) and Horn (1972).

The nature of the items in the lexicon has been ignored in this review. This is its usual treatment in semantic discussions, since the view, at least since de Saussure (1922), has been that the relationship between the meaning of a form and the phonological shape it manifests is arbitrary. We should note that recent work by Ross (1975) challenges this assumption, at least for some classes of words; there appear to be, at this very early stage of research, some unexplainable regularities in the form of words, depending on their meaning. This is particularly true of opposites and of scalar terms. These regularities occur across languages,

not just among Indo-European languages. Ross's hypothesis, if correct, could lead to fundamental changes in the way linguists view language.

Antonymy, then, can be seen to be a very complex concept. Synonymy should be simpler, but it, too, presents problems. It seems a general principle that languages detest synonyms. If a language has a pair of synonyms, for whatever reason, it is very likely that, in time, each word will develop a different meaning, or one will drop out of use. This appears to be due to a principle of economy on the part of the speakers (and hearers)--after all, who needs two words for the same thing? Differentiation of lexical items signals difference of meaning in the overwhelming majority of cases, and a speaker of a language, presented with two putative synonyms, will try hard to find a meaning difference, even if he has to make one up. If this happens often enough, the two terms will not remain synonyms long. Examples abound. For instance, the Norman invasion brought a plethora of French terms into English, including the French words ~~boeuf~~, porc, and mouton. These could not exist as synonyms with English cow, swine, and sheep, and so developed the meanings of the meat derived from these animals--beef, pork, and mutton, as they have been anglicized. (This development is not unexplicable, since the Normans probably saw the meat more often than they saw the animals.)

Another way synonymy is avoided is by the adoption of special sets of vocabulary with distinct meanings. There seem to be basic, culturally salient terms that are primes, or prototypes, along with larger and smaller categories that are derived from these primes. Thus, dog is learned early in English, as is cat, although they are very hard to define in lexical terms. People know, without looking at a dictionary or a taxonomy, that a wolf or a fox is a dog and a lion or a jaguar is a cat--and they are surprised to discover that a hyena is more closely related to a cat than a dog. There are other terms like Pomeranian, setter, boxer, and so on which are obviously derivative and superordinate terms, like carnivore, which also appear to be less basic. Research on the organization of nouns into hierarchies or other groupings and the avoidance of synonymy has been pursued by Fillmore (1974a), Berlin and Kay (1969), and Rosch (1973).

Metaphor, irony, and sarcasm. Antonymy and synonymy do not seem to help explain certain other uses of words. When one utters (25), for example,

(25) My love is like a rose.

one is presumably making a meaningful statement about the individual denoted as my love. But what statement? Does she have thorns? Is she green and thin? Does she have aphids? Does she need mulching? Obviously, these are not what is intended. Metaphors such as this single out a salient feature and posit it of both nouns; in this case, clearly--though not stated--the feature is beauty.

We use metaphors constantly and are rarely misunderstood. This fact alone is staggering, since it means that we are able to pick out precisely the salient dimensions of the metaphor and ignore the others. Further, our ability to do so relies very much on our knowledge of the culture, since the features that determine the meanings of words *and* their varying degrees of salience are culturally bound.

We noted above that salience helps explain why a particular kind of metaphor--irony--is understandable. Myers (1976, 1977) and Cutler (1974) have also begun to explicate some of the processes which allow us to understand this most perverse way of communicating. For instance, Myers (1977) notes that (26), (27), and (28) are appropriate responses to someone cutting in front of you on the highway without signalling, but (29) is not.

- (26) I hate people who don't signal. (non-ironic)
- (27) I love people who don't signal. (ironic)
- (28) I love people who signal. (ironic)
- (29) I hate people who signal. (inappropriate)

(26) is a literally true response (allowing for hyperbole, which is not at issue here), and is not ironic. (27) and (28) are ironic, but note that if we insert

negation in the main clause and the relative clause of (28), it is again literally true (or at least as true as (26), which is not ironic). (27), by these standards, is false. Finally, (29), which is as true as (27), is inappropriate as an ironic rejoinder in this situation. There appear to be syntactic, as well as semantic and pragmatic, constraints on irony.

Limitations of componential approaches to meaning. Even when we consider all relevant syntactic and contextual variables, and when we have a reasonable breakdown of features to express semantically primitive meanings, there are some words that resist explanation. Fillmore (1971b) discusses criticize and accuse in this context. He notes that both words refer to some event or action which is judged, by the speaker at least, to be unpleasant, and they both refer to responsibility for the event or action. Thus:

- (30) Frank accused Bill of telling Mary about it.
 (31) Frank criticized Bill for telling Mary about it.

(30) and (31) can both refer to the event of someone's telling Mary about something and Frank's irritable outburst to Bill about it, yet native speakers will distinguish between the two sentences. The differences relate to a basically epistemological notion, *presupposition*, which we will discuss in more detail below. Essentially, (31) presupposes that Bill was responsible for telling Mary about it, and asserts that Frank said that this was not a good thing to do, while (30) presupposes that telling Mary was not good, and asserts that Frank said that Bill was the person responsible. Criticize and accuse thus share almost the same features, but some are presupposed and some asserted, and the mix is different in each. This distinction must be taken into account in the lexicon.

Much of the past activity in the area of lexical semantics has not been devoted to the nature of the lexicon as such, but rather to the problem of specifying how a particular theory (usually some type of generative semantics) could handle the problems posed by specific words; Horn (1969), R. Lakoff (1971b), and Chafe (1970) are examples. With the lessening of interest in generative semantics, some of the theoretical impetus may have gone out of this type of work. There are, however, new traditions appearing: Fillmore's work (1975) on *frames*, together with work by Rosch and Kay on prototypes, seems to augur well for the future of lexical studies, the more so since this type of research is being integrated with psychological and anthropological studies in the same areas.

Relevance of Lexical Studies to Bilingual Education

Applications of lexical studies to education are not hard to come by, although there is a great deal of overlap of particularly applicable topics with epistemological, cultural, or structural areas of semantic research and with pragmatics. Clearly, words carry more meaning, and different kinds of meaning, than the traditional word lists give them credit for. If languages are to be taught properly, if cultural material is to be presented accurately, and if languages are to be adopted for teaching in content areas, then considerable attention will have to be paid to words--which words are used, how they are used, by whom, and to whom. There is a great deal of information available in linguistic semantics on such topics. Further, research in lexical matters concentrates increasingly on pragmatic concerns in word usage: for example, what situational context evokes a particular word or class of words to describe something and, conversely, what situations are evoked by various descriptions of the same thing? This promises to be a fruitful and exciting area of inquiry which has great potential usefulness to education in general and bilingual education in particular.

STRUCTURAL STUDIES

The notion that the syntactic structure of utterances contributes to their meaning (e.g., a question obviously means something different from a declarative sentence) has been available at least since Sapir (1921). But the detailed studies of syntax of the last two decades have especially encouraged several lines of semantic research

which promise to be very fruitful. There are also immense potential interactions among the topics I will discuss here, including relational grammar, cognitive grammar, functionalism, and many of the epistemological topics discussed in the next section (see Postal et al. 1975; Lawler 1975a, 1977; Tomlin forthcoming; and Dryer 1975).

Research Overview

Case grammar and generative semantics. The first two attempts to employ structural methods to handle semantics were Fillmore's (1968) *case grammar* and the school of *abstract syntax* (later called *generative semantics* in a revised and expanded version). Prior to Fillmore's work, the semantic complexities associated with the grammatical relations *subject*, *object*, and so on were either assumed or ignored. Case grammar, an attempt to deal with these complexities, proposed that each proposition or sentence consists of a predicate (verb) with a number of associated nouns. The verb determined the role, or *case*, taken on by the nouns, that is, the predicate determined the case of the arguments. Additional principles determined other grammatical relations. Thus, case grammar provided a means to specify the fact that a sentence can have a subject which is an agent and an object which is a patient; for example:

(32) Bill kicked Frank.

Case grammar in its original form has been largely abandoned because it proved unable to handle complex syntax and because of the proliferation of ad hoc categories necessary to handle increasingly subtle judgments about roles of nouns. Nevertheless, we have learned that much to do with meaning can be expressed in terms of the structural relationships between predicates and nouns.

Generative semantics also attempted to deal with a number of semantic notions in terms of predicational structures. I have mentioned lexical decomposition, which has been extensively used in abstract analyses of logical structures for words and sentences. This variety of structural semantics also treated grammatical relations in terms of predication. Generative semantics recognized the possibility that predicates could have one or more arguments. There is no logical a priori restriction on how many arguments a predicate can have, but in practice, generative semantics was limited to considerations of three classes of predicates--the so-called 1-place, 2-place, and 3-place types. Examples are (33)-(35):

(33) Bill laughed. = LAUGH (Bill) (1-place)

(34) Bill hit Frank. = HIT (Bill, Frank) (2-place)

(35) Bill gave Frank the book. = GIVE (Bill, Frank, book) (3-place)

(33) is readily recognizable as an example of an *intransitive* predicate, (34) as an example of a *transitive* with both a direct and an indirect object (book and Frank, respectively). There are then implicit claims in generative semantics that: (a) logical predication is the basis of all grammatical relations; (b) there are only three basic predicational relations (exemplified in (33)-(35) above); (c) predicates can be profitably classified semantically according to the grammatical relations they require. In this theory, these logical-semantic notions feed into the syntax. A great deal of research has been done in this vein, and a number of interesting results reported (see the discussion of lexical decomposition above). Several unresolved problems have also come to light, however, resulting in a gradual abandonment of much of generative semantics.

Other structural approaches to semantics. At present there are several emerging traditions in structural studies that bear watching. While they are more or less distinct, in the sense that they are called by different names and are being developed by different groups of people, these lines of study have much in common, and each is influenced by developments in the others. Those singled out for discussion here are functional grammar, cognitive grammar, and relational grammar.

Each of these is primarily a syntactic system, but each has had to come to grips with a variety of semantic problems, and interesting and useful semantic insights have resulted. (A fourth tradition, nondiscrete grammar, is also important in the current potpourri of developing theories, but its contributions have largely been to syntax; some of the significant semantic advances made in this paradigm are noted in the section on cultural topics.)

Functionalism approaches to meaning. *Functionalism* is actually the rebirth of a tradition with a respectably long pedigree; as early as Sapir (1921) and Jespersen (1954), the function of syntax was a target for research. More recently, *natural phonology* (see Bruck et al. 1974) has attempted to put phonological theory on a functional footing. Linguists of the generative semantics school, led by Morgan (1973a) and others, have also delved into the topic. There are, then, a number of different views of what functionalism is; unlike cognitive grammar and relational grammar, there is no theory of functional grammar, nor is one likely to emerge soon--there are too many people doing research on too many topics for a consensus to surface immediately. Common to all functionalist studies, however, is the assumption that at least some aspects of linguistic structure are related to the uses to which language is put. Some researchers maintain that this interrelationship results from the existence of "particular mental mechanisms [which] guide and form certain aspects of linguistics structure," whereas others argue that general properties of both the human mind and the uses of speech are needed to explain linguistic patterns (Bever 1975). The boom in functionalism (see Kuno 1972 and Grossman et al. 1975) has had the beneficial effect of letting common sense into linguistics and dispelling some large clouds of formalism.

As an example of the power of functionalism, we cite Morgan's (1973a) account of *restrictive relatives*. These are the ordinary relative clauses as in (36)-(37):

- (36) The woman who kicked him escaped.
 (37) The man who she kicked is irritated.

Such clauses pose semantic problems because they are presupposed true, rather than being contingent on an assertion for their truth value. Thus, (36) presupposes that there is some woman who kicked a male person (him), and (37) presupposes that there is a man who a female person (she) kicked. We can explain how this presupposition is manifested by pointing out, as Morgan does, that if the function of a relative clause is "to afford the hearer enough information to pick out some individual, then it is obviously more efficient to give a true description than a false one. The fact that the speaker uses the relative clause for this purpose is prima facie evidence that he believes it is true (424)," i.e. that it is presupposed.

Meaning in cognitive grammar. Such appeals to communicative function have led also to more dramatic changes in theories, in the shape of *cognitive grammar*, as developed by G. Lakoff and Thompson (1975a and b). As a listener-based system, this represents a radical departure from classical generative grammars, which have all been speaker-based, if only covertly. Cognitive grammar seeks to account for the listener's ability to process and understand sentences presented to him in "real time." There is abundant evidence that the first parts of sentences are processed as they are heard, before the rest of the sentence is completed by the speaker. The listener, in fact, makes guesses about what is going to come next and about the role the part of the sentence already processed will play; he discovers later whether these guesses were right or wrong. The well-known *garden path phenomenon*, which is operative in sentences like (38),

- (38) The boat floated down the river sank.

can help illustrate this process. A listener who hears (38) will assume that floated is a main verb in the past tense, since the active (noncausative) verb

float can have boat as a subject and has a regular past tense. This assumption will be reinforced by the prepositional phrase, since it is a typical complement for the noncausative float. Then the listener will come to sank, for which there is no place in the parsing he has determined; he will be forced to go back and reanalyze floated as the past participle of the causative float, which can take boat as object, not subject. Floated is therefore the result of a passive transformation--but the passive marker is not there. It must have been part of a relative clause which has been reduced, producing the modifying participle. The hearer's reanalysis, then, entails not only a change of structure, but also an epistemological change from the assertion that the boat (without any overt cause) floated down the river, to a presupposition that someone caused the boat to be floated down the river (hence the relative clause) and an assertion that the boat sank. How much trouble a small change like adding a verb at the end of a sentence can cause, and how much mental labor (performed at breathtaking speed) it can require to correct!

The cognitive grammar approach is similar to (but leads to different conclusions from) functionalist research on speech processing conducted by Bever et al. (1976) and others. It is also amenable to functional explanations, since it deals extensively with the process of communication. Cognitive grammars have available to them all the contextual information (syntactic, semantic, and pragmatic) the listener would use to decode the sentence at each step; thus, cognitive grammar is one formal way to encode functional explanations.

One interesting example of how such generalizations can be explained functionally is the phenomenon of *conspiracies* (see Schmerling 1973, Thrasher 1974, Green 1970, and Lawler 1974). A conspiracy is a tendency in a particular language for constructions with little semantic relationship to resemble one another syntactically. The classic case is the Green conspiracy (Green 1970):

- (39) I found him alive (dead).
- (40) I consider him alive (dead).
- (41) Jesse shot him dead.
- (42) They burned (buried, ate) her alive.
- (43) The doctor declared him dead.
- (44) I saw her alive last week.

Obviously, the meanings of (39)-(44) are quite different, and different syntactic processes must be invoked for each, yet they all seem to have a common structure of Subject-Verb-Object-Adjective, as if the syntax were conspiring to group such sentences together. In analyzing such a set of sentences, a processing model like cognitive grammar [which, unlike classical generative theories (cf. Lawler 1975a), has direct access to semantic and pragmatic generalizations] allows one to take cognizance of such things as the speech situation and context, the structure of the discourse, the probable reasons for the sentence being uttered, the identity and characteristics of the speaker, and so on. Cognitive grammar deals with much more than "grammar," and has tremendous potential as an integrated theory of speech and language.

One of the more vexing problems in recent syntax and semantics has been the semantic correlates of syntactic processes. Borkin (1973), for example, notes that (45)-(47) are not as synonymous as they ought to be.

- (45) Bill found that the chair was comfortable.
- (46) Bill found the chair to be comfortable.
- (47) Bill found the chair comfortable.

(47) represents a state of affairs dealing with Bill's personal experience, (46) reports Bill's experience less personally, and it is not even necessary for Bill to have seen the chair (much less sat in it) for (45) to be true. A perceptually based cognitive strategy recently proposed by Ross and Oehrle (1975) can account for this phenomenon (and many others, including some phonological ones--see p. 35 above).

Semantic aspects of relational grammar. Another emerging theory is *relational grammar*, currently existing in at least two versions, one attributable to Perlmutter

and Postal (1974) and Johnson (1974),³ and the other to Keenan and Comrie (1977). The semantic aspects of these essentially syntactic theories include fundamental notions such as predication, grammatical relations (subject, object, indirect object), role/case structures, and so on. The primary semantic value of these theories is that they have been forced to specify the properties of the various grammatical relations and of the different predicates to which they are related. These specifications are much more detailed and useful than any prior ones and call upon many of the useful insights of case grammar.

Relevance of Structural Studies to Bilingual Education

The applicability of structural approaches to semantics varies considerably with the particular topic. Cognitive grammar has obvious implications--it is clearly necessary to discover the mechanisms by which people process and understand sentences--but much work remains to be done here. Relational grammar may also prove useful, insofar as it contributes to an understanding of structural topics and as it defines a class of universal characteristics of languages, but it is too early to project specific applications. The study of conspiracies is useful because it forces attention on the semantic complexity of items which seem simple: Thrasher's (1974) work on fragments came about because of the difficulty he found in teaching about such utterances as (48)-(50) in English classes:

- (48) Use your phone, ma'am?
- (49) Ever in Ann Arbor, give me a ring.
- (50) Been a snake, it would've bit you.

In order to produce and comprehend idiomatic English, the language learner will need to understand the principles governing what can and cannot be omitted in such utterances. And, of course, any approach to linguistics that proposes such a reasonable paradigm as functionalism does is sure to have practical applications. As noted above, however, contributions from this approach are unpredictable at this rather unsettled stage.

EPISTEMOLOGICAL STUDIES

It is definitely unorthodox to include in one discussion all of the things I propose to present here as epistemological topics. Nevertheless, a large amount of recent linguistic research has dealt with these topics, and I believe they can profitably be viewed from a single perspective. Much of this research overlaps with pragmatics, just as much of what we discussed in the previous section overlapped with syntax. This is all to the good, since it reveals the essential relatedness of the levels of language and of the areas of linguistic study.

The major feature distinguishing epistemological studies from others is their emphasis on the linguistic expression of the speaker's beliefs. Speakers have beliefs about the world, including whatever topic is under discussion. They also have beliefs about their addressees, their relationships with them, and what the addressees themselves believe. Since one major purpose of communication is to exchange information, more specifically information which one or another participant does not already have, it follows that some provision must be made to avoid repetition of old information when it is not necessary to set the context, and to label it as old information when it is necessary. Consequently, languages have a number of linguistic devices which allow certain information to be either conveyed subliminally or conveyed overtly but "backgrounded" as not being the topic under discussion.

Research Overview

Presupposition. A speaker is said to presuppose a proposition if he believes it to be true, and further, believes that his addressee believes it to be true. There are millions of propositions which fit this description: consider "2 + 2 = 4," for

example. Only a few of these propositions will be relevant to a given speech situation, however, and these will be the ones needed to understand the meaning of a sentence in that situation. To give an example, if someone utters (51),

(51) Bill realizes he was in the wrong.

the speaker believes that Bill was, in fact, in the wrong, and expects his listener to believe so as well. If he did not have this belief, he might report the situation with (52):

(52) Bill believes he was in the wrong.

A speaker can also report someone else's lack of belief in something the speaker believes; in this case, one of the differences between presupposed and non-presupposed propositions comes to light. Consider:

(53) Bill doesn't realize he was in the wrong.

(54) Bill doesn't believe he was in the wrong.

The speaker of (53) still presupposes that Bill was in the wrong; the negation here refers only to Bill's lack of apprehension of the proposition that he was wrong. In (54), the speaker takes no obvious position on Bill's being wrong, and Bill not only has no belief that he was in the wrong, he has a definite belief that he wasn't. Predicates like realize, which show presupposition of their complement clauses, are called *factives*. There are a number in every language, although it is not always easy to find a factive in one language with just the same meaning as a factive in another. They exist because it is necessary to refer to known facts in order to comment on their existence, apprehension, and effects, while still making it clear that the facts are known. On the other hand, it is often necessary to refer to propositions which are *not* known to be true, and parallel nonfactives exist for this purpose. There has been a great deal of research on factives; Kiparsky and Kiparsky (1971), Karttunen (1970, 1971, 1973), G. Lakoff (1972a), Morgan (1973b), and others have commented on them at length. The literature on presupposition in general can be represented by Horn (1969), Schmerling (1971), Lawler (1971, 1973b), Fillmore (1971b), Keenan (1971), and many more.

There are other types of presuppositions, of course. Consider (55) and (56):

(55) Nixon isn't President any more.

(56) Nixon used to be President.

Both of these sentences are true, but they have different presuppositions and they assert different things. If someone asserts (55), and I tell him he is wrong, I mean that Nixon is still President; if I tell someone that (56) is wrong, I mean that Nixon never was President. (55) presupposes that Nixon was President at some past time and asserts that he isn't now, while (56) presupposes that he isn't President and asserts that he was at some past time.

Only assertions can be overtly negated; presuppositions remain presupposed. This fact is responsible for the difficulty one has in trying to answer (57):

(57) Have you stopped beating your wife?

(57) presupposes that you beat your wife at some past time, and neither a yes nor a no answer can alter that presupposition.

Presuppositions account for much of what is called *connotation*, that is, the nonliteral meaning of words and sentences. Much of connotation has to do with presuppositions of goodness and badness; we are all familiar with the fact that firm and stubborn have the same denotation but different connotations. The decision to use one adjective or the other can be accounted for by presuppositions of goodness and badness, usually relative to the speaker's values.

Recent research by Gordon (1974) has demonstrated that presupposition is, in fact, a phenomenon which deals with beliefs. In a psychological study, he found that many native speakers of English accepted or spontaneously uttered sentences like (58)

(58) He knows my name is Benjy, but he's wrong.

where the use of the factive verb know should disallow the contradiction inherent in the second clause. Obviously, know is used here in the sense 'believe strongly,' and its use reflects the fact that the subject of know would undoubtedly use know to describe his own belief. This opens the question of whether the strength of the belief conditions the use of a factive, and of the nature of the relationship between the strength of the speaker's belief and that of the person whose belief is being reported. Needless to say, much remains to be discovered in this area.

The semantics of speech acts. While presuppositions convey old information in some sense, there are also numerous ways to convey new information. A branch of linguistics known as *speech acts* deals with the fact that an act of communication can be categorized as one of stating, asking, requesting, ordering, and so on, and that there are semantic and syntactic consequences of this categorization. This type of research is normally placed in pragmatics, but it deals critically with meaning (see Austin 1962, Searle 1969, Grice 1967, Ross 1970, Gordon and Lakoff 1971, Sadock 1974b, Davison 1973, Cole 1975, Green 1973, and R. Lakoff 1969). A direct speech act is labelled unambiguously by the use of a verb such as order, ask, request, but the successful use of such acts are conditioned by requirements called *felicity* or *sincerity conditions*. For example, in order to successfully make a request, the speaker must believe the addressee is able to carry out the act requested and that he would not do so in the absence of a request.

One of the more interesting offshoots of this research is the discovery that there exist codes for indirect speech acts. In "standard" English, (59) conveys a request to pass the salt, not a question about the addressee's abilities.

(59) Can you pass the salt?

An answer of "yes" with no action following is apt to be treated as a joke, since the asker is not interested in a literal response but in getting the salt. Yet there are many languages (and some dialects of English) where such indirect requests would be considered by a listener as a strange question.

Classroom situations can produce misunderstandings as a result of indirect requests based on sincerity conditions. For instance, one of the sincerity conditions on questions is that the asker not already know the answer--obviously, if he knows it already, he is not playing the game fairly. Yet this condition is flung down and danced upon daily in American classrooms--teachers *always* ask questions they know the answers to. How must such a situation appear to a student from a culture without a tradition of such a language game? Probably as if the teacher is insincere, or crazy, or stupid, or any combination of the above. Such evaluations on the part of the student do not make for viable educational experiences.

Varying strength of speaker belief. There are also many ways to temper the strength of speaker beliefs. We have mentioned some of these above in our discussion of semantic scales. Another frequent strategy is to take an epistemological viewpoint, quite literally, and to refer to the type of evidence which has led to a conclusion. This can be done directly by mentioning the evidence,

(60) I saw his car in front of his house, so (I guess) he's home.

or by referring to the type of evidence,

(61) It looks like he's home.

(62) He must be home.

The epistemic modals have meanings associated with certainty, probability, and possibility, all according to the judgments of the speaker. For example:

(63) He'll be home now.

(64) He should be home now.

(65) He might be home now.

(66) He could be home now.

Even (62) and (63), which indicate strong probability and certainty, respectively, are not as strong as the simple statement (67).

(67) He's home now.

The reason for this is that as soon as the speaker refers in any way to his own opinion (instead of simply stating it), a certain amount of uncertainty is injected. Anything said by a human being is his opinion, after all, so there is no need to note that fact, unless we want the listener to take special notice that it is *only* an opinion. R. Lakoff (1972a and b) deals with this topic, and others, in some detail. Many languages codify much the same set of properties by means of what is called *mood*, for example, *subjunctive*, *conditional*, *optative*, and so on, and the syntactic and semantic details are quite complex (as they are in English). There is still much to discover about the means by which the strength of speakers' beliefs in their statements is expressed.

Reference. Speaker beliefs and the speaker's understanding of listener beliefs are crucial also in the matter of reference. It would seem, for example, that identifying the entity denoted by a noun should be easy, but consider the underlined noun phrases in (68)-(70):

(68) I was looking for a policeman, but I couldn't find one.

(69) I was looking for a policeman, but I couldn't find him.

(70) I was looking for the policeman, but I couldn't find him.

The noun phrases in (68) and (69) are *indefinite* (they use the article a), while that in (70) is *definite* (it uses the article the). In (68), the speaker does not have a unique policeman in mind, as shown by the pronoun one in the second clause. In (69), the speaker does have some individual in mind; this is also true of (70). What, then, is the difference? The indefinite in (68) is called *nonspecific*, while that in (69) is called *specific*. A speaker will use a nonspecific indefinite when he has no individual in mind; rather, he is speaking of any individual who meets a given definition. He will use a specific indefinite when he does have an individual in mind, but does not expect the listener to. And he will use a definite when he has an individual in mind, and expects that the listener has the same individual in mind. Thus, definite phrases are often not used in a discourse until after an indefinite has been employed to introduce the individual. For example, consider the following discourse:

(71)a You know how it is--when you want a policeman, you never can find one.

(nonspecific indefinite)

b Well, the other night I had to look for half an hour before I came on a policeman patrolling his beat. (specific indefinite)

c The policeman was a little irritated when I asked him to come with me.

(definite)

In succeeding sentences, the policeman will probably be referred to as he, until and unless some other male is introduced--then occasional references will have to be made to the policeman to keep things straight.

A meaning which has certain things in common with the nonspecific indefinite is possible also with certain definite noun phrases. Consider (72):

(72) O'Ryan's murderer is insane.

On one reading (the *referential* reading), the speaker has an individual in mind and refers to that (known) individual as O'Ryan's murderer. On the other reading (the *attributive* reading), the speaker is making a statement about whoever the murderer of O'Ryan might be; he has no specific individual in mind. The difference between the two readings has to do with whether the speaker believes a referential description of someone as O'Ryan's murderer will call to the listener's mind the same individual as it does to his own.

One last type of peculiar reference also deals with the source and communicative value of definite descriptions. In (73), there is also an ambiguity.

(73) Oedipus wanted to marry his mother.

On one reading (the *transparent* reading), Oedipus wanted to marry an individual who happened to be his mother. Another possible reading (the *opaque* reading) is that Oedipus wanted to commit incest. The phenomenon of opacity, then, also has to do with who is doing the describing. In (73) the description of Jocasta as Oedipus's mother is given by the speaker, not by Oedipus; we know this because we know the content of Oedipus's play. However, since want is a predicate that deals with intentions, and since intentions have to do with the subject's beliefs, there can be a reading of (73) in which the description is part of Oedipus's beliefs. Opacity is thus a function of a difference between the speaker and some other person whose beliefs are in question. A proof of this is the fact that there is no opacity in the first person--anyone foolish enough to utter (74) is proposing to commit incest, since the description is clearly his responsibility.

(74) I want to marry my mother.

Specificity, opacity, definiteness, and attributiveness are only a few of the topics that have been addressed by philosophers and linguists under the general heading of *reference*. The topics treated in the literature center around speaker's beliefs and speaker's beliefs about others' beliefs (see Russell 1905; Kripke 1972; Donnellan 1972; Quine 1953, 1960; Postal 1970a, 1971; Petersen 1974; Cole 1975; Lawler 1972a, 1973b; Morgan 1975; Dryer 1976; and Nunberg and Pan (1975).

Beliefs and knowledge within discourse. In connected discourse, beliefs about and knowledge of the topic under discussion are subject to rapid change (as demonstrated trivially in (71)). We constantly learn new information, which becomes "old" by the time the next sentence is uttered; it forms a kind of ground for the information conveyed in succeeding sentences. The ideal of communication is to convey only and always new information, but that is not possible, since we must have a contextual matrix into which the new information fits. We have mentioned this ideal previously in regard to presupposition, which is largely a sentential phenomenon, but it is also relevant when we deal with larger chunks of language. Every teacher of composition and rhetoric knows how hard it is to write well, and to teach people to write at all, let alone well. Many problems in writing have to do with clear description, but many also have to do with this transition from old to new information, and the use of devices to show the relationship and relevance of one piece to the other. Languages have a number of these devices, and linguistics has investigated many in an attempt to explicate discourse phenomena. There is a tendency in English, for instance, for subjects of simple sentences to be old information, while predicates and often other parts of the sentence are new. This is not true of all languages, but all languages do have syntactic, phonological, and pragmatic devices to distinguish old from new, and rhetorical traditions that exploit these devices. Consider (75)-(78):

(75) Frank killed Bill.

(76) Bill was killed by Frank.

(77) Frank killed Bill. (heavy stress on Frank)

(78) It was Frank that killed Bill.

(75) is the straightforward active sentence, suitable to a discussion of Frank, or Frank's actions, or Frank's misdeeds. In other words, Frank is old information; his killing Bill is new. (76)-(78) are transforms of this sentence, suitable for other contexts and discourses, where Bill's having been killed is old and the identity of his killer is new. Studies on topics such as these have obvious importance for a number of educational endeavors, especially since the variety of devices used in languages is very wide, and few languages have anything like the same kinds of devices. Research on this topic has been pursued by Daneš (1970), Bayless and Johnson (forthcoming), Tomlin (forthcoming), Halliday (1967), Halliday and Hasan (1976), and Fillmore (1974b).

Relevance of Epistemological Studies to Bilingual Education

A number of applications of epistemological topics which we have suggested in this section can be reviewed here. Presuppositions alone constitute a class of phenomena which can be used to advantage by teachers and writers, or can be ignored with serious consequences. Speech act theory has direct implications for teaching methodology, and the phenomenon of old/new information tradeoff (also known as *topic, focus, theme*, and several other terms) is immediately relevant to teaching writing. Further, attention paid to these areas and to expectable differences in the belief structures of students and teachers (and planners) can avoid a host of potential problems.

LOGICAL STUDIES

To a large extent, linguistic work utilizing modern logic has striven to provide a means to express the propositions that constitute what we might call the literal meaning of language utterances. These propositions are seen, in some theories, as constituting the base of the sentence and as being processed in some fashion by the syntactic rules. The details of these and other theories are irrelevant here, since little of the formal research characteristic of this area can conceivably have applications in the field of bilingual education (or any practical field for that matter). There are, however, some notions arising from logic that, while universal in some sense, are manifested in different languages in unpredictable ways, and are sufficiently important to have motivated a great deal of productive research. Some of this research may be applicable to educational problems, at least insofar as it provides insights to language and to contrasts between languages. The notions which will be presented briefly here are the three types of *logical operators* which are important to natural language (*modals, negation, and quantifiers*) and the concept of *predication*.

Research Overview

Modals. English has a class of auxiliary verbs with unusual properties. These *modal auxiliaries* (for example, can, must, may, should, will) are treated in logic as variants of the two basic operators, POSSIBILITY and NECESSITY, and indeed, the syntactic and semantic behavior of the modals allow us to group them into these two large classes. For example, Horn (1972) has shown that there are lexical items and constructions which can only be used around modals which are variants of the operator POSSIBLE. Consider the underlined words in (79)-(81):

- (79) I can afford it.
 (80) Anybody can do that.
 (81) She can't tell time yet.

As can be seen by deleting can, these items depend somehow on the modal for their meaning. And not just any modal will do--must, for example, produces ungrammaticality in these sentences.

Such items as afford, anybody, tell time contain, somehow, the sense of possibility (as opposed to necessity) and hence are termed *POSSIBLE-polarity items*.

These can be used to "sniff out" logical modals which are not manifested as syntactic auxiliary verbs. It turns out that the sense of logical modals is present in many sentences that do not contain an auxiliary verb. For example:

- (82) He's rich enough to afford a Rolls.
 (83) She's too young to tell time.
 (84) Anybody knows that Columbus discovered America.

If we treat constructions with enough and too, and certain uses of know, as if they contained modals in some way, we get a better idea of what they mean: a reasonably good paraphrase of enough in (83), for example, would be 'to a degree which makes it possible.'

Thus, we see that modals are quite frequent in language. Further, they have a number of meanings. In general, each modal has at least one *root* meaning, usually dealing with obligation or permission, as in:

- (85) All applicants must complete the form.
 (86) You may enter now.

and an *epistemic* meaning, having to do with judgments of possibility, probability, or necessity:

- (87) Harry must be home now.
 (88) This may be the place

Logic provides a means to distinguish this type of meaning difference.

A logical approach also allows us to explain the divergent meanings of the following sentences:

- (89) Harry may not be here.
 (90) Harry can't be here.

Epistemic may and can [as in (89)-(90)] both mean 'possible,' but the negation interacts differently with each word. (89) means that it is possible that Harry is not here; (90) means that it is not possible that Harry is here. The logical form of these propositions illustrates this difference precisely:

- (91) POSSIBLE (NOT (HERE (Harry))) = Harry may not be here.
 (92) NOT (POSSIBLE (HERE (Harry))) = Harry can't be here.

Negation. Negation, a topic dealt with in logic, is also a relevant semantic phenomenon (Horn 1969, 1970, 1971, 1972, 1975; Baker 1970; Lawler 1974; and others). Its implications are considerable for other areas of semantics, and we have discussed it elsewhere. Here we will briefly treat some of the logical properties of negation.

The basic logical function of negation is to change the truth value of a proposition, that is, if a proposition P is true, then its negation NOT (P) is false, and vice versa. Negation, like modals, casts a polarity web: there are numerous words, phrases, and constructions which are peculiar to sentences containing negatives. For instance:

- (93) Frank didn't budge.
 (94) He didn't ever come.
 (95) He hasn't been here in weeks.
 (96) They haven't got a red cent.
 (97) You need not go alone.
 (98) He didn't arrive until noon.

As can be seen by removing the negation, these sentences are anomalous in the affirmative. Like POSSIBLE-polarity items, these NEGATIVE-polarity items allow us to detect negatives in unsuspected places.

- (99) Only Bill ever hands in his work on time.
 (100) If you ever do that again, I'll report you.
 (101) Did you ever meet Ed Jones?
 (102) I'm surprised he ever showed up.
 (103) Frank denied ever seeing me there.
 (104) He's too dumb to ever suspect.

In (99), the negative polarity ever is conditioned by the presence of only, in (100) by if; in (101) the fact that the sentence is a yes/no question is sufficient to trigger the presence of ever. (102) contains surprised, which contains a weak presupposed negative. (103) has deny, and (104) has too, both of which are also semantically negative. Thus, a reasonable paraphrase of too in (104) is 'to a degree which makes it not possible.' Note that this definition is parallel to that given of enough above and that the sentence contains both a modal and a negative.

Negation interacts with modals in interesting ways. As we saw in (91)-(92), the logical placement of the negative vis-a-vis the modal is critical to the meaning. In (91), the negation is said to be *inside the scope* of the modal POSSIBLE, while in (92), the modal is inside the scope of the negation. The other logical modal, NECESSARY, interacts with negatives in a precisely complementary way:

- (105) NOT (NECESSARY (P)) = POSSIBLE (NOT (P))
 (106) NOT (POSSIBLE (P)) = NECESSARY (NOT (P))

That is, if something is not necessarily true, it is possibly not true (105), and if it is not possibly true, it is necessarily not true (106).

These logical relations surface in English in interesting places; consider:

- (107) You must not go.
 (108) You don't have to go.
 (109) You may not go.
 (110) You may stay.

Note that (107) does not mean the same as (108), although must and have to are virtually synonymous (the affirmatives of (107) and (108) are synonymous); instead, by using the formulas (105)-(106) we see that (107) means 'It is necessary that you not go,' with not inside the scope of necessary; we can predict that (107) will mean essentially the same as (109), which means 'It is not possible that you go.' (108) means 'It is not necessary that you go,' with not outside the scope of the quantifier; it resembles (110), which means 'It is possible that you not go.'

Quantifiers. Another class of logical entities is *quantifiers*. There are two types, *universal* and *existential*, manifested in English by the words all, every, each (universal), and some, a (existential). Quantifiers are also said to have scope; for example, the negation in (111) is inside the scope of the quantifier some and the negation in (112) is outside the scope of the quantifier every.

- (111) Somebody didn't leave.
 (112) Not everybody left.

Note further that (111) and (112) are synonymous; this is the result of a rule of logic dealing with quantifiers and negatives:

- (113) FOR EVERY x (NOT (Px)) = NOT (FOR SOME x (Px))
 (114) FOR SOME x (NOT (Px)) = NOT (FOR EVERY x (Px))

That is, if it is true of every 'x' that 'x' does not have the property P, then it is not true that there is some 'x' which does have the property P (113), and if it is true that there is some 'x' that does not have the property P, then it is not true that every 'x' has the property P (114). This rule is precisely parallel to that which applies to modals and negatives; in fact, there are logical theories that relate the basic operator NECESSARY to the universal quantifier, and the basic operator POSSIBLE to the existential.

Scope relationships can cause problems; (115) is ambiguous

(115) Everybody didn't leave.

because it is not clear whether the negative or the quantifier has outside scope. Hence, the sentence could be interpreted as either (111) or (112). Similarly, existential and universal quantifiers together can produce ambiguities:

(116) Somebody rings my doorbell every 5 minutes; I wish $\left\{ \begin{array}{l} \text{he} \\ \text{they} \end{array} \right\}$ would stop.

One reading of (116) has the existential quantifier outside the universal: 'There is some person such that every 5 minutes that person rings my doorbell'; this corresponds to the reading "I wish he would stop." The other reading ("I wish they would stop") has the universal outside the existential: 'In every interval of 5 minutes there is some person such that that person rings my doorbell.'

There has been extensive work on quantifiers in semantics; G. Lakoff (1970, 1971a), Partee (1970), Carden (1970, 1973), Heringer (1970), Jackendoff (1972), and others have contributed. Quantifiers, modals, and negatives are, as mentioned above, examples of what are called operators in logic; the properties and inter-actions of such operators in semantics are treated by McCawley (1972, 1975), Horn (1972), and numerous philosophers and logicians, among whom are Hintikka (1972) and Lewis (1972).

Predication. Another logical concept implicit in the preceding discussion, and of great use in semantics, is that of *predication*. One speaks of a proposition predicating something, that is, asserting something to be a quality, attribute, or property of the subject. This is represented logically by the distinction between a *predicate* and its *arguments*. Thus, the proposition Bill is dead predicates deadness of Bill; this would be represented logically as a predicate (DEAD) with one argument (Bill) thus: DEAD (Bill). Propositions themselves can be arguments of other predicates; thus, the proposition Bill died can be viewed as predicating prior occurrence on the proposition Bill is dead, reflected logically by a combination of the inchoative predicate COME ABOUT and DEAD, thus: COME ABOUT (DEAD (Bill)). A predicate can have more than one argument; Bill hit John would be represented as HIT (Bill, John). One can stack predicates almost ad infinitum: a sentence such as Bill wants to begin to learn to speak Spanish (which is lengthy, but not overly so) would be represented as WANT (Bill, BEGIN (Bill, LEARN (Bill, SPEAK (Bill, Spanish)))). There are also sentences involving complex propositions where not every predicate appears overtly in the sentence. For example, Frank killed Bill can be represented as CAUSE (Frank, COME ABOUT (DEAD (Bill)))--that is, kill means 'cause to become dead' the same way die means 'become dead.'

The theory of lexical decomposition, mentioned in our discussion of lexical studies, tries to break up predicates into such basic atomic predicates, in complex relationships with one another. The work of Postal (1970b), McCawley (1968a and b), Ross (1969, 1972a, 1974), G. Lakoff (1968a and b, 1971a and b), and R. Lakoff (1968, 1969, 1971b) has been seminal in this field, and a host of others have contributed: Morgan (1969), Green (1969, 1971), Binnick (1969), Borkin (1972), Lawler (1972b), Rogers (1974), and Dowty (1972), to name a few. While few linguists now espouse lexical decomposition in its more extreme form, this research represents a great body of interesting and useful generalizations about the interrelationships of predicates and therefore of their meanings.

Relevance of Logical Studies to Bilingual Education

There are many notions treated in logic that are of sufficient importance to permeate the whole of semantics, like predication or negation. However, while considerable research on logical topics continues to be pursued, it does not seem to me to be headed in a direction which will lead directly to usable insights in the near future (see Lawler 1973c).

CONCLUSION

Research in linguistics, particularly in semantics and its allied fields, has developed several heterodox research methods which tend to have peculiar effects when one tries to apply results to other fields. Other fields which deal with human behavior (psychology, education, sociology) have resorted to numerical methods to state conclusions, since the data are so numerous and perverse, and represent thousands of interrelated variables. Linguistics, by and large, has not opted for such a treatment; instead, there is an implicit reliance on intuitive investigations of situational and linguistic variance. When properly carried out, such methods can result in generalizations of great explanatory power and potential usefulness, but they cannot give numerical criteria for application: it is a research of qualities, not quantities. Consequently, it is very difficult to judge whether the conditions for the application of any generalization actually obtain, since these conditions are a matter of subjective judgment.

This incommensurability of methods and results has led, in the past, to a lack of communication between linguists and other social scientists, and to a lack of general application of linguistic findings. This need not be the case. In the research I propose, it is important that linguists and educators work together, especially on the second and third of the major agenda items; this will allow the necessary communication of ideas and will result in the research being targeted more exactly to usable results.

Proposed Research Agenda

Basic research and nontechnical reviews. First in terms of temporal priority on this proposed research agenda is more basic research in semantics and allied fields and better presentation of the current state of affairs. Clearly, without a continuing base of creative research, a field will stagnate. There should be a mix of empirical, data-oriented research as well as the more traditional intuitively based work. Such a mix should help to bring a focus to practical problems which education faces.

The second point is somewhat obscure: I refer to the pointless obfuscation which mars the literature in so many places. This is an artifact of the theoretical preoccupation of linguists, and the necessity linguists have felt of dealing primarily with theoretical topics to the exclusion of adequate explication of the data. This can be remedied in several ways: more reviews like the three in this volume should be undertaken (with much reduced scopes) with a view to explaining in nontechnical language the findings of particular areas of linguistics. The work of Fillmore, for example, or Bolinger, shows that it is possible to deal with complex topics in an intelligent manner that is comprehensible to those outside the speciality, and to give detailed, relevant accounts of linguistic facts. A series of papers summarizing various areas in semantics and pragmatics, presenting the data and noting the interactions fully (rather than sampling them, as I have been forced to do here) would be valuable to linguistics, as well as to education and other disciplines.

Language in teaching. Second on the agenda, and hopefully benefitting from the efforts of the first item, is some serious research into the use of language in teaching. There has, of course, been considerable investigation of teaching methodology, but very little of this has been carried out with any sophistication in semantics or pragmatics. Before we can deal with the questions that plague bilingual education, we need to know the answers to a lot of questions about more typical kinds of teaching. For example, how do good teachers use various types of speech acts? What is the mix of questions to statements? How much indirectness is used, and what is it used for, and how efficient is it? What presuppositions are evident in classroom language use? How does vocabulary choice affect effectiveness of communication? And what is effectiveness, linguistically speaking? Many other questions spring to mind--these are just a few. In pursuing this research, it is essential, as I mentioned above, that linguists and educators work together, so that

the results have some uniformity with the concepts of semantics and so that they may be applied in the comparative studies described in the next agenda item.

Interaction of language use, meaning, and bilingual classrooms. Third, and most closely targeted, but last in temporal terms because of the prior research necessary, is the examination of how language use and meaning interact with the day-to-day activities of bilingual education. How much, for example, of the cultural factor in one language overlaps and/or interferes with that in another in an educational setting? Does the fact of teaching or learning in one language, representing a different culture with different pragmatic and semantic conventions, influence motivation? Can interference from a linguistic source be misconstrued by the teacher as boredom, troublesomeness, or ignorance? What effect do different sets of presuppositions, discourse structures, lexical choices, and other matters of meaning have on teaching and learning? How should teaching methodology be altered to capitalize on the similarities and to deal with the differences?

There are, to be sure, many questions. Armed with some answers, we can proceed to implement bilingual education programs with some hope of success.

FOOTNOTES

¹Morpheme is defined as the smallest meaningful unit of a language. See Zwicky (this volume) for a further discussion of morphology.

²Subjective grammaticality judgments are traditionally expressed by notations before the item under discussion. The scale of (un-)grammaticality runs from no notation:

(i) She's beautiful. (which is judged "grammatical")

to an asterisk (*):

(ii) *Furiously ideas colorless sleeps green. (which is judged "ungrammatical")

Intermediate levels are expressed by the following series:

(iii) ?*, ??, ?.

These judgments represent the author's estimate of the degree of difficulty in imagining a context in which the sentence could be used conventionally. They thus tend to vary with author interest and imagination. By convention in the field, it is considered bad form to disagree about grammaticality judgments, since it is recognized that they are intuitional.

³As this review was being prepared for press, a massive revision and formalization of relational grammar by Johnson and Postal was being circulated under the title *Are Pair Grammar*. It is too early to assess its impact on the field of syntax, let alone semantics, but it appears to me to have the potential for a very interesting structural theory of semantics and pragmatics.