ON THE DISTINCTIONS BETWEEN SEMANTICS
AND PRAGMATICS

Jens Allwood

The trichotomy of syntax, semantics and pragmatics is one of the most popular ways of subdividing the study of human languages. It was originally suggested by Charles Morris in Morris (1938) and later again in a revised form in Morris (1946).

The term *pragmatics* was proposed by Morris in 1938 as a tribute to C. S. Peirce's philosophy of pragmatism, to designate the study of signs and their relationship to interpreters. In 1946 Morris changed this slightly to make pragmatics the study of the origin, use and effect of signs. One of the main differences between the two versions is that in the second version the term *use* also includes the production of signs.

The term *semantics* in 1938 was used to designate the more abstract study of the relationship between signs and the objects they signify (leaving out the interpreter). In 1946 this was changed to the study of signification in all modes of signifying. The second version again widens the definition given in the 1938-version. *Syntax* (or *syntactics* (Morris (1938)) in both the 1938 and 1946 version was to designate the even more abstract study of the relationship between signs without taking either their signification, origin, use or effect into account.

Rudolf Carnap (1942) made use of Morris's trichotomy and thus contributed greatly to its becoming widely accepted. In doing this Carnap, however, introduced a distinction of his own, between a pure and a descriptive way of pursuing the three types of study.

A pure study uses normative regimentation and stipulative definitions in order to clarify concepts which are thought to be fundamental to an area. In semantics, for example, such concepts are truth and reference. A descriptive study, on the other hand, tries to capture empirical data in their fullness, thereby describing also phenomena which can be given no clear explications or definitions. For Carnap a pure study was possible both with regard to syntax and semantics but not to pragmatics which seemed to him only open to description. In fact, Carnap, at this stage, regarded all descriptive studies as pragmatical since they all in some sense involve interpretation, origin, use or effect of signs. Later, however, Carnap (1952) came to hold that the analysis of concepts like 'belief' and 'intension' required the development of a pure pragmatics. With work such as Bar-Hille (1954) and R.M. Martin (1959), formal or pure pragmatics came into existence primarily, as the study of indexicals, i.e., expressing such as personal pronouns, time and

place adverbials. This was then further developed in Lewis (1970), Montague (1968) and (1970).

In the trichotomy proposed by Morris, syntax, semantics and pragmatics are seen as successively more abstract levels of enquiry. We can now ask what the abstraction is based on. As far as the distinction between syntax and semantics goes the prevailing view is that syntax disregards meaning in favor of the study of "purely formal phenomena". When it comes to the distinction between semantics and pragmatics this seems mostly to be seen as an abstraction of meaning along the dimension of context and situation dependence. But it has also been argued that it concerns an abstraction of the cognitive aspects of meaning from those of emotion and attitude or as Carnap (1942) seems to have held a distinction between a normative and a descriptive study of meaning. My remarks in this paper will mainly be concerned with situation dependence and only to some extent deal with the latter two ways of establishing the distinction.

The most common way of viewing the distinction between semantics and pragmatics is in terms of situation or context dependence of meaning. Semantics is supposed to be concerned with those aspects of meaning which are situation independent while pragmatics deals with those aspects of meaning which are dependent on situational factors. In pure semantics, situational independence has mostly been achieved through normative, stipulative definitions of such notions as truth, reference and logical form, while in descriptive semantics one has wanted to attain situational independence either by importing notions of pure semantics, claiming that there is no essential difference between a formal language and a natural language (Montague (1970)) or by claiming that meaning which is literal or conventional can be studied independently of context of use. Both of these alternate conceptions of situation independent meaning are supposed to differentiate so-called inherent meaning of linguistic expressions from phenomena such as vagueness, ambiguity, metaphor, suggestion, implicature, emotional and attitudinal associations which all are seen as more fleeting and, accidental and dependent on situation and not characteristic of the "real" meaning of linguistic expressions.

In what follows, I will not be concerned with the pure. normative and stipulative study of meaning, for example through the medium of an artificially constructed language. Since one by fiat can construct most things one can also construct a distinction between semantics and pragmatics this way. I will, instead, be concerned with the extent to which such a distinction can be made for natural languages either via the notions of pure semantics or via the notion of convention.

Let us begin by considering whether pure semantic notions such as reference, truth conditions and logical form when applied to natural languages really can be used to give an analysis of situation independent meaning and thus serve as an instrument in distinguishing semantics from pragmatics. In the tradition of pure or formal semantics the notions of reference and truth are seen as the central semantic notions since they make it possible to achieve what is seen as the central goal of a semantic theory, i.e. linking language to the world. Essentially, this is accomplished by considering only languages with proper names, predicates, sentences, certain operators and variables as

basic categories and then, by defining an interpretation, giving every linguistic expression what is known as its extension in a world consisting of individuals, sets, functions and truth values. Sometimes one adds to this so-called intensional entities such as individual concepts, universals and propositions which can either be seen as primitives or analyzed as constructs out of the above mentioned ingredients of the world. These can then also be assigned to linguistic expressions as part of their meaning. Finally, one usually gives a definition of logical consequence and of what it is for the sentences of the language to be true in a certain model of the world.

Since the whole construction of the semantics is achieved by stipulation one can ensure that each linguistic expression gets a fixed and determinate meaning, i.e. intension and extension, and that this meaning is independent of use in different contexts. In the same way truth conditions can be given for sentences in terms of the fixed situation independent intensions or extensions of the constituent expressions of the sentence.

Let us now see to what extent it is reasonable to think that an analysis of meaning in terms of reference, extension, intension and truth can be situation independent in natural language. Since extension and intension for natural language expressions are mostly not stipulatively given, we face an empirical problem. We have to discover the intensions and extensions of natural language expressions in order to give an account of the truth conditions of sentences in natural language. This is clear, since we are not dealing with stipulation. The meanings of expressions must then be determined empirically. However, once we have empirically discovered what the meanings are, can we then not sit back in our chairs and continue as in formal semantics with situation independent meanings? As long as meaning is conceived of in terms of reference, intension, extension or truth conditions I do not think this will be possible since these notions require a precision and specificity of meaning which in natural language cannot be achieved without the help of context. Let me illustrate this thesis by a number of examples some of which are by now quite well known:

(i)   I was hungry.

In order to determine the reference and truth conditions of (i) we have to know who the speaker was, (ii) when the speech event occurred, (iii) where the speech event occurred, (iv) whether physiological or phenomenal hungriness or both was intended. None of the above points are given in the sentence explicitly, but they are necessary for the determination of truth conditions and reference of this sentence. In natural language we don't need to state these factors since we can rely on context to supply them. In a pure semantic approach they would have to be introduced by stipulation such as in Lewis (1970) where we have speaker time and place coordinates or in Montague (1968) where we have indices for speaker and time. In other words pure semantics would be extended with pure pragmatics. The distinction between the two approaches could be maintained by claiming that only certain predicates needed contextual determination and that only a finite number of factors were involved while other predicates would still belong to the domain of pure semantics having extensions determined once and for all independently of all contexts of use. This conviction breaks down, however, if we start to take seriously

phenomena such as the predicate indeterminacy of *hungry* between a phenomenal and physiological sense, i.e. a feeling of hunger is not always accompanied by a physiological state of hunger and vice versa.

Other examples are:

(ii)   Everyone came to see the small boy.
(iii)   It's raining.
(iv)   We danced while the band was playing.
(v)   3 men danced with 3 women.
(vi)   The picture is beautiful.

In order to assign reference and to determine truth conditions for these sentences we need among other things the following information: For sentence (ii): (1) the universe of quantification for *everyone,* (2) the location of the speaker to determine the deictic reference required by *came*, (3) the veridicality of the predicate *see,* i.e. whether it's phenomenal or not, (4) the universe of comparison for *small:* for sentence (iii): (5) time of speech event, (6) a distinction between rain and fog, mist, hail and snow; for sentence (iv): (7) the reference of *we,* (8) a delineation of dancing from jumping, (9) specification of contemporality - the duration of the intersection of dancing and playing - could we have danced when the band took a pause? (10) a delineation of playing from practising or tuning instruments; for sentence (v): specification of quantificational distribution (from 3 to 9 women), (11) relational characteristics of the verb to *dance;* for sentence (vi): (12) referential aspects, referred to by *picture*, e.g. colouring or drawing techniques.

The list of factors which are needed for the determination of reference and truth conditions can easily be made much longer. The dependence on context and situation in natural language to make meanings precise and specific enough to determine reference or truth values is pervasive. How many of these factors one will be able to explicate in formal pragmatics by use of stipulative idealization remains an open question. One thing, however, should be clear from what has been said: the study of meaning cannot, if it is taken to be concerned with notions such as reference and truth, be pursued for natural language without continuously drawing on situation for determination. This is true also for formal languages as soon as such languages attempt to model something more than very impoverished aspects of natural language. If we attempt to deal with languages that are not wholly stipulatively defined, the notions of truth and reference as developed within formal, pure semantics do not make it possible to distinguish semantics from pragmatics on grounds of situational independence. This does not mean that the distinction could not be drawn some other way. For example, by keeping the idea that semantics deals with reference and truth whilst excluding the requirement that reference and truth be situation independent.

Pragmatics could then be said to deal with non-referential, non-truth-conditional aspects of meaning whether these be dependent on situations or not. This proposal, however, has its own difficulties which will be discussed below.

The adherent of the idea that meaning could be given a situation independent analysis with the help of pure semantic notions might have another resort, i.e. he could turn to the notion of logical form and claim that at least logical form, if not truth conditions and reference, is situation independent.

This claim, however, leads to several difficulties. First, a common way to characterize logical form is to say that it is an abstract representation of the truth conditions of a sentence which, if what we have said above about the dependence of truth conditions on context is correct, would also make logical form dependent on situational factors. A sentence will have one logical form in one situation and another logical form in another situation.

Second, one might try to make logical form depend not on sentence tokens, i.e. sentences used as statements, but on some more abstract notion of sentence type. Logical form could then be seen as a set of conditions holding for all truth conditional specifications that can be associated with a sentence. The problem with such a characterization of logical form is that it would not be rich enough to yield all the entailments of a sentence, - a job which, after all, is supposed to be done by logical form.

For example, notions such as the scope of quantifiers and modal operators can often not be determined without recourse to context. See example (v) above and Kratzer (1977). In general, any inferences which are dependent on contextual specification and determination cannot be captured.

Third, one can always explicate logical form by stipulation, for example by declaring that logical form is dependent on the meanings of a certain logical vocabulary, such as the sentential connectives, where the meanings have been clarified by formal definitions or by introducing meaning postulates that tell you something about the meaning relations between certain predicates. Both logical vocabulary and meaning postulates can then be indefinitely extended. The problem is, as usual, that the notion of logical form is created by stipulation and that this way of producing situation independence begs the question.

To sum up, therefore, it does not seem as if logical form would be a good candidate for an explication of a notion of situation independent meaning. Either (i) it is just as situation dependent as truth conditions or (ii) it becomes too abstract to give us a rich enough notion to characterize a number of interesting entailments or (iii) it is stipulative in which case its situation independence is restricted to the language for which the stipulation holds.

It might be objected that the argument so far has not sufficiently considered the distinction between intension and extension frequently made in formal semantics. Even if extensions are dependent on contextual determination, intensions need not be. Intensions could be construed as situation invariant meanings which in conjunction with situational factors determine reference. These situation invariant meanings could then in turn be identified with linguistic meaning proper. Thus, even if the reference of an indexical pronoun like *I* varies with situation and speaker, it always has the same intension or

linguistic meaning. One could then go on to claim that semantics is the study of intensions while pragmatics deals with how extensions are established.

In order to determine whether this is a reasonable claim we have to investigate whether there is a notion of intension that will serve as a candidate for situation independent linguistic meaning. It is clear that the usual formal semantic approach of characterizing intensions as functions from situations to extensions will not on its own be sufficient, since this characterization does not connect intensions with language. Intensions according to this analysis can be but in no way need to be connected with language. Since we are concerned here with investigating whether there can be an interesting distinction between semantics and pragmatics in the study of natural language meaning, we are interested in intensions only as far as they can be seen as an aid in determining situation independent linguistic meaning. The formal semantic notion of intension does not do this. It only provides a formal functional analysis of something, the determination of which has to be provided on other grounds.

Let us therefore turn from pure semantics to descriptive linguistic semantics in order to see if any notion developed there will help us draw the distinction between semantics and pragmatics along the lines of situation independence. The favorite candidate here is the notion of literal, conventional meaning. The literal meaning of a linguistic expression is its inherent proper meaning. This meaning is either seen as present in all situations of use, due to linguistic conventions dependent on association between form and content only, or as a basic meaning from which the meaning of the linguistic expression in all situations of use can be derived. The role of the literal meaning of a linguistic expression can perhaps be most clearly appreciated when considering written words or sentences out of context. In spite of the fact there is no overt context it seems possible to arrive at an understanding of their meaning. This understanding is claimed to consist of a grasp of the literal meaning.

The question is now whether there is an analysis of literal meaning which can be given without relying on the notions of reference and truth (which as we have seen lead to an analysis of meaning as context dependent). The analysis should also make it possible to show how literal meaning is something that can be differentiated from what is metaphorical, satirical or implied.

There are in principle three types of solutions that have been suggested within descriptive semantics to determine literal meanings:

(1)   The intersection or greatest common denominator approach.
(2)   The basic meaning or ideal representative approach.
(3)   The union or vagueness approach.

The first candidate for the analysis of literal, conventional meaning that I will consider is what one can call the intersection or greatest common denominator GCD approach or to use a German term the Gesamtbedeutung approach. This is the idea that the literal meaning of an expression is that which is common to all contexts of use, i.e. situation

independence by definition. This has the advantage that it suits all types of meaning - referential, cognitive as well as emotive, attitudinal. Further, this type of meaning is totally dependent on conventional use, since the meaning of an expression is the intersection of all its conventional uses. This, as we will see, is not necessarily the case for the next approach.

However, there are other problems with this approach. (i) For many linguistic items there is no intersection of meaning. The greatest common denominator is zero. This is probably true, for example, of the past tense morpheme in English or of the declarative mood markers in English. (ii) Since this consequence is hard to swallow for most people, they, rather than saying that an expression has no meaning, say that it is homonymous. Thus the declarative mood markers in English show ambiguity between a statement, a question or an order, as is illustrated in sentence (vii) below.

(vii)   You win be here to-morrow.

Since the risk of ending up with zero meaning is fairly great if we really take all the contexts of use of an expression into account this approach thus leads to an unnecessary multiplication of meanings. (iii) If a greatest common denominator meaning can be found this will have the property of being very general and abstract. This is a consequence of its being what is common to many different contexts of use. Literal meanings win on this approach be so general that they will be very hard to distinguish from so called metaphorical uses of a meaning. This is so since metaphorical uses are among the uses that have to be taken into account in order to arrive at the greatest common denominator meaning, which in turn often will make it impossible to differentiate literal from metaphorical meaning with this approach. What is needed is an approach to literal meaning giving us meanings with more content.

The next approach is that of identifying literal meaning with a basic or ideally representative meaning, in German often referred to as Grundbedeutung. The oldest suggestion of this type is probably that of identifying literal meaning with that which is known as the essence of something, i.e. those qualities that are both necessary and sufficient to make something what it is. There are many problems connected with this proposal: (i) It is very hard to tell which qualities are essential to a certain entity and which are not. (ii) It is not easy to characterize all types of meanings as essences. Consider the essence of *ouch, even though* or *essence.* (iii*)* Just as with the greatest common denominator approach, the outcome of an analysis of meaning into essences is often an unnecessary multiplication of meaning elements which all represent clear and separable ideas. The word *can* thus be said to mean either permission, ability, possibility or polite request. The word *action* can mean either the intention connected with a certain type of behavior, the behavior itself, the result of the behavior or certain contextual features associated with the behavior. Thus, the price of identifying literal meaning with essence will also be much more widely spread homonymy in language. (iv) Finally, identifying literal meaning with essence has the consequence that the literal meaning is no longer necessarily conventional. Everybody can be wrong about what the essence is or one person can be right and everybody else wrong. For example, when it was discovered

that whales were not fish but mammals, for a while there was a majority of people who were wrong about the meaning of whale. This is, of course, unacceptable if one want to hold that the meaning of an expression is conventional, i.e. what the majority take it to be.

Another suggestion which has a lot in common with the above is the suggestion that literal meanings should be thought of as ideal representative types, the latest version of this theory being the so called prototype theory, cf. Rosch (1976) and (1977). This suggestion too is problematic in several ways: (i) How are prototypes established? Do different people develop different prototypes? If this is the case they are not necessarily conventional. If prototypes are not established on purely biological and ontogenetic grounds, but also on such grounds as idealization and abstraction, it seems hard to differentiate them from essence. (ii) In any case, the question of what qualities are prototypical and what qualities are not seems in general just as impossible to settle for prototypes as for essences. (iii) Finally, it seems clear that not all types of meaning are equally amenable to a prototype analysis. We can ask as we did for essences what prototypical meaning corresponds to *ouch, though, prototype, resource* etc. (consider mental resources). In fact, it seems that prototypes are best suited for exactly what they have been tested for, i.e. fruits, vegetables, animals and furniture.

Another possibility would be to combine the greatest common denominator approach with the ideal representative approach by only considering the intersection of a limited number of typical contexts of use. However, the problem with this approach will again be how the representativity of the contexts is established.

The third approach to the problem of literal meaning is to say that it is not the intersection but the union of all uses. This will have the effect of connecting any information that has been conveyed by a linguistic expression with its literal meaning. It will also have the effect of making literal meaning extremely vague and polysemous and will in no way help to differentiate literal meaning from such things as metaphorical or satirical meaning.

In summary, we can see that all three approaches to literal meaning considered so far have drawbacks which in fact will make them unsuitable for a general analysis of conventional literal meaning if this is to be thought of as situation independent:

(1) Basic meanings such as prototypes or essences are not necessarily conventional, not equally suitable for all types of meaning and cannot be determined by any easily definable method of selection.

(2) The greatest common denominator approach and the basic meaning approach lead to a preponderance of homonymy which in turn leads to a need for a mechanism which can select the right meaning. It is very hard to see how one could help introducing context as this point, if one does not want to separate meanings by stipulation and distinguish expressions by little numerical subscripts, which in fact is the course taken in formal semantics.

(3) The greatest common denominator approach runs the risk of ending up with no meaning at all or with such an abstract meaning that it cannot be distinguished from metaphorical meaning, which in turn leads to a need for contextual specification.

(4) The union approach ends up in such vague clusters of polysemous meaning that some type of selection procedure seems necessary if literal meaning is to be determinate at all. The obvious solution is to make use of context here.

Before we leave the descriptive approaches to literal meaning another solution should be mentioned. This is the solution that not all linguistic expressions have a situation independent literal meaning. Only some - the so called syncategorematic or formal and functional expressions of language - do. The others - the categorematic or contentful expressions of language - depend on context for selection and specification. This solution is especially popular within formal semantics where one likes to identify the logical constants, i.e. those expressions whose meaning is said to be independent of any interpreting model or context, with a subset of the syncategorematic terms. The difficulties here are: (i) This is not a general analysis of meaning. (ii) How does one draw the line between categorematic and syncategorematic terms on semantic grounds? Are all auxiliaries, adverbs, conjunctions, prepositions, pronouns syncategorematic and, on the other hand, are all nouns, verbs, adjectives categorematic? A noun like *resource* for example seems semantically best to be regarded like a pronoun with empty places for agent, goal and activity which is again very like the analysis for *can* and *must* proposed by Kratzer (1977). (iii) Many cases of syncategorematic terms which on the face of it look straight forward, on closer inspection turn out to be problematic. Take, for example, the personal pronouns *you*, *they* and *we*. In English both *they* and *we* can be inclusive or exclusive. *You* can refer to the listener or everybody including the speaker. *We* can refer to the listener as in the doctor's phrase:

(viii)   And how are we today.

In other languages like Swedish additional difficulties attach to pronouns like *he* or *she (han* or *hon)* which can be used to refer to the listener. So even if many syncategorematic terms seem to be good candidates for situation independent meaning, it does not in fact seem so clear that the set of syncategorematic terms will be easily determinable from a semantic point of view.

Thus, the approaches of descriptive semantics do not seem to offer us a straight forward way of characterizing a notion of context independent conventional literal meaning. The notion of convention in conjunction with the ideas of intersection, representative type and union just as little as reference and truth enable us to distinguish semantics from pragmatics by abstraction along the dimension of situational dependence. The solution just as with reference and truth seems to be to make literal meaning context dependent by making the meaning conventions sensitive to features of context.

Let us now turn to the relationship between literal meaning and referential, truth conditional meaning. Some authors such as Kempson (1977) have taken them to be the same. Both of them are supposed to be that sort of situation independent meaning which I have tried to show can be achieved for natural language neither by the help of convention nor by the help of reference and truth. It might then be thought that since both referential and conventional, literal meaning seem to be situation dependent Kempson is, after all, right in equating them. This would, however, be a hasty conclusion. Conventional meaning, even though situation dependent, just as is referential meaning, is a notion of much wider application than referential meaning. It is reasonable to talk of the conventional meaning of *ouch* or *mhm* but hardly of their referential meaning. Thus, there is good reason not to equate these notions even though they are both context dependent.

Returning now to the distinction between semantics and pragmatics it might be said that even though it could not be made in terms of context dependence, using notions such as reference, truth or convention, it could perhaps be made in some other way which comes close to Morris' original intentions. One such suggestion is that the distinction should be made in terms of the distinction between cognitive, referential meaning and emotive, non-referential meaning. This approach, however, also has a number of difficulties: (i) It is not clear that everything that is cognitive is referential or vice versa. For example all tautologies are referentially the same yet they seem to be cognitively different. (ii) Nor is it obvious that what is non-referential is emotive or vice versa. The adjective *beautiful is* emotive in some sense. Yet, it is not clear that it is non-referential. The word *well is* non-referential but it is not clear that it is emotive. (iii) It is also very hard to give a set of criteria that distinguish that which is referential from that which is non-referential or that which is emotive from that which is cognitive. Rather there seem to be both referential and non-referential, both cognitive and emotive components in all meanings which means that also with this criterion semantic and pragmatic aspects of meaning will be mixed. For example, the meanings of the adjectives *thrifty* and *stingy* do seem to involve both cognitive, referential and emotive, non-referential aspects. But it is far from evident how these should be separated.

The last way of making a distinction between semantics and pragmatics that I will consider is that of making the distinction equivalent to the distinction between a normative and a descriptive study of meaning, i.e. more or less the opinion that Carnap originally held. Semantics would then be concerned with the normative analysis and explication of concepts that are used in many different and partly inconsistent ways in ordinary language. Pragmatics on the other hand would be concerned with the full richness of empirical data. The trouble with this way of making the distinction is that it is too close to the classical distinction between theory and data. Every science needs a theory through which its data can be understood. This theory to some extent always has to be made up of normative idealizations of data. Thus, if pragmatics is going to be theoretical enterprise at all, rather than just data collection, it will have to be tied to a theory containing normative idealizations. If we like we can call these idealizations semantics but we will then have to accept that many of them have to do with contextual factors.

The conclusions that can be drawn from the arguments presented are that so far we have no theoretically interesting and consistent way of separating semantics from pragmatics and that perhaps the distinction is more of a hindrance than an aid to clarity in the study of meaning in natural languages. Perhaps, it would in fact be better to abandon the distinction in favor of a semantico-pragmatic approach where linguistic meaning has as its primary function contextual adaptability, which would make such things as vagueness, metaphor and contextual determination of meaning central concerns rather than phenomena which are seen as exceptional and therefore safely left for another day.

REFERENCES

Bar-Hillel, Y.:1954, 'Indexical expressions' in *Mind 63,* 359 -76.

Carnap, R.: 1942, *Introduction to Semantics,* Cambridge, Mass., MIT Press.

Carnap, R.: 1956, *Meaning and Necessity,* 2nd Edition, Chicago, University of Chicago Press.

Kempson, R.: 1975, *Presupposition and the Delineation of Semantics,* Oxford, Cambridge University Press.

Kempson, R.: 1977, *Semantic Theory,* Oxford, Cambridge University Press.

Kratzer, A.: 1977, 'What *must* and *can* must and can mean', *Linguistics and Philosophy* 1, 337-356.

Lewis, D.: 1970, 'General semantics' in *Syntheses* 22, 18-67.

Martin, R.: 1959, *Toward a Systematic Pragmatics,* Amsterdam, North Holland.

Montague, R.: 1968, 'Pragmatics' in Thomason, R. H. (ed.), *Formal Philosophy,* Yale University Press, (1974).

Montague, R.: 1970, 'Pragmatics and intensional logic' in Thomason, R. H. (ed.), *Formal Philosophy,* Yale University Press, (1974).

Montague, R.: 1970, 'English as a formal language' in Visentini, B. et al., *Linguaggi nella Società nella Tecnica,* Milano, Edizioni di Communità pp. 189-224.

Morris, C.: 1946, *Signs, Language and Behavior,* Englewood Cliffs, N. L, Prentice Hall.

Morris, C.: 1938, 'Foundations of the theory of signs', in Morris, *Writings on the General Theory of Signs,* The Hague, Mouton, (1971).

Rosch, F.: 1977, 'Human categorization' in Warren, N. (ed.), *Advances in Cross-cultural Psychology* Vol. 1, London, Academic Press.

Rosch, F., Gray, W., Johnson, D. and Boyes-Braem, P.: 1976, 'Basic objects in natural categories' in *Cognitive Psychology 8,* 382-439.