Definition
A NECESSARY CONDITION on the sense of a predicate is a condition (or criterion) which a thing MUST meet in order to qualify as being correctly described by that predicate.

A SUFFICIENT SET OF CONDITIONS on the sense of a predicate is a set of conditions (or criteria) which, if they are met by a thing, are enough in themselves to GUARANTEE that the predicate correctly describes that thing.

Example
Take the predicate square, as usually understood in geometry. ‘Four-sided’ is a necessary condition for this predicate, since for anything to be a square, it must be four-sided.

‘Plane figure, four-sided, equal-sided, and containing right angles’ is a sufficient set of conditions for the predicate square, since if anything meets all of these conditions, it is guaranteed to be a square.

‘Four-sided and containing right angles’ is not a sufficient set of conditions for square. Many non-square shapes, such as rectangles and trapezoids, meet these conditions.

‘Three-sided’ is not a necessary condition for square.

Practice
(1) Is ‘three-dimensional object’ a necessary condition for the predicate sphere? Yes / No
(2) Is ‘three-dimensional object’ a necessary condition for the predicate circle? Yes / No
(3) Is ‘three-dimensional object and circular in cross-section’ a sufficient set of conditions for sphere? Yes / No
(4) Is ‘three-dimensional object and with all points on surface equidistant from a single point’ a sufficient set of conditions for sphere? Yes / No
(5) Is ‘male’ a necessary condition for bachelor? Yes / No
(6) Is ‘adult, male, human, and unmarried’ a sufficient set of conditions for bachelor? Yes / No

Feedback
(1) Yes (2) No (3) No (e.g. a cylinder) (4) Yes (5) Yes (6) Yes, for us, though some would debate the point, arguing, for example, that a monk or a Catholic priest meets these conditions but could not correctly be called a bachelor. For us, monks and priests are bachelors.
Comment: Obviously, we are stating conditions on predicates in terms of other predicates in the language. Henceforth, we will drop the quotation marks, and envisage necessary and sufficient conditions as relationships between predicates. Thus we shall say, for example, that animal and cat are semantically related in such a way that the applicability of the former is a necessary condition for the applicability of the latter. (Nothing can be a cat without being an animal.) In fact it is possible to give complete definitions of some predicates in the form of a ‘necessary and sufficient list’ of other predicates. Kinship predicates and shape predicates are well-known examples.

Practice

(1) Is father adequately defined as male parent? 
   Yes / No

(2) Is female spouse an adequate definition of wife? 
   Yes / No

(3) Is parent’s father an adequate definition of grandfather? 
   Yes / No

(4) Is hexagon adequately defined as five-sided plane figure? 
   Yes / No

Feedback

(1) Yes (2) Yes (3) Yes (4) No

Comment: The idea of defining predicates by sets of necessary and sufficient conditions can be evaluated from a practical point of view. The parallel with the undecidability of extensions is very close. Just as in a large number of cases it is implausible to postulate the existence of perfectly clearly defined sets of things, such as the set of all cats, the set of all tables, etc., so too the idea that there could be satisfactory definitions in the form of sets of necessary and sufficient conditions for such predicates as cat, table, etc. is clearly misguided.

One of the best-known arguments (by the philosopher Ludwig Wittgenstein) against the idea that definitions of the meanings of words can be given in the form of sets of necessary and sufficient conditions involves the word game.

Practice: Given below are two definitions of the word game, taken from dictionaries of modern English. For each definition, give, if possible, (a) the name of at least one game (e.g. football, chess) not covered by the definition, and (b) at least one thing that is not a game (e.g. piano-playing, watching television) but which falls within the given definition.

(1) An amusement or diversion
   (a) ...............................................  (b) ............................................... 

(2) A contest, physical or mental, according to set rules, undertaken for amusement or for a stake
   (a) ...............................................  (b) ............................................... 

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UNIT 9  Sense properties and stereotypes

Feedback

(1) (a) We can think of no examples of games which are not amusements or diversions. (b) piano-playing, watching television, fishing, embroidery
(2) (a) cat’s-cradle (not a contest), patience or solitaire (also not contests, except in a vacuous sense) (b) a 100-metre footrace, high-jump, pole-vault (such events are not normally called ‘games’ but rather ‘races’, ‘contests’, or ‘competitions’), musical competitions

Comment

Wittgenstein’s example of game cuts both ways. On the one hand, one must admit that a set of necessary and sufficient conditions for game to cover all eventualities (including games played in the past and games yet to be invented) cannot be given. On the other hand, one has to admit that some of the definitions offered by dictionaries, while imperfect, do cover a large number of cases, and are in fact helpful.

It is possible to give at least some necessary and/or sufficient conditions for all predicates in a language. If there were a predicate for which we could give no necessary or sufficient condition, we would have to admit that we literally had no idea what it meant.

Practice

(1) Is the sense of activity a necessary part of the sense of game (i.e. must something be an activity to be a game)? Yes / No
(2) Is the sense of game a necessary part of the sense of tennis (i.e. must some activity be a game to be tennis)? Yes / No
(3) Is the sense of chess a sufficient part of the sense of game (i.e. is the fact that something is chess sufficient evidence to call it a game)? Yes / No
(4) A witty literary lady coined the memorable sentence,
A rose is a rose is a rose, implying that definition could go no further. One can actually go at least a little further.
Is the sense of flower a necessary part of the sense of rose? Yes / No

Feedback

(1) Yes (2) Yes (3) Yes (4) Yes

Comment

Except in a few cases, complete definitions of the meanings of predicates cannot be given, but nevertheless it is possible to give, for every predicate in a language, at least some necessary and/or sufficient ingredients in its meaning. Later units (10–11, and the whole chapter on word meaning, Units 16–20) will explore in more detail just how far one can go in giving definitions of the meanings of words, but it is clear in advance that definitions of many terms will be quite sketchy indeed. It seems reasonable to suppose that speakers of a language have in their heads not only an idea of the bare sense of any given predicate, but also a stereotype of it.

Definition

The STEREOTYPE of a predicate is a list of the TYPICAL characteristics or features of things to which the predicate may be applied.
Example
The stereotype of *cat* would be something like:
Quadruped, domesticated, either black, or white, or grey, or tortoise-shell,
or marmalade in colour, or some combination of these colours, adult
specimens about 50 cm long from nose to tip of tail, furry, with sharp
retractable claws, etc., etc.

Practice
(1) Suggest four characteristics which should be included in the stereotype
of the predicate *elephant*. (Be sure not to include any more basic term,
properly belonging to the SENSE of *elephant*.)

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(2) Give two characteristics which should be included in the stereotype of
*mother*.

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(3) Give four characteristics which should be included in the stereotype of *cup*.

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(4) Give four characteristics which should be included in the stereotype of
*building*.

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Feedback
(1) e.g. grey, very thick-skinned, virtually hairless, with a trunk and two
tusks, adult specimens weighing several tons, etc. (2) e.g. caring for her
young, living with their father, etc. (3) e.g. between 3 and 6 cm high,
round in cross-section, wider at the top than at the bottom, of china, with
a handle, made to fit a saucer, etc. (4) e.g. containing upward of three or
four rooms, built of a durable material, such as concrete, wood, stone,
with a roof, doors, and windows, used regularly by human beings, etc.

Comment
A stereotype is related to a prototype (see previous unit) but is not the same
thing. A prototype of *elephant* is some actual elephant, whereas the stereotype
of *elephant* is a list of characteristics which describes the prototype. The
stereotype of a predicate may often specify a range of possibilities (e.g. the
range of colours of typical cats), but an individual prototype of this predicate
will necessarily take some particular place within this range (e.g. black).

Another important difference between prototype and stereotype is that a
speaker may well know a stereotype for some predicate, such as *ghost*,

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The relationships between stereotype, prototype, sense, and extension are summarized very briefly in the chart. The notions of prototype and stereotype are relatively recent in semantics. We have in fact given definitions which sharpen up the difference between the two terms, which are sometimes used vaguely or even interchangeably. Important though the notion of stereotype is in everyday language, it is obviously not so basic to meaning as the idea of sense, which we have defined as an indispensable hard core of meaning. In this book we will deal no further with the notions of prototype and stereotype, but we will give a lot of attention to sense.

Summary

The sense of an expression can be thought of as the sum of its sense properties and sense relations. Sense properties of sentences include those of being analytic, synthetic, and a contradiction.

With the exception of a few predicates such as bachelor, father, square, sphere, etc. it is not possible to give complete definitions of the sense of most predicates by sets of necessary and sufficient conditions. Stereotypes defined in terms of typical characteristics account for the fact that people usually agree on the meanings of the words they use.

Unit 9 Study Guide and Exercises

Directions

After you have read Unit 9 you should be able to tackle the following questions to test your understanding of the main ideas raised in the unit.

1 You should understand these terms and concepts from this unit:
   - sense
   - synthetic sentences
   - analytic sentences
   - contradiction
   - set of sufficient conditions
   - necessary condition
   - sense properties of sentences
   - stereotype (feature)

2 Assume that John is the same person in each of the following sentences.
   Now, if the sentence John is a bachelor is true, then is it true or false that:
   a. John is male
   b. John is unmarried
   c. John is human
   d. John is adult

   We can say that the sentence John is a bachelor entails (a–d) if the truth of (a–d) necessarily follows from the proposition contained in the sentence.