A SEMANTIC ANALYSIS OF UNDERSTANDING

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Summary

This paper presents a semantic/conceptual characterization of understanding based on a combination of 3 types of semantic analysis. The analyses lead to a characterization of understanding as the ability to relevantly engage in a partly controllable process of establishing integrated modally qualified meaningful connections between linguistic or nonlinguistic input information and background information, resulting In a relevant factive stative relation between an agent and some object of understanding.

1.   Introduction

One way of dividing the process of linguistic communication is to say that it is basically constituted by the two phenomena production and understanding. Both concepts are central to the study of linguistic communication and both concepts are in different ways problematic. In this paper I want to try to make a contribution to the study of understanding by discussing some ways in which linguistically based semantic analysis can be used to characterize the concept of understanding.

I have made use of a three pronged approach consisting of:

(i)   a semantic analysis of the derivational forms and some of the constructional possibilities of the Swedish lexeme *förstå* (understand),

(ii)   a consideration of the variation in meaning exhibited by the lexeme *förstå* in a concordance of 1,500 occurrences of *förstå*, and

(iii)   an analysis based on intuitions about how various semantic dimensions that seem to be involved in understanding interact.

A more complete treatment can be found in Allwood 1986. In Allwood-Abelar 1984 and Allwood 1987 issues relating to the attribution of understanding and nonunderstanding in spoken interaction are also discussed.

2. A semantic analysis of understanding

One way of trying to find an answer to the question of what understanding is, is to look at how understanding is designated by the vocabulary of a natural language This approach will not necessarily, in the end, lead to the best and most correct analysis of understanding, but it has the virtue. if done correctly, of at least paying attention to those features of understanding which, over time, have been important enough to be habitually and conventionally reflected in the use of a certain fragment of the vocabulary of a natural language.

Since space is limited the particular approach to semantic analysis taken here will be demonstrated firstly, by a paradigmatic analysis of the Swedish lexeme *förstå* (understand) and secondly, by a more syntagmatically based semantic analysis of the lexeme in context.

With some minor exceptions, the results arrived at also hold for the English verb *understand*.

2.1 Paradigmatic analysis of the lexeme förstå

In table 1 below an overview of the paradigmatic analysis of the lexeme *förstå* is given.

Table 1 The lexeme *förstå* (understand)

Gramm. class.	Sem. class.*	Swedish	English
V, inf, Imp	1	förstå	understand
Adj	8	förstådd	understood
	8	förståelig	understandable
	4	förstående	understanding
Noun	5	förståelse	understanding
	5	förstånd	understanding
	9	förståelighet	understandability
Adj	4	förståelsefull	understanding
	4	förståndig	sensible
Noun	5	förståndighet	sensibleness
• progr**	1		understanding
• refl	1	förstå sig på	? understand about
• inch.	1	bli/vara förstådd	be understood
• caus.	1	göra sig förstådd	make oneself
agent #			understood
experiencer			
Verb S	7	förstå att/om/huruvida	understand that/if/whether
	7	förstå hur/vad/vem/varför var/när/vilken(a)	understand WH
Verb NP	7	förstå NP	understand NP
Verb Adv	6	förstå Adv	understand Adv
Verb PP	6	förstå PP	understand PP
Verb Verb	2-1	V förstå	V understand
Adj N	6	Adj förståelse/förstånd	Adj understanding
Verb N	2-5	V förståelse/ förstånd	Vunderstanding
Verb N Prep	1	V förståelse Prep.	V understanding Prep.
N PP	7	Förståelse/förstånd PP	understanding PP

*)   The numbers refer to the semantic classification in diagram 1.
**)   Swedish has a present participle *förstående*, but imperfective, progressive aspect is not normally, unlike in English, expressed by this form.

Table 1 can be transformed into the following somewhat complicated diagram (diagram 1) which attempts to bring out the semantic relationships which are expressed implicitly or explicitly by the derivational forms and some of the coocurrence possibilities of the verb *förstå* (understand).

Diagram 1 Some of the semantic relations expressed implicitly or explicitly by the derivational forms and cooccurrence possibilities of the verb *förstå* (understand)
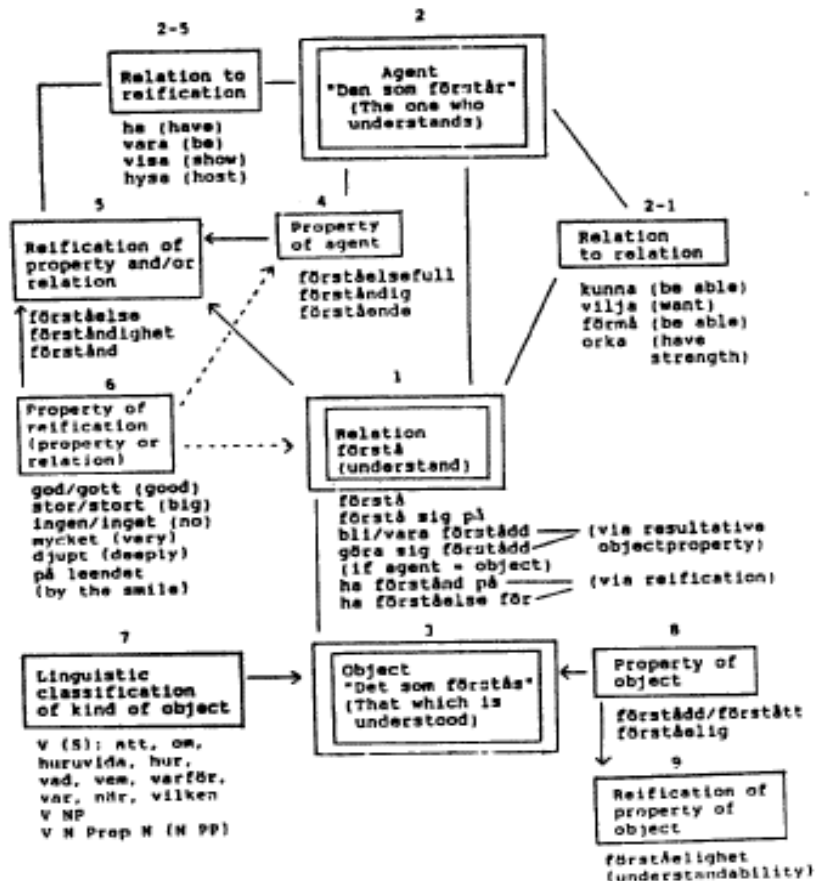
The diagram attempts to show that the concept of understanding basically can be analyzed as a relation between an agent and an object. The inflectional, derivational and syntactic constructions then indicate additional possibilities of semantic structure connected with these 3 basic components. The following example is an attempt to in one sentence combine as many of the possibilities given in diagram 1 as possible.

1. Den förståndige har ett gott förstånd och kan väl förstå (kan hysa god förståelse för) något förståeligt.

    The sensible (understanding) has good sense (a good understanding) and can well understand (can have good understanding of) something understandable.

To be a little more specific the paradigmatic analysis of the lexeme *förstå* seems to show (i) that understanding is a relation between an agent and an object, (ii) that agents by being in

this relation acquire a property of being "understanding or sensible" (Swedish *förståndig* a *sensible)* and that this property, in turn, can be first reified and secondly modified by a property to which the agent can have a relation *X shows, exhibits deep understanding,* (iii) that agents can have a relation or for example ability, need or want to the relation of understanding *X wants to understand*, and that this relation can be viewed actively or passively (*X understands Y* vs *Y is understood by X)*, (iv) that the objects of understanding can be linguistically subclassified and that the objects as a result of being related by understanding to an agent can acquire the property of "being understandable" which, in turn, can be reified into "understandability". The diagram is somewhat simplified in order to enhance perspicuity. For example, *förståndighet* (sensibleness) has been placed together with *förstånd* (sense) although *förståndighet* is a reification of a property derived from *förstånd*.

Below we will now look more closely at the 3 basic components of our analysis of understanding the understanding agent, the relation of understanding and the object of understanding. In doing so, we will to a greater extent than above take syntagmatic context into account, building on a concordance of 1,500 occurrences of the lexeme *förstå* (Språkdata, Bonniers romaner 76/77).

3. The object of understanding

3.1 Linguistic and nonlinguistic objects

Objects of understanding can be both linguistic (a word, a sentence, a story) and nonlinguistic (a situation, (eg a political situation) a process (eg shipbuilding), a relation (eg the identity relation) or an entity (eg the motorcar)).

The structures of the objects can thus be fairly simple like a single word or more complex, e.g an utterance.

3.2 Foci of understanding

In oral linguistic communication certain objects of understanding or perhaps rather foci of understanding are of particular interest:

(i)   The meaning conventions pertaining to linguistic/communicative behavior (words, utterances, gestures)

(ii)   The speaker (him/her and his/her actions, feelings, views, motives, purposes)

(iii)   Topic oriented (background) information (what he/she was talking about)

Normally, the process of understanding requires integration of these three foci in a more holistic act of understanding. But depending on circumstances understanding can also be

directed more particularistically at one focus. Foci may even be in conflict. Compare the following examples:

2. I understood his words but not his gestures
3. I understood what he said but not what he felt
4. I could not understand his words but I understood what he meant
5. I partly understood what he said but could not really understand what he was talking about.

3.3 Understanding, empathy and acceptance

One of the 3 foci of understanding mentioned above is the speaker rather than what is spoken or what is spoken about. Related to this focus are the notions of empathy and acceptance. Consider the following examples:

6. Betty shows empathy for Bill
7. Betty understands Bill's feelings
8. Betty shows understanding of Bill
9. Betty is understanding to Bill
10. He begs for understanding
11. We gave him understanding but no acceptance/?empathy
12. We gave him empathy but no ?understanding/?acceptance
13. We gave him acceptance but no understanding/?empathy

Example 6 is almost synonymous with 7, 8 and 9. Understanding of a person or some aspect of a person is, thus, very close to what we mean by empathy. Examples 8, 9 and 10 also show that understanding in some contexts can be very close to acceptance. Examples 11, 12 and 13, on the other hand, show that there is no necessary connection between understanding and acceptance. One can understand a person without accepting him/her and vice versa. The examples also show that empathy can not in a similar way be dissociated from either understanding or acceptance. Empathy seems to imply some degree of both understanding and acceptance.

4. The relation of understanding

4.1 Factivity

Consider examples 14-17:

14. ? Bill knew who said it but he was wrong
15. ? Bill understood who said it but he was wrong
16. ? Bill knew him to be rich but he was not
17. Bill understood him to be rich but he was not

The factive nature of certain "relational propositional attitude -predicates" like *know*, realize, *be surprised* has been discussed by several authors. See eg Kiparsky & Kiparsky (1971). What is meant by factivity is that the phenomenon towards which the attitude is directed is presupposed to be a fact. Thus example 14 is strange because the *but*-clause contradicts the factive presupposition generated by *know*. Something similar seems to be the case in example 15. So *understand* like *know* seems to be factive. Examples 16 and 17, however, show that the factivity of *understand* is somewhat weaker that of *know*. For more fine grained observations on differences in factivity cf Karttunen 1971 and Karttunen 1973. Compare also Karttunen and Peters 1977 for a better view of how context and language interact in the production of factivity.

Summarizing evidence such as that already mentioned, the main impression in that both *know* and *understand* are factive, but that there seems to be more linguistic support for a non-factive subjective notion of understanding than there seems to be for a non-factive subjective notion of knowledge. So, if for certain purposes a non-factive subjective notion of understanding is thought to be the most relevant, there is some small linguistic support for such an approach.

4.2 Process - product

Is the relation of understanding a process, or a state which is the end product of a process? Most linguistic evidence is in favor of a product interpretation. But there is also some evidence in favor of a process view. Again, we will compare *understand* with *know* which, perhaps, because of its more clearly factive nature is also more clearly statively product oriented.

18. ? I'm sorry I'm not knowing
19. I'm sorry I'm not understanding
20. ? Bill's knowledge of arithmetic is quick
21. Bill's understanding of arithmetic is quick

The examples show that *understand* can more easily than *know* be constructed with progressive aspect and with a temporally related manner adverbial - two linguistic criteria which both point towards a possible classification of understanding as a process.

However, even though it is possible to construe understanding as a process linguistically, I think it is correct to say that there is a preference for construing it in a stative manner as a product. Compare sentences 22 and 23.

22. I'm not understanding what you mean
23. 1 don't understand what you mean

4.3   Ability and controllability

Connected with the dynamic-static issue, discussed above, is the question of ability and controllability. States are normally more difficult to construe as controllable abilities than

processes are. Again, *know* and *understand* show a difference on this respect. Consider examples 24-27.

24. ? Are you able to know
25. Are you able to understand
26. ? Please, (try to) know that I mean well
27. Please, (try to) understand that I mean well

These examples seem to indicate that understanding is, at least, to some extent, a matter of ability and controllability. And, if we add this to the analysis of understanding arrived at, so far, this means that understanding is the ability to engage in a partly controllable integrative process resulting in a factive, stative relation to an object of understanding.

4.4 Degrees of understanding

Another set of examples Indicate that understanding is a matter of degree and evaluation.

28. Bill's understanding of the problem
    has deepened
           increased
           become better
           become more integrated

This view of understanding (as a matter of degree and evaluation) is, I think, compatible with the analysis given above. The analysis has, so far, presented understanding as a relation between an agent and an object of understanding. If we focus on the understanding agent the relation could also be viewed as a relation between certain input information (the object) - i(i) and information the agent already has stored - background information - i(b). The understanding relation itself, I want to suggest, consists in a *set of modally qualified meaningful relations between i(i) and i(b).* By a meaningful relation is here meant a relation that stands for a set of semantic relations including the following (similarity based: set inclusion, synonymy, entailment; contiguity based: part-whole and causality); and by modal qualification I mean that it is qualified by a set of modal operators including the following ones (actual, factual, possible, impossible, necessary etc).

Part of the motivation for claiming that the semantic relations, involved in understanding are modally qualified is a wish to analyze examples of the following sort:

29. Bill understands chess but he does not understand the word *chess.*
30. ? Bill understands the word *chess* but he does not at all understand what chess is
31. Even though Bill can understand the sentence *a square can be round*, he cannot really understand that a square can be round

The three sentences seem to show that there is no necessary 1-1 correspondence between an understanding of linguistic expressions and an understanding of the phenomena they denote. (29) also seems to show that one can understand a phenomenon without

understanding its linguistic designation. The strangeness of (30), however, seems to show that the opposite is not possible. We can not understand linguistically without also, to some degree, at least, understanding the phenomena that linguistic expressions refer to. There is also another interpretation of (30) in which *not at all* in interpreted as *really.* eg as in a master's comment about a novice. In this interpretation we are dealing with degrees of understanding rather than with absolute absence or presence of information about the referent.

Understanding linguistic expressions is, just like understanding in general, a successive meaningful integration of activated information with further stored (background) information. How far this process of integration should go is dependent on relevance considerations triggered by the activity one is engaged in and the situation one is in. (This also applies to our evaluation of understanding, see below.) In some cases, like sentence (31), the understanding process perhaps comes to a halt after information and integration of information linked to lexemes and grammatical construction types has been activated. In other cases, it might then continue by for example metaphorical reinterpretation of the predicates *square* or *round*. It might also conclude by modal qualification, so that (31) is understood to represent a (logical) impossibility.

In general, I therefore suggest that understanding is to be viewed as a process where linguistically triggered and/or non linguistically triggered input information is relevantly and modally (i.e. classified as to actual and factual status), integrated with already stored information.

4.5   Evaluation of understanding

Evaluation of understanding becomes possible by relating understanding seen either as a process of meaningful integration or as the product (endstate) of such a process to different sources of evaluation. Below, I will now exemplify some of the sources of evaluation.

(i)   *Subjective likes and dislikes*

32. Mein kampf shows good understanding of propaganda but I dislike the book

Subjective feelings and attitudes are undoubtedly a source of evaluation, so that using the expression *good understanding* in many cases can probably be correctly rendered as *understanding such that I like it*. What (32) shows is that although evaluations can be linked with subjective likes and dislikes, they must not necessarily be so linked.

(ii)   *Correctness*

Another source of evaluation is not the evaluating subject directly but rather different traits of that which is being evaluated, i.e. the process and products of understanding itself.

A.   *Correspondence (factivity)*

33. * Bill understood that it was cold but it was not

(33)seems to indicate that good understanding should imply factivity or truth.

B. Coherence (factivity)

34. * Bill understood that a blue car is not blue

In a similar fashion (34) seems also to indicate that good understanding should imply factivity by not involving incoherence. Presupposing that reality is not contradictory, coherence is, in fact, a necessary condition for correspondence.

C. Standard

35.   ? Bill understood that *car* means "house" but it doesn't

(35)   indicates that understanding should be in accordance with existing linguistic conventions. Good understanding should be correct understanding. Even though this case is a special case of correspondence (good understanding can only occur when it is true that the linguistic expressions actually mean what they are understood to mean). I have distinguished it since the analysis of the understanding of linguistic expressions is of special Interest.

D. Consensus

On the consensus criterion good understanding of a phenomenon is to agree with everyone else about the nature of the phenomenon.

36. Bill understood the political situation but nobody agreed with him

It has sometimes been suggested that consensus could replace correspondence as a source of truth and factivity. Sentence (36), however, shows that it is not difficult to retain the condition of factivity on the understood object without having simultaneous consensus about the nature of the object. Sentence (36), notwithstanding, it seems clear that consensus or just subjective attitudes remain an important source for evaluating understanding.

E. Completeness

Another classical source for the evaluation of understanding is completeness. Good understanding is full understanding. Compare sentence (37).

37. Bill understands cars but understands nothing about their motors

Can one have good understanding of something one only partially understands? The difficulty here is that we cannot very easily say how many meaningfull connections we must establish in order to have full understanding and since everything in some sense is connected with everything thing else, this means that full understanding is probably impossible to reach.

A way out of this problem is made possible by the notion of relevance (see below). We give up "full understanding" in a more absolute sense and instead employ a notion of "relevantly complete understanding".

F.   Integration

Integration is another feature by which understanding can be evaluated. Compare sentence (38).

38. Bill understands cars since he understands all the details of a car

If (38) seems a little strange this might be because we feel that a grasp of disparate details is not sufficient for understanding. Understanding also requires integration, whereby the structure of a phenomenon somehow becomes perspicuous and irrelevant complications are removed. Just as coherence is a necessary condition for correspondence, integration is a necessary condition for completeness, if we presuppose that reality does not just consist in a collection of unrelated atomic facts.

G.   Relevance

An individual is mostly engaged in understanding in order to do something else. Mostly, understanding is, thus, a means for another activity. Even when we are pursuing understanding for its own sake, it is usually limited to a small subject area which sets limits on what it is relevant to include.

This means that completeness and to varying extents also correspondence, coherence, correctness, consensus and integration do not usually serve as absolute criteria. Both the understanding agent him/herself and external evaluators of that agent's understanding employ a relevance filter on their application of the criteria, so that we get not absolute completeness but rather relevant completeness etc.

39. Bill understands cars since he can get them repaired
40. Bill understands cars well enough to get them repaired
41. Bill only understands cars well enough to get them repaired.

As sentence 39-41 show such relevance criteria can shift as a source of evaluation. In (39) getting cars repaired is depicted as a criterion of understanding, in (40) as a sufficient but supplementable criterion and In (41) as a possibly insufficient criterion. And this kind of variation is precisely what we should expect if the goals to which understanding is related are allowed to be variable.

5.   Results of the analysis

Above I have used a combination of three approaches to semantic analysis:

(i)   an analysis of derivational forms and constructional possibilities of the Swedish lexeme *förstå* (which is very similar to the English lexeme *understand*)

(ii)   a consideration of the variation in meaning exhibited by the lexeme *förstå* in a concordance of 1,500 occurrences of the lexeme. No examples from this concordance

have been used because of space limitations. (English translations and frequent need for context would have been too space consuming for the 15 pages allowed.)

(iii)   an analysis based on intuitions about how various semantic dimensions that seem to be involved in understanding interact

This combination of approaches has been used to give an analysis of understanding which can perhaps be summarized In the following way:

'Understanding" - the ability to relevantly engage in a partly controllable process of establishing integrated modally qualified meaningful connections between input information i(i) and background information i(b), resulting in a relevant, factive, stative relation between an agent and some object (of understanding).

This analysis, which treats understanding as an ability, is intended to be wide enough to enable a derivation of understanding as a process or as a stative, factive relation. A characterization of understanding as a process or an a dynamic relation can be obtained from the characterization of understanding as an ability as follows: "Understanding" - a partly controllable process of establishing relevant integrated ... (see above). And, a characterization of "understand" (understanding) as a stative, factive relation can be obtained as follows: "understand" = a factive, stative relation between an agent and some object of understanding (i(i)), such that i(i) is integrated with the agent's background information i(b) by a set of relevant, modally qualified meaningful connections.

The analysis is, thus, normatively objectively oriented in that it requires that a factive, stative relation actually is established. One could also provide a more subjective analysis by removing the requirement of actual factivity and replacing it by the requirement that an agent or an evaluator believes that a relevant resulting factive relation obtains.

References

Allwood, J. 1984: "On Relevance In Spoken Interaction'. In G. Kjellmer & S. Bäckman (eds) *Papers on language and Literature*, Gothenburg Studies in English 60, University of Göteborg, Dept of English.

Allwood, J. 1986: "Some Perspectives on Understanding in Spoken Interaction" in Furberg M., Wetterström T. and Åberg C. (eds) *Logic and Abstraction*, Acta Philosophica Gothoburgensia 1, University of Göteborg, Sweden.

Allwood, J. 1987: *Some Linguistic Perspectives in Understanding* (forthcoming In GPTL, Gothenburg Papers in Theoretical Linguistics).

Allwood, J. & Abelar, Y. 1994: "Lack of Understanding, Misunderstanding and Language Aquisition, In Extra G. and Mittner M (eds) *Studies in Second Language Acquisition by Adult Immigrants*, Tilburg, Tilburg Studies in Language and Literature 6.

Bonniers Romaner 76/77. Concordance of Swedish Novels, Institutionen för språkvetenskaplig databehandling, University of Gothenburg, Sweden.

Karttunen, L. 1971: "Some observations on factivity" *In Papers in Linguistics* 4, pp 55-69.

Karttunen, L.1973: "Presuppositions of Compound Sentences" in *Linquistic Inquiry* 4, pp 169-93.

Karttunen, L. & Peters, 5. 1977: "Requiem for presupposition" *in Proceeding of the Third Annual Meeting of the Berkelely Linguisitic Society*, pp 360-71.

Kiparsky, P. and Kiparsky, C. 1971: "Fact" in Steinberg, D. and Jacobovits, L. (eds) *Semantics*: An Interdisciplinary Reader in *Philosophy, Linguistics and Psychology*, Cambridge, Cambridge University Press, pp 345-65.

Sperber, D.and Wilson, D. 1986: *Relevance*, Basil Blackwell.

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