Gnosis

Marcus Kracht
Department of Linguistics, UCLA

1 Motivation

Semantic theories generally consider meanings as static objects. Construction and evaluation are seen as distinct processes, and the construction of a representation can be performed without evaluating it. This applies also to dynamic semantics, whose dynamic character rests only in the way the formulae are evaluated, not how they are being built. Yet it seems that it is not the representation that is the ultimate goal but something else. We want to *understand* what is being said. But to understand a sentence is more than simply to evaluate it; it is, if you will, to gain insight into what it says about the world as it is. The fact that it is true or false is part of that. It seems furthermore that the process of understanding itself is a complex affair, not only because it is to date rather poorly understood; but also because not everything that is said can be straightforwardly understood. The underlying message of this paper is that this fact has far reaching consequences. Consequently, to be able to build a representation does not mean that one can *understand.* Such a representation is a lifeless being. Understanding is a psychological process that yields more that just a representation; bypassing the process is dangerous. Content is not easily read off a representation.

The present paper, though using psychological jargon, is not meant to provide a testable psychological theory of understanding. Rather, it wants to show a way how it is that we can understand a sentence without sacrificing logical content. I do offer facts from linguistics to support my claims. I will argue here that (1) there are process directed meanings, which cannot be understood in representational terms, and (2) we can provide an analysis of notions that have so far defied logical analysis, the most prominent among them being topic and focus.

2 Building meanings

Consider the standard picture of what happens when we hear a sentence. At the first stage there is just a sequence of words, nothing more. At the second stage, we trade the words for what they mean. And we start to assemble the meanings into a complex representation. Unfortunately, this picture suffers from several defects: the first defect is that it presupposes that we can always complete the process. This might not be so: we may simply be unable to understand the meaning of each word. (This situation is not as uncommon as one might think. Even of the language we speak we master only a fraction of the words.) We are however not unable to get *some* meaning out of a sentence, filling the gap when we finally know what to put for an unknown word. Secondly: as language is able to express the most complex ideas, it is not reasonable to assume that the representation is everything. For example, one may know what a *solvable group* is. Yet even then one may not know how use it fruitfully. Those that know it well, understand the meaning of "G is a solvable group" to a degree that others do not, even if they know what the definition of the concept is.

The last point may be dismissed as a simple problem of being familiar with the meaning. I think however that this is not the case. To prove my point, I shall turn to boolean logic. What is striking in boolean logic is that even if we are very well acquainted with it, we seem to stumble over part of the same problems as a beginner. For example,

(1) $$(p \wedge (p \to q)) \to q$$

makes almost immediate sense, but Peirce's formula does not:

(2) $$((p \to q) \to p) \to p$$

The reason for this difficulty is that the concept associated with $\to$ is phrased in such a way as to make it impossible to stack implications to the left.

This carries over to natural language. I assume that the English connective *if ... then* is translated into $\to$, which I call its *mental correlate.* Mental correlates need not be unique. It is unimportant for our purposes whether the correlate is literally the same object or not. But it seems reasonable to assume that at least for me the correlate is the same as for German *wenn ... dann,* so that it is a good idea to keep the correlates notationally independent. A sentence *If A then B* uttered assertively is translated into $\vdash A \to B$.[1] This means: the speaker judges the *object* $A \to B$ true. I said 'object' here because it is just a piece of notation. It is perfectly fine for you (or me) as a hearer to stop here. You have heard speaker say *if A then B*, and you take him to have meant $A \to B$. End of story. Suppose you do want to go further and try to see what *that* means. So you trade it for another mental correlate. In the case of the arrow however, there is none. It is different from a simple word like *cat* which has a certain concept associated with it. An implication by contrast has to be *enacted.* This means: you need to go through a series of steps. Here the steps are: (1) assume A; (2) see whether B holds. This is exactly like the Ramsey theory of conditionals. It is important though to realise that this way of assessing an implication (as opposed to using truth tables) is just one way. I do think though that natural language *if ... then* is typically vague, and that the Ramsey test is the lowest common denominator.

The interesting problem with it is that enacting an implication carries the danger of lack of intersubjectivity: it is you who enacts it, but you may not be likely to accept that A implies B. So you will at this point either reject what speaker said, or accept it at face value, that is, you make a leap of faith from A to B. The latter can in the long run establish a disposition to accept that B follows from A (Pavlov's dog).

3 Getting involved

What lies behind all this? Behind all this lies the idea that *thinking* is a series of **noetic acts.** Understanding is a part of it, which I call **gnosis.** One noetic act that takes part in gnosis is to take a sentence and judge whether it is true, or whether one believes it, or rejects and so on. We say in this case that a person P **apprehends** a proposition φ. Apprehending φ is to put it in front of one's mind, so to speak; apprehension is followed by **judgement.** The act of judging a sentence requires the immediacy of appehension. Only while I apprehend a proposition can I reach a conclusion whether it is true or not. But if I don't understand what it says, how can I make such a judgement? Two possibilities exist: the first is that I have a *disposition* to immediately consent to it. Let me call that an **immediate disposition.** This disposition may be acquired in various ways (learning, for example); alternatively, I may build it up from other dispositions that I have. Call that a **derived disposition.** If, for example, I believe that cats eat mice, and I see a particular cat, then I may consent to the sentence *This cat eats mice,* even though I have no immediate disposition to consent to it. I have however a derived disposition to consent to it. The question that I am raising is: how can such a derived disposition take its effect?

Let us return to implication. Rather than having a disposition to consent to some proposition we typically have only a **conditional disposition** to consent to it. This means that we shall

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[1] This is not sloppiness: I do hold that you may put here A and B instead of a translation thereof.

not judge A true all the time, but only if certain other propositions, say B and C, are given.[2] We write this as:

(3)
$$B; C \vdash_P A$$

The symbol $\vdash_P$ is best interpreted here as "P judges true" or "P accepts". The symbol $\vdash_P$ is metalinguistic: P does not carry this statement in his head. The dependency on P is often not denoted (neither do languages require such marking), a point to which we shall return. Even the belief system of Pavlov's dog can be described using the conditional judgement sign $\vdash$. What is unique to humans is that they have a symbolic correlate of this disposition, which comes out as $\rightarrow$. Thus, (3) gives rise to

(4)
$$\vdash_P B \wedge C \rightarrow A$$

Likewise, it gives rise to

(5)
$$\vdash_P B \rightarrow (C \rightarrow A)$$

The latter two express the fact that P judges some proposition unconditionally true. Again, beware that $\vdash_P$ is metalinguistic; it is best rendered as "P has a derived disposition to judge true". Notice also that $\rightarrow$ does *not* contain any relativisation to a subject. This is just an accident. For example, the attitude report *P knows that B* is a linguistic correlate of the statement $\Box\!\!\rightarrow_P B$, which in turn reports a judgement of P (namely that he knows that B). Again, as we may ascribe to a dog D that it knows B (via $\Box\!\!\rightarrow_D B$) we may not ascribe to D any attitude towards *D knows that B*, since the latter requires that the dog has a symbolic representation of that fact.[3]

Immediate dispositions can be anything you like; there is no logic behind them, since they correspond to concepts acquired through time. (They are like the axiomatic basis of a theory.) I do consent to the sentence "Every group of odd order is solvable.", since I know it has been proved. But I do not know how such a proof might go (the original proof is more than 400 pages long!) though I understand each word in that sentence. For derived dispositions, however, there is a logic. For the arrow, the heart is the deduction theorem (DT). It asserts that

(6)
$$\chi; \Delta \vdash \varphi \Leftrightarrow \Delta \vdash \chi \rightarrow \varphi$$

Here, Δ is a set of formulae, φ a single formula. We may even prove it; recall that $\Delta \vdash \varphi$ means that for every deductively closed set T, if $\Delta \subseteq T$ then $\varphi \in T$. From this and closure under modus ponens (if $\delta, \delta \rightarrow \zeta \in T$ then $\zeta \in T$) we can deduce DT.

Translated into the calculus of dispositions this gives:

(7)
$$B; \Delta \vdash A \Leftrightarrow \Delta \vdash B \rightarrow A$$

This rule allows to deduce (5) from (3). There are analogous rules for conjunction, so we can likewise deduce (4).

But we need to be careful here. Just as proofs need to be carefully constructed, so meanings must be built in a judicious way. Since we are talking about derived dispositions, there is

[2] I shall be somewhat vague as to what "given" means. One approximation is: B is given if it has been judged true. This needs elaboration.

[3] I gloss over the problem of personal reference. Obviously, the author of the judgement must somehow be explicitly denoted, causing problems not of correctly ascribing a belief to a given person, but rather of ascribing a given belief to the correct person.

no easy way to see that if P complies with, say, (3) he also complies with (5). For the latter, some work is needed. That is to say, even if (3) expresses an immediate disposition of P's, (4) or (5) need not, and conversely. It is only immediate dispositions that elicit a spontaneous response out of context. All other judgements have to be more or less 'framed'. This is because it may well be that P is unable to see the connection himself. Even though he has all means in his hands, he still cannot work his way to it. In this circumstance, P may either close the matter, or work harder at it. A third possibility is that someone help P in it. (Proofs in mathematics are a case in point. We are reminded of Socrates' position that all learning is rediscovery...)

There are two ways to establish the connection between (3) and (5). The external method (to be used to describe Ps dispositional behaviour) is to use DT twice:

(8)
$$\begin{array}{l} B; C \vdash_P A \\ B \vdash_P C \to A \\ \vdash_P B \to (C \to A) \end{array}$$

The internal method is the one used by P himself. It works with the help of **supposition.** Write $: \varphi$ for the fact that φ is merely supposed. Write φ for the fact that φ is true. Order matters. If $: \varphi$ occurs before χ, it means that χ is stated in the context of φ.

(9)
$$\begin{array}{c} . \\ : B. \\ : B, : C. \\ : B, : C, A. \\ : B, C \to A. \\ B \to (C \to A). \end{array}$$

The first three lines are explained as follows. It is legitimate to start with ., the empty sequence. At any time you may suppose something. P supposes first B and then C. At this point he can use his immediate disposition (as coded in (3)) and he will consent to A. The next two steps simply perform DT backwards: they also introduce some piece of notation ("→"). At the end, a single uncoditional formula is derived.

4 Force

So far the entire discussion was centered around the question of understanding a sentence. This might be deemed a luxury for the linguist. We might simply say that if a sentence is uttered it comes endowed with, say, assertive force, and so we shall simply take it as "speaker judges that sentence to be true" and take it from there. Yet it turns out that force does not apply equally to every part of a sentence. Moreover, the same truth conditional content can be articulated differently and these differences are reflected in subtle differences in the way gnosis works. And as meanings are more than truth conditions, namely *actions,* it is to be expected that sentences transport action sequences rather than just meanings.

We begin with *A implies B.* This is a statement to the effect that $A \to B$. In this case the hearer cannot immediately respond with acceptance unless he has an immediate disposition to accept $\vdash A \to B$; otherwise he will first have to enact the meaning of →. This is done by going through the step of supposing A and then doing the same as above.

Look by contrast to the sequence

(10) *Suppose A. Then B.*

This is different from $A \to B$. Not truth conditionally; but it elicits a different sequence of acts in the hearer. The first half is a *request*. It asks the hearer to enter into the state

(11) $$: A$$

Next follows the proclamation that in this state B follows. If the hearer has the immediate disposition $A \vdash B$ then he will consent to the truth of B. He has understood.

A third way to express the same is by

(12) *If A then B.*

This is not to be confused with either of the above. It actually *expresses* a conditional judgement. It is a claim of B, *given that A*. That there is a difference is seen with probabilities. The conditional probability $P(B|A)$ is different from $P(A \to B)$. If the two are independent, then $P(B|A) = 1/2$, while $P(A \to B) = 3/4$. Analogously, a conditional obligation of B given that A is not an obligation to bring $A \to B$ about. It is an obligation to bring about B when A is the case.

5 Theme and rheme

An immediate application of the previous ideas is in topic and focus (I prefer the words *theme* and *rheme*). It is known that the theme—rheme articulation is not truth functional. Yet it does show interaction with propositional operators, even negation. The explanation that I am going to give is that rheme is the only part to which the force attaches. It establishes the context of some sort for the rheme. The idea is that mental acts have a correlate in language, which I call **phatic acts.** Like noetic acts, phatic acts cannot be subordinated. An utterance enacts not a single act, but a sequence thereof. A **normal sequence** of acts consists in several suppositions followed by a **principal phatic act,** which can be of different type, such as stating, asking, doubting, and so on. Each of the suppositions is expressed by a **theme.** The principal phatic act consists of two parts: the phatic type, denoted by the **pheme,** and the phatic content, the **rheme** (see Zemb 1978).

(13) $$\begin{array}{cccccc} :\delta_1 & :\delta_2 & \cdots & :\delta_n & \succ & \varphi \\ \text{Theme}_1 & \text{Theme}_2 & & \text{Theme}_n & \text{Pheme} & \text{Rheme} \end{array}$$

Notice that the themes and the rhemes are propositions. This presents a phatic sequence that describe by a conditional judgement of the form:

(14) $$\delta_1 \quad \delta_2 \cdots \delta_n \quad \succ \varphi$$

Notice that the colon is redundant and not written in logic. Let me give an example.

(15) *Tullius is Cicero.*

This sentence may express various phatic sequences.

① I picture the person named *Tullius*; and I picture the person named *Cicero*. I consent to the fact that they are the same.

(16) $$: \mathit{Tullius}(x) \quad : \mathit{Cicero}(y) \quad \vdash x = y$$

② I picture the person named *Tullius*. I consent to the fact that he is Cicero.

(17) $: \mathit{Tullius}(x) \quad \vdash \mathit{Cicero}(x)$

③ I picture the person named *Cicero*. I consent to the fact that he is Tullius.

(18) $: \mathit{Cicero}(x) \quad \vdash \mathit{Tullius}(x)$

④ I consent to the fact that Cicero is the same as Tullius.

(19) $\vdash \mathit{Tullius}(x) \leftrightarrow \mathit{Cicero}(x)$

Not all of these phatic sequences are equally likely to be rendered by (15). There are alternatives to the sentence (small caps represent emphasis):

(20) TULLIUS *is Cicero.*

(21) *Tullius* IS *Cicero.*

(22) *Cicero is Tullius.*

It seems to me that (20) fits best with ③, that (21) fits best with ①, (22) with ③. For ④ the neutral intonation on (15) seems to be most appropriate.

This idea has several consequences. For example, if someone else is going to describe my belief state, he may have to choose among these options. For notice that in belief contexts the equivalence between these renderings breaks down. Thus, while the truth conditions of (15)–(22) may be the same, the corresponding embeddings in propositional attitudes are not.

(23) *Marcus believes that Tullius is Cicero.*

(24) *Marcus believes that* TULLIUS *is Cicero.*

(25) *Marcus believes that Tullius* IS *Cicero.*

(26) *Marcus believes that Cicero is Tullius.*

In order to see this we need to explore what these sentences actually correspond to. Return to the sequence of noetic acts above. Suppose what counts as the content of my belief really is only the apprehended fact, not its suppositions. The suppositions are just ways to enter the objects into the scene. In that case the belief reports will have the following representation.

(27) $: \mathit{Tullius}(x) \quad : \mathit{Cicero}(y) \quad \vdash B_M(x = y)$

(28) $: \mathit{Tullius}(x) \quad \vdash B_M\mathit{Cicero}(x)$

(29) $: \mathit{Cicero}(x) \quad \vdash B_M\mathit{Tullius}(x)$

(30) $\vdash B_M(\mathit{Cicero}(x) \leftrightarrow \mathit{Tullius}(x))$

The first is now the de re identity belief: of the people that are called Tullius and Cicero, I regard them as the same (though you may not). The second and the third are de re attributions, and the fourth is completely de dicto. Notice that we could imagine a host of other representations, like this one:

(31) $: B_M\mathit{Cicero}(x) \quad : B_M\mathit{Cicero}(y) \quad \vdash B_M(x = y)$

This says (if representing something you say to a third person): think of the object that Marcus calls Cicero, and think of the object that he calls Tullius. I claim that these two Marcus believes to be the same. There are explicit ways of saying this:

(32) *Marcus believes that the person he calls Tullius is the same person he calls Cicero.*

Additionally, you might believe of the two people that I call *Tullius* and *Cicero*, respectively, that they are the same. But none of that is what a simple belief report says. The underlying principle is that a simple belief report reports a belief state. It does not report any mental acts. The mental acts that are packaged into the sentence are therefore yours, not mine.

If this is true, then also negative belief reports act that way.

(33) $: Tullius(x) \quad : Cicero(y) \quad \vdash \neg B_M(x = y)$

(34) $: Tullius(x) \quad \vdash \neg B_M Cicero(x)$

(35) $: Cicero(x) \quad \vdash \neg B_M Tullius(x)$

(36) $\vdash \neg B_M(Cicero(x) \leftrightarrow Tullius(x))$

(37) *Marcus does not believe that Tullius is Cicero.*

(38) *Marcus does not believe that* TULLIUS *is Cicero.*

(39) *Marcus does not believe that Tullius* IS *Cicero.*

(40) *Marcus does not believe that Cicero is Tullius.*

The logical distinctions I am using here have long been noted; it has also been noted that emphasis can change the meaning and the topic focus articulation (see for example Taglicht 1984). What was missing was an account of how it is that the topic focus articulation bears on the question of de dicto ambiguities; what was missing was a theory that could explain how the sentences (15)–(22), which are truth conditionally equivalent, suddenly part company when inside a propositional attitude. Attempts have been made, for example the structured meaning approach. However, the latter is a massive overkill (see Gupta & Savion 1987). What has not often been noted is that the phenomenon is not restricted to propositional attitudes alone. Even negation is sensitive to the topic focus articulation.

(41) *It is not the case that Tullius is Cicero.*

(42) *It is not the case that* TULLIUS *is Cicero.*

(43) *It is not the case that Tullius* IS *Cicero.*

(44) *It is not the case that Cicero is Tullius.*

Consider the second sentence. It says of the individual named *Cicero* that he is not the same as Tullius. It seems to say (for many) that there is someone else who is. In the present case this is trivially given: it is Cicero. The aboutness is here cashed in as a supposition that some object has a property. The sentence is about Cicero: it starts with the assumption that x is named *Cicero* (you may also think of it as an assignment of x to Cicero, it does not matter). It then forms the claim that x is not called *Tullius*. In the same vein the third sentence is about both Tullius and Cicero and it says that they are different.

6 Pheme, evidentiality and speech act

There is an oscillation between reading $\vdash$ as "is true", "P judges true", "P believes" and other judgements. It follows that the true nature of the pheme very often has to be found out (if it is not signalled). Also, as we discussed earlier, the transition from speaker to hearer is often accompanied by a tacit substitution of "speaker judgement" by "hearer judgement". The hearer will see if he can support what is said. The dependency on speaker is often not marked (but notice the category of evidentials and epentheticals such as *I think*). This has the consequence that people believe much of what other people say because they somehow think that other people speak with objective authority. Languages without explicit evidential marking make that easy.

I should stress that some grammatical expressions, for example the attitude verbs *believe* and *doubt* do not carry the phatic act; they only *report* an attitude. Similarly, the expression *is true* reports a state of affairs and is not in itself phatic. Mood comes closer to expressing a phatic act. In the end there is no one-to-one mapping between formal elements of the language and phatic acts; the problem has been discussed in pragmatics and need not be iterated here.

Notice also that phatic acts are different from traditional speech acts inasmuch as they include acts that pass under the radar of speech act theory, such as suppositions. This is because traditionally the attention has been going to the principal act. On the other hand, phatic acts studied above are a narrower class, which correspond to noetic acts. This excludes promises and requests. Obviously, a more comprehensive theory is needed.

7 Peirce's formula revisited

Let us return to Peirce's formula. If you apply DT you can reduce it to

(45) $$(p \to q) \to p \vdash p$$

No further reduction is possible. This is no accident: the internal calculus is complete for intuitionistic logic, and Peirce's formula is not valid in it. Its truth must be established by different principles. One candidate is obviously bivalence (that a proposition or its negation is true). The inability to disclose the initial part of the formula means that it remains gnostically opaque.[4] Gnostic opacity has many consequences such as lack of anaphoric binding.

8 Concluding remarks

The essence of the ideas go back to 1990. I had difficulties selling the idea to a bigger public. Part of it had to do with my inability to express my views with sufficient clarity; part of it was that topic and focus were quite unfashionable in semantics then. This is no longer the case, and my writing — I may hope — has gained some clarity. 8 Pages limit me to a mere sketch of my ideas. And a lot more needs to be done.

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[4] Notice that this applies to *If . . . then* inasmuch as $\to$ is considered its internal correlate. That need not be so. The opacity is a consequence of the fact that $\to$ is enacted in a particular way. One might envisage different enaction schemes. But I suggest that the enaction scheme is the *definition* of $\to$ and so cannot be changed.