Pragmatics and the Formalist/Anti-formalist Dialectic

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1 What is pragmatics?

Stalnaker 1970: "**Syntax** studies *sentences*, **semantics** studies *propositions*. **Pragmatics** is the study of *linguistic acts* and the *contexts* in which they are performed. There are two major types of problems to be solved within pragmatics:

- first, to define interesting types of speech acts and speech products;
- second, to characterize the features of the speech context which help determine which proposition is expressed by a given sentence.

... It is a **semantic** problem to *specify the rules for matching up sentences of a natural language with the propositions that they express.* In most cases, however, the rules will not match sentences directly with propositions, but will match sentences with propositions *relative to features of the context in which the sentence is used.* Those contextual features are part of the subject matter of **pragmatics**."

Sentence. An expression of natural language expressing a proposition.

Proposition. An idea that can be true or false.

Utterance / linguistic act. An act of expressing something with language. For example, if I say *Hi!* at 3pm on Monday, January 11th, this would be an utterance. If you say *Hi!* at 3:01pm on Monday, January 11, then we will have two utterances of *Hi!*. Utterances are different from *sentences.* If I say *Roses are red,* and then you say *Roses are red,* we have uttered the same *sentence,* but we have made different *utterances.*

(Speech) context. Can mean many things. Here are four of them identified by Korta and Perry (p. 65):

- the previous and subsequent linguistic material in a given text
- the actual basic facts about an utterance: the speaker, time, place, and possible world in which it occurs.

- the *common ground:* that is, shared beliefs that serve as common presuppositions for the interpretation of assertions.
- anything in the indefinitely large surrounding of an utterance, from the intentions of the speaker to the previous topics of conversation to the object discernible in the environment

Pragmatics is also a subfield within the study of meaning. I can't define meaning, but I do think that the meaning of something is revealed by its *implications*, the things that it implies.

Types of implications. The main types of implications are:

- **Entailments:** A entails B if and only if: Whenever A is true, B is true. Example: *All cars are blue* entails *All sportscars are blue*. [semantics]
- **Presuppositions:** A presupposes B if and only if: A takes B for granted. Example: *Robin is nice* presupposes *Robin exists.* [semantics/pragmatics]
- **Conversational implicatures:** A convesationally implicates B if and only if: A does not entail B but a speaker can infer B whenever a speaker says A based on reasoning about the speaker's intentions. Example: *Some of the students passed* implicates *Not all of the students passed*. [pragmatics]

2 The formalist/anti-formalist dialectic

Pragmatics is interesting because it encompasses debates within both philosophy and linguistics about the very nature of meaning.

As a gross and slightly misleading oversimplification, we can say that the development of the field of pragmatics has been fueled by tension between the *formalists* and the *anti-formalists*.

- Formalists try to use the tools of logic to characterize the meanings of sentences.
- Anti-formalists see these methods as hopelessly inadequate for capturing natural language in all of its complexity and glory.

2.1 The formalist view

2.1.1 Meaning in logic

A formal logic is an artificial and clearly defined language with rules of syntax (determining what the *well-formed expressions* of the logic are) and semantics (determining what the *semantic values* of these expressions are).

The semantic values – i.e. meanings – that logical expressions have are provided by a *model*. Possible semantic values include (i) Truth values (1 and 0); (ii) Individuals (such as Robin Möellemann); (iii) Sets of individuals, e.g. {Liz, Robin, Eva}; (iv) Functions from individuals to truth values; (v) Functions from truth values to truth values; etc.

Predicate calculus. Some formulas of Predicate Logic (or Predicate Calculus):

$\textsc{love}(\textsc{John}, \textsc{Mary})$ 'John loves Mary'

$\forall x[\textsc{love}(\textsc{Mary}, x) \rightarrow \textsc{happy}(x)]$ 'Everyone whom Mary loves is happy'

$\exists x[\textsc{even}(x) \wedge x > 1]$ 'There are even numbers greater than 1'

Logics like predicate calculus have a syntax and a semantics.

Syntax: specifies which expressions of the logic are well-formed.

Semantics: specifies which objects the expression correspond to.

Syntactic categories. Let us use the following:

Terms: (i) individual variables; (ii) individual constants.

Pred-1: $\textsc{run}, \textsc{walk}, \textsc{happy}, \textsc{calm}, ...\textsc{even}, \textsc{odd}, ...$

Pred-2: $\textsc{love}, \textsc{kiss}, \textsc{like}, \textsc{see}, ...$

Syntactic composition rules. How to build formulas:

- If P ∈ Pred-1 and T ∈ Term, then P(T) ∈ Form.
- If R ∈ Pred-2 and T_1, T_2 ∈ Term, then R(T_1,T_2) ∈ Form.
- If $\phi \in$ Form , then $\neg\phi \in$ Form.
- If $\phi \in$ Form and $\psi \in$ Form, then $[\phi \wedge \psi] \in$ Form.
- If $\phi \in$ Form and $\psi \in$ Form, then $[\phi \vee \psi] \in$ Form.
- If $\phi \in$ Form and $\psi \in$ Form, then $[\phi \rightarrow \psi] \in$ Form.
- If $\phi \in$ Form and $\psi \in$ Form, then $[\phi \leftrightarrow \psi] \in$ Form.

Interpretation with respect to a model. Knowing the meaning of a sentence does not require knowing whether the sentence is in fact true; it only requires being able to discriminate between situations in which the sentence is true and situations in which the sentence is false.

Expressions of predicate calculus are *interpreted* in *models*. Models consist of a domain of individuals D and an interpretation function I which assigns values to all the constants:

$$\mathbf{M} = \langle D, I \rangle$$

An interpretation function $[\![ ]\!]^M$, built up recursively on the basis of the basic interpreation function I, assigns to every expression α of the language (not just the constants) a **semantic value** $[\![\alpha]\!]^M$.

Here are two models, M_r and M_f (r for "real", and f for "fantasy"/"fiction"/"fake"):
In M_r, j is happy, but m and k are not:

$$I_r(\textsc{happy}) = [\![\textsc{happy}]\!]^{M_r} = \{j\}$$

In M_f, everybody is happy:

$$I_f(\textsc{happy}) = [\![\textsc{happy}]\!]^{M_f} = \{m, j, k\}$$

Semantic composition rules.

- If α is a constant, then $[\![\alpha]\!]^M$ = I(α).
- If $P \in$ Pred-1 and $T \in$ Term, then $[\![P(T)]\!]^M = 1$ iff $[\![T]\!]^M \in [\![P]\!]^M$.

  More general rule: If $R \in$ Pred-n and $T_1, ...T_n \in$ Term, then $[\![R(T_1, ..., T_n)]\!]^M = 1$ iff

  $$\langle [\![T_1]\!]^M, ..., [\![T_n]\!]^M \rangle \in [\![R]\!]^M$$

- $[\![\neg\phi]\!]^M = 1$ if $[\![\phi]\!]^M = 0$; otherwise $[\![\neg\phi]\!]^M = 0$.
- $[\![\phi \wedge \psi]\!]^M = 1$ if $[\![\phi]\!]^M = 1$ and $[\![\psi]\!]^M = 1$; 0 otherise.
- Similarly for $[\![\phi \vee \psi]\!]^M$, $[\![\phi \rightarrow \psi]\!]^M$, and $[\![\phi \leftrightarrow \psi]\!]^M$.

2.1.2 Natural language as formal language

Richard Montague famously began a paper with the following sentence: "I reject the contention that an important theoretical difference exists between formal and natural languages."

If we treat natural language as first-order logic, then we put natural language expressions inside the denotation brackets. We could have a model M_r such that:

- [[Liz]]^{M_r} = Elizabeth Coppock
- Elizabeth Coppock ∈ [[teacher]]^{M_r}
- Elizabeth Coppock ∉ [[smokes]]^{M_r}
- $\left[\!\left[\begin{array}{c} \text{S} \\ \text{NP} \quad \text{VP} \\ \text{Liz} \quad \text{V} \\ \quad\quad \text{smokes} \end{array}\right]\!\right]^{M_r} = 0$

With this approach, we can capture logical relations between sentences of natural language, like:

- *Liz smokes and Liz doesn't smoke* is contradictory.
- *Liz smokes* implies *Liz smokes or drinks*.
- *Liz and Eva smoke* implies *Eva smokes*.
- *Everyone in this room smokes and Liz is in this room* implies *Liz smokes*.

So the view that language is just like logic gives us a clear explanation for a lot of empirical facts about language.

2.2 Challenges to the view that language is like logic

The problem is that there are some aspects of meaning that seem beyond the grasp of logic.

For example, natural languages have presuppositions, as Frege noticed:

> If anything is asserted there is always an obvious presupposition that the simple or compound proper names use have referents. If one therefore asserts "Kepler died in misery," there is a presupposition that the name "Kepler" designates something; but it does not follow that the sense of the sentence "Kepler died in misery" contains the thought that the name "Kepler" designates something. If this were the case the negation would have to run not:
>
> Kepler did not die in misery
>
> but
>
> Kepler did not die in misery, or the name "Kepler" has no referent.
>
> That the name "Kepler" designates something is just as much a presupposition for the assertion
>
> Kepler died in misery
>
> as for the contrary assertion.

This is a deficiency of natural languages, according to Frege:

> Now languages have the fault of containing expressions which fail to designate an object (although their grammatical form seems to qualify them for that purpose) because the truth of some sentences is a prerequisite. Thus it depends on the truth of the sentence:
>
> There was someone who discovered the elliptic form of the planetary orbits
>
> whether the subordinate clause
>
> He who discovered the elliptic form of the planetary orbits

> really designates an object or only seems to do so while having in fact no referent... This arises from an incompleteness of language, from which even the symbolic language of mathematical analysis is not altogether free; even there combinations of symbols can occur which appear to refer to something having (at any rate so far) no referent, e.g., divergent infinite series.... A logically complete language (*Begriffsschrift*) should satisfy the conditions, that every expression grammatically well constructed as a proper name out of signs already introduced shall in fact designate an object, and that no new sign shall be introduced as a proper name without having a referent assured.

Grice 1957:

> It is a commonplace of philosophical logic that there are, or appear to be, divergences in meaning between, on the one hand, at least some of what I shall call the formal devices – $\neg, \wedge, \vee, \rightarrow, \forall, \exists, \iota$ (when these are given a standard two-valued interpretation) and on the other, what are taken to be their analogues or counterparts in natural language – such expressions as *not, and, or, if, all, some* (or *at least one*), *the*. Some logicians may at some time have wanted to cleaim that there are in fact no such divergences; but such claims, if made at all, have been somewhat rashly made, and those suspected of making them have been subjected to some pretty rough handling.

Grice's position (p. 24): "I wish... to maintain that the common assumption... that the divergences do in fact exist is (broadly speaking) a common mistake, and that the mistake arises from inadequate attention to the nature and importance of the conditions governing conversation."

Nor does logic have *indexicals* – expressions like *now, here, I,* and *you,* whose meaning depends on the situation in which they are used. This would seem to suggest that natural language should not be treated like a logic.

The famous philosopher David Kaplan, who developed a famous theory of indexicals, lived across the street from the famous anti-formalist philosopher Strawson, and Kaplan asked Strawson why Strawson believed that there could be no logic for a language with indexicals, and Strawson replied, "Because Quine told me so." Quine was a famous logician! So, as Kaplan put it, there was a "strange alliance" between the formalists and the anti-formalists:[1] They agreed that natural language was very different from logic, and that logical tools should not be applied to the "messier" aspects of language.

But David Kaplan's (1977) analysis of indexicals showed that we can formalize the anti-formalist slogan that 'Meaning is use'. This idea can also be applied to expressives, like *ouch* and *oops* and terms like *good-bye*.

So, partially driven by anti-formalist skepticism, the program of using logical tools to capture the meanings has enjoyed a wider and wider range of application.

[1] UCLA lecture entitled "The meaning of *ouch* and *oops*"