

Do We Need Two Basic Types?¹

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In a provocative book (Carstairs-McCarthy 1999), Andrew Carstairs-McCarthy argues that the apparently universal distinction in human languages between sentences and noun phrases cannot be assumed to be inevitable for languages with the expressive power of human languages, but needs explaining. His work suggests, but does not explicitly state, that there is also no conceptual necessity for the distinction between basic types *e* and *t*, a distinction argued for by Frege and carried into formal semantics through the work of Montague (Montague 1970). Pragmatic distinctions among various kinds of speech acts, including asserting, questioning, commanding, and pointing things out are assumed in Carstairs-McCarthy's work, as are expressions of functional types; what is questioned is whether a syntacticized sentence-NP distinction is essential.

If I am asked why we take *e* and *t* as the two basic semantic types, I am ready to acknowledge that it is in part because of tradition², and in part because doing so has worked well. I would acknowledge that while the model-theoretic domain corresponding to type *e* has been fairly uncontroversial, modulo how big it gets when the products of nominalization are packed into it (Chierchia and Turner 1988, Cresswell 1973), proposals concerning the domain for type *t* have been more varied: truth-values, sets of assignment functions, functions from possible worlds to truth-values, propositions taken as primitives, probably others. In a certain sense Montague had a third basic type, the type of possible worlds; in Gallin's Ty2 (Gallin 1975) this is explicit. But that is not essential, since on some alternatives the basic type *t* is taken to be the type of propositions, inherently intensional. There have also been proposals for adding something like situations or eventualities as an additional basic type, and sometimes times. Arguments for or against various choices have usually been arguments from elegance of resulting analyses, not arguments claiming conceptual necessity.

But suppose we imagine neutralizing the syntactic distinction between NPs and S's, as in Carstairs-McCarthy's thought-experiment language Monocategoric. Here are two examples, with argument-takers written in small caps, and with alternative possible English meanings written below each example.

- (1) (a) [you snake SEE] YESTERDAY
(i) 'You saw a snake yesterday.'
(ii) 'your seeing a snake yesterday'
(iii) 'the snake you saw yesterday'³
(iv) 'you who saw a snake yesterday'

...

- (c) John Mary [[you snake SEE] YESTERDAY] TELL [Carstairs-McCarthy 1999, p.23]

Can we imagine a parallel neutralized basic semantic type? Since Carstairs-McCarthy countenances distinguishing 'argument-takers' from their arguments, we are not being asked to give up functional types, although we could imagine following Chierchia and Turner and not require functions to be of different types from their arguments and try to get along with just one type altogether.

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² Once when I was giving a talk on Montague Grammar in the early 70's, a logician asked me why I was using typed rather than untyped lambda calculus. I replied that the typed lambda calculus was what Montague gave us, and I was only a "consumer" and would be glad to be shown how semantics with the untyped lambda calculus would work. (Chierchia and Turner's property theory work goes part way in that direction.)

³ The possibility of the readings indicated in (iii) and (iv) with the given bracketing are argued for by appealing to the phenomenon of head-internal relative clauses. This may or may not be reasonable, but it is probably orthogonal to the issue of S and NP as basic categories and *t* and *e* as basic types.

This is a question I have only begun thinking about, but it seems to me that it might be possible to put together several lines of recent research to come up with a defense of the conceptual possibility of getting along without the e – t distinction without losing expressive power. I offer some preliminary sketchy notes in this direction, and invite Manfred⁴ or anyone else to help debate whether such an approach is workable (or to let me know if it has already been done!)

Ingredients:

1. Neo-Davidsonian semantics of event sentences. Sentences become similar to indefinite (existential) noun phrases, stating the existence of an event of a certain sort. (Bach 1986, Davidson 1967, Kratzer 1996, Parsons 1985)

2. Irene Heim's and Hans Kamp's semantics for indefinite noun phrases (Heim 1982, Heim 1983, Kamp 1981): removing the existential quantifier from the interpretation of the NP, making the NP more like an open sentence. On the Kamp-Heim theory, the semantic interpretation of (2) is (3).

(2) *A cat walked in*

(3) *cat (x) & walk-in (x)*

The free variable may be bound by a higher operator, e.g. an adverbial quantifier. In a simple sentence like (2), implicit existential quantification comes from the definition of what it is for a file (Heim) or a DRS (Kamp) to be true in a model: there must be some assignment of variables that satisfies it.

3. An open formula like (3) is easy to shift into expressions of various types: existential closure gives a proposition, a lambda operator gives a property of cats, an iota operator gives (if defined) the entity 'the cat that walked in', a choice function gives an indefinite cat that walked in, suitable interrogative operators could ask whether a cat walked in or what cat walked in. In terms of potential interpretations via such operators, the open formula is in a sense already neutral among a range of types, even though when understood as a formula of a familiar logic it has a definite type.

4. Exploit the similarities and shiftability among entities and events, remarked on by many authors (Bach 1986, Krifka 1989, Partee 1991). The notion of *situation* as used by Kratzer is at some remove from classical notions of events or (Bach) eventualities; situations are parts of possible worlds, but they can be event-sized, person-sized, or larger or smaller. I don't know what would be the most ontologically neutral term, but 'situation' might not have to shift very far to be a good candidate.

4. Bach et al (1995a) suggest that common nouns are the basic sortal predicates for describing entities, and verbs the basic sortal predicates for describing eventualities. They also note that the distinction between proper names and common nouns does not seem nearly as basic in natural languages as it is taken to be by philosophers – natural languages are much more likely to syntacticize the distinction between nouns and verbs (both one-place predicates for the logician) than the NP-CNP distinction. So the distinction between entities and properties of entities does not seem crucial. And if the distinction between entities and eventualities might be just a sortal distinction, and the distinction between eventualities and their properties also need not be sharp, then we may be almost there.

5. Then a single basic type might be the type of *situations*, conceived of as neutral between entities and eventualities, or, probably a better choice, a type of *properties of situations*, since it seems easier to get from properties to individual situations (via a property analog of 'singleton set') than vice versa. We will need properties in any case, since we need argument-takers, and perhaps they are enough, if we follow the lead of Chierchia and Turner and exploit the dual nature of properties as potentially saturated or unsaturated.

6. Pragmatics can do a lot of the work. It already does in various places in contemporary semantic/pragmatic theories, and it already does in Carstairs-McCarthy's presentation of how to interpret Monocategoric. Given a typically as well as syntactically 'neutralized' expression, context and pragmatics might be enough to indicate whether something is being said to "hold" or "be instantiated", or is being "indicated" (identifying, labeling, etc. uses), or demanded, requested,

⁴ This note is a contribution to a mini-festschrift for Manfred Krifka on the occasion of his 50th birthday. Happy Birthday to dear Manfred!

queried, etc. – all possible independent speech acts -- or is being “considered” or “envisaged” or “mentioned” in various embedded contexts. Wittgenstein’s primitive “slab” language (Wittgenstein 1953, Part I), while far short of the expressive power of natural languages, exploited context to allow one-word utterances to function as ‘mands’ (“Bring me X”), and context or overt operators could easily extend this to include offers, assertions, etc. Anecdotal feasibility arguments come from our ability to understand children’s early utterances. Formally, it also helps that we know how to shift among properties, propositions, and terms via such operations as existential closure, existential disclosure, iota-operators, and other sorts of type-shifters (Partee 1986). Such operators could operate on a pragmatic level instead of or in addition to within the semantics.

How might the semantics of one part of one of Carstairs-McCarthy’s examples go?

- (1) (a) [you snake SEE] YESTERDAY
 (i) ‘You saw a snake yesterday.’
 (ii) ‘your seeing a snake yesterday’

Let me use type p as the (basic) type for properties of entities/eventualities/situations.

SEE: type $p \times p \rightarrow p$ Maps a pair of properties p_1 and p_2 of situations onto a new property p_3 which holds of a situation s_3 if s_3 contains situations s_1 and s_2 that have properties p_1 and p_2 respectively and in s_3 (something in) s_1 sees (something in) s_2 .

YESTERDAY: type p . The type of a situation contained in the interval yesterday. On the readings in (i) and (ii) it is conjoined with the property denoted by ‘you snake SEE’.

you: type p . The property a situation has if it’s a minimal situation containing you. This should go proxy for “you” and the property “being you”, neutralized as in Straits Salish (Jelinek 1995).

snake: type p . The property a situation has if it’s a snake-containing situation.

[you snake SEE] YESTERDAY : The property a situation has if it’s within yesterday and in it a “you” situation (or its contents) sees a “snake” situation (or its contents). Covert or overt operators could then lead to ‘asserting the existence of’ such a situation (1a-i) or ‘referring to’ such a situation (1a-ii), without a syntacticized S-NP distinction nor a semanticized t-e distinction.

Is that plausible? What are the main problems to worry about? The absence of individual variables? But Polly Jacobson has shown us how not to worry about that (Jacobson 1999). Quantification can proceed by unselective adverbial quantification, the favored choice in various languages (Bach et al. 1995b). While Carstairs-McCarthy in some places emphasizes how often we get along perfectly well with expressions that are ambiguous or vague, and ontological distinctions that are far from sharp, he also notes that a language without an NP-S distinction can still have an arsenal of explicit operators with interpretations related to focus-marking, question-marking, sortal specification, and other semantico-pragmatic functions, to reduce vagueness and indeterminacy. In place of truth-conditions and conditions on reference he suggests ‘applicability’ conditions, which could apply equally to proposition-like interpretations and description-like interpretations. I would add that we shouldn’t have to give up the centrality of entailment relations: an open formula like that in (3) can have entailments; Groenendijk and Stokhof showed how questions can have entailments (Groenendijk and Stokhof 1989); and I suppose one could just as well say that one description entails another if anything that satisfies the first description (to which the first description applies) satisfies the second.

So why not? Are we just following tradition or is there a deeper reason to build a semantics on two basic types rather than just one?

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