

Hyperintensionality Meets Dynamic Semantics

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- More specifically, I am trying to connect work in the DyCG framework with work in other semantic frameworks that employ modern type-theoretic and category-theoretic technology—especially (co-)monads and dependent types.
- To get started, I'll remind you of some of the main features of DyCG.

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The questions I want to raise are related to these five features.

1. Questions Related to Categorical Syntax

- a. Our choice of LCG as the underlying categorial syntax wasn't motivated by dynamic considerations. We just added the **discourse rule**

$$\frac{\vdash \mathbf{s}; D; \mathbf{u} \quad \vdash \mathbf{t}; S; \mathbf{k}}{\vdash \mathbf{s} \cdot \mathbf{t}; D; \lambda_{c:c}.\mathbf{cc} \mathbf{k} (\mathbf{u} \ c)}$$

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- b. LCG (like ACG, HTLG, and mainstream TLG) employs **hypothetical proof** ($\dashv\!\!\dashv\!-\!I$); but CCG does not. Does banning hypothetical proof have semantic consequences, or is it motivated by parsing considerations?
- c. We plan to enrich DyCG with a theory of **intonational meaning**, and believe that the bifurcation of syntax into pheno and tecto levels will help with that. Who else is trying to integrate intonation into dynamic semantics?

2. Questions Related to Type Theory (1/2)

- a. DyCG follows Montague in axiomatizing semantic theory in a higher order logic (HOL) where meanings are expressed by **terms**, not types. By contrast, Sundholmian semantic theories such as DTS express meanings with **types**. Is this an important difference, or just an implementation detail?

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- c. In DyCG, static propositions are axiomatized such that entailment is a boolean preorder. What in DTS makes NL logic classical? Or isn't it?

2. Questions Related to Type Theory (2/2)

- d. Much has been made in recent years of the difference between **proof-theoretic** and **model-theoretic** semantics. But if semantic theory is explicitly axiomatized in HOL, there is no need to ever think or care about the interpretations (e.g. toposes); conversely, theories in MLTT themselves have categorical interpretations (e.g. Quillen model categories). So, what is the crucial difference (if any) between the two approaches?

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- e. Since HOL extends typed lambda calculus, it is easy to add **computational monads** *à la* Moggi or Benton et al. to DyCG if needed. Is this a missed opportunity?

3. Questions Related to Hyperintensions (1/2)

- a. It's been known since the 1940's that intensions are too coarsely grained to serve as NL meanings. Yet among dynamic theories, DyCG is unusual (unique?) in its embrace of hyperintensionality. **Could other dynamic frameworks “go hyperintensional”?** What would it mean?

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- b. Some monad enthusiasts advocate the idea of extensions as ‘the main thing’, and intensionality as a ‘side effect’. Can that idea be reconciled with the existence of hyperintensionality? Is there a **hyperintensionality monad** that generalizes the intensionality monad?

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- c. Analogously, is there a version of hyperintensional semantics to which Zwanziger's comonadic analysis would generalize? This would require an analog of Montague's $\hat{\quad}$ (Zwanziger's b).

3. Questions Related to Hyperintensions (2/2)

- c. The first (implicit) use of the **nondeterminism monad** in linguistics was the way that Hamblin computed his interrogative semantics. But Karttunen (1977) showed long ago how to compute interrogative semantics *without* nondeterminism, and that works for Hamblin semantics too.

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- d. If you try to imitate the nondeterminism monad with t replaced by p , the monad associativity law still holds, but the identity laws only hold up to truth-conditional equivalence.

4. Questions Related to Dynamic Sentence Contents

- a. One (and maybe the only) similarity between DyCG and Heim's context change semantics (CCS) is that both model **dynamic sentence content as functions from contexts to contexts**. Is this idea present (maybe implicitly) in other frameworks?
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- b. Are there arguments for rejecting this idea?
- c. DyCG distinguishes between a **dynamic content k vs. the context change (cc k) that it induces**; the former captures the pretheoretic notion of asserted or at-issue content. Is it important for dynamic frameworks to capture this distinction? Do other frameworks capture it?

5. Questions Related the Notion of Context

- a. Everyone agrees contexts need to keep track of **drefs**. Some (CCS, Martin) track the **common ground** (CG: what has been said and accepted about the drefs). Others would add some notion of **urgent topicality** (Ginzburg/Roberts QUDs, Yasavul's TUD). Do all frameworks have mechanisms corresponding to these?

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- b. What else has to be in contexts?

Answers?