Chapter 1

Pragmatics and dialogue semantics

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The chapter covers basic dialogue dynamics in terms of clarification requests and grounding and a dialogue-compatible account of quantified noun phrases. Based on the reprise content hypothesis and the data structures encoded by typed features structures, the chapter starts by arguing for a type-theoretical underpinning of pragmatics and dialogue semantics. The type-theoretical framework integrates grammar signs known from HPSG with dialogue dynamics in terms of dialogue game boards. It is then shown how this framework gives rise to a dialogue-compatible model of QNPs, which is dialogue-compatible in providing antecedents for various kinds of referential relations in context. The chapter concludes with spelling out a fragment for a compositional analysis for (most of) the phenomena covered.

1 Introduction

The prime subject matter of grammar is written text, usually complying to spelling norms. Dialogue, in contrast, is neither written nor follows strictly spelling (better: speaking) rules (see the vast amount disfluencies (Ginzburg et al. 2014)): it has its own rules. Challenges of dialogue with regard to linguistic theorizing have recently been put forth by Ginzburg (2012), Ginzburg & Poesio (2016) and

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Kempson et al. (2016). One such challenge are sub-sentential utterances (Fernández & Ginzburg 2002; Fernández et al. 2007) like clarification questions and reprise fragments, which are main actors in arguing *against* doing semantics within a unification-based framework (Section 2.2 below). Instead, a type theory with records (TTR), which is briefly introduced in Section 2.1, provides a better account to dialogue semantics. However, TTR allows for "emulating" a HPSG-kind of grammar, giving rise to a unified home for sign-based syn-sem interfaces bridging to dialogical game boards (covered in Section 3).

2 A type theory for pragmatics and dialogue semantics

2.1 A brief primer to TTR

types, judgements, record types, records Cooper (2005b), Cooper (2005a), Cooper (2012), Cooper (2017), Cooper & Ginzburg (2015)

2.2 Sub-sentential meanings: unification vs. reprise content

In (1), B poses a clarification request concerning (in one interpretation – the other would be an acoustic one: "did I understood it correctly, *finagle*?") the meaning of the verb of A's utterance (Ginzburg 2012: 115):

(1) A: Did Bo finagle a raise? B: finagle?

The point is that B queries *exactly* the meaning of the verb (Purver & Ginzburg 2004; Ginzburg & Purver 2012), and not the meaning of the verb phrase (verb plus direct object) or the sentence (verb plus direct object and subject). The latter options, however, follow from unificational semantics, where the content of the mother (S and VP, respectively) is *identified* with the content of the daughter (VP and V, respectively).

2.3 Semantic objects: data structures vs. types

In HPSG formulated in terms of typed of feature structures (Pollard & Sag 1994), the semantic structures *encode* semantic entities. TTR, though looking similar to feature structures, *provides* semantic entities (Ginzburg 2012: Sec. 5.2.2). This issues related to the question of what does or what should a grammar encode (see also Richter in this volume)?

3 Putting things together: HPSG_{TTR} and Dialogue game boards

How to incorporate semantic entities directly into grammar? Cooper (2008), Cooper (2014), and Ginzburg (2012) provide an answer by, so to say, reversing the question: grammar can be formulated in terms of TTR, resulting in HPSG_{TTR}.

HPSG_{TTR} is extended by an architecture known as *dialogue game board*, extending the phon-syn-sem to a phon-syn-sem-dialogue interface (Lewis 1979), Ginzburg (1994), Ginzburg (1996), Ginzburg (2003), Ginzburg (2012). The basic architecture is given and a clarificational turn-taking protocol is introduced.

4 Outlook

One of the main challenges of dialogue semantics is the integration of non-verbal communication means, like gaze, gestures, body posture, timing and non-language vocal sounds (e.g., laughter (Ginzburg et al. 2015; Tian et al. 2016)).

Dialogue is the interaction between *two* interlocutors. How can one scale up to multilogue (Ginzburg & Fernández 2005)?

Appendix: a HPSG_{TTR} fragment for quantified noun phrases

The appendix provides a compositional fragment for many of the phenomena discussed above.

References

Barwise, Jon & Robin Cooper. 1981. Generalized quantifiers and natural language. *Linguistics and Philosophy* 4(2). 159–219. DOI:10.1007/BF00350139

Cooper, Robin. 2005a. Austinian truth, attitudes and type theory. *Research on Language and Computation* 3(2-3). 333–362. DOI:10.1007/s11168-006-0002-z

Cooper, Robin. 2005b. Records and record types in semantic theory. *Journal of Logic and Computation* 15(2). 99–112.

Cooper, Robin. 2008. Type theory with records and unification-based grammar. In Fritz Hamm & Stephan Kepser (eds.), *Logics for linguistic structures*, vol. 201 (Trends in Linguistics: Studies and Monographs), 9–33. Berlin & New York: Mouton de Gruyter.

Cooper, Robin. 2012. Type theory and semantics in flux. In Ruth Kempson, Tim Fernando & Nicholas Asher (eds.), *Philosophy of linguistics*, vol. 14 (Handbook of Philosophy of Science), 271–323. Oxford & Amsterdam: Elsevier.

Cooper, Robin. 2014. Phrase structure rules as dialogue update rules. In *Proceedings of dialwatt – the 18th workshop on the semantics and pragmatics of dialogue* (SemDial 2014), 26–34. Edinburgh.

Cooper, Robin. 2017. Adapting Type Theory with Records for natural language semantics. In Stergios Chatzikyriakidis & Zhaohui Luo (eds.), *Modern perspectives in type-theoretical semantics*, vol. 98 (Studies in Linguistics and Philosophy), 71–94. Cham, Switzerland: Springer International Publishing AG. DOI:10.1007/978-3-319-50422-3_4

Cooper, Robin & Jonathan Ginzburg. 2015. Type theory with records for natural language semantics. In Shalom Lappin & Chris Fox (eds.), *The handbook of contemporary semantic theory*, 2nd edn., chap. 12, 375–407. Oxford, UK: Wiley-Blackwell.

Fernández, Raquel & Jonathan Ginzburg. 2002. Non-sentential utterances: a corpus study. *Traîtement Automatique de Languages* 43(2). 13–42.

Fernández, Raquel, Jonathan Ginzburg & Shalom Lappin. 2007. Classifying non-sentential utterances in dialogue: a machine learning approach. *Computational Linguistics* 33(3). 397–427. DOI:10.1162/coli.2007.33.3.397

Ginzburg, Jonathan. 1994. An update semantics for dialogue. In *Proceedings of the first international workshop on computational semantics*. Tilburg, The Netherlands.

Ginzburg, Jonathan. 1996. Dynamics and the semantics of dialogue. In Jerry Seligman (ed.), *Language, logic and computation*, vol. 1 (CSLI Lecture Notes). Stanford, CA: CSLI.

Ginzburg, Jonathan. 2003. Disentangling public from private meaning. In R. Smith & J. van Kuppevelt (eds.), *Current and new directions in discourse & dialogue*, 183–211. Dordrecht: Kluwer Academic Publishers.

Ginzburg, Jonathan. 2012. *The interactive stance: meaning for conversation*. Oxford, UK: Oxford University Press.

Ginzburg, Jonathan, Ellen Breitholtz, Robin Cooper, Julian Hough & Ye Tian. 2015. Understanding laughter. In Thomas Brochhagen, Floris Roelofsen & Nadine Theiler (eds.), *Proceedings of the 20th amsterdam colloquium*, 137–146. Amsterdam, Netherlands. http://semanticsarchive.net/Archive/mVkOTk2N/AC2015-proceedings.pdf.

Ginzburg, Jonathan & Raquel Fernández. 2005. Scaling up from dialogue to multilogue: some principles and benchmarks. In *Proceedings of the*

43rd annual meeting on association for computational linguistics (ACL '05), 231–238. Ann Arbor, Michigan: Association for Computational Linguistics. DOI:http://dx.doi.org/10.3115/1219840.1219869

Ginzburg, Jonathan, Raquel Fernández & David Schlangen. 2014. Disfluencies as intra-utterance dialogue moves. *Semantics and Pragmatics* 7(9). 1–64. DOI:10.3765/sp.7.9

Ginzburg, Jonathan & Massimo Poesio. 2016. Grammar is a system that characterizes talk in interaction. *Frontiers in Psychology* 7(1938). 1–22. DOI:10.3389/fpsyg.2016.01938

Ginzburg, Jonathan & Matthew Purver. 2012. Quantification, the reprise content hypothesis, and type theory. In Lars Borin & Staffan Larsson (eds.), *From quantification to conversation. festschrift for robin cooper on the occasion of his 65th birthday*. London: College Publications.

Kempson, Ruth, Ronnie Cann, Eleni Gregoromichelaki & Stergios Chatzikyriakidis. 2016. Language as mechanisms for interaction. *Theoretical Linguistics* 42(3-4). 203–276. DOI:10.1515/tl-2016-0011

Lewis, David. 1979. Scorekeeping in a language game. *Journal of Philosophical Logic* 8(1). 339–359.

Peters, Stanley & Dag Westerståhl. 2006. *Quantifiers in language and logic*. Oxford, NY: Oxford University Press.

Pollard, Carl & Ivan A. Sag. 1994. *Head-driven phrase structure grammar*. Chicago: Chicago University Press.

Purver, Matthew & Jonathan Ginzburg. 2004. Clarifying noun phrase semantics. *Journal of Semantics* 21(3). 283–339. DOI:10.1093/jos/21.3.283

Tian, Ye, Chiara Mazzoconi & Jonathan Ginzburg. 2016. When do we laugh? In *Proceedings of the 17th annual sigdial meeting on discourse and dialogue* (SIGDIAL 2016). Los Angeles, USA.