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General Information

Registration: Building GA Level 04 Room 42.

Plenary Talks: Building GAFO Level 03 Room 252**.**

Way to the Conference:

From the train station of the U-35 ("Ruhr Universität") go up to the pedestrian bridge and walk towards the university. Your route takes you directly to the building of the university library. Keep right of the library and go down the stairs and continue straight ahead to a second stairway. Go down these stairs and turn right. In front of you to your left you will see 3 tall yellow buildings. The first of these is GA. Enter the building and go through the first glass doors to your right and take the elevator down to floor 04 for the registration office.

Internet Access:

A Wireless LAN environment is available in the conference center. Please ask the reception desk for access ID.

Poster Sessions & Coffee:

The coffee breaks and the poster sessions take place in the Mercator Rooms: GA 04/187 and GA 04/189.

Lunch:

There is a cafeteria very close to the conference venue in the GA building (level 02) that offers snacks and coffee. The Mensa (level 02) and the Bistro and Coffee bar (level 01) are behind the Audimax of the Campus. You can pay only cash in the university cafeterias, Mensa and Bistro. The UniCenter, close to the U35 station (10 min walk from the venue) also offers fast food alternatives and nice terraces.

Dinner:

The conference dinner is planned on Friday evening at the Restaurant in Beckmanns Hof, which is located behind the Mensa at the borders of the Botanic Gardens of the Ruhr-University, less than 10 min walk from the conference venue.

Orientation:

A map with important places highlighted can be found at the end of this booklet.

Investigating Semantics: Empirical and Philosophical Approaches
Ruhr-University Bochum, October 10-12, 2013

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11:00 – 11:30	Martin Schäfer Semantic transparency of compounds and the semantics/pragmatics boundary	Minyao Huang Bottom-up or Top-down Context Sensitivity?	Bernhard Fisseni, Benedikt Löwe & Bernhard Schröder The Empirical Quest for 'Zahlendreher'
11:30 – 12:00	Jonathan Cohen & Andrew Kehler Failure-Free Extrasemantic Content	Erica Cosentino The effect of contextual information on affordances and telicity in the meaning of nouns: An ERP study	Mariusz Urbański Erotetic inferences and formal modeling of deductive problem-solving
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	Compositionality GAFO 03/252 Chair: Kristina Liefke	**Lexicon II: Fictional names** GAFO 03/901 Chair: Mariusz Urbanski	**Modality** GAFO 03/974 Chair: Derek Ball
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12:45 – 13:15	Anna Drożdżowicz Putting Heim & Kratzer in the head - compositionality and cognitive neuroscience	Justine Jacot & Peter Gärdenfors: Do we speak of the same witch? Intentional Identity and the Meeting of Minds	Tuukka Tanninen The Origins of Epistemic 2D, and its Problems
13:15 – 14:30	Lunch		
14:30 – 15:30	Max Kölbel: Making sense of the Methods of Natural Language Semanticists Chair: Markus Werning		GAFO 03/252
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15:45 – 16:45	Manfred Krifka: The Mass/Count distinction: Philosophical, linguistic, and cognitive aspects Chair: Maria Spychalska		GAFO 03/252
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17:15 – 18:15	Paul Pietroski: What is a Theory of Human (Linguistic) Understanding? Chair: Max Kölbel		GAFO 03/252
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11:30 – 12:00	Piotr Wilkin Cognitive representations and compositionality	Agustin Vicente The green leaves and the expert: polysemy and truth-conditional variability	Markus Kracht & Udo Klein De Lingua Knowledge
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12:15 – 13:15	Markus Werning: Semantics naturalized: Between mental symbols and embrained simulations Chair: Erica Cosentino		GAFO **03/252**
13:15 – 14:30	Lunch		
	Descriptions and Reference GAFO 03/252 Chair: Markus Werning	**Lexicon IV: Context-Sensitivity** GAFO 03/901 Chair: Erica Cosentino	**Semantics of Non-Verbal Symbols** GAFO 03/974 Chair: Kevin Reuter
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15:00 – 15:30	Daniel Gutzmann & Eric Mccready Reference and use-conditions. A multidimensional approach to referential descriptions	Camilo Quezada, Carlos Cornejo, & Vladimir Lopez The impact of the physical features of objects in the semantic representation of novel words: an N400 study	Endre Begby Homesign Semantics
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16:45 – 17:45	Ira Noveck: Finding Consistency among Pragmatic Inferences GAFO 03/252 Chair: Maria Spychalska		

Abstracts – Plenary Talks

Abstracts – Concurrent Talks

Plenary Talks

Giosuè Baggio

Following the neural footprints of semantic composition off the N400 path

The N400 is an evoked brain potential whose amplitude varies as an inverse function of the degree of semantic affinity between the eliciting word and the context in which it occurs. The N400 has become a prominent dependent measure of lexical semantic processing. However, there are reasons to believe there is more to meaning construction in the brain than is reflected by the N400. In this talk I will present research from our laboratory suggesting that certain kinds of semantic operation indeed result in brain potentials that differ from the N400 in latency, duration or scalp distribution, and that yet other types of semantic computation produce oscillatory effects with no counterpart in evoked responses. I will argue that following these other neural footprints of meaning composition may lead us to a vantage point from which a connection between neural data and formal semantic theory can be established in ways that may allow specific neural signatures to be assigned to particular formal operations. I will conclude presenting a model of semantic composition in the brain in which the N400 as well as other negative potentials can be accommodated.

Derek Ball

Idealisation, Abstracta, and Semantic Explanation

I present two arguments -- one based on the role of abstracta, and the other based on the need for certain sorts of idealisation -- that neither our best current semantic theories nor any forseeable development of them are true. I then show how semantics can provide correct explanations of linguistic phenomena despite this fact, with special attention to the how facts about other forms of scientific representation (such as models and measurements) can illuminate semantics.

Emma Borg

Facing the Evidence: what can empirical facts tell us about semantics?

On the one hand, it seems almost a truism that we want a semantic theory which is informed by empirical evidence. However, on the other, it proves notoriously difficult in practice to map between empirical claims and theoretical ones. This paper aims to clarify the potential problems in moving between theory and evidence in this area, in the hope of coming to relate experimental evidence and semantic theories more closely in the future. The first part of the paper surveys semantic theories in general, asking what a semantic theory is supposed to be a theory of and what kind of evidence might be relevant to what kind of semantic theory. Focusing on the psychological dimension of language, I then explore what might be involved in the claim that a semantic theory is cognitively real. The second part of the paper turns to the empirical evidence and I sketch three distinct types of evidence that might be relevant to a cognitively real semantic theory: neurophysiological evidence, behaviour in experimental tasks, and behaviour in non-experimental situations. However, as we will see, there turn out to be significant problems in mapping from each kind of evidence to semantic claims. Time allowing, in the third and final part of the paper I will demonstrate these problems by looking at some examples from recent work on the semantics/pragmatics border, asking how the connection between theory and evidence might be tightened.

Max Kölbel

Making sense of the Methods of Natural Language Semanticists

There are many ways of investigating language. I am here interested in the methods of what one might call "traditional natural language semantics": the pursuit of describing and examining formal languages in order to model certain aspects of natural languages in the tradition of Montague. This relatively young scientific pursuit seems to have become an institutionally recognized discipline within linguistics and to some extent within philosophy. Traditional natural language semanticists in this sense tend to follow a certain methodology: the data against which they seem to test their theories seem to be data concerning the conditions under which the utterance of a given sentence would be true, and perhaps also data concerning the felicity of certain sentences, and data concerning logical relations amongst sentences or amongst utterances of sentences. In most cases, traditional semanticists seem to obtain these data by simply "consulting their own linguistic judgement".

There is considerable unclarity and uncertainty about the object of study of natural language semantics, and the method of relying on one's own judgement has been questioned. In this paper I shall outline an account of the objects and methods of natural language semantics that vindicates to a large extent the customary methods of semanticists. I will argue that semantic theories model certain aspects of the competence of language users, that metaphysically speaking, competence is a kind of disposition, and that dispositions of this sort can legitimately be examined with the customary methods. As a by-product of this account, I shall also briefly provide an answer to Kripkenstein and address the issue of I- versus E-languages.

Manfred Krifka

The Mass/Count distinction: Philosophical, linguistic, and cognitive aspects

The distinction between mass nouns and count nouns (and related notions such as collectives, plurals and measure constructions) has played an important role in philosophy of language and ontology, in linguistics, and in cognitive studies. In this talk I will try to draw on these contributions and attempt to come up with a description of these notions.

Gina Kuperberg

What can the study of schizophrenia tell us about the neural architecture of language processing?

"I always liked geography. My last teacher in that subject was Professor August A. He was a man with black eyes. I also like black eyes. There are also blue and grey eyes and other sorts, too ..." (Bleuler, 1911/1950).

This is an example of language produced by some patients with schizophrenia—a common neuropsychiatric disorder that affects 1% of the adult population.This type of disorganized speech is usually attributed to a 'thought disorder' or a 'loosening of associations', which influencesnot only the production of language but alsocomprehensionand other aspects of higher-order cognition in schizophrenia patients. It is usually assumed that thought disorderreflects aqualitative abnormality in the neurocognitive mechanisms engaged in language processing. The assumption is thathealthy individuals first retrieve the meaning of individual words, combine these words syntactically to form sentences, and then combine sentences with other sentences to construct whole discourse. In contrast, thought disorderhas often been viewed as aseparate disturbance of memory—stored associations between single words and whole events intrude upon normal language comprehension and production mechanisms.

Over the past ten years, our lab has carried out a series of cognitive neuroscience studies in both patient and control populations that challenge these assumptions.We are using multimodal neuroimaging techniques—event-related potentials, functional MRI and magneto-encephalography—to probe the time-course and neuroanatomical networks engaged in language comprehension. Our findings suggest that memory-based mechanisms play a much largerrole in normallanguage processing than has often been assumed.We are able to retrieve and mobilize stored semantic relationships between words and eventsvery quickly to facilitate the processing of upcoming words as language unfolds in real time. This facilitation manifestsas reduced activity within the anterior temporal cortex within 300ms afterthe onset of incoming words.Combinatorial mechanisms appear to beprolonged when bottom-up input conflicts with stored semantic knowledge, leading to the recruitment of left frontal and inferior parietal cortices past 500ms.

This type of language processing architectureoffers several advantages: it allows us toextract meaning from languagevery quickly, even in ambiguous and in noisy environments, and it explains how our language systems are dynamic and flexible enough to respond to ever-changing task and environmental demands. Italso can explain how language and thought can break down in disorders like schizophrenia: Seen within this broad framework, thought disorder does not reflect a qualitative abnormality in how language is processed; rather, it is best

conceptualized asreflecting an imbalance of a tight reciprocal relationship between the memory-based and combinatorial neurocognitive mechanismsthatconstitute normal language processing.In this way, the study of how language breaks down in neuropsychiatric disorders like schizophrenia can give important insights into the architecture of the normal language processing system.

Michiel van Lambalgen

Processing discourse: where logic meets neuroscience

The task of formal semantics is generally taken to be to account for entailment relations between sentences; it is not claimed that formal semantics yields insight into the cognitive processes involved in language comprehension and production.

Here and in the talk by Giosuè Baggio a more ambitious program will be outlined, in which (i) formal semantics can be used to derive predictions about EEGs recorded during discourse comprehension, and (ii) observed EEGs constrain semantic theorising. The main example will be discourse consisting of arguments involving indicative conditionals, for which probabilistic analyses have recently become popular.

We will investigate the electrophysiological predictions made by probabilistic and logical accounts of the condition, and will report on an experiment testing these predictions.

Ira Noveck

Finding Consistency among Pragmatic Inferences

In this talk, I will take a careful look at conditional statements in order to defend a deflationary account of the generally accepted notion of invited inferences (see Noveck, Bonnefond & Van der Henst, 2012; Geis & Zwicky, 1971). This will provide a springboard for a view on pragmatic processing that I will refer to as narrowing, which is a way to gain information by refining aspects of the linguistic code (Noveck & Spotorno, in press). While assuming that this process is ubiquitous, I will rely on experimental data in order to detail a set of phenomena that fall under this category more generally. This process can be further subdivided into voluntary and imposed narrowing, with scalar inferences serving as the flagship example of the former (see [1b] as a derivation of the utterance in [1a]) and with metaphor being exemplary of the latter (see [2b] as the derived interpretation of [2a]).

(1) a. Some of the guests are hungry.

b. Some but not all of the guests are hungry.

(2) a. Nobody wanted to run against John at school. John was a cheetah.

b. John was fast.

Those called voluntary have linguistically encoded readings that can lead to a more informative reading with extra effort. For those call imposed there is no obvious relationship between linguistic readings and their intended ones as the latter are forced on the listener. I will then return to conditionals and show how an invited inference is of the imposed sort.

Paul Pietroski

What is a Theory of Human (Linguistic) Understanding?

Following Dummett and others, I think that a good theory of meaning for a naturally acquirable human language L will be theory of understanding for L, and that a good theory of understanding for L may not be theory of truth for L. One need not endorse any traditional form of verificationism to think that the natural phenomenon of linguistic understanding reflects the nature of human psychology--and how our "faculty of language" interfaces with other cognitive systems--in ways that are not captured, and perhaps distorted, by "truth conditional semantics." In the talk, I will review some experimental work (done with colleagues in Maryland) that suggests a connection between understanding and verification, though not the kind of connection that many philosophers have tried to establish on a priori grounds. As time permits, I will link this work to the more general idea that meanings are instructions for how to build concepts of a special sort.

Markus Werning

Semantics naturalized: Between mental symbols and embrained simulations

The principle of compositionality is pivotal to any theory of meaning and amounts to a homomorphism between syntax and semantics. It is often associated with the idea of a correspondence between syntactic and semantic part-whole relations, but - as will be shown - logically distinct therefrom. The idea of a part-whole correspondence between syntax and semantics is characteristic only for symbolic theories of meaning. In this talk a neurobiologically motivated theory of meaning as internal representation is developed that holds on to compositionality, but is non-symbolic. The approach builds on neurobiological findings regarding topologically structured cortical feature maps and the a proposed neural mechanism of object-related binding. It incorporates the Gestalt principles of psychology and is implemented by recurrent neural networks. The semantics to be developed is structural analogous to model-theoretical semantics, which likewise is compositional and non-symbolic. However, unlike model-theoretical semantics, it regards meanings as set-theoretical constructions not of denotations, but of their neural counterparts, their emulations. The semantics to be developed is a neuro-emulative model-theoretical semantics of a first order-language.

Concurrent Talks

Corien Bary & Emar Maier

Unembedded Indirect Discourse

There are conspicuously diverging opinions about whether or not Ancient Greek has Free Indirect Discourse (no says Banfield 1982; yes says Fludernik 1993). Independently there has been considerable debate about how best to analyze Free Indirect Discourse semantically (double context dependence, monstrous operator, quotation). We want to contribute to both debates by introducing a distinction between Free Indirect Discourse (FID) and what we call Unembedded Indirect Discourse (UID). More specifically, in this paper we (i) describe the phenomenon of UID as distinct from FID in Ancient Greek, and (ii) propose an analysis based on Fabricius-Hansen & Sæbø's presuppositional analysis of a similar phenomenon in German. We conclude that failure to recognize the distinction between FID and UID has (a) led philologists to overestimate the occurrence of FID, and (b) led semanticists like Sharvit to classify FID incorrectly as a kind of indirect discourse.

Data: UID in Ancient Greek. In Ancient Greek indirect discourse, a verb of saying can take as complement (i) an indicative finite *that*-clause; (ii) an optative (subjunctive) finite *that*-clause; or (iii) an infinitival clause with accusative subject (AcI). Interestingly, when an author wants to report a longer discourse indirectly, she can continue to use the latter two indirectness markings (subjunctive/AcI) for several syntactically unembedded sentences. In fact, even the initial, overt indirect speech embedding may be parenthetical or implicit. We call this phenomenon Unembedded Indirect Discourse (UID).

UID shares some characteristics with the narrative technique known as Free Indirect Discourse (FID): both are (i) reportive, (ii) syntactically unembedded, and (iii) have pronouns behaving as in indirect discourse.

But UID and FID diverge semantically. With respect to *de re* readings, FID behaves like direct discourse/quotation (Banfield), while UID behaves like indirect discourse. In the fragment below, Herodotus reports what the Greeks say in UID. Yet, surely the Greeks didn't use the description *the island that the Greeks call Erytheia*, so it is *de re*.

Σκύθαι μὲν ὧδε . . . λέγουσι, Ἑλλήνων δὲ οἱ τὸν Πόντον οἰκέοντες ὧδε. Ἡρακλέα . . . ἀπικέσθαι ἐς γῆν ταύτην . . . Γηρυόνην δὲ οἰκέειν ἔξω τοῦ Πόντου, κατοικημένον τὴν Ἕλληνες λέγουσι Ἐρύθειαν νῆσον

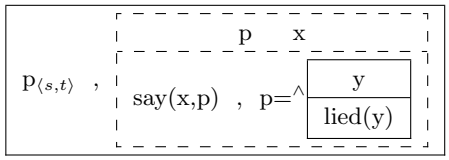
This is what the Scythians say . . . but the Greeks who live in Pontus tell the story as follows: Heracles . . . came-INF to this land, . . . Geryones lived-INF west of the Pontus, settled in the island that the Greeks call Erytheia. . . (AcI-UID continues, Hdt 4.8)

Analysis: reportive presuppositions. Greek UID closely resembles a use of the German oblique mood, the Reportive Subjunctive, which likewise can occur freely, especially in a context where it is implied that we are reporting another's speech.

Er sagte, sie sei schön. Sie habe grüne Augen. (Jäger 1971)
He said she was-subj beautiful. She had-subj green eyes [⇝, he said].

We modify Fabricius-Hansen & Sæbø's (2004) account of the Reportive Subjunctive as a presupposition trigger.

When a subjunctive morpheme attaches to a clause, say *someone lied*, it lexically triggers the presupposition that some x said that someone lied. To get a proper unification of embedded and free subjunctives, the at issue content is a free propositional variable p of type $\langle s,t\rangle$

SUBJ [someone lied] $\rightsquigarrow$ 

In words: the interpretation of *someone lied-subj.* is the proposition that p, where p is presupposed to be (i) a proposition that was said to be true by some salient source x, and (ii) the proposition that someone lied.

In UID there would be no further embedding,[1] so we'd proceed to search the context looking for an antecedent speaker (x) and proposition (p), or else accommodate them. If the context provides a salient speaker, as is typical with UID reports, we bind x, otherwise it's accommodated, leading to a generic reading (*it is said that someone lied* cf. Hdt 1.86). To bind p we need to partially accommodate the condition that someone said that p. This gives the correct final output: the contextually salient source said that someone lied.

We propose that AcI constructions trigger a similar presupposition, i.e. we assume that syntactically, AcI clauses (as opposed to modern Germanic/Romance infinitival complements) are full sentences (cf. Ferraresi & Goldbach 2003) that house a 'reportivity' feature instead of phi-features. Following Spyropoulos (2005), the lack of phi-features leads to morphological spellout as accusative (=lack of nominative) plus infinitive. We thus unify Aci-UIDs and Subjunctive-UIDs by seeing both as realizations of the same reportivity feature, which is interpreted as triggering the presupposition that the proposition expressed by the clause was said by some presupposed source.

Conclusion: UID as free, presupposed indirect discourse. UID is a form of syntactically unembedded speech reporting, marked by a reportive mood or a sentence-like infinitival construction. The possibility of *de re* interpretation in UID sets it apart from FID and direct discourse. We proposed a formal semantic account which covers both forms of UID in Greek.

We suggest that the failure to distinguish UID and FID has led to considerable confusion. Literary scholars disagree about when FID first emerged, and if we might not see some evidence of it in Ancient Greek literature already. In some cases, we suspect, cases of Greek UID have mistakenly given the impression of early occurrences of FID.

The confusion between FID and UID has even affected the accepted terminology. We have come to refer to a quotative, vivid, direct discourse-like construction as Free *In*direct Discourse – Sharvit even analyzes FID semantically as such – while a distinct, and perhaps much older, phenomenon would have been more deserving of that title.

[1] The same LF works if the subjunctive clause is embedded under *say*, but that's not at issue here.

Endre Begby

Homesign Semantics

This paper presents the first in-depth philosophical study of the phenomenon of homesign; i.e., spontaneous gesture systems devised by deaf children for the purpose of communicating with their non-signing peers. My focus is on understanding how semantic content arises in homesign communication, a question which is underexplored even in the scientific literature. To this end, I develop an account of the emergence of key semantic features such as displaced reference and arbitrariness in homesign. I argue, contrary to widespread philosophical assumptions, that individual homesign gestures are capable of carrying meaning much like the words of established natural languages in spite of the fact that (i) they are not supported by convention, and (ii) for the most part, they retain deictic and iconic form. Drawing on Clark's model of discourse collaboration, I argue that many of the evident limitations and peculiarities of homesign can be traced back to the fact that it constitutes a largely *non-bidirectional* communicative system: recipients' ability to comprehend what the children are communicating far outstrips their ability to reciprocate in kind.

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Anton Benz & Nicole Gotzner

Reconsidering Embedded Implicatures in the Truth-Value Judgment Paradigm

1 Introduction

Pragmatic theories dispute over whether quantifiers like some give rise to scalar implicatures under embedding. For example, the sentence John ate some of the cookies is usually understood such that John ate some but not all of the cookies. However, under embedding with another quantifier as for example all (e.g.,All kids ate some of the cookies), intuitions about the scalar implicature of some are less clear. According to localist theories (Chierchia, 2004; Chierchia et al., 2012; Levinson, 2000), whenever a lexical item like some is encountered, a scalar implicature is triggered that might have to be cancelled in certain contexts. Globalist theories (Sauerland, 2004; Geurts, 2009), on the other hand, claim that implicatures are not triggered locally.[1]

Intuitions concerning embedded implicatures are hard to verify, and it is clear to everyone involved that without objective experimental basis the debate about localism and globalism cannot be decided. However, there has been far less experimental research on embedded implicatures than on other aspects of quantity implicatures. As particularly influential proved the study by Geurts & Pouscoulous (G&P, Geurts and Pouscoulous (2009)) who claimed (1) overwhelming experimental evidence against strong localism, and evidence for the superiority of truth–value judgement tasks (TVJTs) over inferencing tasks. They carried out a series of experiments employing the truth value judgment paradigm, asking participants to verify pairs of sentences and pictures. The results showed that hardly any of the participants seemed to have pursued a reading with a scalar implicature in the embedded case (henceforth SI reading). They claimed that the higher percentages found by other studies are an artefact which is due to their use of inferencing tasks instead of TVJTs.

In this talk we present the results of three experiments which tested the claims of G&P. We found, first, that, contrary to appearance, the data of G&P provide neither evidence for nor against localism, and, second, that TVJTs show little sensitivity for implicatures in general. The third experiment shows that a prerequisite for investiagating embedded implicatures is to introduce contextual relevance.

[1] See (Sauerland, 2012) for an overview of different positions.

2 Experiments

We carried out three experiments with the same experimental paradigm as G&P. We prepared them by first successfully replicating G&P's TVJT experiment.[2] We noticed that G&P had no control condition testing whether implicatures influenced TVJs at all. Their experimental results are consistent with the null hypothesis that test subjects evaluate purely on the basis of semantic meaning. This led to the first experiment (n = 37) in which we added a control item with the test sentence Some of the squares are connected to circles with a picture on which all squares are connected to circles. If G&P's paradigm is sensitive to implicatures, then this item must receive a high percentage of false answers. However, only 38% judged it false (62% true). As can be seen from Fig. 1, the results for the original items are in agreement with G&P's, and the control item fits best with the semantic hypothesis, although it deviates significantly from all three hypotheses, the semantic, localist, and globalist.

Condition	Sem	Glob	Loc	G&P	Exp 1	Exp 2	Exp 3
all	1	1	0	1	.92	.92	.85
exactly two 1	1	1	0	1	.95	.92	.78
exactly two 2	0	0	1	0	.14	.05	.18
more than one	1	1	0	1	.95	.89	.70
not all	0	0	0	0.04	.05	.08	.28
not more than one	0	0	0	0.04	.17	.13	.20
some (control)	1	0	0	—	.62	.68	.20

Figure 1: Comparison of experimental results, 1.0 = 100% true. Sem = predicted if interpreted semantically; Glob = prediction by globalism; Loc = predicted by strong localism; G&P= results reported by G&P. For Exp 3, the predictions of Sem, Glob, and Loc are reversed to (1 – p); for ease of comparison, percentages are given as 1.0 = 100% false.

In a follow up experiment (n = 38), we therefore tested how subjects judge the items when explicitly instructed to concentrate on the truth of sentences, and, in particular, not about how they would normally understand them. In addition, we gave them one example with a disjuctive implicature, and warned them that this is not what we want. The results are shown in Fig. 1, Experiment 2. As can be seen, still 32% judged the critical control item false (68% true). The results were not significantly different from Experiment 1 (all pairwise comparisons were tested with a Wilcoxon rank sum test revealing p's >.23). This indicates that in TVJT's of the G&P paradigm, test persons judge items according to what they believe to be their semantic meaning. The 32% false answers can then be explained along the

[2] We thank Bart Geurts for sending us their experimental items.

lines of (van Kuppevelt, 1996), who sees implicatures as semantic consequences of information structure.

We conjecture that the geometrical nature of G&P's test items in combination with the TVJT lowered the relevance of implicatures to such an extent that test persons were led to consider literal meaning only. We therefore performed a third experiment in which a game was introduced to participants (n = 40) with the intention to increase the relevance of SI readings. In this game, one player had to describe a picture, the other one to guess which one was meant. Test subjects then had to judge as true or false a list of complaints stating that the first player's description did not fit the picture. Test items where the same as in the G&P study. A series of Wilcoxon tests comparing the first and third experiment revealed that SI readings significantly increased in the condition with some ($p < .0001$), more than one ($p < .01$) and exactly two ($p < .05$)(see Fig. 1). This experiment confirmed our conjecture that implicatures were not relevant enough in the original G&P setting.

3 Conclusions

The study by G&P proved hugely influential. It was widely seen as experimental refutation of strong localism, and as a proof of the superiority of TVJTs over inferencing tasks for testing implicature. However, the claims need to be taken cautiously. The first two experiments reported here showed that participants in the G&P setup interpret test sentences semantically. Their paradigm shows a low sensitivity even for unembedded SIs. The third experiment indicates that this was due to the lack of contextual relevance of SI interpretations. Apart from these negative results, the experiments confirm the importance of choosing a setting in which SIs occur naturally. This is in line with previous studies, as e.g. (Papafragou and Musolino, 2003; Papafragou and Tantalou, 2004) which saw a rise of SIs when their contextual relevance was increased.

Hsiang-Yun Chen

Descriptions and Attitudes

The behavior of descriptions in attitude contexts raises serious challenges for both the traditional Russellian (e.g. Neale (1990)) and the Fregean (e.g. Heim (1991), Elbourne (2005, 2010) and Kripke (2005)) analyses. Neither analysis tells a coherent story concerning the existential import of descriptions in such constructions. More speci_cally, there are three problems| the existence problems, the projection problem and the coordination problem| that no currently available accounts can answer adequately. In order to deal with these problems, one must, among other things, give up the static semantic framework in which the traditional views are couched. Building on the work of Kamp (1981), Heim (1982), Asher (1987), and Schoubye (2011), I propose a novel, radically dynamic version of the Fregean presuppositional account that explains these problems. In so doing, I argue that descriptions in attitude contexts commit us to a level of entity representation that is in no way descriptive.

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Jonathan Cohen & Andrew Kehler

Failure-Free Extrasemantic Content

On a familiar and widely held view, extrasemantic contributions to interpretation that occur at a post-semantic stage (e.g., Gricean implicatures) can be thought of as rescue operations triggered by the threat of failure. On this view, extrasemantic contributions occur when semantic interpretation results in a content C that is underspecified, incomplete, or infelicitous (in some respect). In this situation, the thought goes, the hearer recognizes that the utterance expressing C threatens to violate some variety of grammatical, communicative, or other norm. Consequently, she engages in an extrasemantic rescue operation to (i) generate from C some distinct and norm-compliant content C', and (ii) treat the original utterance as having expressed the norm-compliant C' (rather than the norm-violating C). Disaster averted.

Despite its wide acceptance, we believe that this view ignores an important and understudied form of conveyed content that is extrasemantic, but that (unlike more familiar forms of extrasemantic content, such as implicature, impliciture, and expliciture) does not arise in an attempt to rescue utterances from any kind of linguistic or communicative failure. In this sense, the extrasemantic contents at issue are *failure-free*. Such contents are easy to spot in the following sorts of examples:

(1) a. *A jogger* was hit by a car in Palo Alto last night. (Hobbs, 1990)

b. *A rapper* was hit by a car in Palo Alto last night.

(2) a. *The drug-induced undergrad* fell off of the Torrey Pines cliffs.

b. *The well-liked undergrad* fell off of the Torrey Pines cliffs.

c. *The normally risk-averse undergrad* fell off of the Torrey Pines cliffs.

Although not entailed, the indefinite *a jogger* in (1a) strongly invites the defeasible inference that the victim was jogging at the time of the accident. In contrast, the analogous inference for (1b) – that the rapper was rapping at the time of the accident — is not normally evoked. Similarly, (2a) invites the inference that the drugs *caused* the undergrad to fall off of the cliff, while (2b) does not invite the corresponding inference that being well-liked was a cause of the falling. Further, (2c) yields a counter-to-expectation inference, leading us to be surprised that a normally risk-averse undergrad would fall off of the cliffs.[1]

What makes these cases of extrasemantic content importantly different from more familiar examples is that, while they go well beyond what is encoded in logical form, they need not be triggered by violations of linguistic (e.g., semantic, syntactic) or communicative (e.g., Gricean) norms. Nor do they result from filling a value for an otherwise unsaturated (explicit or hidden)

[1] Analogous phenomena occur in a wide variety of syntactic configurations — the effects are by no means limited to definites and indefinites.

parameter, nor a filling out of an otherwise underspecified logical form. On the contrary, standard utterances of (1a) succeed in expressing a perfectly well-formed and felicitous semantic content that does *not* require that the victim was jogging at the time of the accident. But hearers of such utterances make an inference to the latter content nonetheless.

We are currently designing a Mechanical Turk study designed to investigate the existence of such inferences; critical sentences will include examples like (3a–c) and (4a–c), each containing relative clauses that are intended to yield (a) explanation inferences, (b) no explanation inferences, and (c) violated expectation inferences:

(3) a. The airline trusted the pilot who has a spotless flying record.

b. The airline trusted the pilot who flies the nonstop from Philadelphia to San Diego.

c. The airline trusted the pilot who has a notoriously spotty flying record.

(4) a. The editor corrected the reporter who had made an obvious error.

b. The editor corrected the reporter who had written that day's lead story.

c. The editor corrected the reporter who was usually known for getting his facts right.

Participants will read passages that contain such sentences and then be asked to continue the passage by adding a next sentence to the discourse. We expect that continuations for the (a) sentences will contain relatively few causal explanations, if in fact participants infer causal explanations from the relative clauses in those cases. In contrast, we expect that continuations for the (b) and (c) sentences will more frequently mention causal explanations, because causal explanation are not inferred from the relative clauses in those examples. Finally, we expect that the continuations for the (c) sentences will attempt to address or resolve violated expectation inferences, if these are indeed invited by the relative clauses in these sentences.

We take the inferences at work in these examples to motivate a novel and more general way of thinking about extrasemantic enrichment. On our picture, the inferences we have highlighted are instances of general cognitive (not specifically linguistic) strategies for building mental models of the world. These strategies draw on not only information that is semantically encoded in heard utterances, but also general and specific world knowledge, and the results of extending the latter sorts of information by a variety of deductive and non-deductive heuristics, associative principles, and rules of inference. And, indeed, this perspective suggests that the forms of extrasemantic enrichment that have attracted the most attention from linguists and philosophers — e.g., conversational implicature — are best regarded as interesting special cases of a much more general phenomenon.

Daniel Cohnitz & Jussi Haukioja

Experimental Data and Theories of Reference

Especially since Machery et al. (2004) published their experimental results, claiming to show substantial cross-cultural variation in non-philosophers' semantic intuitions regarding the reference of proper names, a debate has been raging about the relevance of experimental data on theories of reference in philosophy. A striking fact about the recent debates is that many of the most vocal supporters of empirical methods in theories of reference (e.g. Machery, 2011; Devitt, 2011) seem to presuppose a view on which our semantic intuitions track, more or less fallibly, independently existing semantic facts. Given such a background assumption, it is unclear why experimental work should focus, à la Machery et. al, on such fallible intuitions, and not study the semantic facts directly. If the semantic facts are as independent of our semantic judgements as, say, the physical facts are of our intuitive physical judgements, why should an empirical study of semantics concern itself with our judgements any more than physics does?

We have, in previous work (Cohnitz & Haukioja, forthcoming), characterized the kind of view presupposed by Machery and Devitt as meta-externalist: on such views the truth about which theory of reference is correct for a given expression is at least partly determined by facts independent of the individual psychology of the speaker in question. We have argued that meta-externalist views cannot make sense of the role of reference in explaining successful communication, and defended an alternative, meta-internalist view. On such a view the question of whether, for example, externalism or internalism is true about a speaker's use of a proper name, is determined by some facts concerning the individual psychology of the speaker; in particular, the speaker's dispositions to use the name in question to communicate information about a particular individual, the speaker's dispositions to re-evaluate his or her use of the name in the light of new information, etc.

On this kind of a view, the facts about reference are not independent of our semantic judgements and dispositions, but rather constituted by them. In our usage of referring expressions, we are disposed to treat some word-world relation R as the reference relation: we are disposed, for example, to use a particular name to communicate information about a particular individual only when we believe relation R to obtain between them, and so on. Theories of reference, then, try to specify what relation R is, for a certain expression (or a class thereof), and for a certain speaker (or a class thereof).

If the facts about reference, and thereby the facts about which theory of reference is true, are in this way determined by speakers' referential dispositions, experimental data should be directly relevant for theorizing about reference. However, we should note that there is no immediate reason to expect untrained

subjects to be very reliable in reporting the dispositions that are constitutive of facts about reference. Hence, we should be cautious in placing too much evidential weight on the results obtained in survey-based studies, such as Machery et al (2004). More direct data about our referential dispositions could be had by other experimental means. In particular, the eye tracking methodology that has successfully been used in psycholinguistics, could also be used to study the reference of proper names and other referring expressions in philosophy of language. We will end by proposing some ways of conducting such studies.

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Erica Cosentino

The effect of contextual information on affordances and telicity in the meaning of nouns: An ERP study

Classical theories of meaning are two-step models, according to which contextual information is considered only after establishing phrase or sentence local meaning. In this perspective, local semantics cannot initially be overruled by the wider context. In this study we tested this prediction analyzing the effect of discourse context on affordances. Two-steps models predict that a verb-object violation, as in "She uses the funnel to hang her coat" will always be considered inappropriate, regardless of the wider discourse. In the current study we found that when this anomalous combination is embedded in a neutral context it elicits a typical N400, indicating that the subject is experiencing interpretative problems. However, when preceded by a supportive context, the very same sentence becomes perfectly acceptable, as reflected by the absence of an N400 effect. This finding challenges the classical approach to meaning suggesting that affordances are immediately integrated in the construction of meaning and that contextual information is immediately taken into account.

Anna Daria Drozdzowicz

Putting Heim & Kratzer in the head – compositionality and cognitive neuroscience

Despite sharing a genuine interest in natural language, formal semantics and psycholinguistics differ profoundly both in the specific questions they raise and the methods they use to address them. While formal semantics is a descriptive and conceptual enterprise aiming to explain how the meaning of a sentence is built out of the meanings of its parts, psycholinguistics, via variety of experimental methods, studies psychological and neurobiological factors that enable humans to acquire, use, comprehend and produce language.

It is an open question whether certain results obtained within the former domain can be fruitfully related to those coming from the latter one. In particular, most of the prominent theories within formal semantics operate with the notion of compositionality (Heim & Kratzer, 1998, Larson & Segal, 1999; Chierchia & McConnel-Ginet, 1990), but the notion has never been given any empirical applicability. Only recently some interest within experimental research on language has been shown in compositionality as a processing hypothesis. Those have resulted in mixed conclusions (Baggio et al., 2009; 2012; Panizza, 2012).

My talk will be a comment on the one of recent proposals of the interface between formal semantics and cognitive neuroscience of language. In a paper entitled "Grounding the Cognitive Neuroscience of Semantics in Linguistic Theory" Liina Pylkkänen and colleagues (2010) propose an account that explicitly grounds a cognitive neuroscience investigation in the framework of formal semantics. Compositionality is taken as a fundamental semantic feature and a starting point for the theoretical model to be applied in psycholinguistics. The underlying idea is that compositionality is to be exhibited in human cognition and thus might have psychological reality.

In a series of studies Pylkkänen et al. (2007; 2008) applied this methodological approach in order to identify brain correlates of the two compositionality processes: functional application and predicate modification. In order to isolate semantic composition processes from syntactic ones the authors focused on the complement coercion phrases, such as 'began the article' in 'The professor began the article', and measured brain activity using magnetocephalography (MEG) during their comprehension. The results they provided are taken to suggest that the anterior midline field (AMF) activity generated by the ventromedial prefrontal cortex (vmPFC) is the neural correlate of semantic composition (Pylkkänen, 2010).

Incredible as it may seem, I take the implementation of formal semantics in cognitive neuroscience to be a valid theoretical possibility worth further investigation. I address it in my presentation taking Pylkkänen et al.'s account as a case study. In particular, I will discuss both the explicit methodology adopted in Pylkkänen et al. and its actual application in their experiments (2008; 2010).

My task will be to unpack and assess the idea of grounding, as developed in Pylkkänen et al.'s account. After briefly presenting their framework and

results, I will rise points along three dimensions: the notion of *semantic* applied in the Pylkkänen et al.'s proposal and experimental design, the interpretation of experimental results and the idea of grounding as presented in the account.

Given the difficulties and caveats of the proposal, I will argue against this idea of grounding. In brief the argument goes as follows: formal semantics in principle cannot be falsified by claims about its psychological reality and as such cannot provide a rich theoretical framework for cognitive neuroscience of meaning.

However, this is not to say that certain claims and basic notions of formal semantics cannot be tested for psychological reality. The additional worry is that of how much of the formal semantic's treatment of meaning is preserved, once the notions it operates with are operationalized.

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Bernhard Fisseni, Benedikt Löwe & Bernhard Schröder

The Empirical Quest for Zahlendreher

We present a usage-based study of the lexical semantics (and pragmatics) of a vague term. The study clearly indicates the dependency of the interpretation on the experimental task. The investigations described here concern the German term `Zahlendreher' (ZD), which refers to an erroneous change of a number. Dictionaries define ZD to refer to a transposition of digits.

In German (as in other, mainly Germanic, languages) the order of numeral morphs in the numbers from 13 to 99 is reversed with respect to the representation in the decimal system: 23 is expressed as `dreiundzwanzig' (`three-and-twenty'), and thus the pronunciation of the number does not follow the left-to-right order of the digits in the decimal representation. The transposition of digits (ZD) for these numbers corresponds to switching between the pronounced order of digits and the order represented in the decimal notation. Some authors have made a connection between the fact that German has a specific word for this transposition error (ZD) and the relative difficulty of transcoding numbers (compared to languages without reversal).

In this paper, we shall cast a critical light on this purported connection; for one, the connection presupposes that the term ZD stably denotes the error type of transposition of digits. Starting with the “gut feeling” that ZD can also be used to refer to various other kinds of number mistakes, we wanted to see what test subjects to in a experimental situation. Of course, an experimental situation should by default give us a very conservative and “hard" denotation.

Consequently, we (a) asked test subjects to produce ZD and (b) to judge whether a certain pair of numbers constituted a ZD. All questionnaires for the judgment pairs included cases of transposed digits; some also contained reversed digits (6 ↔ 9), or number words (403/304 expressed as `vierhundertdrei' and `dreihundertvier').

The experiments were conducted with groups of students of German, and the production part was later repeated with a group of mathematicians.

The results indicate that the test subjects producing ZD where much more lenient in their interpretation of the term than those judging ZD: the latter very much preferred transpositions of adjacent digits, while the former also performed stronger digit permutations, introducing leading zeros, or even reversals of digits (6 ↔ 9).

These results would figure well with a theory of pragmatic meaning that assigns a prototypical core meaning to a term that will be adjusted to the exigencies of the task. They also show that empirical research on semantics cannot rely on a single task only.

Justyna Grudzinska

The dynamics of quantification: two-dimensional system with chains and types

In this talk I introduce a two-dimensional system with chains and types (CATS) for the interpretation of anaphoric relationships between pronouns and quantifiers. By a two-dimensional system I understand a system encompassing two layers of meaning: the level of the truth-conditional content and the level of the dynamic contributions of quantification (context). The truth-conditional component builds on the semantics for quantification in Bellert & Zawadowski (1989) and employs the machinery of chains of quantifiers (i.e., polyadic quantifiers). (Compare also e.g., Benthem, 1989; Westerståhl, 1994). To model context, elements of dependent type theories are used (e.g., Martin-Löf, 1984; Ranta, 1994). The main novelty of our system is in the essential use of types. Firstly, types play an essential role in the interpretation of language expressions, i.e., quantifier phrases (e.g. every man, …) are interpreted over types (e.g. man, …), and not over the universe of all entities. Secondly, types are used in modeling the dynamic effects of quantification, most notably (i) dependent types are used to model quantificational subordination, as observed with both cross-sentential (discourse) anaphora (e.g. Every man loves a woman. They kiss them) and intra-sentential (donkey) anaphora (e.g. Every farmer who owns a donkey beats it); (ii) discourse referents of function types are used in modeling 'functional' anaphora (e.g. Every man loves his woman. He kisses her). The linguistically important technical contribution of our proposal consists in generalizing the notion of chains of quantifiers (polyadic quantifiers) to dependent types.

By combining the machinery of chains with the tools from dependent type theories, our multi-dimensional device allows (1) to give a compositional treatment of the dynamic phenomena involving quantification, while keeping a classical, static notion of truth (as in Dekker, 2008; in contrast with Groenendijk & Stokhof, 1991; van den Berg, 1996); and (2) to capture all types of anaphora, including the notoriously difficult cases such as quantificational subordination and 'functional' anaphora.

CATS: chains of quantifiers. The language **L** of our system is many-sorted, i.e., it contains a set of types (man, woman …) and a set of variables for each type (x_1, x_2 …). Expressions of the form Qx are quantifier phrases. A sentence of **L** is an expression of the form: C $P(x_1, \ldots, x_n)$, where P is an n-ary predicate and C is a prefix of n (generalized) quantifiers, binding distinct variables $x_1, \ldots, x_n$ (as in Bellert & Zawadowski (1989), but extended to complex sentences of both the relative clause and conditional varieties). The prefixes C (i.e., polyadic quantifiers), what we call after Bellert & Zawadowski (1989) chains of quantifiers,

are formed with special operators: |, ( ), -. The semantical operations that correspond to the operators (also known as iteration, cumulation, and branching) capture in a compositional manner scope-dependent, cumulative and branching readings, respectively. A sentence of **L**, C $P(x_1, \ldots, x_n)$, is true if the interpretation of the predicate P belongs to the interpretation of the chain of quantifiers C.

CATS: dependent types. Dependent types are another key aspect of our system. If Y is a type depending on X, then for each variable x of the type X we have a type Y(x). We interpret types as sets and the fact that Y depends on X is modeled as a function p: $||Y|| \rightarrow ||X||$. So that if the variable x of type X is interpreted as an element $a \in ||X||$, the type Y(x) is interpreted as the fiber of p over a, i.e. $||Y(x)|| = ||Y||(a) = \{b \in ||Y||: p(b)=a\}$.

CATS: unbound anaphora. In order to account for some instances of unbound anaphora (most notably, quantificational subordination), we generalize the notion of chains of quantifiers (polyadic quantifiers) to dependent types. In our system, unbound anaphoric pronouns are treated as quantifiers and interpreted with reference to the context created by the foregoing text. Our notion of context builds on the tools from dependent type theories, i.e., whenever a quantified sentence is being interpreted, context is extended with type-theoretical constructs (potential quantificational domains for the anaphoric continuations to follow): (possibly dependent) types or discourse referents of function types.

CATS: some illustrations. First consider a case of discourse anaphora: Every man loves a woman. They kiss them. We represent the first sentence as $L(\forall m^M, \exists w^W)$ with m being the variable-type of men and w being the variable-type of women. This sentence (on the most natural interpretation where a woman depends on every man) translates into the translates into the **L**-sentence: $\forall m:M \mid \exists w:W\ L(m,w)$, and extends the context by adding a dependent type: m:M, $w_L:W_L(m)$. We represent the anaphoric continuation as $K(pr_m, pr_w)$, i.e., $K(\forall m^M, \forall w_L^{W_L(m)})$ (unbound pronouns are treated as universal quantifiers). This sentence receives the **L**-form involving quantification over fibers: $\forall m:M \mid \forall w_L:W_L(m)\ K(m, w_L)$, yielding the desired truth-conditions: $||W_L||(a) = ||K||(a)$, for $a \in ||M||$ (Every man kisses every woman he loves). As the type dependencies can be nested, our account can be easily extended to sentences involving three (and possibly more) quantifiers.

By combining CATS analysis of complex sentences with the machinery of dependent types, donkey anaphora can be accounted for. To illustrate, consider: Every farmer who owns a donkey beats it. The relative pronoun who is represented by a bound variable f, and the whole sentence gets represented as: $\forall f\ (O(f, \exists d) \rightarrow B(f, pr_d))$. The role of the restrictor is to add a dependent type: f: F, d_O: $D_O(f)$, and the sentence receives the **L**-form: $\forall f:F \mid \forall d_O:D_O(f)\ B(f, d_O)$. The main clause universally quantifies over fibers, yielding the correct truth-conditions: $||D_O||(c) = ||B||(c)$, for $c \in ||F||$ (Every farmer beats every donkey he owns). This analysis can

be easily extended to account for more complicated donkey sentences such as Most farmers who own a donkey beat few of them. Importantly, since we quantify over fibers (and not over the set of pairs $\langle f, d_O \rangle$ with $f \in F$, $d_O \in D_O(f)$), our solution does not run into the 'proportion problem'.

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Daniel Gutzmann & Eric McCready

Reference and use-conditions.

A multidimensional approach to referential descriptions

In his classic 1966 paper, Donnellan introduces the difference between the attributive and referential uses of definite description (a- and r-*descriptions*).

(1) **The man with a martini** is the murderer.

On the *a*-use, the (unique) individual satisfying the description's content is the murderer, whomever that may be. This contrasts with the *r*-use of the description which is used to refer to a particular person. Here, the description is used as a vehicle for establishing reference; the truth of the content of the description is secondary to this goal.However, the concrete nature of Donnellan's distinction remains unsettled (Soames 1994, i.a.). In this talk, we want to revisit it based on the progress that has been made in our understanding of different kinds of meanings. Given the reference-fixing role of the description in referential uses, together with the fact that its truth is secondary, we think it is promising explore a treatment in terms of expressive or use-conditional meanings (Kaplan 1999, Potts 2005, McCready 2010, Gutzmann 2012). Thereby we not only want to shed new light on Donnellan's distinction, but also gain insights into the communicative strategies associated with use-conditional meanings.

The basic idea is that the distinction between *a* and *r*-descriptions lies in the dimension of meaning to which the content of the description contributes. In the case of *a*-descriptions, the content is at-issue and becomes relevant for the sentence's truth-conditions. In the case of *r*-descriptions, the content is not at-issue and not truth-conditional, but imposes the use-conditions on the use of the description. To give a such multidimensional semantics, we assume that the determiner does not only apply to a noun phrase but also to a covert variable. Hence, the two types of descriptions are therefore structurally distinct. *A*-descriptions have the standard structure D(NP) and interpretation, whereas *R*-descriptions involve a covert argument: D(NP)(v). Furthermore, the NP-content is shifted from a truth-conditional into a use-conditional function. This is done by a type shifter $\star$, which serves as the translation for the referential determiner and is akin to Potts's COMMA operator (Potts 2005). After this shift, the NP-content will end up in the use-conditional dimension (behind the bullet). The *r*-description thus functions similarly to an *a*-description, except for the fact that its content is use-conditional.

(2) $\|the_{\text{ref}}\| = \lambda P.\, \star P : \langle\langle e,t\rangle, \langle e,u\rangle\rangle$ (3) $\|the_{\text{ref}}\ NP\|(x) = x : e \bullet \star\|NP\|(x) : u$

Crucially, the way use-conditional material applies to the truth-conditional argument is such that the variable remains unbound in both dimensions. This view of *r*-descriptions – a referring variable plus a use-conditional comment – makes them akin to personal pronouns and proper names that appear with appositives. Pronouns are viewed as free variables (and therefore are directly referential) which come with additional use-conditions determined by the φ-features of the pronoun (4a). Instead of features, *r*-descriptions as in (4b) have carry content

in form of the NP (shifted by *the-ref*) that comments on the variable. Cases like (4c) exhibit use-conditions as delivered by the (shifted) noun that applies to a constant argument, instead of to a variable. (From this perspective, it is no surprise that *the-ref* then has similar content to Potts's COMMA feature.)

(4)

a.	he	$[\phi_m \quad x]$	$x \bullet \mathbf{male}(x)$
b.	the linguist ∅	$[[the_{\text{ref}}\ linguist] \quad x]$	$x \bullet \mathbf{linguist}(x)$
c.	the linguist Pete	$[[the_{\text{ref}}\ linguist]\ Pete]$	$\mathbf{pete} \bullet \mathbf{linguist}(\mathbf{pete})$

In contrast *a*-descriptions do not have an individual argument and therefore should not be able to combine with an individual argument. Therefore, there is only a referential/appositive reading of *the linguist Pete*. The analysis also makes the nice prediction that *r*-descriptions, in contrast to *a*-descriptions can be stacked, which seems correct.

(5) the linguist, the semanticist, the blond one ...

From this analysis, the observed differences between *a*- and *r*-descriptions follow directly. If the content of an *a*-description does not apply to its referent (=the denotation of the variable) the sentence lacks a truth-value due to presupposition failure or, if we assume a Russellean approach, becomes false (cf. Hawthorne and Manley 2012). In contrast, the sentence involving a *r*-description is true if the referent of the variable (as resolved by the processor) falls under the denotation of the main predicate. The content of the description can only render the sentence infelicitous if it does not apply to the referent, but the variable still refers to the correct individual when reference is successful. We thus explain the pragmatic function of referential descriptions in terms of pragmatic meanings, yielding what we take to be a natural and intuitive account.

The communicative advantage of using the description in the *r*-case is twofold. First and primarily, the description may provide an extra clue to the hearer useful in properly resolving the reference of the free variable. It is often the case that the context fails to determine a referent for some pronominal; the additional content may be necessary in order to find one. Second, the speaker is able by use of the *r*-description to avoid negative consequences of using an incorrect description. In particular, consider again the example in (1). If (as Donnellan notes) the martini glass actually contains water, the descriptive content is false, but without it resolution of the variable may be impossible. But, given a use-conditional semantics for the *a*-description, the speaker has said nothing false by using (1) in such a scenario; instead, her utterance is (merely) inappropriate. Little has been said in the literature on expressive meanings about the result of 'wrong expression', but presumably it is a kind of pragmatic infelicity weaker than genuine falsehood (though see Saul 2011). While asserting falsehoods is by definition an uncooperative discourse move and a violation of Gricean Quality, conveying expressively incorrect content can sometimes be cooperative, as this example shows. We speculate that this sort of behavior is a general feature of, at least, some kinds of expressive content; we will explore this point in more detail in the full paper, but we hope that our analysis will help in understanding the nature of use-conditional content in addition to clarifying the referential-attributive distinction in definite descriptions.

Lotte Hogeweg

Suppression in interpreting coerced nouns: evidence for overspecification in the lexicon

Word meanings are flexible; the same word may have different meanings dependent on the context. This raises the question what aspect of the meaning of words is stored in our mental lexicon. Are all possible meanings of a word memorized? Is there a very basic meaning stored which is enriched in each context? Or is there perhaps a very rich meaning which can be weakened in a context?

In formal semantics, the most common assumption is that word meanings are underspecified; they have a very basic meaning which is made more precise in a context (e.g. Reyle 1993, Blutner 2004). However, this view of lexical semantics has developed independently of psycholinguistic studies on the processes that are at play during interpretation. For example, psycholinguistics studies have shown that the interpretation of ambiguous words and the interpretation of metaphors involves the suppression of aspects of meaning that are incompatible with the context (e.g. Onifer and Sweeney 1981, Rubio Fernandez 2007).

The literature on suppression seems to suggest that the activation of conceptual or encyclopedic information is not restricted by an intervening semantic representation but is activated as soon as a word is encountered and elements of this representation have to be deleted to come to a coherent interpretation of the complete utterance. In other words, these findings suggest that instead of starting with an underspecified representation to which details are added based on the context, we start with a very rich, overspecified representation from which elements are deleted based on the context.

However, the mechanism of suppression has not been investigated in contexts where compositional application takes place as for example between an adjective and a noun, while these are the contexts that are of interest for the formal views on lexical meaning that I mentioned above. In this talk, I report the results of a lexical decision-experiment that tested whether suppression takes place in the interpretation of adjective noun combinations involving metonymic type coercion like stone lion. Adjective noun combinations like these have received much attention from formal semanticists like Partee (1995, 2010) and like metaphors, coerced nouns involve a shift in the meaning of the noun. I will show that the interpretation of phrases like stone lion involves the initial activation (at 0 milliseconds) but subsequent suppression (at 400 milliseconds) of conceptual features like roars.

I will also go into the question of how we can formally model meaning composition when we assume overspecified lexical representations. I will show

that the resolution of the conflicts between semantic features that arise when rich lexical representations are combined, is not random but is governed by principles or constraints. Finally, I will discuss the possibility that particular semantic mechanisms, such as coercion but also the distinction between subsective, intersective and privative adjectives, should not be seen as semantic rules that govern interpretation but as effects that emerge from the resolution of lower level conceptual conflicts.

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Minyao Huang

Bottom-up or Top-down Context Sensitivity?

In the literature on the semantics/pragmatics interface, a distinction is often made between bottom-up versus top-down contextual effects on the proposition expressed by the utterance of a declarative sentence in a context (Recanati 2004, 2010). Roughly speaking, a bottom-up contextual effect is triggered by the semantic meaning of certain overt constituent(s) of the sentence, e.g. indexicals and demonstratives, whereas a top-down contextual effect is triggered by the need to interpret an act of ostensive communication, and not traceable to the meaning of the sentence being used. Following Recanati (2010: 18), I shall use 'modulation' to denote the pragmatically-driven mechanism that delivers top-down contextual effects, and 'saturation' to denote the semantically-guided mechanism responsible for bottom-up contextual effects. This paper argues that, in the case of observational expressions, the distinction between saturation and modulation is essentially vague.

Observational expressions are illuminating for the present study, as they seem to instantiate different kinds of context sensitivity. Firstly, the application criterion of an observational expression is often relativized to the type of objects it modifies in a context. It has been suggested that such contextual relativity shall be construed in terms of saturation (Kennedy 2007). That is, the lexical entry of the expression is taken to contain a variable ranging over types of sortally appropriate objects. Assuming that such a construal of lexical meaning is correct, with respect to 'red', its meaning could interact with, say, the meaning of 'apple', in the form of the latter's denotation (a set of apples or the property of apple-hood) saturating a variable encoded in the former, to determine the literal sense of 'red apple'. Accordingly, 'red apple' literally applies to an apple with deep-red skin. Secondly, the application criterion of an observational expression could be loosened up in suitable contexts. For instance, in a context wherein it is common knowledge that the interlocutors have red-green blindness and the communicative goal is to enable them to pick out a green apple from yellow ones, one could use 'red apple' to fulfil this goal. In this case, the contextually-relevant sense of 'red apple' results from pragmatic modulation of its literal sense. Now consider a series of apples which transition smoothly from the ones with red skin to the ones with green skin. While the uses of 'red apple' to describe the apples on the red end are clear instances of saturation and on the green end clear instances of modulation, it is unclear where the boundary lies in the series between instances of saturation and instances of modulation.

Such meta-linguistic vagueness is arguably robust. Provided that the use of an observational expression is based on casual observation, the semantic rule

governing its uses shall dictate that its use in a context does not discriminate between a pair of objects whose difference is saliently unnoticeable in the context (Wright 1975, Raffman 1994). For argument's sake, suppose 'red apple' literally applies up to ai in the apple series. In a context wherein the difference between ai and ai+1 is saliently unnoticeable, given that the use of 'red apple' must satisfy tolerance, the literal sense of 'red apple' must either be extended to a looser sense, by which 'red apple' applies to ai and ai +1, or be tightened to a stricter sense, by which 'red apple' does not apply to ai or ai +1. Either way, the literal sense is adjusted in accordance with tolerance, which is arguably encoded in the semantic meaning. If so, the adjustment cannot be an instance of pragmatic modulation, which, by definition, is unconstrained by semantic meaning. In short, modulation becomes superfluous in any adjustment of the literal sense to satisfy tolerance.

Here I consider three possible solutions to the meta-linguistic vagueness. Firstly, according to the epistemic solution (cf. Williamson 1994), there is a sharp boundary between saturation cases and modulation ones in a transitional series, but such a boundary is unknown to ordinary speakers. I argue that such a solution has the unwelcome consequence of attributing inexact knowledge of semantic meaning to a linguistic community. Secondly, according to the supervaluationist solution (cf. Fine 1975), there is a gap in the transitional series, inhabited by uses that neither are definitely semantically-governed nor definitely pragmatically-driven. However, in order to avoid higher-order meta-linguistic vagueness, the supervaluationist solution has to be amended with multiple or even infinite distinctions ranging from purely semantically-governed cases to purely pragmatically-driven ones. It is thus indistinguishable from the degree-theoretic solution to the meta-linguistic vagueness (cf. Zadeh 1965), according to which the uses of an observational expression are more or less governed by its semantic meaning. I argue that the degree-theoretic solution is supported by the fact that our meta-linguistic judgements on the acceptability of uses instantiate a smooth transition from unconditionally acceptable uses through deviant uses to re-interpretations. If correct, the degree-theoretical solution implies that the distinction between semantically-governed uses derived by saturation and pragmatically-driven uses derived by modulation is essentially graded.

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Justine Jacot & Peter Gärdenfors

Do We Speak of the Same Witch? Intentional Identity and the Meeting of Minds

Intentional identity (henceforth II) is a medieval semantic puzzle firstly developed in its modern form by (Geach, 1967). It occurs in statements containing different propositional attitudes about the same object of focus, such as:

(S_{Geach}) Hob thinks a witch blighted Bob's mare, and Nob thinks she (the same witch) has killed Cob's sow.

and in sentences expressing modal subordination such as:

(S_{MS}) John believes that someone broke into the house, and Mary believes that they stole the silver.

According to Geach, it is impossible to render the logical form of such sentences due to the presence, in an intentional clause, of an anaphoric pronoun referring to a term occurring in another intentional clause. The difficulty of the anaphora resolution is doubled by the ontological indeterminacy of the object of focus. Indeed, this object can be a fictional one as in (S_{Geach}), or an indeterminate class as in (S_{MS}). So far, the solutions proposed have been centered on the analysis of the logical form of sentences with II, trying to give a sound semantics for propositional attitudes (Edelberg, 1992), to construct the kind of mapping accurate to analyze the re-identification of individuals occurring in propositional attitudes (Hintikka, 1969; Sandu, 2006), and to get around the impossibility to translate those sentences into first-order logic (Kaplan, 1969; Pietarinen, 2001; Jacot and Sandu, 2008). Few solutions have taken into account the pragmatic conditions of assertability of such sentences, a notable exception being (Edelberg, 1986, 2006), where the author analyzes the kind of contexts of use of II sentences, and their power to explain human behavior.

We propose in this paper a new solution with a semantics based on the theory of conceptual spaces (henceforth SBCS), developed by (Gärdenfors, 2000, 2011; Warglien and Gärdenfors, 2012). Instead of viewing meaning as a match between the world and a language, SBCS is a cognitive semantics that conceives meaning as a meeting of minds, where what counts in establishing the meaning of words is the communicative acts between speakers, i.e. interaction. Meanings are construed through a social process that involves utterances in particular contexts, and generalization of meanings is abstracted from this collective effort. SBCS represents concepts as convex regions in a mental space, and meanings as points in those regions. The analysis of concepts as convex regions bears strong similarity with the prototype theory (Rosch, 1975, 1978; Mervis and Rosch, 1981; Lakoff, 1987). Prototypes represent a basic and general level of categorization, for instance the concept 'cat', between 'animals' and 'Siamese'. When we categorize objects we match them with the prototype which contains the most representative features inside the category. In SBCS, the points at the center of the convex regions are prototypes, i.e. the basic general meaning of a

word. Given the metrics of conceptual spaces, we can analyze the meaning of II terms as prototypical fixpoints in conceptual spaces–meanings whose emergence and stabilization are made possible by the interaction between speakers.

SBCS reconciles semantic as well as pragmatic accounts for II sentences, and explains the kind of inference one has to make in order to interpret them.

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Simon Kasper

Is a syntax-semantics homomorphism cognitively plausible?

In the presentation I explore the problem of the relationship between objects and events in cognition and language. At least since Chomsky (programmatically: Chomsky, 1968), linguistics has often been considered a branch of cognitive psychology, theorizing about the grammatical competence of language users and their ability to relate form and meaning. Today, many of the frameworks modeling the relationship between syntax and semantics and claiming cognitive plausibility for their theories assume one or another kind of "homomorphism" between semantic and syntactic "algebras". This assumption is expressed in, for instance, the (Extended) Projection Principle, the (Relativized) Uniformity of Theta Assignment Hypothesis, the Universal Alignment Hypothesis, Jackendoff's (2002) interface constraints, and the Linking Algorithm in Role and Reference Grammar (for overviews see Levin & Rappaport Hovav, 2005; Butt, 2006). Broadly speaking, these hypotheses, generalizations, and/or mechanisms claim a regular correspondence in the mapping between predicates and arguments on the one hand and verbs and complements on the other. Importantly, the "syntactocentrism" of Chomskyan Linguistics has made huge efforts to underpin the syntactic notions that are part of grammatical competence, notably the relationship between verbs and complements, while it has mostly neglected the semantic side to linguistic competence. A discussion of the cognitive psychological plausibility and ramifications of the relationship between predicates and arguments – ultimately reducible to the cognitive distinction between states/processes/activities (henceforth: "circumstances") and objects – has, at least to my knowledge, not taken place.

With the advent of Cognitive Linguistics, alternative views of semantic structures have arisen, adopting embodied-simulative, i.e., modality and perception-based, views on "meaning" in place of algebraic, symbol- manipulating ones (cf. Geeraerts & Cuyckens, 2007 for an overview). However, this does not always prevent cognitive linguists from employing predicate–argument structures (e.g., Goldberg, 1995).

I will point out that, if one takes the embodied-simulative perspective seriously, the assumption of a syntax–semantics homomorphism possibly misconceives the relationship between predicates and arguments (or circumstance and object concepts) on the one hand and between verbs and complements on the other, since the relationship between predicates and arguments is ontologically different from that between verbs and complements. Within the newly developed Instruction Grammar framework (cf. Kasper, 2013), utterances are conceived of as

instructions for conceptualization. Conceptualization, in turn, is in a sense simulated perception. Neurophysiologically, when events are visually perceived, the topological distribution of light waves on the retina is preserved in the neuronal structure of the subsequent processing stages (retinotopic mappings). Experiments on visual imagery show that perception and conceptualization exhibit similar neuronal activity, partially overlapping in those brain regions which also exhibit retinotopic structures (cf. Ganis, Thompson & Kosslyn, 2004). Moreover, Shepard & Metzler (1971) could show that the time required to rotate an object in terms of visual imagery is proportional to the degree of rotation − the further it is rotated, the longer it takes. These findings suggest that conceptualizing something is simulating its actual perception. As a consequence, a speaker's utterance can be conceived of as set of instructions for a hearer to incrementally assemble a concept on the basis of the incoming linguistic material, i.e., to simulate a perception of some circumstance from an utterance. This instructional character of utterances is also evident on the formal, syntactic side: basic syntactic constructions are diagrammatically iconic with respect to the structure of concepts.

Re-assessing the notion of homomorphism, a straightforward relationship between verbs and complements can be found on the formal, syntactic side. In an utterance, both verbs and complements are physical parts of the speech stream. Conceptually, they are both represented as some kind of an "acoustic image". On the semantic side (i.e., in terms of conceptual structures originating in retinal images from visual perception), however, it is hard to tell what exactly in the retinal image is to be called the "predicate" (or circumstance), and what is the "argument" (or object). What one finds, in fact, is that objects in the visual world make retinal images, and that circumstances are no more than aspects of these objects. Circumstances manifest themselves only "at" objects and never without them. Hence, while we can clearly distinguish verbs and complements in syntax, we cannot clearly distinguish an object concept from a circumstance concept. Circumstances are inherent to objects as they present themselves in perception and cognition.

For a semiotic system to be an effective means of sharing concepts among interlocutors, the inherence of circumstances within objects on the conceptual level cannot be preserved in the semiotic system. Instead, symbols must be developed that "outsource" aspects of objects in order to be able to communicate the circumstance in which the objects stand. This is where verbs, adjectives, adverbs, and prepositions arise as "concessions" to the semiotic system, which – due to its nature – is less perfect than the embodied simulations it encodes. These considerations lead to the tentative claim that the assumption of a homomorphic relationship between predicate–argument and verb– complement structures is inadequate for a cognitively plausible modeling of the ability to relate form and meaning.

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Dirk Kindermann

Content, Communication, and the Aims of Semantic Theory

My target in this talk is a conception of natural language semantics on which `the fundamental task of a semantic theory is to tell us what sentences say in various contexts of utterance.' (Soames 1989; cf. Kennedy & Stanley 2009, Kaplan 1989) I will focus on two theses implicit in this conception:

(1) The fundamental task of semantic theory is to (help to) explain communicative facts.
(2) The fundamental task of semantic theory is to map sentences in context to (informational/communicated) content (`what sentences say').

I will start by reviewing recent arguments for the conceptual distinction between `(informational/communicated) content' on the one hand, and `compositional semantic value' on the other hand (Lewis 1980, Ninan 2010, Rabern 2012, Yalcin forthcoming). Then I will argue (against thesis 1) that the conception leaves semantics' core business of explaining productivity facts unmotivated. But even granting that semantic theory should contribute to the explanation of facts about communication, I will argue (against thesis 2) that a notion of (informational/communicated content) is neither necessary nor sufficient even in simple cases of communication.

Udo Klein, Insa Röpke, Florian Hahn and Hannes Rieser

Using Parameterised Semantics for Speech-Gesture Integration

Face-to-face communication is often accompanied by gestures: Speakers point at things or shape their contours. Foundational questions arise: What is a gesture's meaning and how is it determined? And, given that speech and gesture meaning interact, how can they be fused? The issue of speech-gesture integration (SGI) has been studied in various paradigms such as Montague Grammar, HPSG and theories of Discourse and Dialogue; it is also the focus of our talk. We will demonstrate a methodology for integrating verb phrases with accompanying gestures based on parameterised semantic composition.

Figure 1: Gesture (l.) depicting a path around a pond (r.)

Our work is based on data from a systematically annotated corpus, the Bielefeld-Speech-and-Gesture-Alignment-corpus (SaGA; (Lücking et al., 2012)), which consists of 25 dialogues of dyads engaged in route descriptions. Consider the following example (cf. fig. 1). The speaker in Fig. 1 describes how to walk through a park passing a pond. While uttering *Gehst quasi drei Viertel um den Teich herum* (engl.: '(You) roughly walk three quarters around the pond (around)'), a round shape is depicted in overlap with *drei Viertel um den Teich herum*.

So far, we have developed a general methodology for SGI, abstracting from speech acts. We worked out a λ-calculus based solution for SGI (cf. Röpke et al., 2013), in which speech meaning is type-lifted to a function which takes gesture meaning as an argument and yields the integrated meaning. In this talk, we present a different approach to SGI distinguished by two key features. First, semantic content is parameterised (i.e. represented as a pair consisting of a set of parameters and a formula) and one of the basic composition principles is conjunction (cf. Pietroski, 2005) relative to a coordination scheme (cf. Fine, 2007) which identifies parameters represented by free variables. The main motivation for using parameterised content in SGI is to allow for gesture meaning to hook onto certain parameters of speech content without thereby having to change the logical type (and thus the combinatory potential) of the speech meaning. The second key feature is that the choice of the parameter that the gesture meaning specifies is determined by a context-dependent inferential process.

Parameterised composition of $[\![\, \textit{drei Viertel} \,]\!]$ and $[\![\, \textit{um den Teich herum} \,]\!]$ conjoins the two formulas and identifies the degree parameters d' and d by adding the equation $d' = d$:

$$
\begin{array}{lcll}
[\![\, \textit{drei Viertel} \,]\!] & & [\![\, \textit{um den Teich herum} \,]\!] & [\![\, \textit{drei Viertel} \ldots \textit{herum} \,]\!] \\
d' & & e, x, d, t & e, x, d, t, d' \\
d' = 0.75 & \circ & \mathsf{trajectory}(x, e) = t \wedge & = \quad \mathsf{trajectory}(x, e) = t \wedge \\
 & & \mathsf{around}(t, \imath x.\mathsf{pond}(x), d) & \mathsf{around}(t, \imath x.\mathsf{pond}(x), d) \wedge \\
 & & & d' = 0.75 \wedge \boxed{d' = d}
\end{array}
$$

(x's trajectory in event e is t, t circumscribes some pond r to degree $d = 0.75$)

The semantic integration of speech and gesture is based on inferences involving (among others) the following two principles:

(1) **Synchronicity**: $[\![G]\!]$ specifies $[\![U]\!]$ iff G is synchronised with U.

(2) **Iconicity**: If parameter p of $[\![G]\!]$ is an iconic representation of some parameter p' in $[\![U]\!]$, then $[\![G]\!]$ specifies $[\![U]\!]$.

Given that gesture G_1 in Fig. 1 is synchronised with the utterance U_1 of *drei Viertel um den Teich herum*, the interpreter infers that $[\![G_1]\!]$ specifies $[\![U_1]\!]$. By instantiating (2) in the utterance context, the interpreter also infers that if the parameter t' (the finger trajectory) of $[\![G_1]\!]$ is an iconic representation of some parameter of $[\![U_1]\!]$, then $[\![G_1]\!]$ specifies $[\![U_1]\!]$, explaining why G_1 is synchronised with U_1. The interpreter can then infer by abduction that the finger trajectory t' iconically represents some parameter t'' of $[\![U_1]\!]$, i.e. $\mathsf{iconic}(t', t'')$:

$[\![G_1]\!]$	$[\![\textit{drei} \ldots \textit{herum}]\!]$	$[\![G_1]\!] \circ [\![\textit{drei} \ldots \textit{herum}]\!]$
e', t', t''	e, x, r, d, t	$e', t', t'', e, x, r, d, t$
$\mathsf{trajectory}(\mathsf{finger}, e') = t' \wedge$	$\mathsf{trajectory}(x, e) = t \wedge$	$\mathsf{trajectory}(x, e) = t \wedge$
$\mathsf{iconic}(t', t'')$	$\mathsf{around}(t, r, 0.75) \wedge$	$\mathsf{around}(t, r, 0.75) \wedge$
	$r = \imath x.\mathsf{pond}(x)$	$r = \imath x.\mathsf{pond}(x) \wedge$
		$\mathsf{trajectory}(\mathsf{finger}, e') = t' \wedge$
		$\mathsf{iconic}(t', t'') \wedge \boxed{t'' = t}$

To conclude, we propose a novel approach to speech-gesture integration, in which the gesture denotation is determined by a context-dependent inferential process and gets integrated with the utterance denotation by parameterised semantic composition: in our example the interpreter infers that the finger trajectory in gesture G_1 iconically represents some parameter t'' of $[\![U_1]\!]$, and via parameterised semantic composition identifies this parameter t'' with the parameter t of $[\![U_1]\!]$. In our future work, we intend to compare this approach with the λ-calculus based approach to SGI, focusing in particular on how these approaches explain the fact that speech and gesture interpretation mutually influence each other.

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Corinna Koch, Alexander Thiel, Emanuela Sanfelici & Petra Schulz

On the semantics of relative clauses – evidence from a preference task with children and adults

Semantic properties of relative clauses (RCs) have rarely been studied experimentally in children and studies focussed on few phenomena in adults. Therefore this study investigates children's and adults' preferred interpretation of structurally ambiguous subject RCslike (1),addressing two questions: (Q1) What is the interpretation preference of (ambiguous) RCs in adults? (Q2) What is preschool children's most dominant interpretation pattern for (ambiguous) RCs?

(1) Nimm das dritte Auto, das rot ist. (Take the third car that/which is red.)

a. Restrictive reading: 'Take the third of the red cars'

b. Appositive reading: 'Take the third of the cars if it is red'

c. #Intersective reading: 'Take the third object if it is a car and red'

With respect to acquisition, 5-year-old English-speaking children correctly interpret that-RCs as restrictive NP-modifiers (Trueswell et al. 1999, Fragman et al. 2007). However, in restrictive double adjective constructions like Point to the second green ball 5-year-olds also prefer the deviant intersective interpretation like (1c) (Matthei 1982, Hamburger/Crain 1984).

Based on Matthei's (1982) design,18 RCs were tested with a picture-choice-task in two conditions: 6 contextually ambiguous RCs (Appendix-A), 12 RCs disambi-guated by context and prosody (Appendix-B&C). A pre-testassessed children's in-terpretation of ordinal numbers. Data are reported on 32 out of 52 children (aged 4;1-6;7, mean: 5;3) who performed at ceiling in the pre-test, and on 10 adults.

Results (Table 1 & 2) show that for contextually ambiguous RCs adults show sensitivity to prosodic cues, but prefer a restrictive interpretation over an appositive one in both prosodic conditions. Adults interpreted unambiguous restrictive RCs target-like, while unambiguous appositive RCs were answered correctly only in 56.7%,indicating a strong preference for restrictive readings (Q1). Addressing (Q2), in contextually ambiguous RCschildren prefer intersective and restrictive interpretations over appositive readingsindependent of the prosodic marking. Contextually and prosodically unambiguous RCs (restrictive, appositive) were both interpreted target-like in 38% of the cases by the children, indicating that both readings are in principle available in children at age 5. However, the 'no match' responses in the child group may result from a deviant intersective interpretation suggestingthat (non-)restrictivity in RCs is not fully acquired by 5-year-old

German-speaking children.Further research should address the nature of the dominance of restrictive readings in children and adults.

A) Ambiguous context (presented with both restr. and app.prosody)[1]:

Puppet: "Nimm das dritte Auto, das rot ist." *'Take the third car that/which is red'*

						
blue	red	Red	Red	blue	red	red
1	2	3=intersective	4=appositive	5	6=restrictive	7

B) Restrictive context with restrictive prosody[1]:

Puppet: "Nimm das dritte Auto, das rot ist." *'Take the third car that is red'*

						
blue	red	red	blue	red	red	red
1	2	3	4	5	6=restrictive	7

C) Appositive context with appositive prosody[1]:

Puppet: "Nimm das dritte Auto, das rot ist." *'Take the third car, which is red'*

						
red	blue	red	red	blue	blue	blue
1	2	3	4=appositive	5	6	7

Table 1: Responses (%) to ambiguous test items (cf.A) by prosodic condition

	Children (n=32)		**Adults (n=10)**	
Reading	**Restr. pros.**	**App. pros.**	**Restr. pros.**	**App. pros.**
Restrictive	35.4	35.4	90.0	56.7

[1] The child chooses a separate symbol if she does not find a picture matching her interpretation.

Appositive	9.4	7.3	10.0	43.3
#intersective	54.2	56.3	-	-
Other	1.0	1.0	-	-

Table 2: Responses (%) to restrictive items (cf. B) & appositive items (cf. C)

	Children (n=32)		**Adults (n=10)**	
Reading	**Restrictive**	**Appositive**	**Restrictive**	**Appositive**
Correct	38.0	38.5	98.3	56.7
'no match'	42.7	54.7	1.7	43.3
other	19.3	6.8	-	-

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Markus Kracht and Udo Klein

De Lingua Knowledge

The idea of a homogeneous language community has always been regarded as a piece of (useful) fiction. That fiction has been upheld in the theoretical debate for quite a long time. Change is overdue. While formal syntax has only recently started to discuss idiosyncratic variation ("microvariation"), in semantics and philosophy of language the existence of meaning variations has been debated for a long time (Burge (1979), Putnam (1988), see also Fleck (1980) for a precursor). It has become clear that learning the meaning of expressions is such a formidable task that subtle differences are to be expected in the outcome. Indeed, that time constraints in learning can lead to language change and language diversity has been demonstrated, see Niyogi (2006). If that is so, however, it is inevitable that communication, on all occasions, serves two incommensurable goals: one is to communicate a message and the other is to find out about each other's language. Thus communication *uses* language and at the same time *puts language into focus*. This has consequences worth exploring.

Success of Communication Standardly, for A to successfully communicate some message m by means of an utterance u means that B also takes this utterance to mean m. (See Pagin (2008) who uses the word "thought" in place of "meaning".) In virtue of the inhomogeneity of language, this sets the standards too high. There will always be—if only marginal—differences. Pagin, by the way, is happy to relax the requirement of identity to sufficient similarity. Note that according to Williamson (1996), vagueness in language is the result of meshing together millions of slightly different concepts. While concepts cannot be vague, their average is likely to be just that. If languages are actually expected to be different, it is not useful to require, pace Dummett, that interlocutors know that they speak the same language. On the contrary, very often they know that this is *not* so, as Pagin notes. But how can A talk to B when the languages they use are different? And what happens in cases when they actually *know* that this is so? In such cases we claim that what is transmitted, at least in part, is knowledge *about the language*. This information is used to form what we may call *de lingua knowledge*: knowledge about other people's language, and that knowledge can be used to enhance subsequent communication.

When Language is Topic Consider a situation where A and B are looking at some piece of paper. A says to B: "This sheet of paper is blue." Since B can see the colour of the paper, A cannot have meant to convey information about that paper. Rather, A has revealed information *about (his) language*. This is what happends when eg parents talk to children. However, it is often not clear whether what A says is taken by B to be information about the situation or whether it is used to learn about A's language. In the situation above, if B is colour blind he may use A's utterance to get information about the colour he

is seeing. Or think of A telling B something that B already knows. Then what he says can be used to reason about A's state of mind, including his language. There are in fact many such situations. Consider the case where A needs some information and says to B: "I shall check my smartphone." If B does not know what smartphones are he will find out as soon as A takes out his gadget. Or let A say to B (in German): "Dieser Film war belst gut." ("This movie was super good.") The syntactic environment of the word "belst" (superlative of "bel", meaning *evil* or *nasty*) makes it clear that it is not used in its original meaning. It is not hard for B to figure out that it was used by A as an intensifier.

Incommensurability Obviously, the two uses are incommensurable. Either the utterance lets someone learn how you speak, or it lets you tell them what you intended to say. However, that does not make the problem of communication unsolvable. It just means that one of the uses goes to some extent at the expense of the other. First, assuming that messages can be useful even if some words are missing we can extract parts of the meaning. Second, given some other information (eg the shared situation) we may be able to find out what the missing words mean. Third, once we have an inkling of their meaning we may understand the original utterance even better and have increased the knowledge of speaker's language. Therefore, using language enhances our mutual understanding and allows us to "converge". The more we talk, the easier it gets.

So, if speakers factor that problem in by lowering their expectations of communicative success, they can manage to get across as much as they want. The most they have to do is to teach their interlocutors enough of their own language. Much of teaching in schools and universities is actually devoted to doing exactly that: homogenising language across a large community of speakers.

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Kristina Liefke

Type-Logical Semantics: Insights from Language Development

Natural languages presuppose a rich semantic ontology. To provide an interpretation for, e.g., English, we require the existence of individuals (e.g. Bill), propositions (Bill walks), first- and higher-order properties (walk, rapidly), relations (find), and many other kinds of objects. Theories of formal semantics, e.g. (Montague, 1976a; 1976b), tame this ontological 'zoo' by casting its members into a type structure, and generating objects of a more complex type from objects of a simpler type via a variant of the following type-forming rule:

(**CT**) *If α and β are types, then $\langle \alpha, \beta \rangle$ is the type for functions from objects of the type α to objects of the type β.*

In this way, Montague (1976a) reduces the referents of the small subset of English from (Montague, 1967b) (hereafter, *PTQ-fragment*) to constructions out of *two* basic types of objects: individuals (or *entities*, type e) and propositions (or functions from indices to truth-values, type $\langle s, t \rangle$). Proper names (e.g. Bill) and sentences (Bill walks) are then interpreted as entities, resp. propositions, intransitive verbs (walk) as functions from entities to propositions (type $\langle e, \langle s, t \rangle \rangle$), transitive verbs (find) as functions from entities to functions from entities to propositions (type $\langle e, \langle e, \langle s, t \rangle \rangle \rangle$), etc.

Montague's distinction between entities and propositions (or between entities, indices, and truth-values) has today become standard in formal semantics. This is due to the resulting semantics' modelling power, and the attendant possibility of explaining a wide range of syntactic and semantic phenomena. However, recent findings in language development (Carstairs-McCarthy, 1999), nonsentential speech (Merchant, 2008), lexical syntax (Kim and Sag, 2005), and syntactic coordination suggest the possibility of an even *simpler* semantic basis for natural language. This basis lies in a *single* basic type (dubbed 'o'), whose objects encode the semantic content of entities and propositions. From them, objects of a complex type are constructed via a variant of the rule **CT**:

(**ST**) *If α and β are single-type types, then $\langle \alpha, \beta \rangle$ is a single-type type.*

In reflection of the observations from the previous paragraph, Barbara Partee (2009) has recently made the following claim about the linguistic type system:

Proposition (Partee's conjecture). *The distinction between entities and propositions is inessential for the construction of a rich linguistic ontology. The PTQ-fragment can also be modelled through the use of <u>one</u> basic type of object.*

In virtue of the neutrality of the type o between Montague's types e and $\langle s, t \rangle$, any semantics which satisfies Partee's conjecture (called *single-type semantics*) will identify basic-type objects with the values of proper names, sentences, and complement phrases. As a result, it will also assign the same type, $\langle o, o \rangle$, to common nouns, complementizers, and sentence adverbs. The types of all other ex-

pressions are obtained by replacing the labels 'e' and '$\langle s,t\rangle$' by 'o' in their associated Montague type.

This paper investigates the range of empirical evidence for Partee's conjecture and models this evidence by providing a single-type semantics for the PTQ-fragment. In this way, we yield a number of insights into the semantic ontology and the type system of natural language. In particular, we observe the following:

1. The possibility of interpreting proper names in the type for sentences suggests the identification of the single basic type o with the type for propositions, $\langle s,t\rangle$. This type enables the truth-evaluation of proper names in a given situational context, and enables the identification of semantic equivalence relations between names and sentences, cf. (Merchant, 2008).

2. The specification of an e-to-$\langle s,t\rangle$ type-shifting function (for the 'lifting' of traditional name-referents to propositions) identifies new representational relations between different types of Montagovian objects. Since these relations extend the set of relations from flexible Montague grammar, cf. (Hendriks, 1990), they widen the empirical scope of Montague semantics.

3. To identify a name's sentential equivalents (cf. 1), we need to constrain the interpretation of single-type PTQ translations via non-lexical meaning postulates. Since these postulates are formulated in the language of IL, our single-type semantics does not obviate the use of Montague types.

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Andy Lücking

Eclectic Semantics for Non-Verbal Signs

Semantics, at least in linguistics and philosophy, deals nearly exclusively with the meanings of words and sentences. However, in natural language discourse speech seldom comes alone, but is accompanied by gaze, gestures, facial expressions, and the like. These non-verbal communication means contribute to the meaning of the whole discourse (Enfield, 2009; Fricke, 2012; Lascarides and Stone, 2009). This in turn implies that (1) non-verbal means have some meaning, and (2) that these non-verbal meanings interacts with verbal meaning. Both issues have to be dealt with in semantics (in a multimodal semantic interface). Since non-verbal signs cannot be assumed to meet the symbolic, arbitrary, and grammatical characteristcs of words and sentences *a priori*, we propose a general approach that can be called *eclectic semantics*. The advice of eclectic semantics is discipline-crossing in nature: a basic non-linguistic understanding of the non-verbal means under discussion can be obtained from the respective individual sciences. Based on this understanding, a link to linguistic meaning has to be found (for instance, by invoking a framework around the notions of grounding or embodiment). Finally, the semantic integration between linguistic and non-linguistic signs has to be modeled within a linguistic framework.

In order to give an example for this rough sketch, we focus on co-verbal, iconic gestures (Kendon, 1980; McNeill, 1992). The semantic significance of iconic gesture is not like that of words (Lücking, 2012). In particular, iconic gestures have to be treated as *non-denotative* signs (Posner et al., 1997, 2553-4). A philosophical account for non-denotative signs has been developed by Goodman (1976), namely in terms of *exemplification*. But how can such non-denotative signs be linked to current linguistic theories of grammar and discourse? We propose an eclectic semantics, that rests on philosophical reasoning, linguistic modelling and psychological research. In particular:

1. It is argued that gestures can be treated ontologically as events according to the metaphysical framework of Lombard (1986).

2. The gesture event is constituted by biological motion and as such belongs to the domain of visual perception and can be analyzed in terms of vector sequences (Johansson, 1973).

3. Sets of vectors are needed as denotations of (at least) locative PPs and path shape verbs in model theoretic semantics (Zwarts, 1997; Weisgerber, 2006).

4. Thus, vector representations can be used as a starting point for linking "the theory of language and the theory of vision", as has been envisaged by (Jackendoff, 1987, 90).

This eclectic background can partly be brought together within a unification-based grammar framework like HPSG (Sag et al., 2003). Exemplification can be modelled as the matching – i.e., unifyiability – of the meaning (intension) of verbal predicates and gestures represented as movements in terms of vectors or vector sequences.

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Emar Maier

Fictional Names in Formal/Cognitive Semantics

Introduction. Given its dependence on the notions of truth and reference, formal semantics has a fundamental difficulty dealing with fictional names:

(1) Odysseus was set ashore in Ithaca while fast asleep.

Since *Odysseus* doesn't denote anyone, (1) is neither true nor false, by compositionality. This Fregean view fails to do justice to our truth value intuitions. We often consider such sentences true, and certainly (1) is "more true" than its negation. Lewis (1978) suggests a neat semantic solution: interpret fiction utterances as if prefixed with an invisible modal operator, "in all worlds compatible with the contextually relevant story,. . . ".

I want to address two fundamental objections against this now standard semantics of fiction. First, it is incompatible with the standard semantics of proper names as rigid designators. If names have no intension, their reference/meaning is not affected by embedding under modal operators, so (1) would never even express a proposition.

Second, consider a metafictional utterance like (2):

(2) Odysseus is a fictional character

If anything, (2) is even more clearly true than a purely fictional sentence like (1). Yet, the empty name requires the use of Lewis's invisible operator, which gets the wrong result: in the Odyssey-worlds, Odysseus is clearly *not* fictional.

Cognitive Semantics meets Formal Semantics. I propose to simply accept that in an objective, truth conditional sense ("wide content"), (1) does not express a proposition, let alone have a truth value. I conclude that we need to really consider some kind of *subjective meaning* ("narrow content") to analyze fiction. Instead of capturing objective truth conditions we should use formal semantic tools to try and make sense of what goes on in the mind of a reader interpreting fiction.

In linguistics there already is a growing movement called Cognitive Semantics that purports to do something like that: study interpretation as a process of building mental representations, inspired by work in AI and cognitive psychology. However, I want to avoid going the radical way of Cognitive Semantics, as it is rather quick to dismiss *all* achievements of formal semantics, along with its most basic assumptions (e.g. compositionality) and the rigor of logical formalization.

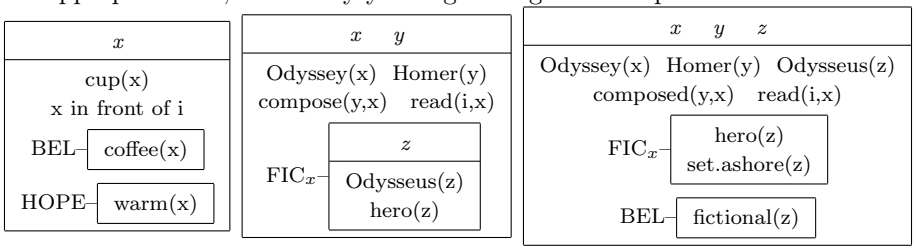
I defend a middle position: use the linguistically motivated, dynamic semantic framework of Discourse Representation Theory (DRT) as a means for representing both (narrow) mental and (wide) truth conditional levels of meaning uniformly. Although it is now mostly neglected by formal semanticists, the psychological aspect of DRT was actively developed in the 1980's by Asher, Kamp and others. Moreover, it fits rather well with the Mental Files framework that has been gaining popularity with philosophers of language and mind (cf. Jeshion 2010, Recanati 2013). I will to explore an analysis of fiction in such a DRT account of "subjective meaning."

Representing mental states in DRT. The idea behind the Kampian approach is that we can model mental states with the same tools that we use to model discourse interpretation in dynamic semantics. More specifically, mental states are (i) compartmentalized into beliefs, desires, intentions, etc. each represented by a DRS-like structure, but (ii) these compartments are highly interconnected. The latter aspect is modeled by their sharing of discourse referents. The shared discourse referents are grounded in "entity representations", roughly corresponding to what philosophers have called dossiers, or mental files.

Concretely, the first box below represents the attitude I have when I see a cup in from of me, containing what I believe to be coffee, which I hope to be still warm. Notation: i denotes the self; the top level DRS contains the entity representations; the embedded levels carry labels specifying the mode of attitude the agent has toward the proposition so labeled.

Fiction as a mode of attitude. I propose that interpreting fiction means storing the information in a compartment similar to, but separate from other attitudes like hopes and beliefs. Thus, in the second diagram, FIC_x labels the information gathered from interpreting text x, e.g. that there is someone named Odysseus, who is a hero.

The crucial feature of attitude complexes is that they rely heavily on globally accessible shared files. This is precisely what we need to capture metafictional utterances like (2). To accommodate those I assume that, on encountering a fictional proper name, the agent creates a global Odysseus file that can be shared across the various attitudes. The difference between such a fiction-based file, and a file that is "externally anchored" (via acquaintance) to an actual individual, matters for the wide proposition expressed by sentences like (1)–(3). But, crucially, the presence or absence of external anchors matters little for the mental life of the individual herself: as far as cognitive interpretation is concerned, the Odysseus file functions rather like the Homer file. The process of updating her mental state upon interpreting with a metafictional utterance like (3) thus proceeds as with a referential name, i.e. by linking the name with the appropriate file, eventually yielding the rightmost representation.



In sum, traditional formal semantics has fundamental difficulties with fictional and metafictional statements. I show how we can use DRT to model a cognitive perspective on interpretation and communication that handles both fiction and metafiction, without sacrificing the idea of modeltheoretic conception of meaning.

Marta Maleczki

The meaning of there in existential sentences and the logic of natural languages

0.Introduction

From a broader perspective, the aim of the linguistic investigations presented here is to find a way from a seemingly purely linguistic problem to the logic (or logics) of natural languages. From a narrower perspective, the talk intends to give an explanation to the definiteness effect in existential sentences. The connection between the two purposes is the meaning of the non-locative there: I will argue that its contribution to the meaning of existential sentences can be given by a three-place permutator function, which is known as **C** combinator in combinatory logic. Thus the lexical meaning of the there element cannot be considered an ad hoc, model-dependent meaning characteristic to the non-logical constants of the lexicon, but it is similar to that of logical constants, which play a key role in defining the logical structure of a language. The linguistic outcome of grasping the meaning of there in this way is that the widely studied, but still mysterious definiteness effect will follow without any stipulation. This will be shown in the first part of the talk. The theoretical consequence of this analysis of there is that we might make a step toward discovering the nature of the logic of natural languages if we explore the status of the **C** combinator, and, more broadly, the role of combinators and combinatory logic in the structure of natural languages. This will be the topic of the second part of the talk.

1. The meaning of there in existential sentences

The semantic content of there-sentences is usually not stating the mere existence of the entities denoted by the DP (called pivot nominal), as it happens in the case of sentences containing the exist predicate, but to relate these entities to a more restricted or specific domain of entities than the universe (cf. Moltmann 2013). Thus, there-sentences containing an explicit locative PP seem to be the prototypical instances, and they will be the type of data the present analysis is based on:

(1) There are at least two hedgehogs in the garden.

The rough structure of this sentence-type is shown in (2):

(2) there are DP PP_{loc}

If we assume that the denotation of a locative PP can be considered a set of points (as defined e.g. in Zwarts and Winter 2000), and we describe the semantic structure of (2) by the relational structure the generalized quantifier approach

offers to us, then the denotational structure of (3) with respect to a given world w' can be grasped as shown in (3):

(3) there are $\|\text{Det}\|^{M,g,w'}$ $\|\text{N}\|^{M,g,w'}$ $\|\text{PP}_{loc}\|^{M,g,w'}$ = there are D A B

where D is the relation expressed by the determiner of the pivot DP, A is the denotation of the bare noun occurring in the pivot nominal (a set of entities in w'), and B is the denotation of the PP_{loc} (also a set of entities in w').

The open question is the syntactic and semantic role of the there (are) part of the sentence. A main claim of this talk is that the semantic interpretation of the there in existential sentences is a special argument-permuting function known as combinator C in combinatory logic (see in Hindley et al. 1972, among others), definable by lambda-terms as in (4):

(4) **C**FAB= $\lambda f\lambda a\lambda b[f(b)(a)]$

Applying this combinator to the denotational structure given as D A B above, we get (5):

(5) $\lambda f\lambda a\lambda b[f(b)(a)]DAB = \lambda a\lambda b[D(b)(a)]AB = \lambda b[D(b)(A)]B = DBA$

This means that the interpretation of there is simply a function operating on another function (the determiner of the pivot DP) in a way that it changes the order of its two arguments. The result is that the interpretation of (1) will be roughly equivalent to (6):

(6) At least two entities in the garden are hedgehogs.

In this way the definiteness effect occuring in existential there-sentences is not to be stipulated as a constraint: it is simply **derivable** from the fact that the semantic arguments of the determiner should be interchangeable (recall that the application of the combinator **C** does not affect the truth-conditions of sentences). Sentences in (1), (6) and (7) are truth-conditionally equivalent:

(7) At least two hedgehogs are in my garden.

This equivalence in meaning is guaranteed only in the case of symmetric (or, equivalently, intersective) determiners. The obligatorily symmetric property of the determiner simply follows from conservativity: this, being a universal property of the determiners, should remain valid after the application of C as well. This means that the determiner should also be anticonservative. So the symmetric property of the determiners in existential sentences (stipulated by Barwise and Cooper 1981) simply follows from the meaning of the there and the conservativity property of natural language determiners.

2. Remarks on the logic of natural languages

It can be reasonably supposed that the semantics of natural languages has some logical structure in the sense that valid semantic inferences follow patterns of a special logical system. For instance, if it turns out that adding a new premise to a set of sentences has some effect on the conclusions that could be drawn from the

original set of sentences, then the logic of natural languages is supposedly not monotone. Or if some contradictions are tolerated in natural languages without resulting in triviality, then we might assume that the underlying logic of natural languages is paraconsistent. And so on. The underlying logic also depends on where we draw the borderline between semantics and pragmatics; that is, what kind of inference types is considered semantic, and what pragmatic in nature. Two things are, however, very clear. The one is that lexical meaning is part of natural language semantics. The another is that there are lexical units in natural languages which can be dealt with on a par with logical constants of logical languages, and these by no means are restricted to the well-known connectives and quantifiers (see e.g. the **W** combinator as the meaning of reflexive pronouns in Szabolcsi 1989). It is important that **C** is to be restricted to the lexicon, because if it were set free, this would result in permutationally closed languages, which is clearly not the property of natural languages. From the fact that **C** may be present in the lexicon, but cannot be set free as a constructive combinator we suspect that its presence, place, etc. varies from language to language. For instance, **C** might also be present as a lexical rule (working on some specified set of categories) in natural languages where both SVO and OVS word orders are possible variants of a sentence, with no difference in truth-conditions. In general, **C** might be present in languages whenever the change in some ordering does not affect the truth-conditional meaning of sentences.

In sum, the discovery of lexically given logical constants (e.g. in forms of combinators) in natural languages may give us a good starting point for finding the underlying logic(s) of natural languages. Combinatory logic may provide us a useful tool not only when we try to give compositionally and truth-functionally transparent descriptions for (fragments of) natual languages. The types of possible combinators may also help us in discovering the implicational system(s) natural languages may have in common (or differ in).

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Shen-yi Liao and Aaron Meskin

What's the Matter with Aesthetic Adjectives?

The nature of ordinary and expert aesthetic discourse is of central concern to philosophical aesthetics. In a series of studies, we investigate one crucial component of aesthetic discourse: the use of aesthetic adjectives. The vast majority of aesthetic terms (e.g., „beautiful", „ugly", „pretty", „dainty") are gradable adjectives. That is, they admit of comparative constructions and degree modifiers such as „very" and „extremely". Linguist Chris Kennedy (2007) has argued that there are two distinct categories of gradable adjectives: relative gradable adjectives such as „tall", „long" and „fat" which are context sensitive and absolute gradable adjectives such as „straight", „bent" and „full" which "are demonstrably gradable but do not have context dependent interpretations". Semantic data (i.e., patterns of entailment) suggest that many positive aesthetic adjectives such as „beautiful" are relative gradable adjectives and, hence, context-sensitive.

Our experimental results complicate the standard account in two ways. First, we found that, contrary to extant semantic data, aesthetic adjectives in fact do not function like paradigmatic relative gradable adjectives. Second, we found that aesthetic adjectives resist the existing classification scheme altogether because they do not function like paradigmatic absolute gradable adjectives either.

Our experiments are based on a paradigm, the Presupposition Assessment Task, developed by linguist Kristen Syrett that was used to test children‟s understanding of gradable adjectives (Syrett et al. 2006, 2010). Participants were presented with pairs of stimuli and asked to pick out the long one, the spotted one, the straight one, or the beautiful one. In this task, the „the" construction is alleged to presuppose existence (that there is at least one object satisfying the adjective) and uniqueness (that there is at most one object satisfying the adjective). With paradigmatic relative gradable adjectives, such as „long", participants typically comply with the request to pick out the object satisfying the adjective. With paradigmatic absolute gradable adjectives, such as „spotted" and „straight", participants typically refuse the request. For example, when presented with two rods that are bent to different degrees, participants typically refuse to pick out the rod that is straight because uniqueness is violated. On this experimental paradigm, the respective patterns of compliance and refusal allow us to identify a gradable adjective as either relative or absolute.

In the first study, we replicated Syrett's results with adults in an online setting.[1] 97.4% of participants complied with the request to pick out the long object. In contrast, only 17.9% of participants complied with the request to pick out the straight object (where existence is violated) and only 10.3% of participants

[1] 40 participants recruited from Amazon Mechanical Turk. 19 female. Median age = 27.

complied with the request to pick out the spotted object (where uniqueness is violated). We found no gender or order effects with any adjective.

However, in this study we also found that 43.6% of participants complied with the request to pick out the beautiful object amongst two male faces (fig. 1). When we compared patterns of compliance and refusal between the adjectives tested, it turns out that ordinary people use „beautiful" very differently from „long" (X2 (1) = 54.384, p < .001, Cramer's V = .590), but also from „straight" (X2 (1) = 7.510, p = .006, Cramer's V = .253) and from „spotted" (X2 (1) = 13.173, p < .001, Cramer's V = .336). These results suggest that aesthetic adjectives, such as „beautiful", do not function like either paradigmatic relative gradable adjectives or paradigmatic absolute gradable adjectives.

To show that the earlier results are not merely products of some quirks with „beautiful" or the particular stimuli used, we conducted a second study with the same experimental paradigm plus some modifications.[2] Instead of „beautiful", we tested „ugly". We also used a range of stimuli from different domains: persons (female faces with different levels of asymmetry), artifacts (sports cars in different stages of restoration), and natural objects (sunflowers in different stages of life). Again, we used „long" as our paradigmatic relative aesthetic adjective, and „spotted" as our paradigmatic absolute aesthetic adjective.

We observed the same kind of results as before when we compared patterns of compliance and refusal between the adjectives tested. With persons as stimuli, ordinary people used „ugly" differently from „long" (Fisher's exact (2-sided)[3], p = .029) and „spotted" (X2 (1) = 24.742, p < .001, Cramer's V = .637). With artifacts as stimuli, ordinary people used „ugly" differently from „long" (X2 (1) = 6.853, p = .009, Cramer"s V = .309) and „spotted" (X2 (1) = 28.474, p < .001, Cramer's V = .625). With natural objects as stimuli, ordinary people used „ugly" differently from „long" (X2 (1) = 19.208, p < .001, Cramer's V = .531) and „spotted" (X2 (1) = 12.093, p = .001, Cramer's V = .419). These results again suggest that aesthetic adjectives do not function like either paradigmatic relative gradable adjectives or paradigmatic absolute gradable adjectives.

A second phase of the same study revealed another way in which aesthetic adjectives do not function like paradigmatic relative gradable adjectives or paradigmatic absolute gradable adjectives. Recall that in the first phase, we asked participants to pick out the ugly (or long or spotted) object from each pair of stimuli. In the second phase, we asked participants to compare each pair of stimuli. Specifically, participants are asked to choose from: Object A is more ugly (or long or spotted) than Object B, Object B is more ugly (or long or spotted) than Object

[2] 40 participants recruited from Amazon Mechanical Turk. 11 female. Median age = 25.5.

[3] We used Fisher's exact test because the minimum-expected-cell-count assumption of Pearson's chi-square test is not met in this instance.

A, Neither object is ugly (or long or spotted), and Both objects are equally ugly (or long or spotted). If the participants chose one of the latter two options, then we counted them as refusing to even make the comparative judgment between the stimuli. We then used participants‟ comparative judgments to make sense of their selection judgments. So, one clarification is in order. In the analysis above, we have excluded participants who refused the request to pick out the ugly (or long or spotted) object and who also refused to make the corresponding comparative judgment.[4] Once we include these participants, the patterns of responses with "ugly" appear even more dramatically different from the patterns of responses with paradigmatic relative gradable adjectives and paradigmatic absolute gradable adjectives. Some people simply refused to make comparative judgments with „ugly".

We explore a range of possible explanations for our data including: ambiguity, category-specific thresholds, semantic indeterminacy, and the relevance of the difference in degree to which objects possess relevant properties. At present, the data we have does not support any specific hypothesis, but we are engaged in follow-up studies which should provide useful data.

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[4] Obvious nonsense responses, such as picking Object A to be the ugly one but judging that Object B is uglier than Object A, are also excluded.

Guillermo Montero-Melis

A data-driven approach to comparing semantic similarity of event descriptions across languages

A fundamental question in cross-linguistic semantics is to what extent languages systematically differ in the information they convey about the same events. Methodologically this is a problematic question since it is difficult to compare meanings across languages. It thus easily becomes a subjective matter to decide whether and to what extent the meaning of expression x in language A is equivalent to that of expression y in language B. Essentially we lack a reliable *tertium comparationis* to determine meaning equivalences.

A way to overcome this problem is to take a distributional perspective on meaning, where the meaning of an expression (e.g. a word) is defined by the set of contexts in which it occurs (Harris, 1954). From this perspective, two expressions are similar if they occur in similar contexts, and conversely, two contexts are similar if they are described with similar words. In order to compare what aspects of reality are encoded in different languages, we hold the contexts constant and compare the patterns of word occurrence across languages (e.g. Majid et al., 2008). This insight allows for an essentially data-driven approach to meaning, and a wide array of statistical tools used in the field of natural language processing become available. While this method does not directly tell us anything about the inherent meaning of an expression, it is very well suited to determine meaning similarity (Wälchli and Cysouw, 2012). Crucially, it allows us to answer the question above: to what extent do languages differ in the aspects of reality they convey?

This study applies the ideas above in an experimental setting to the domain of caused motion events, that is, events in which an agent causes an object to move (e.g. 'he pushed a chair into the cave'). The two languages in focus are Swedish and Spanish, a satellite-framed and a verb-framed language respectively according to Talmy's two-way typological distinction (Talmy, 2000, 2007). Swedish and Spanish contrast in the way motion events are typically described, both in terms of what information is conveyed and by what syntactic means.

Eighty participants (40 native speakers of Swedish and 40 native speakers of Spanish) carried out a verbal production task. Each participant described 32 video stimuli consisting of short animated cartoons that showed a human-like agent displacing an object (Hickmann and Hendriks, 2010). Three factors were crossed in the video stimuli: the manner in which the agent moved the object (two levels: pull/push), the manner in which the object moved (two levels: roll/slide), and the path followed by the agent and the object (four levels: up/down/across/into).

Analyses are based on the vector space model (e.g. Berry et al., 1999; Manning et al., 2008). Each video clip is represented as a vector in two distinct vector spaces, one for each language. The question of whether Swedish and Spanish make the same semantic distinctions is thus reduced to comparing the relative similarity between vectors in each of the two vector spaces. The results point to semantic distinctions that are largely common to both languages, such as the path followed by the agent and the object, and the manner in which

the agent causes the object to move. However, interesting cross-linguistic differences arise regarding the granularity of the semantic distinctions, as well as the relative weight given to these categories, with Spanish speakers showing a tendency to omit the manner component in some cases. Furthermore, speakers of Swedish tend to be more consistent in their semantic distinctions while we observe a greater variation in Spanish.

The approach adopted is methodologically innovative for this area of research, in which studies typically rely on the investigator's semantic coding of expressions *before* analysis, leading a) to a subjective component in the analyses, and b) to considerable data reduction. Instead, here we draw from techniques in computational linguistics and natural language processing to capture the patterns that arise directly from the experimental data. The results will be discussed in the light of earlier studies, highlighting advantages and limitations of this methodological approach.

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Sonja Müller

How the linguistic context influences the acceptability of the order of modal particles in German

This talk is concerned with the combination of modal particles (MPs) in German. (1) illustrates that MPs can in principle combine.

(1) (i) Frag **doch ruhig!** (ii) Wir kennen uns **ja doch** so lange.
Ask MP MP We know us MP MP so long
'Don't hesitate to ask!' 'But remember, we have known each other for such a long time.'

However, (2) and (3) show that those combinations are severely restricted. Constraints have been formulated that, on the one hand, concern the conditions that regulate which MPs can combine at all (cf. (2)). On the other hand, restrictions concern the question in which order the MPs can combine (cf. (3) [and (1)]).

(2) *Wen hat Peter **denn ja/ ja denn** angerufen?
Who has Peter MP MP/MP MP called
'Who did Peter call?'
(3) (i) *Frag **ruhig doch**! (ii) *Wir kennen uns **doch ja** so lange.

Accounts concerned with the restrictions on the relative order of MPs (cf. (3)) range from mere classifications (cf. Helbig & Kötz 1981), the formulation of descriptive generalisations (cf. Thurmair 1989), semantic/pragmatic criteria (e.g. assertive force [cf. Doherty 1985], illocutionary weight [cf. Abraham 1995]), syntactic conditions (e.g. scope relations [Rinas 2007], input conditions [Doherty 1985]) and information structural criteria (de Vrient et al. 1991) to phonological (Lindner 1991) and historical (Abraham 1995) argumentations.

Focussing on the combination of ja and doch (cf. (1) (ii) and (3) (ii)), I will argue that the (putatively) fixed order of ja and doch is an **iconic reflex** in grammar. By referring to new authentic material I collected myself as well as the results of a rating experiment (see below), I will argue that the order ja doch presents the unmarked order, but that linguistic contexts can be found in which the reversed (marked) order doch ja is attested and acceptable.

I will suggest a discourse-semantic analysis which integrates the MP description by Diewald & Fischer (1998) and Diewald (2007) into the formal model of discourse developed in Farkas & Bruce (2010). My analysis traces the difference in markedness between the two orders of ja and doch back to discourse

structural requirements which have been assumed to hold in communication independently. In particular, I will claim that ja refers to a "stable context state" (terminology by Farkas & Bruce 2010) whereas doch refers to an unstable state. As discourse partners aim at reaching a stable state (cf. also Farkas & Bruce 2010), I will claim that the order ja doch fulfills this aim in the most direct way. According to my analysis, the order doch ja is therefore allowed in those contexts in which reaching this aim is not the primary goal of the speaker. I will show which linguistic material systematically goes together with the order doch ja (namely a) emphatic assertions, b) epistemic modalisations, c) subsidiary (causal) illocutionary acts). I consider this co-occurence as support for my analysis.

The analysis which is developed on the basis of corpus data (Cow Corpus, cf. Schäfer & Bildhauer 2012) is supported by the results of a rating experiment. 70 German native speakers were tested (judgements on a five-point scale) on ja doch and doch ja in standard assertions and illocutionarily interpreted causal clauses (ocurring at the end of a context). My analysis makes the prediction that the unmarked order ja doch cannot be reversed in standard assertions ([-wh], V2, falling intonation), but that it can be reversed in denn-clauses which give reasons for making particular speech acts more easily. Table 1 shows the arithmetic means for all experimental conditions.

context / order	ja doch	doch ja
standard assertion	2,44	1,86
illocutionary causal clause	2,51	2,28

Table 1. arithmetic means

The results were analysed by subjects and by items using a repeated measures anova procedure (assuming that the data are interval-scaled, cf. e.g. Rietveld & van Hout 2005: 135ff. on calculating anovas with judgement data of that sort). The main effects for "context" ($F1(1,69) = 10,24$, $p < 0,01$; $F2(1,14) = 21,28$, $p < 0,001$), "order" ($F1(1,69) = 44,04$, $p < 0,001$; $F2(1,14) = 64,33$, $p < 0,001$) and the interaction of "context" and "order" ($F1(1,69) = 7,71$, $p < 0,01$; $F2(1,14) = 11,39$, $p < 0,01$) are statistically robust. Post hoc comparisons using the Scheff・-test ($p<0,05$) indicate that:

- ja doch is judged better in standard assertions than doch ja is in standard assertions
- ja doch is judged better in illocutionary causal clauses than doch ja is in illocutionary causal clauses
- doch ja is judged better in illocutionary causal clauses than doch ja is in standard assertions Although I am definitely dealing with subtle differences here, the statistical analyses reveal that there is not only the simple difference between the orders ja doch and doch ja, but that it is also "order depending on context"

which is relevant for the differences between the mean judgements. The experimental results thus support the analysis which I sketched above.

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Joanna Odrowaz Sypniewska

A contextualist semantics for vague assertions and disagreement

The standard objection against content-contextualist theories of vagueness is that they make genuine disagreement impossible (see e.g. Keefe 2007). Truth-contextualism can account for genuine disagreement, but it has been argued (Greenough 2005) that it makes permissible (faultless) disagreement impossible, where permissible disagreement is disagreement that concerns borderline cases of vague expressions (see Wright 1995, Kölbel 2003).

I'll argue that the speech act which consists in uttering "Philip is tall" when Philip is clearly tall and the speech act which consists in uttering "Philip is tall" when Philip is borderline tall are not the same speech act and have different contents. The content of the former speech act is such that it allows for genuine disagreement, while the content of the latter is such that although it does not permit genuine disagreement, it does allow for permissible disagreement.

My solution rests on an analogy with predicates of personal taste such as "salty" (i.e. such taste predicates with which we associate common standards of applications). I argue that when we predicate saltiness of a clear case of e.g. salty water our ascription "The water is salty" means roughly that the water is salty simpliciter ("absolutely", whatever the context), not just salty for us. In such a case disagreement over saltiness would be genuine. On the other hand, if the water is merely salty-ish, but we are asked to decide whether to call it "salty" or not, and – after some hesitation – we say that it is salty, the content of such a speech act is just that that the water is salty is true relative to the given context. We've decided to treat this assertion as true for the purpose of the conversation at hand, but we do not mean by this that it should be regarded as salty in all contexts. We say "The water is salty" but what we really mean is that the water is salty-according-to-us (in the given context), not salty "absolutely".

"Salty" is a personal taste predicate but it is vague as well. I suggest that we interpret normal everyday usage of all vague predicates (such as "tall", "rich" etc.) in the same manner. That is for every vague predicate F, when someone takes a to be a clear case of F-ness and says "a is F", his utterance says that a is F simpliciter ("absolutely", whatever the context), whereas when someone takes a to be a borderline case and says "a is F", his assertion says merely that a is F-according-to-him (in the given context). My solution weds context-contextualism with truth-contextualism. The view proposed is partly content-contextualism because it argues that the content of a given vague predicate changes with the cases in the sense that it is different for clear and borderline cases. Truth-contextualism is needed because it explains why the change of content

occurs at different places in different contexts. Moreover, the content of vague assertions is such that in order to evaluate assertions concerning clear cases circumstances of evaluation consisting of pairs <world, count-as parameter> are needed, whereas to evaluate assertions concerning borderline cases one needs circumstances consisting of a world, count-as parameter and the speaker.

The content of all assertions concerning clear cases is the same, which makes room for genuine disagreement in such cases. As far as borderline cases are concerned, the property that A ascribes is not the same property that B denies, so it might be objected that in such cases there is no disagreement after all. However, we may appeal here to the arguments used by Lopez de Sa (2007: 276) in his defense of a certain form of moral contextualism. Namely one can argue that when we apply predicates such as "salty", "tall" or "bald" to their borderline cases, we presuppose that others are similar to us and this presupposition gives rise to the expectation that they will judge borderline cases in a similar way. If the expectation is not fulfilled, the appearance of disagreement arises. Strictly speaking the assertions „a is tall" and „a is not tall", where a is a borderline case of tallness, are not contradictory, but due to the presupposition that their utterers are relevantly similar and to the expectation that they should judge borderline cases in a similar way, such assertions will be regarded as conflicting.

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Cathal O'Madagain

Beyond Intentions and Conventions: Shared Beliefs and Linguistic Meaning

There are at least two things that an effective theory of meaning needs to be able to account for. First, the meanings of our words seem to vary with great sensitivity to context of use. Second, in spite of this flexibility, there are limits to the ways in which words can be effectively used. Theories of meaning divide loosely into accounts that give a good explanation of the flexibility of meaning and its sensitivity to context, but fail to provide limits to the ways in which words can be used, and those that give a good account of the limits of meaning but fail to account for its flexibility. Thus, we have 'intentionalist' accounts that hold that the meaning of a word is fixed as whatever its speaker intends it to mean, and easily account for the flexibility of meaning (Grice 1957, Travis 2008, Recanati 2010). But since it is not obvious that there is any limit to what I can intend my words to mean, these accounts are criticized for failing to set any limits to the meanings words can have. Hoping to account for these limits, others propose that what a word can be used to mean is determined by social conventions (Searle 1969, Lewis 1970, Borg 2002, Cappellen and Lepore 2004). But the conventionalist approach has a hard time, in turn, accounting for the flexibility explained by the intentionalist: as soon as the conventionalist claims to have identified a rule set in place by convention, the intentionalist manages to identify an effective use of language that defies the convention.

Most theorists at this point hold that some combination of speaker intentions and social conventions can be established to account for the flexibility and limits of meaning. I argue here that such hybrid models do not remove the difficulties that face intentionalist and conventionalist proposals, since the division of labor between intentions and conventions is largely split along the lines of classes of terms. Some hold, for example, that conventions govern all words except for demonstratives like 'this' or 'that', whose meaning is fixed by speaker intentions (King and Stanley 2005). But there are limits even to the meanings that demonstratives can have (I can't point at a flower pot in front of me, say 'this', and refer to the moon), so assigning one class of terms as governed purely by speaker intentions doesn't really handle the problem of the simultaneous flexibility and constraints that we find in meaning. All classes of terms exhibit both flexibility and limits. The same objection can be presented to any other hybrid view.

Here, I explore an alternative approach. I argue that it is neither speaker intentions nor social conventions that determine the meaning of our words, but the extent to which a speaker shares beliefs with her audience about her intended

meaning in any context. Since a speaker can be wrong about the extent to which her beliefs match those of her audience, this account constrains meaning in a way the intentionalist cannot; but since a hearer's beliefs about a speaker's linguistic intentions can update with far greater sensitivity to context than any version of conventionalism, the account accommodates the flexibility insisted on by the intentionalist. This marks an appeal to return the notions of score-keeping (Lewis, 1979) or pragmatic presupposition (Stalnaker 1974) to centrality in the debate about linguistic meaning.

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Walter Pedriali

What Compositionality Could not Be

Compositionality is standardly taken to be a non-negotiable constraint on a semantics for natural language. The most often cited motivation in support of the compositional constraint is the need to explain what is taken to be a basic datum about linguistic competence, namely, the open-ended nature of linguistic understanding. Competent speakers of a language, that is, are taken to be able to understand indefinitely many novel sentences in the language. The only explanation available, it is then argued, is that speakers compute complex meanings on the basis of their knowledge of constituent meanings. A compositional semantics is thus taken to be eo ipso a theory of understanding (or more weakly, to provide the privileged basis for such a theory).

In my paper, I use the case of so-called semantically aberrant sentences to argue that the creativity/productivity considerations are in fact incompatible with the bottom-up determination of complex meanings built into a compositional explanation of linguistic understanding, as well as with another key constraint on a semantic theory, namely, learnability.

I will argue that in the case of sentences where genuinely novel meaning combinations are instantiated, the evidence from language change phenomena shows that the lexicon will typically require re-setting of the thematic structure of the lexemes involved following their embedment in a novel linguistic context. I will argue that this establishes that, contrary to the productivity considerations, linguistic understanding is not unbound and that meaning–determination is in fact a top-down affair.

I will conclude that the semanticist will only have three options: a) to renounce the claim that linguistic understanding is unbound, or b) to renounce the claim that there is a sufficiently robust connection between providing a semantics for natural language and giving a theory of linguistic understanding, or c) to adopt a radically minimal (i.e. highly schematic) conception of truth conditions. Only in the latter case can the productivity considerations be retained as a motivating reason in favour of compositionality.

Claudia Poschmann

Does position really matter? Testing acceptability and interpretation of appositive relatives with quantified heads

Abstract

This talk presents the results of two experiments in German investigating the acceptability and interpretation of (plural) non-restricitive relative clauses (NRCs) with quantified heads. Contrary to standard assumptions (Del Gobbo 2003, Nouwen 2007), the position of a NRC does not significantly affect its acceptability or its anaphoric possibilites. As we will argue this observation does not only give interesting insights into the nature of NRCs, but might have far reaching consequences for existing dynamic approaches to plural anaphora in discourse.

Background

Based on contrasts such as (1), Del Gobbo (2003) concludes that NRCs are ungrammatical if attached in subject instead of object position.

(1) Del Gobbo (2003)

a. *Most students, who were late, came to the party. (subject)

b. They invited most students, who arrived very late. (object)

Nouwen (2007), by contrast, argues that the position of an NRC does not affect its grammaticality but its interpretation. According to Nouwen (2007), both sentences in (1) are grammatical, but differ in interpretation. In (1)b, the NRC can refer to the intersection of restrictor and scope of the quantification (ref-set reading), giving rise to an interpretation according to which all of the invited students arrived late. In (1)a, by contrast, such a ref-set reading is unavailable. The NRR can only refer to the maximal set of all students in the discourse (max-set reading), which leads to a contradiction. Whereas the matrix clause implicates that most but not all students came to the party, the NRC tells us that all students (in the discourse) arrived very late at the party.

A simple explanation for this contrast could be that at the time of evaluation of the NRC in (1)a, the intersection of restrictor and scope of the quantification is not yet specified. In fact, this is quite what one would expect following standard theories to plural discourse anaphora. In DRT for example, the reference set (the intersection of restrictor and scope of a quantifier) is made accessible by a separate process called ”abstraction” only after the quantification is evaluated (Kamp/Reyle 1993). Similar predictions are made by the more fine-grained dynamic approach of

Nouwen (2003). According to this approach, quantifiers introduce two separate indices (sets of assignments), one denoting the max-set and one denoting the ref-set. Whereas the max-set index is available in sentence-internal position, since presupposed, the ref-set index is defined only after the intersection of restrictor and scope of the quantification is evaluated.

An exception to this generalization o↵ers the account of Brasoveanu (2010), which assumes that quantifiers introduce DRT-like discourse referents for their max-set and ref-set. These discourse referents can be made available for anaphoric reference even before their content is specified. Contrary to standard assumptions, Brasoveanu (2010) would hence predict that a ref-set reading of the NRC in (1)a should be available. Note that no such prediction is made for anaphora in restrictive relative clauses, which would lead to over generation with respect to standard handbook examples such as (2). Unlike appositive relatives, restrictive relatives contribute to the scope of the quantifier, which leads to a circularity problem as soon as reference is made to the restriction and scope of the quantifier.

(2) Most lawyers hired a secretary they liked. (Kamp/Reyle 1993:322)

To differentiate between these highly developed approaches, it would thus be interesting to decide whether the ref-set reading in (1)a is indeed missing or only less salient.

Experiments

We recruited 106 native speakers of German via online-questionnaire (survey monkey). The questionnaire consisted of two parts: In a first step we tested the general acceptability of (plural) NRCs with quantified heads (test-items) in subject position compared to their singular counterparts (wrong fillers) and the respective restrictive relative clauses (correct fillers). In this part, the test-items were designed to be neutral with respect to a possible max-set or ref-set reading. Contrary to Del Gobbos assumption, the test-items rated nearly as high (4.02 on a scale form 0 to 5) as the corresponding correct fillers (4.26) and significantly higher than wrong fillers (0.72). Only 3 out of 106 participants rejected all the test-items they were confronted with (ratings below 3).

In a second step, we tested the availability of ref-set readings depending on the NRC's position in the matrix clause (intern versus final) and the strength of the head's quantifier (strong versus weak). Therefore, we presented the NRCs in contexts, in which a max-set reading was explicitly ruled out. The participants were asked to judge, whether the story was acceptable or clearly contradictory. If the participants didn't get the ref-set reading, they were expected to judge the context as contradictory. The following is an example for the condition with strong quantifier and sentence internal position of the NRC.

(3) Das Lego-Set City umfasst über 300 Steine **verschiedener Farben und Grössen**, unter anderem für eine Poststelle und eine Polizeistation. Die meisten Steine, **die natürlich alle rot sind**, gehören zu einem Feuerwehrhaus.
The Lego Set City includes more than 400 bricks of **different colour and size**, for examplefor a post office and a police station. Most bricks, **which are of course all red**, belong to a big fire station.

Whereas we found a significant effect of the quantifier's strength (WEAK OR STRONG), we didn't find any effect of the position of the NRC in the matrix clause (INTERN OR FINAL). Although conditions with strong quantifiers rated significantly lower than those with weak quantifiers, their overall acceptability was surprisingly high (the relative frequency of accepted ref-set readings was 0.9 for strong quantifiers versus 0.98 for weak quantifiers). Moreover the comments the participants were invited to give whenever they judged a context as contradictory revealed that many participants didn't even realize the availability of a competing max-set reading. This strongly suggests that the tested ref-set-reading is not only an effect of a post -semantic repair strategy (as suggested by Nouwen (2007) with respect to similar readings of nominal appositives). Especially, since we got very fine-grained contrasts of monotonicity and discourserelations, which otherwise would probably have been blurred.

Conclusion

Neither the grammaticality nor the semantic interpretation of an NRC is affected by its position in the matrix clause. We will argue that this contradicts standard assumptions about NRCs as well as standard theories of plural anaphora. As an outlook, we will sketch very briefly how Brasovenau (2010) can take account of this observation without over generating with respect to other standard handbook examples.

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Camilo Quezada, Carlos Cornejo & Vladimir Lopez

The impact of the physical features of objects in the semantic representation of novel words: an N400 study

The semantic representation of words is arguably one of the most complicated problems for Cognitive Science. In the Cognitivist tradition, word meaning was assumed as symbolic, amodal, and "encapsulated" (Fodor, 1983), but there is no doubt that these assumptions have been called into question both by theory-based modeling proposals (Rumelhart & McClelland, 1986) and by empirical research conducted within Neuroscience (Nieuwland & Van Berkum, 2006, Hagoort et al, 2004). Other approaches (Barsalou, 1999, Taylor et al, 2011, Borghi et al, 2011) claim that language is strongly tied to the perceptual system, allowing for an embodied account of meaning. In this presentation we intend to approach the problem from an often overlooked angle: the linguistic sign itself. Based on Saussure´s notion of "associative relations" (1916/1959) and the "physiognomic" nature of symbols proposed by Werner & Kaplan (1963), an attempt was made to explore how two different-shaped objects can impact on the semantic expectations of a single novel word arbitrarily linked to both objects. The main hypothesis of the study is that linguistic signs can and do interact with concrete entities in the world and that this interaction modulates linguistic, "symbolic" associations.

An experiment was conceived to test this hypothesis. Participants were assigned to 2 groups (n= 46, evenly distributed in two conditions). In the first one, participants were asked to blindly manipulate, feel, and later on visually inspect the object X. In the second group, participants were asked to do the same with object

Y. After inspecting both objects (which were very rare and not likely to have been ever encountered before), participants in both groups were given the same written text in which the objects were described and assigned the same noun (a pseudoword generated ad-hoc for the experiment). The text was highly technical and described both objects as being part of a sophisticated mechanism used for industrial purposes. Once the text had been read, participants were presented word-pairs on a screen, primes being pseudowords followed by real Chilean-Spanish words as targets. Participants were asked to discern whether the target word had been mentioned in the text they read. The same task was performed in three differently randomized blocks to explore the decay of the expected ERPs in time. Three kinds of targets were used: words mentioned in the text, words congruent with object X, and words congruent with object Y.

Effects were found in the latency and amplitude of the N400 component in target words in both conditions of interest, especially in electrodes located in the central region. The point will be made that the meaning of a plausible novel noun

can interact both with other words and with concrete objects in the world, which allows words to dynamically shape their semantic content by establishing links both with linguistic signs and non-linguistic entities.

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David Rey

Analogical Thinking in Formal Semantics

I am interested in the contrast between two models of formalization within the tradition of formal semantics. The first model accounts for shifty phenomena by positing different kinds of intensional operators at the level of logical form. On this model, the semantic contents assigned by a semantic theory are neutral with respect to certain parameters –e.g. the world and time of evaluation. The other model uses variable-based logical forms and minimizes the postulation of parameter-neutral semantic contents.

Early Montagovian theories formalized tenses and various modal locutions as intensional operators acting on sentential formulas (see Montague 1974, Dowty et al. 1981). Despite the influence of Montague's pioneering work, the last four decades of research in formal semantics have been characterized by a paradigm shift towards the variable model. The Davidsonian analysis of event reports was a first step in this direction (see Davidson 1967). Another key step was a paradigm switch in the study of tense. The starting point of this line of research was the structural parallel between pronouns and tenses discussed in Partee 1973 (see also her 1984, section 2). During the eighties and nineties linguists progressively gathered a powerful body of evidence against operator-based analyses of tenses and other temporal devices[1]. The alternative treatments proposed by most theorists working in this area involved covert variables ranging over times or events. More recently, a number of theorists have argued that the parallel between pronouns and tenses extends to the realm of modality (see Stone 1997, Schlenker 2006, and Schaffer 2012). They have thus advocated a symmetric treatment of pronouns, tenses, and modals. This line of thought can be rationally reconstructed as an argument for world/time specific contents:

(I) Pronouns, tenses, and modals exhibit strikingly similar behaviors

(II) We must look for a uniform semantic account of pronominalization, modality, and tense [supported by **(I)**]

(III) Pronouns are the analogues of variables in natural language

(IV) We must dispense with modal/temporal operators and opt for variable-based treatments of tense and modality [supported by **(II)** and **(III)**]

(V) On standard variable-based accounts, the semantic contents of sentences are world/time specific

[1] References to the relevant literature can be found in King 2003, pp. 215-219, and Kusumoto 2005, pp. 321–333.

Conclusion Semantic contents are world/time-specific [supported by **(IV)** and **(V)**]

The aim of my talk will be to analyze the structure and dialectical status of this argument. As it can be seen, the argument relies on analogical considerations in order to favor one of the two models of formalization that I described before. I will argue that the behavioral similarities mentioned in premise **(I)** do not speak by themselves for or against any of the two models in question. Such similarities can also be seen as motivating a symmetric treatment of pronouns, tenses, and modals along the lines of the operator model. There are two main reasons why the possibility of a unified operator treatment has been discarded in the literature: **(a)** variable-based theories of tenses are believed to be empirically superior to any possible variant of the operator model; **(b)** it has been assumed that the operator model cannot be plausibly extended to pronouns. After critizicing claim **(b)**, I will outline a sophisticated operator-based approach to tense and modality that will allow me to shed doubt on claim **(b)**. This approach differs from standard operator treatments in postulating predicative intensional operators rather than sentential operators.

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Michael Richter & Roeland van Hout

The use of semantic associations for the classification of verbs

Are human semantic associations related to the classification of verbs? In order to give an answer we chose a small test set of 35 diverse verbs predominantly taken from Schumacher (1985) that cover the complete semantic range of his typology. We will discuss four theory dependent classifications: (1) the classification presented by in Schumacher (1986) who used concrete semantic properties of verbs, and three theory based classifications that use the more abstract semantic properties of verbs, viz. aspect and transitivity properties, (2) a Vendler (1967) inspired classification, (3) a classification using Dowty's (1991) conceptions of prototypical thematic roles of verbal arguments and (4) our own classification of five verb classes which builds on the conception we presented in Richter & van Hout (2010) and which fuses Vendler's and Dowty's models.

In addition, we used three empirical data sets. The first consists of raters' associations/judgments on the semantic similarities between verbs from our test set of 35 verbs. The other two data sets in our study are corpus based similarity values from the co-occurrence data bank (CCDB) of the "Institut für deutsche Sprache" in Mannheim (data provided by Cyril Belica) and similarity vales values taken from the implementation in Fürstenau (2011) (data provided by Hagen Fürstenau who calculated the similarity of verbs by comparing their dependency structures (graph alignment)).

It came to light that the classifications based on the human associations and on the IDS data can be explained to a substantial degree by the models using abstract semantic properties of verbs. If associations of raters confirm this classification we may conclude that human unconsciously use abstract semantic properties in forming verb classes. Using a vector space model we found indeed that the human associations are almost perfectly consistent with the classification in Richter & van Hout (2013) in at least three out of the five verb classes, that is, states, accomplishments and accomplishments with an affected subject. Not as consistent but still highly consistent as these classes are achievements since some members of this class are associated with different verb classes. Not confirmed by human semantic associations is the small class of activity verbs. At sum we draw the conclusion that semantic associations reflect aspectual and transitivity properties of verbs, to a fairly high degree.

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Martin Schäfer

Semantic transparency of compounds and the semantics/pragmatics boundary

This paper discusses to what extent empirical data on and models for the semantic transparency of compounds allow to meaningfully reasses the question of the boundary between semantics and pragmatics in compound noun interpretation. In the study of compound nominals, the question of the semantic transparency of compounds and the question of the semantic analysis of compounds have usually been discussed independently. Semantic transparency is a property of a compound in relation to its constituents, either viewed in terms of meaning predictability or, less strict, in terms of relatedness of the contituents' meaning to the meaning of the whole compound. Measures of semantic transparency are often based on pencil and paper tests, cf. e.g. Libben et al. (2003). In contrast, discussions of the place of semantics and pragmatics in compound interpretation are typically based on introspection (cf. e.g. classic studies such as Levi (1978) and Fanselow (1981)). The general problem is how to deal with the fact that English and German endocentric NN compounds allow for multiple, contextsensitive interpretations, cf. e.g. the well known contrast between *olive oil* and *baby oil*, where the former is usually taken to mean *oil made from babies* and the latter *oil for babies*, but where clearly context allows the corresponding other interpretations (e.g., *Using baby hatches to provide the raw materials for the production of baby oil is universally despiced*). As shown by Downing (1977), even ad-hoc usages, e.g. *baby oil* and *olive oil* used to refer to oil bottles with pictures of olives and babies on them respectively are perfectly possible. One position to account for these possibilities is to assume that what the semantics gives us for NN compounds is nothing more than an existentially quantified variable over relations, where it is the job of pragmatics to provide the exact relation (cf. e.g. Levinson (2000, 147)). While a purely pragmatic account for the ad-hoc usages discussed by Downing seems unavoidable, the status of relations like *made of/for* in the semantics of compounds is not so clear: For one thing, *made of* and *for* occur in almost any standard compound classification, and it has been shown that the semantic relations between compound constituents are predictors of e.g. the stress assignment in English NN compounds (cf. e.g. Plag et al. (2008)). Thus, they seem at least to present useful generalizations at some level, though which level that is is still an open issue. While late 70ties generative semantics treatments like Levi (1978) placed both relations as underlying predicates in the semantics, authors like Fanselow (1981) describe the *made of* relation as a basic relation, whereas the *for* relation only superficially emerges from looking at the stereotypes associated with either the first or the second constituent. In contrast, if one considers the generative lexicon approach (Pustejovsky, 1995), then clearly both relations would be generated from the interaction of the qualia structures of the two nouns, and therefore again fall into the domain of semantics.

In this paper, I discuss the link between semantic transparency and the semantic relations and its implication for the place of these relations in the language system. The empirical basis for the discussion are the two papers **?** and Bell and Schäfer (2013). The first paper provides experimental semantic transparency ratings for 90 English compounds and discusses a number of distributional semantic models for these ratings, while the second paper builds on the first paper's data and adds semantic annotations to the compounds and then builds regression models, again with semantic transparency as the dependent variable. While being severely limited due to the size and the high degree of lexicalization of the dataset, the second paper shows that two semantic relations, *in* and *for*, survive as predictors in a model of the semantic transparency of the whole compound. While thus again proving the general usefulness of these semantic relations, the key question in this talk will be in how far being a) a predictor for semantic transparency of a compound and b) being a semantic-based predictor can be used to determine the place and status of these semantic relations in compound noun interpretation on the semantics/pragmatics continuum.

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Pragmatic Processing and the Truth-Value Judgment: Exploring the Processing Cost of the Scalar Implicature in an ERP study.

In this paper we present results of our experiment in which we use electroencephalography (EEG) to investigate how people process the scalar implicature *nicht alle* (*not all*) of the German quantifier *einige* (*some*). Scalar implicatures are results of *pragmatic* inferences that are based on the so-called *Maxim of Quantity*, i.e. the principle that a speaker should contribute to a conversation by providing an appropriate amount of information. Accordingly, a sentence *Some As are B* implicates that *Not all As are B*, since a speaker should rather say *All As are B*, if she knew that such an informationally stronger statement was also true. We adopted a sentence-picture verification paradigm to examine event-related potentials (ERPs) that are associated with a violation of this implicature. We were particularly interested whether such a violation elicits an N400 or a P600 effect, i.e. the amplitude difference between the EEG signals in the compared conditions recorded roughly 400/600 ms after the onset of the stimulus, respectively. The former effect is known to be linked to a recognition of a semantic incongruence in language (Kutas & Federmeier, 2011), the latter has been recently suggested to reflect a general reprocessing of the stimulus (Hagoort, 2003). It has been shown that both effects can in principle be elicited by a pragmatic violation (Chevallier at al., 2010), (Niewland, Ditman & Kuperber, 2010).

Previous studies (Niewland, Ditman & Kuperber, 2010), (Noveck& Posada, 2003) have focused on the N400 effect triggered by a pragmatic infelicity of the use of the quantifier *some* in so-called underinformative sentences, e.g. *Some people have lungs* compared to informative sentences, such as *Some people have pets*. Whereas the first sentence is semantically true (there are people who have lungs) but pragmatically infelicitous (since all people have lungs), the second one is both true and pragmatically felicitous. In those sentences, in which the truth-value can be evaluated in reference to a person's world-knowledge, the semantic expectancy of the critical predicate depends not only on the pragmatic felicity of the use of the quantifier but also on the lexical-semantic relationship between the subject and the predicate, measured by the frequency of their co-occurrence in the contexts. This relationship is usually stronger in underinformative rather than in informative sentences. Although the infelicity of the use of the quantifier in underinformative sentences is expected to elicit a higher N400 compared to informative sentences, this effect might be balanced out by the relatively stronger lexical-semantic relationship in the underinformative sentences. Thus, our purpose in using a sentence-picture verification paradigm was to dissociate the process of implicature calculation from world-knowledge-based or semantic memory-based sentence evaluation and record ERPs elicited by pragmatic violations that are based on short-term memory. By gathering truth-value judgements we also aimed at measuring individual differences in

implicature processing that depend on subjects' more logical or pragmatical reasoning profiles.

We measured 54 (28 women) neurotypical right-handed German native speakers (mean age: 24.2, SD: 4.4) using a 64 channel BrainAmp acticap EEG recording system. They were also screened for their working memory (digit span test). Sentences of the form *Some/All pictures contain Cs*, with C being a critical noun and denoting a target object, were evaluated with respect to arrays of 5 pictures. Each array contained two different types of objects: one occurring in each of the pictures, the other occurring only in 2 or 3 of the pictures (see Figure 1). Subjects were first presented with the beginning of the sentence, then the pictures, and after that the critical noun, which determined the logical truth and the pragmatic felicity of the sentence. The ERPs were measured at the onset of the critical noun.

Figure 1: Time-course of the experimental trail

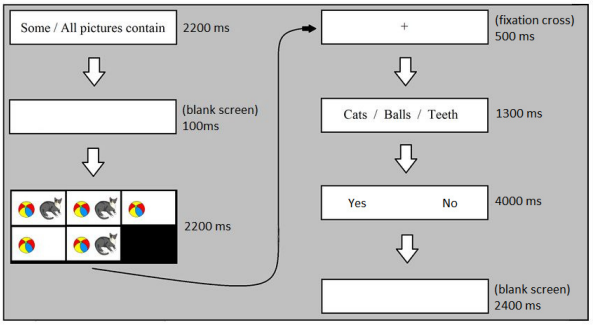


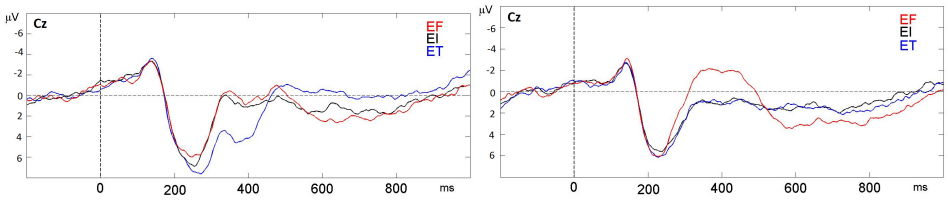
Table 1: Truth-conditions for each quantifier

Quantifier	Balls	Cats	Teeth
Some	EI	ET	EF
All	AT	AF	AF2

There were three truth-conditions for each of the two quantifiers. For the quantifier *some* these were: *true and felicitous* (ET), *true and infelicitous* (EI), and *false* (EF). For the quantifier *all* there was one *true* condition (AT), and two *false* conditions: when the critical noun was primed by the pictures (AF) and when it was not primed ($AF2$) (see Table 1).

The analysis of subjects' truth-value judgements revealed that our participants were divided into two groups: those who more consistently (at least 70% responses) accepted the quantifier *some* in the infelicitous case (N=28, "logicians") and those who rejected *some* in this condition (N=26, "pragmatists"). This result is consistent with the data reported in the literature (Bott & Noveck,

Figure 2: Grand averages for all three conditions for the quantifier *some*



(a) *Pragmatists* (b) *Logicians*

2004).

In order to determine significance as well as latency (onset and offset) of the N400 and P600 effects, we conducted a re-sampling procedure, i.e. the cluster-based permutation test (Maris & Oostenveld, 2007). This procedure revealed that in sentences with the quantifier *some*, the critical words elicited more negative ERPs in the *infelicitous* condition (EI) compared to the *true* condition (ET) ($p < .001$) in the time window of $262 - 438$ *ms* post-onset (EI/ET N400 effect). This effect was followed by a significant (EI/ET) P600 effect ($502 - 626$ *ms*, $p < .01$). A similar effect was obtained for the comparison between the *false* (EF) and the *true* (ET) conditions for *some*: an N400 effect followed by a P600 effect ($p < .0001$). A significant N400 effect was obtained also for the comparison between conditions EF vs. EI ($p < .0001$), but there was no P600 effect in this case. Comparable effects were obtained for the quantifier *all*.

The most interesting results come from our follow-up analysis indicating that "pragmatists" and "logicians" showed different effects (Fig. **??**). The "pragmatists" got a significant EI/ET N400 effect, followed by a significant EI/ET P600 effect, whereas the "logicians" had no significant effects for this comparison. An independent t-test revealed that the EI/ET N400 effect was significantly larger for the "pragmatists" than for the "logicians" ($t(39.727) = 3.459, p = .001$). Moreover, there was also a significant correlation between the behavioral responses (percentage of pragmatic responses) and the size of the EI/ET N400 effect ($r = .434, p = .001$). Additionally, there was a correlation between subjects' working memory value and the size of the EI/ET P600 effect in the frontal area ($r = -.296, p = .030$).

The results of our experiment confirmed the hypothesis that the violation of a scalar implicature can elicit an N400 effect similar to the N400 effect in standard semantic violations. In the case of a clear semantic violation (falsity) a typical N400 effect was observed (EF vs. ET) for the whole group of subjects and for both subgroups separately. However, in the case of pragmatic infelicity (EI vs. ET) the N400 effect was dependent on subjects' (behavioral) evaluation of the underinformative sentences: the pragmatic interpretation of the quantifier *some* correlated with the size of the (EI/ET) N400 effect. The correlation of the EI/ET P600 effect with working memory is especially interesting as it suggests

that in this case the P600 might reflect not only a truth-related reprocessing (evaluation of a sentence as false) but also some kind of pragmatic reprocessing that is less effortful for subjects with larger working memory span.

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Andreas Stokke & Torfinn Huvenes

Discourse-centrism

Discourse---centrism is the view that, first, contexts consist of information that can be fully characterized in terms of the attitudes of the conversational participants, and second, that this kind of context is all we need to theorize adequately about context---sensitive languages. Versions of this view have been defended by a number of theorists, most prominently by Stalnaker, 1978, 1998, 1999, 2002, and underwrites many approaches to the study of natural languages, such as dynamic semantics.

We argue that Discourse---centrism, understood in this way, is false. In particular, we argue that the informational conception of context is insufficient for certain purposes. These are, first and foremost, making adequate predictions about truth and reference. Briefly, the problem is that if the reference of words like he, she, that, this, here, now, etc. are solely fixed by information that is characterized by the attitudes of the participants, there is no way of avoiding making wrong predictions in some cases. In particular, there will be cases in which the Discourse---centrist theorist predicts one referent, and hence one set of truth conditions, while the intuitively correct referent, and hence truth conditions, are different.

Several possible strategies for adequately theorizing about truth and reference from with a Discourse---centrism framework are considered. The Discourse---centrist theorist may propose to define contexts in terms of information that uniquely characterize the facts, she may appeal to information characterized in terms of a special kind of belief or presupposition, or in terms of what is known by the participants, or she may appeal to centered information of various sorts. We argue that all of these strategies either fail to give the right results or constitute an abandonment of Discourse---centrism itself.

We conclude that to account adequately for truth and reference from within a Discourse---centrist framework, we need a richer notion of context than has typically been employed by such theories.

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Tuukka Tanninen

The Origins of Epistemic Two-Dimensionalism, and its Problems

Chalmers (2006) and Schroeter (2012) date the dawn of two-dimensional approaches in modal semantics to the late 70's and credit Jackson (1998) and Chalmers (2002) as the originators of the so-called epistemic two-dimensionalism. I argue that the main ideas behind this framework were introduced by Jaakko Hintikka in his Models for Modalities, a collection of essays published in 1969. Hintikka's view has been either ignored or misconstrued (e.g. in Stalnaker 1972), perhaps because Models for Modalities contains some papers in which Hintikka's two-dimensional technique is underdeveloped and far from clear. My aim is to clarify these ideas and their history and to discuss the problems of the epistemic two-dimensional approaches. I also evaluate the possibility to unite different approaches for even more fine-grained account – a point of interest for those who embrace the Jackson-Chalmers framework.

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Daniel Tiskin

Two Kinds of Modal Scope

It is well-known that propositional attitude reports like (1) containing quantifiers typically exhibit two readings. One of them, called *de re* (2), requires there to be an individual in the actual world that is the object of the belief, while for the other one, *de dicto* (3), it suffices that there be, in any of the agent's alternatives, a satisfying individual for the proposition (no specific individual is required, as well as its existence in our world).

John believes that someone has stolen his manuscript. (1)

$$\exists x \mathrm{B}_j S(x, m(j)) \tag{2}$$

$$\mathrm{B}_j \exists x S(x, m(j)) \tag{3}$$

In my paper I argue, however, that this scope distinction is not the only one that is relevant for belief reports. Recalling the distinction between the *priority scope* and the *binding scope* of a quantifier made in (Hintikka, 1996), we may distinguish between the priority scope and the *interpretational* scope of a doxastic operator. I will present two arguments in favour of my position, one empirical and one philosophical.

The **empirical argument** proceeds as follows. Consider for the proper name *Kyoto*:

John believes that Kyoto is the capital of Japan. (4)

Here a similar *de dicto*/*de re* ambiguity arises, but there is also the third reading of (4): imagine that, although John has been to both Tokyo and Kyoto and knows *de re* which one is the capital, he is confused about names and calls Tokyo *Kyoto*. In this case John's belief can be characterised *true* at least in a specific sense. So, the utterer of (4) may intend the name *Kyoto* either in her own interpretation, "taking responsibility" for its denotation, or in John's. Therefore I say that the belief operator introduces not only a new possible world but also a new *available interpretation* whose use is nevertheless not obligatory. This phenomenon does not seem to obtain for (5) which is usually taken to be a paraphrase of the *de re* reading of (4).

As for Kyoto, John believes that it is the capital of Japan. (5)

The question may arise why not treat "irresponsible" readings as quotations. My answer is that, strictly speaking, one need not hear John say *Kyoto is the capital of Japan* to be justified in uttering (4): John's belief may be inferred otherwise. What does happen, however, is a "language-shift" where "the words ... are interpreted as belonging to the 'language' (idiolect) of the source" (Recanati, 2008, 452). We might as well dub it "potential quotation" or even "*de dicto* in another sense" which amounts to being "faithful to how the believer himself would express his beliefs" (Fine, 2007, 92).

The **philosophical argument** rests upon the idea that one and the same possible world can be described in different words, given that the doxastic agents diverge in their ways of using terms. One could in principle treat such divergences as different possible worlds, but this would violate our intuitions. (In fact that seems what (Parikh, 1999) did and what resulted in a neat and consistent formalism which, unfortunately, mixes up "words and worlds": when an agent acquires a new linguistic entity—with no new evidence about the world!—her accessible worlds multiply in order to represent new possible states of affairs.) Facts about (co)reference are not facts about the world.

Here we see that the interpretation shift mentioned above extends beyond proper names, involving, e.g., evaluative predicates. It would be extravagant to suppose that Mary has evidence quite distinct from that available to us merely if (6) is true.

Mary believes that roses are not beautiful. (6)

The first intuition about (6) is just that Mary's view on what counts as beautiful is different from ours. So even if she is absolutely certain that she is in our actual world, her description of it would be different. In my eyes this shows that in belief reports, one has properly to distinguish between diverging beliefs (different sets of worlds accessible to the agents) and diverging language uses.

So we conclude that the usual scope of a belief operator (the one that determines the possible world we find ourselves in while evaluating the formula) and its interpretation-introducing scope sometimes fall apart, calling for separate treatment. Moreover, the considerations of "responsibility" lead us to the idea that quotation (including partial, but probably restricted to wffs) may be analysed as involving the operator which excludes the utterer's interpretation from the set of available interpretations. (Even if the utterer actually uses the words in the same way as the reported agent does, by resorting to quotation marks she makes this fact irrelevant.) That would require explaining why, as (Recanati, 2008) notes, in the case of quotation the speaker might be echoing a third person's use, say the hearer's.

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Mariusz Urbański

Erotetic inferences and formal modeling of deductive problem-solving

Erotetic inferences are inferences which involve questions either as conclusion or as both premises and conclusion. These inferences are good representations of some techniques of problem solving, either by reduction of an initial problem to a simpler one(s), or by identifying missing information which is needed in order to solve the initial problem (Urbański & Łupkowski (2010)).

In order to define validity (or, at least, correctness) of erotetic inferences a logic of questions is needed, which allows to capture semantic properties of and relations between questions (or interrogatives). However, there are many possible models of validity of erotetic inferences. And, as usual, a normative yardstick accounts for only a limited range of cases of real-life reasoning. In this study I shall report some results concerning application of different such erotetic yardsticks in modeling empirical data of deductive problem-solving.

I shall focus on some versions of erotetic implication, defined within the framework of Inferential Erotetic Logic (IEL), developed by Wiśniewski (1995, 2013), which is a ternary relation between a question (an initial problem, or question-premise), a (possibly empty) set of sentences (declarative premises) and a question (question-conclusion).

The "canonical" erotetic implication (Wiśniewski (1995)) meets the following conditions:

1. transmission of truth/soundness into soundness: if the question-premise is sound (i.e., if there exists a true direct answer to this question) and all the declarative premises (if any) are true, then the question-conclusion is sound as well;

2. cognitive usefulness: each answer to the question-conclusion is useful in answering the question-premise (each answer to question-conclusion narrows down the class of possible answers to question-premise), provided that all the declarative premises (if any) are true.

A weaker version of erotetic implication results from replacing general quantifier in condition 2 by the existential one:

2'. weak cognitive usefulness: some direct answer to the question-conclusion, together with declarative premises, entails the disjunction of some (but not all) direct answers to the question-premise (each answer to question-conclusion narrows down the class of possible answers to question-premise, provided that all the declarative premises are true).

Yet another weakening of erotetic implication, falsificationist erotetic implication, has been proposed by Grobler (2012):

2". falsificationist cognitive usefulness: some answer to the question-conclusion, together with declarative premises, entails the negation of a direct answer to the question-premise.

In a recent study Urbański et al. (2013) applied IEL as a logical basis for Erotetic Reasoning Test (ER), aimed at measuring fluency in difficult deductive reasoning. Each ER item consists of a detective-like story in which the initial problem and evidence gained (i.e. declarative premises) are indicated. The task is to pick a question (one out of four), each answer to which will lead to some solution to the initial problem. The subjects are asked to justify their choices. The correctness of a solution in each ER task consists of correct choice of question-conclusion as well as of proper justification of the choice, based on two conditions imposed on erotetic implication: transmission of truth/soundness into soundness and cognitive usefulness.

In these research it turned out that the subjects often found it justified to solve the ER tasks employing a weaker versions of erotetic implication than the canonical one. Drawing on subjects' justifications to their solutions of ER tasks, I shall formally model these solutions in terms of different versions of erotetic implication and extend them to problem-solving schemes by means of erotetic search scenarios (Wiśniewski (2003)).

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Agustin Vicente

The green leaves and the expert: polysemy and truth-conditional variability

In this paper, I want to use two elements present in Pustejovsky‟s approach to polysemy to argue that some apparently "wild" variations in an utterance‟s truth conditions are instead quite systematic. In particular, I will focus on Travis‟ much debated green leaves case. The two elements I will avail myself of are: first, the idea that lexical entries contain, or systematically give access to, rich conceptual information, information which can plausibly said to incorporate world knowledge; second, the idea that contexts can differentially activate parts of this rich conceptual structure thereby highlighting aspects or perspectives.

According to Travis, meaning only puts some vague, and undeterminable, constraints on the contribution of words to contents, since a word simply cannot be used to refer to anything (Travis, 2000). But, apart from that, truth-conditional variation is relatively unconstrained and quite unsystematic. Meaning puts some constraints; the rest depends on the "occasion" of the utterance (Travis, 2008).

Travis's widely discussed examples have been taken to be good illustrations of his skeptical position concerning meaning‟s role in the determination of truth-conditional contents. However, at least some of the examples fall clearly short of establishing what they are taken to establish. Before I go to consider the famous green leaves case, I want to briefly look at another example, which he discusses at length in his (2000). This is the blue ink case. Travis (2000) tells us that „the ink is blue‟ can have different truth conditions on different occasions, depending on the evaluation circumstances. Someone can assert correctly that the ink is blue just in case the ink looks blue when in its container. But it is also possible to assert correctly that the ink is blue just in case it writes blue, even though the ink may have a black appearance in its container.

Now, this variation may simply be a result of a differential activation of different components of the INK concept. Using the Pustejovskyan apparatus, we can hold that, in the first case, the quale of the ink that is highlighted is its formal quale (ink **is_a** liquid). In the second case, the quale highlighted is the telic one, roughly: the function of writing. This second reading of „the ink is blue‟ –roughly: the ink writes blue- is, as I say, obtained by focusing on the telicity aspect of the entry for „ink‟. The idea is that the color predicate modifies its head in this case in the same way that, for instance, „fast‟ modifies „car‟ in „this car is fast‟. When FAST is applied to CAR, FAST selects the telicity aspect of CAR, giving as a result the reading this car drives fast.

It seems that the blue ink case is the "easy" Travis case. However, Travis‟s most debated case is that of the green leaves. According to Travis, an assertion like „those leaves are green‟ can be rightly judged to be true in case the leaves are "naturally" green and false if they are "naturally" red. However, the assertion can be also judged to be true if the leaves are naturally red but have been painted green. That is, the truth conditions may vary, so that the conditions under which the assertion is true are those situations where the leaves only have a green appearance.

Now, I want to argue that this variation in truth-conditions can be handled in terms of polysemy, and in particular, by means of the strategy of the "differential activation" of senses or aspects stored in the noun's lexical entry. To begin with, it has to be noted that, according to the account I want to put forward, the polysemous term is not the color predicate, but the noun. To develop my position I need to begin by noting that concepts are hierarchically structured, and that subordinate concepts inherit features from their superordinates. „Leaf‟ comes marked as a natural kind. Now, objects that belong to kinds, in general, and to natural kinds, in particular, have essential make ups. However, they also have "appearances" at each stage of their existence. By „essential make up of an object‟ I want to refer not just to the constitutive, or essential, properties of the object, but also to those properties causally connected to them.

"Appearances" do not have to coincide with essential make ups, or better, the appearance of an object at t does not have to coincide with the essentially grounded appearance of the object. This is something that we learn about objects, and it is plausibly connected with the development of the essentialist stance (see Keil, 1989). In the early childhood, we begin to distinguish between appearance and reality: the painted horse looks like a zebra, but it is really a horse. Thus, we understand that having stripy hair can be a property that the object has (e.g. if it is a zebra) or it can be a property that the object simply displays (e.g., if it is a horse disguised as a zebra). Now, the interesting thing is that if we paint stripes on a horse, and we think about the horse as it is (in terms of its essential make up), it is not true that it has stripes. However, if we think about the horse as it appears, it is true that it has stripes.

Now, it seems to be the case that, if we find a sentence of the type „a is F‟ (where a is a noun of an object of a certain kind, and F is an adjective), we may wonder: is „F‟ supposed to apply to the essential makeup of the object or to its apparent look? In the case of colors: when we hear „a is green‟, we may wonder: is green a color that the object has or is it a color that the object displays? There is an ambiguity in utterances of the kind „a is F‟, and it is due to the fact that objects can be thought of in terms of their essential make ups and in terms of their temporary appearances. Prima facie, it is a systematic ambiguity. For instance, it is

exemplified by Bolinger‟s (1967) discussion of pre- and postnominal adjectives. Bolinger discusses the following pair:

(a) The visible stars include Capella, Betelgeuse and Sirius.
(b) The stars visible include Capella, Betelgeuse and Sirius.

An utterance of the second sentence can only mean that the stars currently visible include Capella, etc. However, as Kennedy (2012) notes, (a) is truth-conditionally ambiguous: it can have the same truth-conditions as (b), but it can also be understood as being about the stars that are intrinsically visible, such that even if they are not seen at the moment of the utterance –the night is a bit cloudy, or it is sunny-, it is true that they are visible –they can be seen by the naked eye. It is reasonable to think that the ambiguity affecting (b) is of the same kind as the one that affects the "green leaves" case. The stars can be thought of in terms of their appearance or in terms of their intrinsic nature, such that it is not established in what way the modifier „visible‟ has to be applied to „stars‟. If (b) is uttered during the day, and the stars are thought about in terms of their appearance, (b) is false. However, even in those circumstances, (b) is true if we think about the stars in terms of their essential make-up.

The alternation in the truth conditions exhibited by sentences containing color predicates thus elongs within a systematic alternation. This systematic alternation consists in that adjectives can modify nouns in two different ways, thus giving raise to two different kinds of truth-conditions.

The different kinds of truth-conditions of an utterance of the type „a is F‟ can be paraphrased as "a is intrinsically F", and "a is apparently/currently F", or, alternatively, highlighting aspects, as "a as it is is F", and "a as it looks is F". The generalization is:

(*) If we have an object (or entity) O, and a modifier property P which is causally linked to the essence of O, then „O is P‟ is ambiguous.

As it can be seen, the explanation of the green leaves example takes us deep down into issues having to do with the nature of concepts. Nouns denoting kinds can offer two senses, aspects or perspectives to noun+adjective constructions or „a is F‟ sentences. The object can be thought of as it is or as it appears. Properties denoted by modifiers apply to any of the two ways of thinking about objects only if they are properties that are connected to the object‟s essential properties. Thus, to know the possible meanings of a particular noun+adjective construction we need two kinds of conceptual knowledge: first, knowledge of the "is/appears" distinction; and second, knowledge of the theory-like concept associated to the noun. The two are connected: once we start developing the essentialist stance,

which consists in conceptualizing kinds in terms of theories, we begin to master the "is/appears" distinction. However, in order to know whether „a is F" is ambiguous or not, it is not enough to know whether a belongs to a kind. You also needto know whether F stands for a property that is causally connected to the essence of a. And for that, you need to have a theory about a.

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Matthijs Westera

Exhaustivity implicatures and attentive content

I provide a solution to a long-standing problem in pragmatics: *exhaustivity implicatures*, as exemplified in (1) by the part in italics:

(1) Which colours does John like?
He likes green. $\rightsquigarrow$ *He doesn't like red, blue, yellow, etc.*

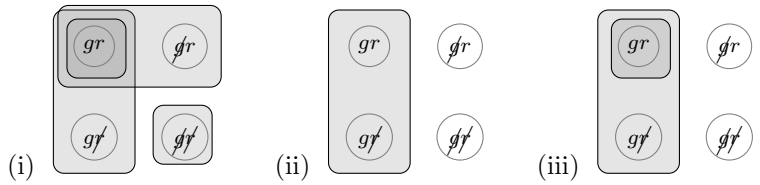
Exhaustivity has been considered a prime example of a *conversational implicature*, i.e., a supposition necessary to maintain the assumption that the speaker is cooperative (Grice, 1975). However, no theory exists that wholly explains it as such. The key difficulty has been to show how the Quantity implicature ('the speaker lacks the belief that John likes red') can be strengthened to obtain exhaustivity ('the speaker believes John doesn't like red'), a strengthening known as the *epistemic step* (Sauerland, 2004). It has been claimed that the epistemic step does not follow from the assumption of cooperativity (e.g. Chierchia, Fox, & Spector, 2008). I show that it does.

The source of the problem, I argue, is that existing pragmatic theories are built on top of a classical semantics, which models only the *informative content* of utterances. Such a semantics provides insufficient semantic foothold for a theory of exhaustivity, because while the response in (1) is just as informative as the response in (2), only the former is interpreted exhaustively, as far as the colour 'red' is concerned:

(2) Which colours does John like?
He likes green, or red and green $\not\rightsquigarrow$ *He doesn't like red.*

The difference between the responses in (2) and (1) doesn't lie in their informative content, but in the possibilities they *draw attention to*. The response in (2) draws attention to the possibility that John also likes red, while the response in (1) doesn't; it leaves the possibility *unattended*.

To capture this, we need a semantic backbone for our pragmatics that models attentive content. Roelofsen's (2011) *attentive semantics* was designed for this purpose. Meanings are sets of sets of worlds, i.e., sets of classical propositions. Under the simplifying assumption that there are only two colours, red and green, the meanings of our examples can be depicted below, with (i) the question, (ii) the response in (1), (iii) the response in (2). Circles represent worlds, regions sets of worlds, and '$gr\not$' means that in that world, John likes green but not red:



On top of these meanings, I adopt a very standard maxim of Relation:

Definition 1 (Maxim of Relation) *A speaker with information state s should utter A in response to B, only if A, plus the information in s, entails B.*

Crucially, how strict our maxim of Relation is depends on the sparseness of entailment, and *the richer the semantics, the sparser entailment*. If we would use the same semantic backbone as Roberts (2012), my maxim of Relation would logically follow from her *relevance* (contextual entailment). But with attentive semantics, we get the following notion of entailment:

Definition 2 (Entailment) *For all meanings A, B, $A \vDash B$ iff (i) $\bigcup A \subseteq \bigcup B$ (informatively stronger) and (ii) for all $b \in B$, $b \cap \bigcup A \in A$ (attentively stronger).*

Now the question is entailed by the response in (2), but not in (1), because although both responses are more informative than the question, the one in (1) is *less attentive*. For the latter to entail the question relative to the speaker's information, she must be able to exclude either world '$g\not{r}$' or world 'gr', i.e., she must know $g \rightarrow r$ or $g \rightarrow \neg r$. This enables the epistemic step:

1. The speaker believes g.	(Quality)
2. The speaker lacks the belief that r.	(Quantity)
3. The speaker believes $g \rightarrow r$ or $g \rightarrow \neg r$.	(Relation)
4. The speaker believes $\neg r$.	Exhaustivity!

In contrast, (2) yields no Relation implicature, hence no exhaustivity (though if we would drop the simplifying assumption that there exist only two colours, we would get exhaustivity with respect to all colours except red and green).

In sum, with a richer semantic backbone, the maxim of Relation automatically becomes strict enough to enable the epistemic step. The maxim effectively requires that a speaker knows, for each possibility left unattended, how it depends on the information given. This suggests that pragmatic reasoning is sensitive to attentive content, and that exhaustivity implicatures are genuine *conversational* implicatures. I will discuss attentive semantics and its entailment relation in more detail, show how the above result generalizes to certain cases of 'embedded' implicature, and contrast my theory with the mainstream approach that relies on a *competence assumption* for taking the epistemic step.

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Piotr Wilkin

Cognitive representations and compositionality

Compositionality has been taken for granted as one of the defining features for a theory of natural language, and for a good reason – to explain our cognitive abilities for language acquisition and linguistic productivity, one pretty much has to take compositionality for granted. Compositionality is pretty much a feature of Montague-style formal systems which aim to capture natural language – however, it has been a surprisingly difficult task to save compositionality in the face of various challenges posed by the more intricate constructions found in natural language.

First of all, there are numerous problems that contextualism raises for compositionality (see eg. Recanati 2010). There have been long-standing problems with certain propositional attitudes and reported speech (generally Quinean referentially opaque contexts per Quine 1960). Finally, there are problems with formalizing certain complex constructions due to scope issues; Chris Barker's program of adapting continuation semantics to natural language (Barker, 2002) can be seen as an attempt to provide a more complex albeit still compositional semantics for natural language.

The one thing all the abovementioned problems have in common is that they are mostly technical problems – since compositionality is a key feature of the natural language theory one aims for, it is just a question of finding a solution that is compositional in nature. The question we want to pose here is: how difficult would it be to maintain compositionality if we would further have to coordinate it with a theory of cognitive representations upon which our theory of language is built?

Such matchings have of course been attempted, with probably the most notable being Fodor's Language of Thought, already in its second revision (Fodor, 2008). However, Fodor's attempt is ad-hoc in the sense that he doesn't try to build a theory of language based on a neutral theory of mental processes and cognitive representations; instead, he constructs a theory of cognitive representations based on his pre-existing concepts of language.

In recent years, there have been multiple results in language-acquisition studies on infants and small children (see eg. Carey 2009) that have shed much light on how the language acquisition process looks like. It might therefore seem reasonable to try to construct a theory of natural language from the ground up based on a theory of cognitive representation that takes into account those recent psychological findings. However, building such a two-layered theory of language now means that compositionality has to be coordinated with constraints on the level of the underlying cognitive representations which drive our linguistic

competence (unless we adopt a strong nativist hypothesis regarding innate compositional syntax).

The aim of this paper is to study the possible interactions between the compositionality constraint on natural language syntax and the underlying cognitive processes and representations. The main idea is using continuation-based semantics for cognitive processes (considered as transitions between cognitive states, in a similar style to denotational programming language semantics) and constructing a compositional semantics of natural language based on such a process semantics for cognitive states. The three main problems considered are: existence (can a proper cognitive description be given for a provided linguistic construction), linguistic feedback (how far can the constraints placed by language acquisition drive the structure of our cognitive faculties) and supervenience (in what way does compositionality on the linguistic level supervene upon compositionality on the cognitive level). An attempt will be made to show how considering the cognitive level, although considerably complicating the formalization, can yield valuable insight into our understanding compositionality on the linguistic level.

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Julia Zakkou

Metalinguistic Negotiation and Metalinguistic Negation

In order to accommodate the claim that exchanges like

(1) (a) Hannah: "Licorice is tasty."
(b) Sarah: "No, that's false, licorice is not tasty."

can express faultless disagreements, friends of indexical contextualism (henceforth: contextualism) have emphasized that devices of linguistic denials (such as "No, that's false") need not target the proposition literally expressed, but can also target a proposition that is pragmatically conveyed. This strategy, though, seems to face a problem from metalinguistic negation (Horn, 1989). It can be presented as follows (see for a similar argument: MacFarlane, MS, p. 12):

(P1) If the denial device prefixed to a sentence containing a morphologically unembedded negation (such as "not") targets a proposition that is pragmatically conveyed, then the negation is used metalinguistically.
(P2) If a negation (such as "not") is used metalinguistically, it cannot be morphologically embedded.
(P3) In (1b), the negation can be morphologically embedded ("licorice is non-tasty").
(C) In (1b), the denial device does not target the proposition that is pragmatically conveyed.

Among the proponents of contextualism, only Plunkett & Sundell (Plunkett & Sundell, in press; henceforth: P&S) explicitly address an argument along these lines. They argue, though, that it doesn't affect their view. If (1) is a faultless disagreement, they claim, then Hannah and Sarah are having an implicitly metalinguistic negotiation (P&S, p. 27). Hannah is expressing the proposition that licorice is tasty according to a standard s1 and conveys that the appropriate usage of "tasty" is one that is relativised to s1. Sarah is expressing the proposition that licorice is not tasty according to a standard s2 and conveys that the appropriate usage of "tasty" is one that is relativised to s2. So, if (1) is a faultless disagreement, P&S claim, the device of denial that is used by Sarah doesn't target the proposition expressed but rather the proposition that is conveyed by Hannah.

In order to show that their view is not threatened by the argument from metalinguistic negation, P&S argue as follows: As a first step they claim, contra (P1), that targeting the proposition conveyed is not sufficient for the negation to be

a metalinguistic negation. The following condition has to be met as well: Given a descriptive reading of the negation, there is a contradiction between the proposition expressed by the sentence containing the negation and the proposition expressed by what is sometimes called a "correction sequence" (as in "She is not happy. She is ecstatic.") (P&S, p. 64). As a second step they claim that given their analysis of (1b), this further condition is not met. For the following sentences don't express contradictory propositions: "Licorice is not tasty according to s2. The appropriate usage of "tasty" is one that is relativised to s2." (P&S, p. 65).

I argue that P&S's defense is not convincing: Firstly, the additional condition for metalinguistic negation suggested by them is not plausible. Standard examples of metalinguistic negation like "The king of France is not bald. There is no king of France" don't necessarily meet it. What is more plausible is the following one: Given a descriptive reading of the negation, there is a contradiction between the proposition expressed or conveyed by the sentence containing the negation and the proposition expressed by the correction sequence.

Secondly, given P&S's account, there is such a contradiction. For as they themselves would acknowledge: Not every instance of (1) is a faultless disagreement, i.e. one where the speakers are having an implicitly metalinguistic negotiation. Hannah and Sarah can use their sentences also "descriptively", as they call it (P&S, p. 24). This amounts to the following: Hannah expresses that licorice is tasty according to s1 and conveys that the appropriate usage of "tasty" is one that is relativised to s1. Sarah expresses that licorice is not tasty according to s1(!) and conveys that the appropriate usage of "tasty" is one that is relativised to s1(!). Hence, given a descriptive reading, there is a contradiction between the proposition conveyed by (1b) (i.e. that the appropriate usage of "tasty" is one that is relativised to s1) and the proposition expressed by the correction sequence (i.e. that the appropriate usage of "tasty" is one that is relativised to s2). So, contrary to what P&S claim, unless it is clear from the context that Hannah and Sarah are having an implicitly metalinguistic negotiation, reparsing would be necessary in order to make sense of a sentence like "Licorice is not tasty. The appropriate usage of "tasty" is one that doesn't apply to licorice."

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Jasko Zanic

Externalism, Naturalizability of Content and Research Programs in Semantics

Semantic externalism, in its causal (as opposed to social) variety, is the view that the content of certain classes of terms/concepts (viz. names/singular concepts and natural kind terms/concepts) is in part determined or individuated by factors external to the mind/brain – in particular, by causal interaction with the environment (cf. Kallestrup 2011). In this paper I differentiate between two types of causal semantic externalism, and attempt to show that neither of them leads to a promising research program with regard to naturalizing content. In the final part of the paper I show why semantic internalism, due to a very different way it construes the (possible) role of causation in studying meaning, does seem to be able to form the basis of a promising research program with the aim of naturalizing content.

I will term the two types of causal externalism as follows: "ultimate cause" externalism and "causal co-variance" externalism. They share the problem of needing the relevant causal links to "self-identify", to somehow keep track of themselves.

Ultimate cause externalism is the view that the content of certain classes of terms/concepts is (partly) determined by an individual (but repeatable) event of causal grounding of the term/concept in its referent or member of extension, with the referent or member of extension causally affecting the grounder in some way. This is the original Kripke-Putnam idea concerning proper names and natural kind terms, elaborated by Devitt & Sterelny (1999). I show that, although there is nothing incoherent in this idea (at least on a careful construal that Devitt and Sterelny miss), it is extremely vague, both in the single-grounding version and the multiple-grounding version. This kind of externalism amounts to what Evans (1973) called a "magic trick" holding the reference relation steady, and since it doesn't show promise of becoming less vague, it can hardly form the basis of a promising research program.

Causal co-variance externalism, associated notably with Fodor (1990, 1994, 1998, 2008), attempts to achieve naturalization of content by claiming that content depends on reliable causal co-variance of the tokenings of the relevant term/concept with instantiations of the property that it "locks onto". I will show that it fails in this attempt. The failure is due to the inability of this approach to isolate the cause that is supposed to be the meaning of the term, given that there will always be other ineliminable candidates for this role, viz. other causes that are also part of the causal chain. Fodor's asymmetric dependence cannot solve this problem. The causal co-variance approach might achieve the desired results in controlled experimental conditions – however, externalism is not a theory about

what happens in such conditions, but a theory of the constitution of content as such. This approach also faces the problem of giving untestable, or wrong, or extremely counterintuitive, results in certain cases of semantic analysis.

Therefore, the externalistic approaches to content don't seem to be able to deliver promising research programs with regard to naturalizing content. Internalism does seem to be able to do this, in part because of a very different view of the role of causation in investigating content. In the basic causal link schema C → E, externalism locates content (or at least part of it) in the cause (C), and so runs into the problems enumerated above. Internalism, on the other hand, locates content in the effect (E), e. g. the mental effect that occurs upon hearing certain sequences of noises or seeing certain entities. It thus avoids the said problems, and offers a promising way of naturalizing content by investigating how meanings/concepts are instantiated in the brain.

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Henk Zeevat

A Plea for Classical Representations

Classical mental representations are the vehicles of thought in the philosophical tradition from Aristotle to Husserl. In his attacks on 'Psychologismus' in the foundations of logic, Frege did not spare these representations: they are inherently vague and conflate the distinctions between concept, object and proposition. This paper formalises classical representations as a variable-free update semantics, comparable to Kamp's DRT on the one hand and to AI formalisms for visual content on the other, thereby overcoming Frege's objection. The system makes definiteness into a fundamental logical notion and provides a logical approach to intersubjective agreement and attitudes. The system can be interpreted as a direct interpretation of dependency structures for natural language utterances in a context and allows the formalisation of communication combining verbal utterances with perception.

1. The special features of classical representations are the internal object, the external object and the feature that the truth of representation is equivalent to the existence of an external object. The dual nature of representations as propositions and referential devices is captured by identifying the set of propositions with the set of terms of the system as the set of *representations*. Concepts are taken as primitives with their signature determining which other representations they can organise into a new unity. Information states will be identified with sequences of representations $[r_1, \ldots, r_n]$ called contexts.

Concept constants come with a signature of the form $< m, n >$ where m indicates the number of object arguments and n the number of context arguments. In this abstract, the only concepts with context arguments considered are: $\Rightarrow$: $< 0, 2 >$, $\neg$:$< 0, 1 >$ and **Belief**:$< 1, 1 >$ and representations derived from these concepts cannot occur as arguments of other concepts. The identity function Id ($< 1, 0 >$) is distinguished from proper identity: $=$ ($< 2, 0 >$). A set of indices is used to distinguish different copies of otherwise formally identical representations. The expressions of the language are given as follows:

1. if P is a concept with signature $< m, n >$, $r_1, \ldots$ and r_n are representations, $c_1 \ldots c_n$ are contexts and i is an index then $(r_1 \ldots r_m c_1 \ldots c_m)P_i$ is a representation.

2. if $r_1, \ldots$ and r_n are representations, $[r_1, \ldots, r_n]$ is a context.

Models for this language are triples $w =< U, F, B >$ where U is a domain, F a mapping from $< n, 0 >$ concepts to subsets of U^{n+1} and a partial mapping from representations into U. B is a partial function that assigns a mental state $< r, b >$ to the agents among the elements of U, where r is the representation of the subject of the state within b and b is a complete and consistent context modelling the beliefs of the agent. A context c is complete iff for every $r \in c$, c also contains all argument representations of r. A context d is complete relative to a context c if $c \circ d$ is complete. Representations are interpreted on a model w with respect to a complete and consistent context c and on condition that $c \circ [r]$ is complete and that $w \models c$. $G =_d F$ iff $Gx = Fx$ if $x \notin d$. As in DRT, $\neg$ can be used to define implication and universal quantification.

$c, w \models (r_1 \ldots r_n)P_i$ iff $< F((r_1 \ldots r_n)C_i), Fr_1, \ldots Fr_n) \in FP$.

$c, w \models (d)\neg_i$ iff d is complete relative to c and there is no G such that $G =_d F_w$ such that $c, < U, G, B > \models c \circ d$.

$c, w \models (rs) =$ iff $Fr = Fs$

$c, w \models (r)Id$ iff $Fr = F((r)Id)$

$c, w \models (rd)\mathbf{belief}_i$ iff there is a context e relative complete wrt $B(Fr, w) =< s, b >$ such that $b \models e$ and there is a consistent and complete subcontext f of $c \circ b \circ [(sr) =]$ such that $f \models e = d$

2. The basis for the treatment of belief is the relation $c \models (r\ s) =$. This is a relativised intensional identity. $c \models (d\ e) =$ iff $\forall s \in d \exists r \in ec \models (s\ r) =$ and inversely. A context c can so be seen as an identity criterion that identifies parts of d and e (say the beliefs of two people) with each other). This gives natural treatments of the identity puzzles in beliefs, inclusing the Edelberg cases and allows treatments of shared beliefs and common ground.

3. Definiteness is a fundamental logical distinction between representations r relative to a context c. Let s differ from r only in its index. s is definite relative to c iff $c \circ [r, s] \models (rs) =$. Definite representations are given in c, functionally determined from entities given in c or proper definitions by this definition. The definite marker or the lexically coded feature of definiteness (for demonstratives, pronouns, proper names) can be seen as an instruction to interpret the NP by means of a definite representation in the context of utterance. This aligns remarkably well with the use of definite NPs, leaving only a small idiomatic fringe.

4. Visual content is standardly captured by a hierarchical structure organised by concepts and bottoming out in visual primitives. Such visual representations can be seen as representations as above enriched by a mapping from the nodes to visual attributes such as location, colour, position, shape, size etc. As a result, integrated representations of visually given and verbally given content are quite feasible, thus making it possible to model transactions as discussed by Herbert Clark. This is not surprising: classical mental representation is much more about visual perception than about language interpretation.

5. A dependency structure for a linguistic input is the input string of words annotated with labelled arrows: from predicates to their arguments, from pronouns to their antecedents, from presupposition trigger to its presupposition. We add two extra kinds of arrows: from elements to the scope and restrictor of operators and marking arrows (e.g. from the definite article to its head noun). If on such a structure the words are replaced by suitable concepts and marking arrows are omitted, it is isomorphic to a context of the formalism, in which the individual words denote representations that show up in that context or in the subordinate contexts provided by the operators in the context.

6. Concepts are distinct from representations by not being indexed. An internal object can be identified with the mapping from models of the context in which a representation occurs to its denotation in that model. Let h be a model that corresponds to the actual world and c a context for which h is a model. c is then true and representations r of c have an external object $F_h(r)$. A representation r of c can be said to have an external object (or be true) iff r is part of a true subcontext of c.

Posters

Solveiga Armoskaite and Aysegul Kutlu: "A category neutral maximizer: evidence from Turkish"

Jin Cui: "A functional analysis of definite article"

Daniel Gutzmann: "Compositional use-conditional semantics"

Jana Hasenäcker and Berry Claus: "What's up with valence? – Investigating conceptual metaphors in the processing of emotional words"

David Hommen: "Empirical and philosophical issues about concepts"

Eva Horch and Ingo Reich: "Investigating Fragments"

Pawel Lupkowski: "Capturing the relevance of dependent questions with erotetic implication"

Pawel Lupkowski: "Non-cooperative strategies in the Loebner contest"

Susanna Melkonian: "Gaining Concepts by Productive Action?"

Radek Ocelák: "On evaluation of color categorization models"

Manuel Rebuschi, Maxime Amblard and Michel Musiol: "Interpreting conversations in pathological contexts"

Koen Roelandt: "(The) most in Dutch: Definiteness and Specificity"

Jonathan Shaheen: "Philosophical Lexical Semantics for 'Because'"

Tamara Vardomskaya: "A Two-Factor Model for Subjective Predicates"

Jan Wislicki: "Compositionality of some types of non-verbatim quotations"

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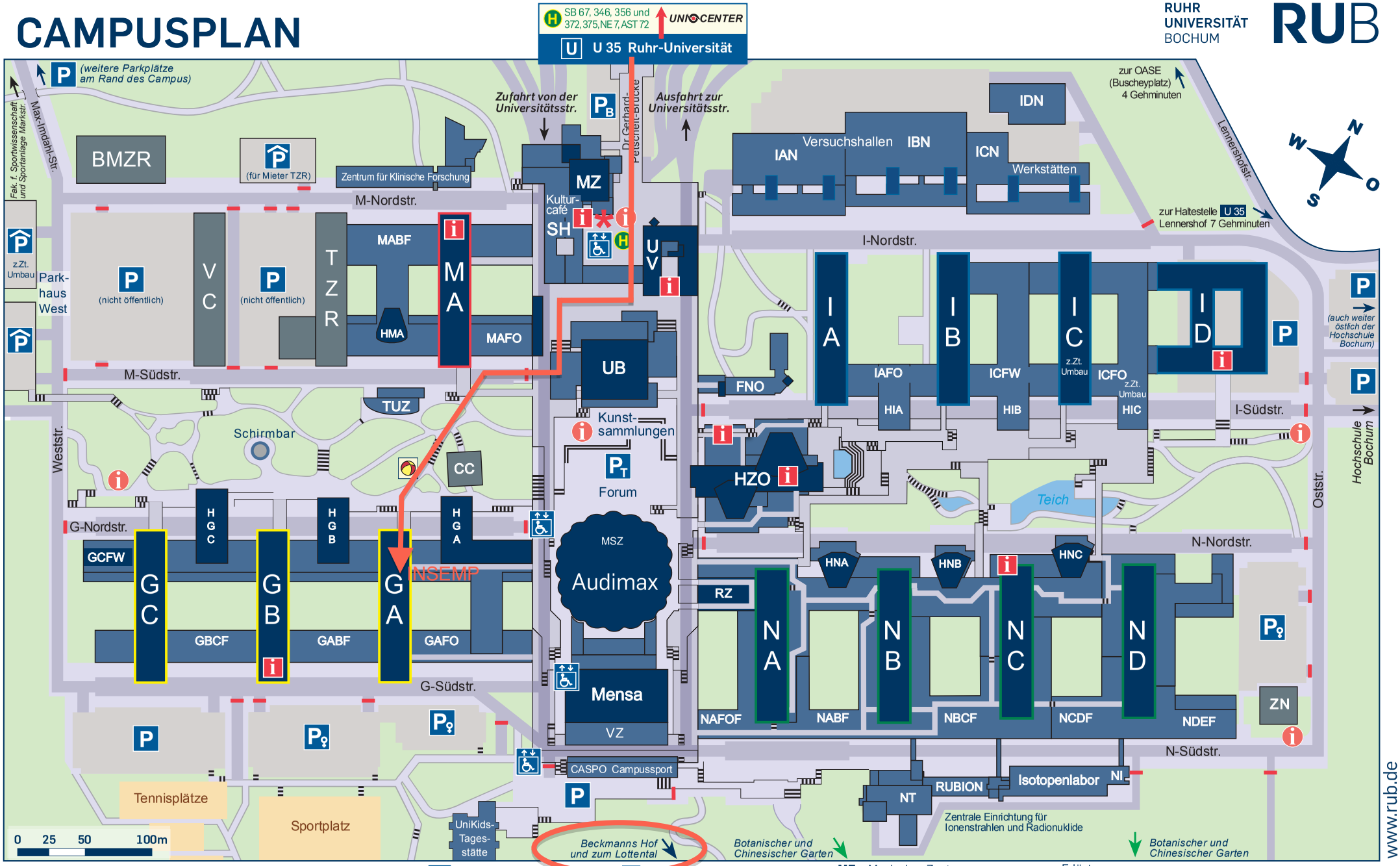

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MSZ Multimedia-Support-Zentrum

MZ Musisches Zentrum
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TUZ Tutorien-Zentrum
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