BRIDGE-14

Workshop on Bridging Formal and Conceptual Semantics
12-13 April 2014, Düsseldorf, Germany

PROGRAM BOOKLET

Organized in co-operation with the DFG Collaborative Research Centre 991.
Workshop site

Haus der Universität
Schadowplatz 14
40212 Düsseldorf
# PROGRAM

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| 11.30-12.00 | Tillmann Pross and Antje Rossdeutscher  
*Sublexical bridging of formal and conceptual semantics* |
| 12.00-12.30 | Natalia Zevakhina  
*Which semantics better accounts for the predicates embedding exclamatives?* |
| 12.30-13.00 | Bridget Copley and Phillip Wolff  
*Exploring the hypothesis space for non-culmination* |
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| 14.30-15.30 | Peter Gärdenfors  
*Lexical semantics based on conceptual spaces (Invited talk)* |
| 15.30-16.00 | Scott Grimm, Lotte Hogeweg, Sander Lestrade, Elizabeth Allyn Smith and Henk Zeevat  
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| 16.30-17.30 | Fritz Hamm  
*Applications of Minimal Models (Invited talk)* |
| 17.30-18.00 | General discussion & Closing |
INVITED TALKS

Peter Bosch (University of Osnabrück)

Meanings and Concepts

Unlike ambiguity, polysemy confronts us with two hard problems: (1) It strongly suggests that there is a productive mechanism of language that yields new meanings with potentially every occasion of use; no formal or algorithmic model of such a mechanism is currently available. (2) It demonstrates that we have no generally applicable criteria for the identity of meanings, i.e., we cannot tell, in general, of any two meanings that are given in different terms, whether or not they are identical.

The current paper will not propose a fully worked out algorithm for the productivity of word meaning, but the sketch of a cognitive architecture that holds the promise for such an algorithm. The basic idea of the proposed architecture is a new division of labour between meanings and concepts that makes “meanings” more abstract and attenuate than is generally assumed, and shifts much of the perceived variation in “meaning” into the realm of concepts, which in turn are modelled as Fregean truth functions, however, in a psychologically realistic fashion.

Peter Gärdenfors (Lund University)

Lexical semantics based on conceptual spaces

In logic most information is carried by predicates, but in natural language predicates correspond to several word classes – nouns, adjectives, verbs, prepositions, etc. I shall argue that there are cognitive and communicative reasons why natural languages have word classes. I shall do this by presenting models of the semantics of the main word class in terms of conceptual spaces. A consequence is that one obtains a partial explanation of how children can learn the meanings of words so quickly as they do.

Fritz Hamm (University of Tübingen)

Applications of Minimal Models

Minimal models of constraint logic programs are used in [3] to compute preferred models for a given discourse. This talk will present three applications of such models. The first concerns the treatment of the imperfective paradox as proposed in [3] and experimental results due to [1]. This part of the talk will introduce the most important technical concepts of the semantic theory developed in [3]. The second application of minimal models concerns anaphora resolution with respect to German unger–nominalisations as in (1).

   ‘The cordonning-off of the town hall was disturbed by protesters the day before yesterday. Due to continuing unrest, it is sustained today as well.’

In [2] it is shown that this kind of anaphora resolution requires a rather complicated computation of the minimal model. This contrasts with simpler examples such as (2) that require fewer computation steps.

   ‘Hans wrote a letter. It lasted two hours.’
Therefore the theory provides clear *predictions* for psycholinguistic experiments. The final application of minimal models investigates processing differences between English and German accomplishments. In a forthcoming paper Bott and Hamm present experimental evidence that there are significant processing difference between the coerced English sentence (3) and its German counterpart (4).

(3) The architect built the house for two years.
(4) Der Architekt errichtete das Haus zwei Jahre lang.

The question arises how the computations of the minimal models for (3) and (4) differ. The talk will close with a couple of methodological remarks concerning the relationship between formal semantic theories and psycholinguistic experimentation.


**Galit W. Sassoon** (Bar-Ilan University)

*Predictors of linguistic gradability*

One of the issues at the core of the controversy between formal and conceptual semanticists pertains to the lexical semantics of nouns. Conceptual approaches associate nouns with gradable structures, while formal approaches do not. Conceptualists support a conceptually gradable representation for nouns by stressing the existence of linguistic manifestations of this gradability (cf., Lakoff 1987 a.o.), while formalists support non-gradable linguistic representations by stressing robust and systematic ways in which nouns differ from, e.g., gradable adjectives (cf., Baker 2003, Kennedy 1999, a.o.). With the goal to bridge the gap between the different approaches, I conducted several experimental studies to investigate (i) predictors of linguistic gradability, including syntactic category (classification of a lexical item as a noun or an adjective) and conceptual category (classification of a lexical item by the way the dimensions underlying categorization under it combine to create a categorization decision), as well as (ii) the relations between the syntactic and conceptual factors (Sassoon 2012, 2013a,b, in progress). The talk will provide an overview of this work and its main results and implications.

**Martin Stokhof** (University of Amsterdam)

*What cost naturalism?*

The talk reports on ongoing joint research with Michiel van Lambalgen. In the talk we want to look at the question of comparing theoretical frameworks in linguistics from the vantage point of their commitment to a naturalistic construal of their object of inquiry, based on the assumption that language is a natural kind that can be studied in the manner of the sciences. Naturalism appears to be a shared assumption of various theories, but the question is how intrinsic the relation between that commitment and other theoretical and methodological assumptions that make up a framework is, and hence what costs a defence of naturalism brings with it. Thus the costs of naturalism will provide a measure with which frameworks can be compared as to their ontological and epistemological presuppositions. We will provide some examples of such a cost-benefit analysis and argue that in some of them the balance is negative.
One of the differences between the perspectives of formal and ‘cognitive’ semantics is related to De Saussure’s distinction between the syntagmatic and paradigmatic dimensions of language. In the formal perspective, with its central role for compositionality and close relations with generative and categorial syntax, the syntagmatic (combinatorial) dimension of meaning is dominant. Words and word meanings are analyzed in relation to their contribution to the overall meaning of a sentence. The ‘cognitive’ perspective, because of its attention for lexical and conceptual phenomena like prototypes, polysemy, metaphor, and grammaticalization, emphasizes the paradigmatic dimension of meaning. Words and word meanings are seen as part of lexical fields, radial networks, semantic maps, conceptual spaces, grammaticalization clines.

The difference between the two approaches is especially seen in the treatment of polysemy. The dominance of the syntagmatic dimension in formal semantics sometimes leads to a tendency to derive the different senses of a (monosemous) word from its different positions in an abstract syntactic structure. A case in hand is the decompositional treatment (Dowty, Von Stechow, and others) of the restitutive/repetitive ambiguity of again in The door opened again:

- The door [ again [ ‘became’ open ]] (repetitive)
- The door [ ‘became’ [ again open ]] (restitutive)

Fabricius-Hansen and others have argued that these two senses of again (and its German counterpart wieder) are part of a larger landscape of (often directional) senses that cannot be reduced to one monosemous item occupying different syntactic positions, but that require a paradigmatic perspective on how different senses of a word hang together, both semantically and diachronically. The question is how this paradigmatic alternative can be developed in a way that is still firmly rooted in formal, compositional semantics.

My lecture is about the highly polysemous Dutch adverb terug (back, zurück), that derives from the body part word rug ‘back’, but that now covers a wide range of senses, including the restitutive and repetitive ones illustrated above. I will show that it is possible to do justice to both the syntagmatic and paradigmatic dimensions of this item by formally modeling these senses in terms of vectors, paths, and vectors and working out how they hang together. The result is a network of meanings, defined on semantic grounds, that accounts for the polysemy of terug and its relations with other adverbs in a principled way and builds a bridge from formal semantic methods to phenomena and notions that have largely been the domain of cognitive semantics, functional typology, and grammaticalization studies.
**SUBMITTED TALKS**

**Bridget Copley and Heidi Harley** (CNRS, Paris 8 / University of Arizona)

*Modeling branching as the origin of imperfective readings in a force-theoretic framework*

**Force dynamics is useful for representing the meanings of verbs.** It has been argued that force dynamics is a necessary conceptual ingredient in the meanings of verbs of maintaining such as keep and stay (e.g., Talmy, 2000, Croft, 2012), force-dynamic verbs such as *help* and *prevent* (e.g., Talmy 2000, Wolff, 2007) and verbs more generally (e.g. Croft 2012, van Lambalgen & Hamm 2005, Gardenfors 2005). We can also imagine using the idea of an ongoing (net) force as an conceptual interpretation of what some (e.g., Parsons, 1990) refer to as a partial event, in order to model progressive readings. However, it is not so clear how the intensionality seen in progressives would be understood from such a perspective. If there is such a thing as a Mary-build-a-house force, how do we account for the fact that the house is referred to but need not exist?

**Possible-world branching theories are useful for intensionality of imperfectives.** Intensionality in the progressive has been modeled for a long time (beginning from Landman, 1992) using branching possible worlds. However, from a conceptual point of view such models require lots of laborious logical metalanguage to represent what arguably should be represented in the conceptual system, namely the fact (or impression) that things could turn out otherwise. Given the intuition that what happens next should be derivable from physical and social force-dynamic laws, it is a duplication of labor to account for this fact/impression in the logical system as well.

**Mapping the conceptual level to the logical level: Forces as functions.** To understand imperfectivity by synthesizing these theories, we propose a conceptual domain separate from but mapped to the logical domain; the ontology in the former is accessed by the lexicon, while the ontology in the latter is invoked by syntactic logical form. Conceptual forces in the conceptual representation are mapped to force functions in the logical domain. These force functions are functions from situations to possibly non-occurring result situations (with additional constraints on which s:s functions can be a force function). For any situation s and force function f, net(s)=f iff f is mapped to the net conceptual force of the conceptual analogue of s. (The net conceptual force is the summation of all the conceptual forces operating in the conceptual analogue of s). We can then represent a progressive/imperfective sentence prog p as being true when p(net(s)); any intensional object is represented in the result situation, which is characterized but not asserted to exist.

**Modeling branching.** However, perfective aspect should also be given the meaning p(net(s))! We distinguish imperfective and perfective by allowing the possibility for branching only with the imperfective. We do this by modeling additions/subtractions to the initial conceptual state of affairs represented by the speaker only in the case of the imperfective. A different result situation may thus arise in the deterministic naive physics of the conceptual representation. In this way we construct a force-dynamic analogue to branching possible worlds for imperfectivity.

**References:**

In this talk we explore and evaluate familiar and under-represented possibilities in the theoretical hypothesis space for non-culmination of telic predicates, as in (1):

(1) Kerim e˘ sik-ni ac-xan-dâ, alaj bo¸ sa-ma-?an-dâ.
Kerim door-ACC open-PERF-3SG but finish-NEG-PERF-3SG

(Context: The lock is broken and Kerim tries to open the door.) Lit. ‘Kerim opened the door, but he did not succeed.’ (Karachay-Balkar; Tatevosov 2008)

Existing theories of non-culmination are split largely into two strategies: the (i) causation plus possible world strategy that uses two sub-events with a causal relation between them and have the caused event happening only in certain possible worlds (Matthewson 2004, Tatevosov 2008, e.g.) and the (ii) causal skeptic strategy, which avoids the problem of non-actual results by using a relation between a non-maximal (sub)event and a maximal event (Parsons 1990, Singh 1998, Koenig and Muansuwan 2000, Pion 2009, e.g.). The possible worlds strategy is heir to Dowty’s (1979) inertia worlds account of the English progressive, which builds on Lewis’s (1973) counterfactual theory of causation.

We present a third, under-utilized strategy: one can avoid complicating the semantics with possible worlds without being a causal skeptic if one’s theory of causation does not entail the occurrence of the result. Non-result-entailing theories of causation exist and fall into two categories: force-dynamic theories (Wolff 2007, Wolff et al. 2010, e.g.) and probabilistic theories (Suppes 1970, Eells 1991, e.g.). But as far as we know, the (iii) non-result-entailing causation strategy has rarely been used to account for non-culmination, and then only the force-dynamic option (Dell 1987, Copley & Harley, 2012). We present an alternative, probabilistic approach to non-culmination, noting that non-result-entailing causation strategies should be palatable to causal skeptics, since other relationships besides the causal relation can be accounted for in either force-dynamic or probabilistic models of verbal predicates. And since strategy (iii) puts the complexity of inertia in the conceptualization of causation, it also has the advantage of expressing the truth conditions of non-culmination but not placing the burden of this complexity in the semantics (as does strategy (i)) or eliding the issue altogether (as does strategy (ii)).

Paul Dekker (University of Amsterdam)

*The Live Principle of Compositionality*

With this paper I argue for a live understanding of the principle of compositionality which is taken to apply to so-called live meanings of constituent expressions and their live mode of composition. This pragmatic rendering of the principle renders its orthodox intent consistent with previously deemed disastrous conclusions deriving from contextualist views on language and language use.

The live principle of compositionality is taken to imply a conception of live meanings which are present, and past meanings which are not. This conception can be fruitfully applied in the evaluation of quite a few examples known from the literature, e.g., cases involving deferred ostension, aspectual coercion, and presupposition.

The live principle of compositionality does not actually connect formal semantic analyses with conceptual counterparts, but it may show the results from both areas of work to be mutually accessible, through the accommodation of a pragmatic notion of meaning theoretically and methodologically compatible with both.

Scott Grimm, Lotte Hogeweg, Sander Lestrade, Elizabeth Allyn Smith and Henk Zeevat (University of Rochester / Radboud University Nijmegen / University of Montreal / University of Amsterdam)

*Lexical Meaning and Meaning in Use*

The paper describes ongoing collaborative work in investigating the format of the meaning of lexical items. It aims at replacing lexical disambiguation by the construction of meanings in use from a single meaning specification for the word without sacrificing typological validity, cognitive plausibility or the aim of characterising the truth-conditional, pragmatic and expressive contribution in a context.

The proposed specification format is based on semantic features that are interpretable as templates for describing semantic frames. The features themselves (or the frame templates as which they are interpreted) should allow of model-theoretic interpretation, if their meaning is not expressive or purely pragmatic. They can so be seen as the building blocks in a conceptual semantics or as the basis of a logical interpretation.

The set-up derives from the idea of Smolensky and Hogeweg Smolensky (1991); Hogeweg (2009) that words outside a particular context associate with a set of semantic features that typically overspecifies in the sense that there could not be a situation that satisfies all the features. Meanings in use are given by a subset of these features and are given as the maximal set of semantic features associated with the word that fit in the particular context. Since the associations between words and semantic features are a product of associative learning, it seems reasonable to assume that learning leads not to a set but to a probability distribution over a set of features. This makes it possible to overcome problems with the proposal of Hogeweg in which all features receive equal weight. It is now possible to distinguish obligatory ($p(A) = 1$), default features ($p(A) > 0.5$ or $p(A)$ is dominant within a set of mutually incompatible features), conditional features ($p(A | B) = 1$, conditional defaults and incompatible features ($p(A | B) = p(B | A) = 0$). This makes for a simple logic in which contextual information straightforwardly selects a set of semantic features as the meaning in use. Word meanings come out as overspecified frames assigning weighted properties to their paths and the semantic features considered can be identified with properties of paths in the frame.

The project aims for an integrated description of 5 motion verbs over a typological meaningful set of 6 languages in which each meaning in use of each verb in each language can be derived from the language independent description and the language specific distribution and is currently engaged in data collec-
The multilingual aspect aims at guaranteeing the typological validity of the description. While it is not a project task to fix the physical or experiential properties of the colour red or the human motion type of running—these are taken to be given by experience—there is in work like Dowty’s analysis of thematic role or Levin’s verb classification Dowty (1990); Levin (1993) or the analysis of locative marking a rich set of candidate semantic features with a sound typological base that can be exploited in the verbal semantics we are aiming for. One expects a harmony between typological validity and cognitive importance for such features. The first explorations indicate that extra primitives from experience are only rarely needed.

As an example consider the different uses (a-c) of the verb fall.

a. Tim fell on the floor.
b. Her hair falls on her shoulders
c. That fate falls on me (Russian).

Fall can be described as

Fall puts the fallen object at a position that is down in some dimension with respect to a source. It may describe the movement of the object to that position as in (a). The dimension is spatial per default. In (b) the subject needs to be split in two parts: part of the hair is on the shoulders, down from the other part of the hair. For (c), the dimension can be taken as set up by the process distributing fates, where the source is the process itself and the positions below it the persons on whom the fate may land. The properties of the subject will select the correct features by selecting and overriding defaults, avoiding incompatibilities and evaluating conditional dependencies. For example (a) and (b) will make the updimension into space from a specification, while (b) selects the theme splitting option: theme = source + theme₁ against the default that theme = theme₁. (c) selects outcome(process) for process = fate (allowed in Russian). Updimensions are sets of "locations" ordered by a relation up.

 updimension ∈ {space; posture; moral; health; level; quantity; life; outcome(process)}

The talk will discuss fall for a representative set of uses in English and Russian, proposing a single frame with an English and Russian distribution and discuss the truth-conditions of the selected meanings in use. It will also discuss some preliminary results on walk/run.

References

Choonkyu Lee (Utrecht University)

Typicality knowledge in the truth-conditions of adjective-noun combinations

The interpretation of an adjective in an adjective-noun (ADJ-N) combination is sensitive to the noun. We investigated the role of commonsense knowledge in a categorization experiment in Dutch. Stimuli. Our linguistic stimuli were seven adjectives, each combined with a Biased and a Neutral noun category: red hair/car, green tomato/chair, striped apple/T-shirt, straight leg/road, cork mug/board, wooden bike/frame, and woolen shoe/floormat. The Biased vs. Neutral distinction was established based on a pilot study. We prepared two photographs for each ADJ-N combination, one “Focal” (e.g., red hair with a bright focal red) and one “Nonfocal” (red hair with a more typical orange/copper hue).

Procedure. Twenty-four adult native speakers of Dutch participated in the experiment. We presented
a photo along with the target ADJ-N combination and asked participants to judge (in yes/no format, within three seconds) whether the picture matches/fits the expression. Each participant saw both photos for each of the 14 ADJ-N combinations for a total of 28 main trials, along with 28 filler trials including dummy mismatching-noun trials. Results. In the Focal condition, acceptability judgments were high (> 80%) for all ADJ-N combinations except one (striped T-shirt, 33%), confirming that participants treated the task as a category- or truth-judgment and not just a typicality decision (e.g., even with a highly unlikely photo of a focal-green tomato, 96% of the responses were Yes to green tomato). In other words, the typicality distinction (Biased vs. Neutral) did not affect peoples categorization judgments when the adjective dimension was clearly true (often overly so) of the image presented. In the critical Nonfocal condition, in contrast, Biased categories (hair, bike, etc.) led to significantly higher ‘Yes’ responses (55%) than Neutral categories (car, frame, etc., 27%; p < .001), even though the values on the relevant adjective dimensions (RGB for color, pixel proportions for material, etc.) were held constant between a Biased-Neutral pair.

Our finding demonstrates that when typical properties of (noun) categories in our commonsense knowledge are biased against the ‘focal’ value of an adjective dimension (e.g., focal red in hair, 100% wood throughout a bike, etc.), our standards for categorization are relaxed such that a ‘nonfocal’ value (orange/copper rather than red, or wood only in parts of a bike) is more acceptable for these categories compared to those that have no such typicality bias against a focal value. This typicality effect in rapid discrete categorization (beyond typicality ratings, e.g., Smith & Osherson, 1984) lends support to theoretical accounts that assume the same representational space for both typicality and truth judgments, such as Hampton’s (2007) threshold model.

References

Louise McNally (Pompeu Fabra University)
Distributional semantic representations as alternatives to descriptions over Carlsonian kinds

Zamparelli 1995 and many others postulate Carlsonian (1977) kinds or descriptions of kinds in the internal semantics of nominals to account for facts involving DP-internal syntax and semantics. However, descriptions of kinds have empirical and conceptual limitations, not the least of which is the fact that modeling kinds as an abstract subsort of entity ultimately says little about what kinds are or how complex kind descriptions are interpreted. In this talk I propose addressing these limitations by combining Discourse Representation Theory (DRT, Kamp 1981) and compositional distributional semantics (see Garrette, et al. 2011 for such a combination designed for other purposes).

Distributional semantic (or Latent Semantic, vector-space semantic) models vary in detail, but all represent expression meanings as vectors or matrices based on co-occurrence distributions in a corpus, and combine them via vector addition or multiplication, or more complex product operations (see Landauer & Dumais 1997 for discussion of the psychological interest of these representations; see Turney & Pantel 2010 and Baroni et al., to appear, for overviews of more recent developments). Distributional representations are successful at modeling polysemy resolution and co-composition-type phenomena (Pustejovsky 1995) for small phrases, particularly for generic contents (Boleda, et al. 2013, McNally, et al. 2013); in contrast, they are currently less successful at modeling highly discourse-dependent aspects of meaning. A model therefore naturally suggests itself on which e.g. adjectives and nouns are translated not as predicates (1b, 2b) but rather as valenceless constants that stand in realization or predication (i.e. property bearer) relations to discourse referents (1c, 2c). These constants can then
be interpreted not as functions from indices to sets of entities or as abstract entities (kinds or entity correlates of properties) whose real nature is unspecified, but rather as vectors (or perhaps in some cases matrices, following e.g. Baroni & Zamparelli, 2010) that constitute ersatz conceptual representations.

(1) a. Rex is a dog.

b. \( \langle x; r = x, \text{dog}(x) \rangle \)

c. \( \langle x; r = x, \text{Realize}(x, \text{dog}) \rangle \)

(2) a. Rex is brown.

b. \( \langle x; r = x, \text{brown}(x) \rangle \)

c. \( \langle x; r = x, \text{Bear}(x, \text{brown}) \rangle \)

In the talk, I show how DRS construction rules can permit both direct composition of vectors and more familiar, discourse-referent mediated semantic composition; I also show how the model can extend to verbs. The rest of the DRT framework remains intact.

Though distributional representations have limitations (see Copestake & Herbelot 2013), they can greatly enrich the formal semantic toolkit, and they are arguably less rigid and more tractable computationally than hand-built representations that attempt to approximate the conceptual dimension of meaning. Their integration into DRT is technically feasible, and the resulting models promise to advance our understanding of how the referential and conceptual dimensions of meaning interact.


Ralf Naumann (Heinrich Heine University Düsseldorf)

Formal semantics, frame theory and the challenge from event-related potentials

Baggio & Hagoort (2011) argue that formal semantics in its present state is inappropriate as a theory of semantic processing because it cannot explain such neurophysiological phenomena like the N400 or the SAN (sustained anterior negativity) both of which are event-related potentials whose amplitudes are modulated by semantic complexity.

(1) Het meisje was een brief aan het schrijven toen haar vriendin koffie op het papier / tafelkleed morste.

‘The girl was writing a letter when her friend spilled coffee on the paper / tablecloth.’

In (1), ‘tablecloth’ triggers a larger N400 compared to ‘paper’ because the former is semantically less related to an event of writing than the latter. According to Kutas & Federmeier (2000), this effect is closely related to predicting upcoming words in a sentence or a discourse which, in turn, has to do with semantic relations between words in the memory component of the brain and which are responsible for pre-activation processes. For example, paper is semantically more related to a writing event than a tablecloth because it can be the object on which the created object (e.g. a letter) is written. A SAN effect is evoked by a word if a previously drawn inference has to be retracted. In (1), this is the case when ‘morste’ (‘spilled’) is processed at the end of the sentence in the context of ‘paper’ because the spilling of coffee on the paper makes it unlikely that the letter gets finished, in contrast to the context with ‘tablecloth’ (Baggio et al. 2008).

According to Baggio & Hagoort, the main challenge for formal theories of meaning w.r.t. to the above data is the fact that those theories are “by design insensitive to differences between words of the same syntactic category denoting objects of the same type” (Baggio & Hagoort:1343). For example, the
meaning of both ‘paper’ and ‘tablecloth’ is defined as a subset of the domain of the underlying model M. This challenge can even be extended to the level of combinatorics or compositionality: if verbs or nouns do not have a fixed argument structure, as argued in Petersen (2007) (see also Jackendoff’s 2002 thesis ‘Unify pieces’), how is a verb, say ‘write’, combined with possible arguments like ‘the girl’, ‘a letter’ or ‘paper’?

We present a solution to these two challenges using the formalization of the Löhner-Barsalou Frame Hypothesis developed in Petersen (2007) and Naumann & Petersen (2013). Frames for common nouns like ‘paper’ or ‘tablecloth’ are interpreted as teams in the sense of Dependence Logic (Väänänen 2007). Teams are sets of agents like human beings, artefacts or events. Each agent is defined in terms of a set of attributes where the latter are like variables which can take values in a fixed set according to suitable typing constraints. Relations expressing semantic constraints between lexical items as exemplified by the N400 are formalized by associating with each team an expectancy model generated by this team (Naumann & Petersen 2013, Baltag & Smets 2008). The elements of this model represent possible continuations of how information can be added to the team and they are ordered by lexical expectancy relations which are determined empirically (see e.g. van Elk et al. 2010). Each expectancy relation corresponds to a particular attribute.

(2) a. write: {paper, computer} > {tablecloth, wall}
   b. paper: {writing, reading} > {submitting} > {burning}

Given a context c, corresponding to the representation of an expression a, c is combined with the representation c’ of the next upcoming expression b by using an update operation between c and c’ (Naumann & Petersen 2013). This operation is sensitive to the expectancy relations in the sense that they are used to determine the most likely attributes with respect to which the update has to be executed. The ‘best fit’ between the expectancy models associated with the two expressions is therefore dependent both on c and c’ so that the preceding context can have an effect of how c is integrated into it, yielding the new updated context. Each lexical expression is associated with a set of update operations so that its meaning can be defined in terms of this set. This has the effect of introducing non-determinism which is used to account for contextual dependencies. In contrast to dynamic approaches in formal semantics like DPL and Update Semantics as well as unification-based approaches, the update functions are explicitly defined in the model M, similar to Dynamic Epistemic Logic (Baltag, van Ditmarsch and Moss 2008, Van Benthem 2011).

Tilmann Pross and Antje Rossdeutscher (IMS, University of Stuttgart)

Sublexical bridging of formal and conceptual semantics

We propose to bridge the perceived gap between conceptual structures and truth-conditional semantics in a framework of the semantic analysis of morphologically complex words (e.g. Roßdeutscher [2012], Roßdeutscher and Kamp [2010]) in pervasive syntax approaches such as Distributed Morphology (DM, Halle and Marantz [1993a]), where (a) the same syntactic principles are assumed to be at work below and above the ‘word level’; (b) words are formed from ‘roots’; atomic, non-decomposable and category-neutral elements associated with encyclopedic knowledge and which combine with features to build larger linguistic elements; (c) the ‘lexical’ semantics of words (argument structure, aspect, selection restrictions) is derived along the same principles that govern the derivation of meaning at the sentence level, i.e. compositionality of truth-conditions and coherence of conceptual structures. We illustrate our account of bridging truth-conditions and conceptual structures with a sublexical analysis of German spatial expressions, i.e. denominal prefix-verbs such as überdachen (over.prfx.roof), #unterdachen (under.prfx.roof) and unterstützen (under.prfx.pillar) and prepositions such as in (in) along the analyses
proposed in Roßdeutscher [2013a,b, 2012]. über (over), unter (under) and in (in) are spatial expressions and so are prefix-verbs formed with über and unter. In our analysis, we distinguish two aspects of the linguistic structure of spatial expressions determined with respect to (a) an abstract geometrical model of space which derives truth-conditions of spatial expressions with respect to a formal theory of observer-centered vector space (in the spirit of Zwarts [2005], Kamp and Roßdeutscher [2005]); (b) an interpretation of geometrical objects and relations as concepts standing in conceptual relations such as ‘application’ or ‘support’. We argue that spatial expressions such as in are rather insensitive to conceptual restrictions of arguments in that the sublexical semantics of in only requires the geometry of its arguments to afford the appropriate geometrical inclusion relation. Furthermore, we show that in the sublexical semantics of überdachen both truth-conditions and conceptual structures are relevant (not any geometrical object located in the above region of another object is a roof) and that spatial expressions such as unterstützen are rather insensitive to the geometrical relation of contact but impose fine-grained conceptual restrictions on its possible arguments (support is not a geometrical but a conceptual relation between objects). In general, our sublexical analysis suggests that there is a continuum of relations between formal and conceptual semantics rather than a binary distinction between formal (sentence-based) and conceptual (lexical) semantics, with expressions emphasizing truth-conditions at one end and expressions emphasizing conceptual structure at the other, and a fine graduation of emphasis on truth-conditions and conceptual structure in between. Because the logical forms employed in truth-conditional semantics are insensitive to conceptual coherence (in that any well-logical form has an interpretation but not any interpretation of a well-formed logical form is conceptually coherent), in a pervasive approach to the syntax-semantics interface the continuum of relations between truth-conditions and conceptual structure manifests empirically in terms of conceptual restrictivity on possible fillers of argument slots of a logical form: the more conceptual restrictions are imposed on the fillers of argument slots of logical forms, the more emphasis is put on conceptual structures in the meaning of an expression.

References

Bob van Tiel and Bart Geurts (University of Bielefeld / Radboud University Nijmegen)  
Truth and typicality in the interpretation of quantifiers

The interpretation of quantifiers has been investigated from a range of perspectives. The standard view in formal semantics is that quantifiers denote relations between sets. For example, “Some A are B” is true if and only if the intersection between A and B is nonempty. Psychological research, however, has shown that quantified statements often convey finer-grained information than what is conveyed by their set-theoretic definitions. For example, Newstead et al. (1987) found that participants infer from the
statement “Some A are B” that somewhere between 17% and 45% of the A are B. In other words, the statement is more typical when a third of the A are B than when all but one is.

What is the relationship between set-theoretic definitions and typicality structure? Are these meaning aspects disparate or reflections of one underlying dimension? Are set-theoretic definitions of quantifiers still needed in light of the findings from psychological experiments? We address these questions based on the results of two experiments. In both experiments, we presented participants with sentences of the form “{Q circle / Q of the circles} are black” in situations with ten circles, each of which was coloured black or white. In Experiment 1 (orange dots), 220 participants had to indicate if the sentence was true or false in the corresponding situation. In Experiment 2 (grey dots), 120 participants had to indicate on a seven-point scale how well the situation was described by the sentence. The proportions of positive responses in Experiment 1 and the normalised average typicality judgements in Experiment 2 are provided in Figure 1.

![Diagram](image)

Figure 1: Normalised typicality judgements and proportions of positive responses in the truth value judgement task for ten quantifiers.

To determine if set-theoretic definitions feature in the conceptual representation of quantifiers, we first constructed and compared three models for the truth-value judgements (orange dots). Model 1 was based on set-theoretic definitions. Models 2 and 3 were based on typicality judgements: Model 2 included the average typicality judgements; Model 3 dichotomised these based on an optimal cutoff point. The deviations from Model 1 were significantly smaller than those from Models 2 and 3. Truth-value judgements are thus determined by set-theoretic definitions of quantifiers.

To evaluate the relationship between set-theoretic definitions and typicality judgements, we also constructed and compared two models for the average typicality judgements (grey dots). Model 1 measured typicality exclusively in terms of distance from the prototype. Model 2 in addition penalised the predicted values for situations where a sentence was false according to its set-theoretic definition. The deviations from Model 2 were significantly smaller than those from Model 1. So typicality judgements depend in part on set-theoretic definitions.

These results argue against the view that the conceptual representations of quantifiers are structured exclusively in terms of typicality. Set-theoretic definitions have a prominent role in shaping both
truth-value judgements and typicality judgements. Aside from this theoretical conclusion, we offer an elegant model of truth-value judgements and typicality judgements based on set-theoretic definitions, distance from the prototype, and pragmatic inferences.


**Natalia Zevakhina** (NRU Higher School of Economics Moscow)

*Which semantics better accounts for the predicates embedding exclamatives?*

In my talk, I address the question of which approach – formal, conceptual or lexical – better explains the choice of matrix predicates embedding exclamatives in the world’s languages and Russian in particular.

From a formal point of view, [Karttunen 1977] and [Grimshaw 1979] among others suggest to distinguish between factive and non-factive matrix predicates and claim that unlike the latter, the former ones embed exclamatives. This predicts that predicates like *know* and *be amazed* allow for exclamatives (*John knows/is amazed how very tall Bill is*) and predicates like *ask* don’t (*#John asks how very tall Bill is*). Moreover, this analysis captures factive uses of non-factive predicates like *believe* (*You won't believe whom she married!*), however, not all factive predicates take exclamatives as their arguments, e.g., *know* vs. *regret* (*#John regrets how very tall Bill is*).

Taking a more cognitively oriented perspective, embedding predicates divide into conceptual classes – emotive, perceptual, mental, etc, which enables to account for some more data. To illustrate, the evidence for that perceptual and emotive verbs are acceptable as matrix predicates comes from Catalan [Castroviejo 2006], Chinese [Visan 2000], Hungarian [Lipták 2006], Basque [de Urbana, Hualde 2003], Malagasy [Potsdam 2011] among others. Nevertheless, we still cannot account for the contrasts between English *know* vs. *regret* and Japanese ‘think’ vs. ‘know’ (according to [Ono 2006], the latter, unlike the former one, is unacceptable).

A finer-grained lexical approach claims that each lexical unit has its own semantics and can serve as a good instrument to capture the data. For instance, Russian predicates *predpolagatjf* [impf] / *predpolozhitf* [pf] ‘assume’ cannot embed exclamatives, whereas their close synonyms *dogadyvatjsya* [impf] / *dogadatjsya* [pf] ‘guess’ can. Corpus data render invaluable help in that. For instance, according to the National Corpus of the Russian language (www.ruscorpora.ru), perceptual verbs *smotretjf* [impf] / *posmotretf* [pf] ‘look’ occurs with the *kakoj* ‘what’ exclamative much more frequently (226 occurrences, 0.98 ipm) than *glyadetjf* [impf] / *glyanutf* [pf] / *vzglyadetf* [pf] / *poglyadetf* [pf] ‘look’ in the context of *kakoj*-exclamatives (48 occurrences, 0.208 ipm). In other words, verbs’ frequency rates can give rise to their lexical peculiarities. Furthermore, such predicates differ in grammatical forms. To give an example, *smotretjf* [impf] / *posmotretf* [pf] ‘look’ in the context of *kakoj*-exclamatives usually takes an imperative form (199 out of 226, 0.86 ipm) and *znatjf* [impf] / *uznatf* [pf] in the same context usually takes a subjunctive form (54 out of 103, 0.23 ipm) and does not occur in an imperative form at all. That is, each predicate has a number of possible constructions it might be used in and describing the predicates we are supposed to take into consideration both semantic and grammatical aspects of a lexical unit.

To sum up, all the three approaches has its advantages and limitations and looking at the data needs a broader unified perspective.

**PRACTICAL INFO**

**Workshop dinner**

**When:** Saturday, April 12, from 19.00  
**Where:** Loungebar Restaurant Canoo  
**Address:** Robert-Lehr-Ufer 19, 40474 Düsseldorf  
**Tel:** 0211 - 49 55 48 88  
**Web:** [www.canoo.de](http://www.canoo.de)

**How to get there by public transport**

- walk to subway station “Heinrich-Heine-Allee” (approximately 5 minutes)
- take subway U78 (direction “D-ESPRIT arena / Messe Nord”) or U79 (direction “Duisburg Meiderich”) to the stop “Kennedydamm”
- walk to Robert-Lehr-Ufer (approximately 6 minutes)

**Walking (approx. 25 minutes)**

- Follow Schadowstraße heading Düsseldorfer Schauspielhaus/Tram-station “Jan-Wellem-Platz”
- Turn left and follow Kaiserstraße which leads you directly to Fischerstraße
- Follow Fischerstraße and turn left to Sittarder Straße
- Follow Sittarder Straße heading the Rhine, which leads directly to Robert-Lehr-Ufer
- Robert-Lehr-Ufer is the street, that is right next to the Rhine. After 450m, you will find Club Canoo (a ship) on your left.

**Restaurants nearby the workshop site**

There are plenty of restaurants in the old town (“Altstadt”) in short walking distance of the workshop site (5-10 minutes).

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