



# **Linguistic versus non-linguistic knowledge**

**Tübingen, December 3-5, 2014**

Hosted by the SFB 833 "The Construction of Meaning" at the  
Eberhard Karls Universität Tübingen funded by the DFG



## **Accommodation**

Participants are accommodated at the guest house of the University of Tübingen.



## **Workshop venue**

The workshop will take place in the newly renovated Department of Psychology (Room 4.332). The walking distance from the guest house of the University is about 10 minutes.

Department of Psychology; Schleichstr. 4; 72070 Tübingen;  
[www.pi.uni-tuebingen.de](http://www.pi.uni-tuebingen.de)



**Coffee and snacks**

You will find coffee, refreshments, and snacks during the workshop in front of room 4.332.

**Lunch**

You'll find a great variety of restaurant and snack stalls in the city center. Here are a few suggestions:

Wurstküche (Swabian cuisine) – Am Lustnauer Tor 8

Neckarmüller (with beer garden; Swabian cuisine) – Gartenstraße 4

Herrenschlosser – Metzgergasse 37

Kichererbse (Vegetarian) – Metzgergasse 2

Collegium – Lange Gasse 8

Tulsi Palace (Indian restaurant) – Wilhelmstraße 88

Saints & Scholars – Wilhelmstraße 44

Al Dente (Italian restaurant) – Clinicumsgasse 22

Manufaktur (Italian restaurant) – Vor dem Haagtor 1/2

Coffee and dessert:

il dolce – Metzgergasse 6

Tübinger Zuckerbäcker – Ammergasse 16

### **Dinner on Wednesday and Thursday**

There will be a welcome dinner at the Greek restaurant “Traube” at 7 p.m. on Wednesday (Neckarhalde 14).

On Thursday, we’ll visit the Chocolate Market in the Tübingen’s medieval town center, and have then dinner at the “Kelter” (Schmiedtorstraße 17)



(Source: chocolart.de; Photographer: Alexander Gonschior – agowebworks)

### **Excursion on Saturday**

We’re planning an excursion on Saturday to one of the Christmas Market of the region (e.g., to the medieval Christmas Market in Esslingen, or to the baroque Christmas Market in Ludwigsburg). Everybody interested is welcome to join us!!

## Schedule

### Wednesday, December 3th

19.00 Welcome Dinner at the Greek restaurant  
"Traube"  
Neckarhalde 14

### Thursday, December 4<sup>th</sup>

09.30 Welcome

09.40 **Barbara Malt, Lehigh University**  
*Concepts and word meanings:  
Why they aren't the same*

10.20 Coffee break

10.50 **Matthias Irmer, OntoChem GmbH, Halle**  
*The impact of script knowledge on text  
interpretation: The case of phase particles  
in German adjectival passives*

11.30 **Carolin Dudschig, University of Tübingen**  
*Semantic versus world-knowledge  
violations: Is there a difference between  
four-legged bananas and four-legged  
spiders?*

12.10 Lunch break

14.30 **Gabriella Vigliocco,  
University College London**  
*Do you see what I am talking about?  
Iconicity as a core property of language*

15.10 **Keith Stenning, University of Edinburgh**  
*Qualitative causal reasoning: Observing  
the synthesis of heuristics*

15.50 Coffee break

16.20 **Maj-Britt Isberner, University of Kassel**  
*Linguistic vs. non-linguistic knowledge:  
Insights from research on validation*

**afterwards:**

Visit to the Chocolate Market in the old town center

Dinner at the restaurant “Die Kelter” (Schmiedtorstraße 17)

**Friday, December 5<sup>th</sup>**

9.30

**Hans Kamp, University of Stuttgart**  
*How much ontology? And where? And why?*

10.10

**Olav Mueller-Reichau,  
University of Leipzig**  
*Russian factual imperfectives, event kinds,  
and rules in background knowledge*

10.50

Coffee break

11.20

**Tillmann Pross & Antje Rossdeutscher,  
University of Stuttgart**  
*The encoding of knowledge in linguistic  
structures*

12.00

Lunch break

14.30

**Tessa Warren, University of Pittsburgh**  
*Verb-argument representation and world  
knowledge in language comprehension*

15.10

**Sebastian Bücking & Claudia Maienborn,  
University of Tübingen**  
*On the interaction between semantic and  
conceptual knowledge: Integrating global  
context information into local meaning  
composition*

15.50

Coffee break



16.20

**Ken McRae,**

**University of Western Ontario**

*Empirically distinguishing between lexical-semantic and real-world knowledge depends on multiple assumptions*

17.00

Final discussion



## **Abstracts of the talks**

**Barbara Malt**

**Concepts and word meanings: Why they aren't the same**

To study concepts, cognitive scientists need to be able to identify them. Prevailing approaches conflate word meanings with concepts and assume that general-purpose, non-linguistic concepts are revealed by words such as triangle, table, and robin. But languages vary dramatically in how they carve up the world by name. Either general purpose concepts are heavily language-dependent or the words of a language cannot be a direct route to them. In this talk, I will argue that the second of these possibilities is true, and I will illustrate the argument with data on words for human locomotion. The data show that shared conceptual content across four languages is distinct from the answers suggested by any single language. They support the conclusion that words such as triangle, table, and robin do not individuate general-purpose concepts. However, words can help identify underlying components of domain knowledge. This observation suggests new approaches to understanding the word meaning-concept relation and underscores the need to distinguish between them.

**Matthias Irmer**

**The impact of script knowledge on text interpretation: The case of phase particles in German adjectival passives**

Linguistic communication depends heavily on extra-linguistic knowledge sources. Hardly any utterance can be made and understood without resorting to other knowledge sources. While this is a known fact, the exact way how compositional semantics and ontological knowledge interact is often left unsaid. This talk is about German adjectival passive sentences containing temporal sentence focus particles, or phase particles, such as 'immer noch' (still), which are felicitous only under certain conditions which until now have not been explained sufficiently. It will be argued that knowledge of scripts, defined as a finite sequence of conceptual frames, plays a major role in their interpretation: Adjectival passives denoting the result state of a script-final event cannot be combined with 'immer noch' due to conflicting inferences arising from different knowledge sources. While the expression of such a state carries an expectation of inertia, some phase particles bear a meaning component which explicitly cancels this effect. The proposed integration of linguistic material with background frame and script knowledge is based on the central assumption that event kinds correspond to conceptual frames that are evoked during text interpretation, which opens up a new perspective on the relation between conceptual structure and compositional semantics.

**Carolyn Dudschig, Claudia Maienborn & Barbara Kaup**

**Semantic versus world-knowledge violations: Is there a difference between four-legged bananas and four-legged spiders?**

The distinction between linguistic and non-linguistic knowledge is particularly relevant because it points to the status of compositionality in meaning composition. In a study by Hagoort, Hald, Bastiaansen, and Petersson (2004), the distinction between linguistic and non-linguistic knowledge has been challenged. Here we investigated the influence of sentence structure on the N400 complex. Our results replicated the findings by Hagoort and colleagues and showed that the N400 onset latency does not vary between linguistic violations ('Bananas are four-legged') and non-linguistic world-knowledge violations ('Spiders are four-legged'). Critically, the N400 complex was not affected by the sentence structure (generic vs. specific: 'Spiders are four-legged' vs. 'These spiders are four-legged'), but only by the noun-adjective combination. This questions the assumption that the N400 results obtained by Hagoort and colleagues reflect processes at the sentence level. Implications for future studies addressing the differences between linguistic and non-linguistic knowledge will be discussed.

**Gabriella Vigliocco**

**Do you see what I am talking about? Iconicity as a core property of language**

Language is often defined as a symbolic system where the symbols (e.g., word forms) are only arbitrarily linked to aspects of human experience (e.g., sensorimotor experiences). However, the existence of less arbitrary (iconic) links between linguistic form and meaning is also present, especially in sign languages. In the talk I will argue that assuming language to be only arbitrary is a direct consequence of using a narrow-focus lens on what language is. This narrow lens neglects that language has evolved, is learnt and is used (for the most) in face-to-face communicative contexts that afford clear visual iconicity in the signs (for signed languages) but also in co-speech gestures (in spoken languages). If we broaden our lens to consider language to extend to these aspects of communication, then languages are iconic, in addition to being arbitrary. I will discuss how taking iconicity, along with arbitrariness, as core property of language brings about new hypotheses concerning language processing and development and present relevant evidence.

## Keith Stenning

### Qualitative causal reasoning: Observing the synthesis of heuristics

An experiment extending Cummins' 1995 paradigm of 'naive causal reasoning' explores the possibility that everyday causal reasoning using existing general knowledge is based on intensional representations and heuristic decision, rather than on Causal Bayes Nets, as is nowadays widely supposed (e.g. Fernbach and Erb 2013 JEP). This talk focusses on analysing the 'birth' of contentful heuristics in the recruitment of causal knowledge. It is part of an argument that those who would espouse probability are under an onus to demonstrate that probability is **\*necessary\*** to explain such data: not just that it can model it.



**Maj-Britt Isberner & Tobias Richter**

**Linguistic vs. non-linguistic knowledge: Insights from research on validation**

In this talk, we address the implications of research on validation on the distinction of linguistic vs. non-linguistic knowledge. This distinction is a logical prerequisite for two-step models of comprehension and validation, which assume that comprehension and validation are nonoverlapping stages of information processing. These two-step models presuppose that comprehension relies purely on linguistic knowledge, while non-linguistic world knowledge is only accessed optionally and after comprehension has terminated, in order to judge the real-world truth or plausibility of the output of the comprehension process. However, this notion is at odds with the situation model account of comprehension, which posits that comprehension entails the construction of a situation model of the text content, and that such a model is constructed by integrating text information and world knowledge. We will also present empirical findings that speak against two-step models of comprehension and validation and suggest that validation of information against non-linguistic knowledge is in fact an integral component of language comprehension.

## **Hans Kamp**

### **How much ontology? And where? And why?**

My aim with this talk is to stimulate discussion on certain questions of a general and ‘philosophical’ nature, which have worried me personally over the years, which I take to be among the central concerns of the workshop and about which I hope to be able to learn from the other participants of this workshop.

I will start with a brief resume of the origins of Formal Semantics in the work of Montague and the (quite modest) role that ontology seems to be playing there. A possible entry for ontology into Montague Grammar, I will argue, is offered by Meaning Postulates, but how much of an entry they offer depends on what kinds of Meaning Postulates one is prepared to adopt.

I will then focus on two later developments in Formal Semantics. The first of these is the one that led to Discourse Representation Theory, in which the interpretations that language users are assumed to construct of a sentence, discourse or text are treated as inseparable from the question of its truth conditions; in this way the construction of semantic representations becomes a central part of what the theory is intended to capture. The treatment proposed in this framework of, in particular, the tenses of the verb and other linguistic devices for expressing temporal and aspectual relations presupposes that the language user is equipped with certain assumptions about the structure of time and of the temporal properties of events and states occurring in time.

Secondly I will review some developments in the semantics of spatial prepositions, including current work on the semantic contributions that spatial particles make to German verbs. These developments imply that the semantic composition of spatial PPs with verb phrases or noun phrases – and, likewise, the compositional processes that build particle verbs from spatial particles and verbal roots – involve a substantive spatial ontology, which must be available to a language user who is capable of executing these compositional operations.

In conclusion I will try to relate these various observations to the distinction, drawn many decades ago by Emmon Bach, between 'real metaphysics' and 'natural language metaphysics'.

## Olav Mueller-Reichau

### Russian factual imperfectives, event kinds, and rules in background knowledge

Factual imperfectives pose a "perennial problem" (Klein 1995) to Russian aspectology. Consider the paradigm example (1): Why is the verb coded by imperfective aspect despite the fact that the event referred to is clearly completed, which otherwise calls for perfective morphology? (On the phenomenon, see, inter alia, Rassudova 1968, Glovinskaja 1982, Padučeva 1996, Grønn 2004, Mehlig 2013).

(1) *Ja čital<sup>IPF</sup> "Vojnu i mir"*. ('I have read "War and Peace"')

Given that the imperfective is a signal of "avoidance of the precise meaning of the perfective" (Forsyth 1970), and given that perfectives express "target state relevance" (Grønn 2004), it follows that the speaker chooses the imperfective in (1) to avoid drawing attention to the conditions of the event's target state. But where does she want to draw attention to instead?

Forsyth's (1970:82) classic answer is that "the speaker is merely interested in the fact that the type of action named did occur (or alternatively that it did not occur)". I will argue that this view is only partly correct. What is correct is that the speaker is interested in the fact that the type of action named did occur, yet this is not her "mere interest".

In particular, I will propose that factual imperfectives come with a specific background/focus structure of the VP. What is focussed is a condition expressing event realization, what is backgrounded is the event description, i.e. the event kind identified by the sentence VP ("the type of action named" in Forsyth's words). The approach predicts that the existence of the event kind named will have to be known to the interlocutors (at least if we adopt Geurts & van der Sandt's 1997 Background/Presupposition Rule, what I do, following Grønn 2004:193). I will show that this prediction is borne out. As I will also show, however, mutual knowledge of the event kind is only a necessary, but not a sufficient condition for successfully uttering a factual imperfective.

What is additionally required is that there is a rule (in the sense of Carlson 1995, Cohen 2001), that the rule is socially accepted (=in-effect in the given discourse situation), and that the event kind named by the VP concurs with the rule in a specific way. Given that a rule may logically be represented as a conditional being subject to an operator '!', "which maps a

formula to the rule it describes if there is such a rule, and is undefined otherwise" (Cohen 2001), the hypothesis is as follows.

(2) A factual imperfective can successfully be uttered only if the event kind named by the VP matches the event kind in the protasis of (the conditional of) a socially accepted rule of the type:  $!(\forall e\forall x. R(e, \cap P) \ \& \ \text{agent}(x,e) \rightarrow \exists s. \text{result}(e,s) \ \& \ \text{in}(s,x) \ \& \ Q(s))$ .

The whole point about factual imperfectives seems to be that the speaker refers to the realization of an event kind (hence to a completed event) in order to trigger an implicature. The implicature is drawn from two premises (this builds on ideas of Šatunovskij 2009): the first is the claimed truth of the realization of the event kind, and the second is a background rule being in-effect, as required by (2). Thus, by uttering a factual imperfective, the speaker not only communicates "the fact that the type of action named did occur" (Forsyth). This only serves a vehicle for something else: the speaker also communicates that the performer of the action (=the realizer of the event kind) belongs to a certain category of people, i.e. the class of individuals being in a state of property Q. Wrt (1), for instance, the most likely reading is that the realizer (here: the speaker) is claimed by the speaker to be in a state of prestige, which is possible because the following arguably holds in the discourse situation:

(3) in-effect( $!(\forall e\forall x. R(e, \cap \text{read\_W\&P}) \ \& \ \text{agent}(x,e) \rightarrow \exists s. \text{result}(e,s) \ \& \ \text{in}(s,x) \ \& \ \text{state-of-prestige}(s))$ )

In the talk, I will outline the approach described above, and I will present the sketch of a typology of factual imperfectives sorted according to the nature of property Q.

**Selected References:** Carlson, G. (1995). Truth Conditions of Generic Sentences: Two Contrasting Views. In G. Carlson and F. Pelletier (eds.), *The Generic Book*. Chicago, London: University of Chicago Press, 224–237. ♦ Cohen, A. (2001). On the Generic Use of Indefinite Singulars. *Journal of Semantics* 18 (3), 183–209. ♦ Glovinskaja, M. J. (1982). *Semantičeskie tipy vidovych protivopostavljenij russkogo glagola*. Moskva: Nauka. ♦ Grønn, A. (2004). *The Semantics and Pragmatics of the Russian Factual Imperfective*. Oslo: Acta Humaniora. ♦ Klein, W. (1995). A time-relational analysis of Russian aspect. *Language* 71, 669–695. ♦ Mehlig, H. (2013). Obščefaktičeskoe i edinično-faktičeskoe značenija nesoveršennogo vida v ruskom jazyke. *Vestnik Moskovskogo Universiteta* 9 (4). ♦ Padučeva, E. (1996). *Semantičeskie issledovanija*. Moskva: Jazyki ruskoj kul'tury. ♦ Rassudova, O. (1982[1968]). *Upotreblenie vidov glagola v*

sovremennom russkom jazyke. Moskva: "Russkij jazyk". ♦ Šatunovskij, I. B. (2009). Problemy russkogo vida. Jazyki slavjanskich kul'tury.



## Tillmann Pross & Antje Rossdeutscher

### The encoding of knowledge in linguistic structures

We address the question for the relation between linguistic structures and world knowledge in an account of word meaning in which words are formed from 'roots', atomic, non-decomposable and category-neutral elements associated with encyclopedic knowledge. Roots combine with features to build larger linguistic elements according to the same syntactic and semantic principles which are at work above the word level. The semantics of a root in a particular insertion context is incrementally specified by the semantic interpretation of the syntactic structure of the insertion context. That is, one and the same root can have different meanings, depending on the syntactic context in which it is inserted and interpreted. In the talk we will focus on German constructions with (i) the verbal kernel *vzieh*, contributing the application of force at some region of an entity in the direction of the source of the force; and (ii) the prepositional element *van*.

- (1) a. den Zahn (\*leicht) in 5 Minuten (\* für 5 Minuten) ziehen  
b. den Wagen (\*leicht) (\*in 5 Minuten) ( für 5 Minuten) ziehen  
c. die Grenze (\*leicht) in 5 Minuten (\* für 5 Minuten) ziehen
- (2) a. die Rübe (\*leicht) in 5 Sekunden aus der Erde ziehen  
b. für 5 Sekunden leicht (\*in 5 Sekunden) an der Rübe ziehen
- (3) a. die Mutter leicht anziehen  
b. den Schmutz (\*leicht) anziehen  
c. den Schuh (\*leicht) anziehen

The root *vzieh* is characterized in the examples in two different ways. First, in (1a) vs. (2a) vs. (3a), the meaning of *vzieh* in its insertion context is differentiated by linguistic differences of the insertion context: +/- PP +/- *van*. We take this differences to be induced by differences of the syntactic-semantic insertion context and thus to be determined by linguistic knowledge. Second, and this is where the question for non-linguistic knowledge becomes relevant, *vzieh* has a different semantic spell-out of



although the syntactic-semantic insertion context is the same in (1a) vs. (1b) vs. (1c); (3a) vs. (3c) vs. (3b). The standard explanation for the different meaning of *vzieh* in the same insertion contexts would involve regress to non-linguistic knowledge in the form differences spelled out in terms of a structured ontology of eventualities (i.e. Aktionsart calculi) that underlies linguistic knowledge. In our framework, the differences in Aktionsart are identified with different insertion contexts, where the type of insertion context is testified by linguistic modification tests.

The consequent question which we would like to address with this talk is of what kind the difference exemplified by minimal pairs such as (1a) vs. (1b) vs. (1c); (3a) vs. (3c) vs. (3b) is: is it a difference pertaining to linguistic or non-linguistic knowledge? We further explore the question by highlighting the consequences either answer has on the concept of Aktionsart and its role in linguistic theorizing.

**Tessa Warren**

**Verb-argument representation and world knowledge in language comprehension**

The role of world knowledge in language comprehension has been hotly debated (e.g. Frazier, 1987; McRae, Ferretti, & Amyote, 1997). Classical theories (Chomsky, 1965; Katz & Fodor, 1963) assumed that general world knowledge and linguistic representations were separate and used at different stages of comprehension. But a large and growing body of evidence suggests that they may not be dissociable in comprehension (e.g. Hagoort, Hald, Bastiaansen & Petersson, 2004), and that world knowledge might drive many processing effects traditionally attributed to linguistic knowledge (e.g. McRae, Ferretti, & Amyote, 1997). In this talk, I will present the results of a series of experiments that were designed to get at the question of whether verb-argument processing reduces to the activation of event-based knowledge, or whether comprehenders draw on some kind of verb-based knowledge as well. As the findings suggest there may be a role for verb-based knowledge, I will provide some speculation as to what that knowledge is and how it comes about.

## Sebastian Bücking & Claudia Maienborn

### **On the interaction between semantic and conceptual knowledge: Integrating global context information into local meaning composition**

Within linguistic semantics, compositionality is commonly considered to be one of the cornerstones of natural language meaning constitution. Semantics investigates how and to what extent the meaning of a sentence is determined by its syntactic structure and how such a compositional meaning skeleton is enriched by contextually accessible encyclopedic knowledge. Recently, this perspective has been challenged from the point of view of cognitive psychology. Nieuwland & van Berkum (2006) and Hagoort & van Berkum (2007) among others argue that an analytic distinction between a locally determined compositional level of meaning and a contextually specified encyclopedic level of meaning commits us to a “two-step model of interpretation”, according to which the compositional meaning is computed first and contextual information is only considered in a second step. They reject such a two-step model in favor of a “single-step model of interpretation”, in which all kinds of information – local syntactic and lexical cues as well as global pragmatic cues – are available at once and will be merged without any prioritization of the compositional build-up.

We take issue with this perspective by arguing that semantic knowledge (i.e. compositional meaning parts) and conceptual knowledge (i.e. contextually accessible encyclopedic information) are distinct, but may interact with each other at various stages of building complex meanings. As a case in point, we discuss the combinatorial meaning contribution of modifying *schnell* ('quick/fast') and its cognates such as *flink* ('brisk') in German. See the following set of examples for illustration:

- (1) Paul rauchte eine schnelle Zigarette.  
Paul smoked a quick cigarette

(2) # Paul rauchte {das Rauchen / das Drehen} einer Zigarette.  
Paul smoked the smoking the Rolling of-a cigarette

(3) a. # Paul rauchte eine flinke Zigarette.

Paul smoked a brisk cigarette

b. Paul hat flink eine Zigarette gedreht.

Paul has briskly a cigarette rolled

(4) Paul will, dass wir uns möglichst bald ausführlich zusammensetzen. Das heißt, wir brauchen ein schnelles Meeting.

'Paul wants that we sit together soon for an extensive discussion. That means that we need a quick meeting.'

Conceptual and semantic knowledge interact here in the following ways:

- (i) The interpretation of (1) builds on interpolating an adequate event that mediates between the event sensitive predicate *schnell* and its argument cigarette, which is of a physical type. This mediation is locally operative in two senses: first, it must be put to work within the local predication that combines the modifier with its nominal target; notably, it should not change the type of the whole NP's referential argument: smoke selects for physical objects, not events, compare (2). Second, conceptual knowledge regarding the locally given noun *Zigarette* allows for specifying the mediating event instantaneously.
- (ii) The conceptual repair is not arbitrary, but rooted in specific lexical, that is, semantic information: in contradistinction to

schnell, flink does not allow for an analogous repair, although this would be conceptually plausible, see (3a) vs. (3b).

- (iii) The repair is controlled for by semantics; however, it can be triggered by conceptual conflicts as well, see (4): A meeting could, in principle, last only for short; however, the context suggests that the meeting itself will not be brief, but that it must be organized within a short amount of time.

We will spell out our perspective in terms of Asher's (2011) type composition logic and show how it allows for integrating semantic and conceptual knowledge within a dynamic model.

**Ken McRae**

**Empirically distinguishing between lexical-semantic and real-world knowledge depends on multiple assumptions**

Empirically distinguishing between lexical-semantic (linguistic knowledge) and real-world knowledge (non-linguistic knowledge) has proven to be challenging. It appears that some of the difficulty concerns the fact that testing this distinction, and interpreting experimental results, requires various assumptions to be made. I will discuss a few of these assumptions, and present experimental results that rely on them. One set of assumptions concerns precisely what sorts of information count as lexical-semantic, and what counts as real-world knowledge. These assumptions lead directly to decisions regarding how the distinction in a particular study is operationalized, and therefore how results are interpreted. Another assumption concerns the time-course of language comprehension, specifically whether lexical-semantic knowledge necessarily should influence comprehension more rapidly than should real-world knowledge. Also related to timing and modularity is the assumption that world knowledge (being non-linguistic) should influence syntactic processing only after a delay. The degree to which empirical evidence is interpreted as supporting or refuting a distinction between linguistic and real-world knowledge depends on a researcher's stance with regard to such assumptions, and researchers' views differ. Despite these challenges, I will conclude that it is not necessary to posit special lexical-semantic linguistic knowledge.









