Course: LIN 443/543 Semantics II
Term: Spring 2008
Instructor: Jürgen Bohnemeyer
Text: Cann 1993 plus additional readings

Overview: This course provides a first introduction to the linguistic study of sentence and utterance meaning. It is designed to be complementary to LIN438/538 *Semantics*, which focuses on lexical meaning. While there is arguably no clear "logical" order among the two courses, and you are in fact free to take them in any order you like, students commonly prefer to start with 438/538, perhaps among other things because it is the less technical of the two. Also, because compositional semantics presupposes a solid grounding in syntactic theory and analysis, 443/543 has more entry requirements than 438/538 (see below).

Requirements: Students must complete LIN415/515 Syntax I before taking LIN443/543.[1]

Goals: At the center of LIN443/543 lies the predominant approach to compositional semantics (the study of sentence meaning) in contemporary linguistics and philosophy: *formal semantics*, developed by philosophers of language such as Max Cresswell, Donald Davidson, David Lewis, Richard Montague, and Robert Stalnaker in the 1960s and 70s based on the groundwork laid by the logicians Gottlob Frege (1848-1925) and Alfred Tarski (1902-1983). Formal semantics seeks to capture the contribution that the constituents of a sentence make to its meaning in terms of *truth conditions*. Formal semantics is often equated with *truth-conditional*, *referential*, or *denotational* semantics,[2] as opposed to *representational*, *conceptual*, or *cognitive semantics*, which views meaning as a mapping between linguistic utterances and some internal cognitive representations they invoke.[3] We will discuss the philosophical controversy over the understanding of the notion of "truth conditions" and their role in semantics. Truth conditions are usually - though not necessarily - characterized in a formal metalanguage. The formal language most widely used in linguistics is (mostly, first-order) *predicate calculus*. But translations into a formal language do not explicate the meaning of English sentences any better than translations into, say, Mongolian, until the semantics of the formal language is defined. Formal

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[1] In order for the course to make sense to you, you need a working understanding of how to describe English syntax in a simply context-free phrase structure grammar. If you haven't taken Syntax I, come talk to me so we can figure out whether you have that working understanding.
[2] In his series of seminal papers, *English as a formal language* (1970), *Universal grammar* (1970, often cited as *UG*), and *The proper treatment of quantification in English* (1973, often cited as *PTQ*) Richard Montague (1930-1971) provided the first comprehensive, explicit, and detailed treatment of "fragments" of natural language in formal semantics. For this reason, formal semantics was often equated with *Montague Grammar* or *Montague Semantics* in the 1970s and 80s.
[3] None of these terms are synonymous, though. For instance, a compositional semantics arguably *can* be wholly or partially representational. We'll try to clarify the relations among these concepts in class.

semanticists describe meaning in terms of truth conditions; but the meaning of a sentence is independent of its actual *truth* (truth is dependent on meaning, not the other way around). Semanticists evaluate the truth conditions of a sentence, as captured in formulae of predicate calculus, not with respect to (cognitive representations of) the real world, but with respect to simple mathematical (algebraic) *models*.[4] For this reason, formal semantics is also known as *model-theoretic* semantics. Thus, in principle, the semantic analysis of a sentence involves a model-theoretic interpretation and evaluation, customarily (though not necessarily) facilitated by a preceding translation into a formal meta-language such as predicate calculus.

The first part of the course (which comprises two-thirds of it – the first nine weeks) is dedicated to the conceptual and technical/mathematical basics of formal semantics. Your goal for this phase will be to learn to translate sentences of simplified versions ("fragments") of English into predicate calculus (or similar formal metalanguages), in such a manner as to reflect certain aspects of their syntactic structure, and to evaluate the resulting predicate-calculus formulae with respect to appropriate models to see whether they meet native speaker intuitions about the truth conditions of the utterances. Towards the end of this part, we move beyond the "manual" translation of individual syntactic constructions/configurations, in search of general – as opposed to construction-specific – rules and constraints of the syntax-semantics interface. This first part of the course should also be of interest to anybody thinking of specializing in syntax (regardless of theoretical persuasion), even if they do not otherwise care a great deal about semantics – think of it as the minimum amount of appreciation for compositional semantics you need to have in order to do syntax. Plus, we'll add lambda-calculus to our technical bag of tricks, which is a useful tool not just for formal/compositional semantics, but also for lexical semantics. It's a convenient way of defining predicates in terms of conditions on their arguments such as properties and relations among them (think, for example, semantic roles).

The final fragment we build in Part I of the course is designed to deal with some aspects of the problem that has attracted the most attention in compositional semantics: scope ambiguities in quantification. Part II and III of the course introduce applications to other domains: temporal, aspectual, and modal operators, number marking and the mass-count distinction, telicity, and discourse semantics. Linguists of virtually all stripes and specializations can benefit from (and may sooner or later require) a working understanding of these semantic domains. And this is the one required-for-all course that offers an introduction to them.

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[4] The goal of compositional semantics is to capture how the meaning of complex expressions depends on the interpretations of their parts. It was Montague's insight that "dependence" in this sense can be described in terms of algebraic *functions*. Thus, if the interpretation of the component expressions is characterized in terms of constants and variables, the meaning of the complex expression emerges as a mathematical function of these constants and variables. It is then up to model theory to construct a model of values that "interpret" the constants and variables and test whether the resulting interpretation of the complex expression – the function – depends on the interpretation of the component expressions in a way that matches native speakers' linguistic intuitions about the truth conditions of the expression. Model theory, a branch of mathematics, was founded by Tarski.

Characterizing sentence meanings in terms of truth conditions, especially when it involves translation into a formal metalanguage, inevitably entails a great deal of idealization and abstraction. For example, nobody has so far been able to construct a metalanguage that can encode the bulk the meanings expressed in lexical items. An equally powerful idealization of formal semantics as introduced in the first Part of this course is the restriction of compositional semantics to isolated sentences. One goal of Part III is to alleviate this shortcoming, by putting in place additional tools (and some revisions) that in combination with (classical = "static") formal semantics allow us to analyze the meanings of actual real-life utterances, rather than abstract sentences. At the same time, Part III offers an introduction to two major branches of linguistic pragmatics (the study of language use, when linguists or philosophers, as opposed to anthropologists or psychologists, are doing the "studying") – Austinian pragmatics (after J. L. Austin (1911–1960)), or the study of *speech acts*, and Gricean pragmatics (after H. P. Grice (1913-1988)), or the study of *implicatures*. Speech acts – utterances viewed as goal-directed actions – are a good starting point for correcting the shortcomings of the reduction of meaning to truth conditions. Implicatures are inferences that allow hearers to make plausible assumptions about the speaker's communicative intention, given what she says in truth-conditional terms in a given context. Austin and Grice share the vision of truth-conditional meaning as merely a pale shadow of, and in some sense a vehicle for, utterance meaning. Pragmatics has important applications in most other fields of the study of language – especially in descriptive linguistics, language processing and language acquisition research, computational linguistics, and applied linguistics.

Another fundamental aspect of utterance meaning – apart from the speaker's communicative intentions – is context-dependence. The interpretation of all natural-language utterances – there really appears to be no exception! – is heavily dependent on both the linguistic and the extra-linguistic context. Since the late 1970s, formal semanticists have been working on modified versions of the classical "Montague Semantics" capable of dealing with meaning in context. These approaches are often grouped together as "dynamic" frameworks, since they consider the semantic contribution of a sentence to an utterance dependent on the context in which the sentence occurs. We discuss in particular the most widely used among these frameworks – *Discourse Representation Theory* (DRT). DRT ascribes truth conditions, not to isolated sentences, but to mental representations that are the product of the processing of stretches of discourse and that are updated with every new clause or sentence parsed. DRT has important applications in the treatment of discourse anaphora, tense and aspect, and information perspective, some of which we will consider.

Classes: T/R 12:30-13:50 in 17 Clemens

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Course work:

- Day-to-day reading assignments are listed in the syllabus below.

You will N-O-T be able to follow the course and complete the homework assignments and exams if you skip the readings! ***This has nothing to do with how smart you are. The brightest student in the course will flunk the homework assignments and exams without doing the preparatory readings.*** This is simply a consequence of the technical nature of the material.

- Four homework assignments. Homeworks must be completed within a week. Students in 443 have a lower grade scale (i.e., require fewer points for the same grade) compared to grad students. You get one chance (a replacement, handed out at the end of the course) to make up for a missed or flunked assignment. After that, every additional missed or flunked homework counts as flunked.
- Midterm exam. Obligatory for everyone. Problems will be similar to problems in the first two homework assignments or problems discussed in class. Again, undergraduate students will require fewer points per grade.
- Final exam. Obligatory for everybody except for those who can replace it with a term paper (see below). Problems will be similar to problems in the homework assignments and the midterm exam. Again, grading will be adjusted to undergraduate vs. graduate level.
- Term paper. Graduate students, and exceptionally, with permission of the instructor, students in 443 as well, have the opportunity to submit a short term paper (5-10 pages) instead of or in addition to the final exam. The paper must present an original semantic or pragmatic analysis formulated within the theoretical frameworks introduced in the course.
- In-class participation. I grade participation as follows: Regular active participation – A; regular attendance and occasional active participation – B; regular attendance, no active participation – C; irregular attendance, no active participation: D; poor attendance, no active participation: F.
- Exercises. At the end of each lecture I will assign a few exercises which we will discuss at the beginning of the following meeting. I will not collect or grade these; you complete them for the sole benefit of your own training. However, presenting the solution to an exercise in class is one excellent way of boosting your participation grade.

Assessment:

- Homework assignments: 40% (10% per assignment)
- Midterm exam: 20%
- Final exam or term paper: 30%
- Participation: 10%

Syllabus (highlighted parts still under construction as of 01/15)

Part I	**The basic machinery of formal semantics**		
week	day	topics	reading[5]
1	1	welcome!; lexical, compositional, and pragmatic meaning; the principle of compositionality	ch.1.1
	2	referential and representational approaches; meaning and truth conditions	ch.1.2-1.4
2	1	*** **Class cancelled due to colloquium Nikitina** ***	
	2	meaning and truth conditions (cont.); formal semantics in a nutshell; a very brief history of formal semantics; why we make you do it; translating English into a logical language; the syntax of L_P	ch.2.1-2.1.1
3	1	the syntax of L_P (cont.); a grammar fragment for English; the translation procedure	ch.2.1.1-2.1.3
	2	preview: the final; the translation procedure (cont.); exercise 2.1-2.2; interpreting L_P; individuals and identity; a little light set theory; interpreting predicates	ch.2.1.3-2.2.3
4	1	interpreting predicates (cont.); exercise 2.3-2.4; compound sentences; complex formulae; interpretation	ch.2.2.3-3.3
	2	interpreting operators and connectives; exercise 3.1-3.2, 3.5; formal interpretation	ch.3.3-3.4
		First homework assignment out 02/07; due 02/14	
5	1	HW#1 - your questions; formal interpretation (cont.); semantic types (cont.); verb phrases and other constituents; a typed logical language; semantic types	ch.3.4-4.2.1
	2	semantic types (cont.); translating verb phrases	ch.4.2.1-4.2.2
6	1	translating verb phrases (cont.); more set theory; exercise 4.1, 4.3; interpreting L_{type}; denotation	ch.4.2.2-4.4.1

[5] Unless otherwise stated, reading assignments refer to our text book, Cann 1993, *Formal semantics*. Additional readings are marked with ^ if downloadable from the library's online course reserve page for this course and with * if downloadable from the UBLearns/Blackboard system.

	2	revising the theory; exercise 4.4, 4.5; adverbs; type-driven translation (preview); the passive; introducing the lambda operator	ch.4.4.2-5.2
7	1	extending L_{type}; exercise 5.1, 5.2; interpreting lambda expressions	ch.5.2.1-5.2.2
	2	the passive again; exercise 5.3, 5.4; generalizing lambda expressions	ch.5.2.3-5.3
Second homework assignment out 02/28; due 03/06			
8	1	HW#2 - your questions; midterm exam: sneak preview; generalizing lambda expressions (cont.); exercise 5.5-5.7; reviewing co-ordination; sentential co-ordination	ch.5.3-5.4.1
	2	sentential co-ordination (cont.); co-ordinating other categories; the variety of noun phrases; introducing the logical quantifiers; the quantifiers; interpreting L_Q	ch.5.4.1-6.2.2
****************03/10 – 03/15 Spring break****************			
10	1	**Guest lecture: JP Koenig on *approaches to the syntax-semantics interface***	*Heim & Kratzer 1998: ch.3; ^Koenig 2006
	2	****************!!!Mid-term exam!!!****************	
11	1	quantification and negation; exercises 6.1-6.2; a compositional approach; translating quantifier pronouns; complex NPs	ch.6.2.3-6.3.2
	2	nominal modifiers; proper names and definite descriptions; exercises 6.6, 6.9; type raising; generalized quantifiers	ch.6.3.3-6.6

Part II	**The basic machinery applied and exploded: possible worlds, events, paths, and parts**		
week	day	topics	reading
12	1	where entailments fail; intension and extension; introducing other worlds; simple modality	ch.9.1-9.3.1
Third homework assignment out 04/01; due 04/08			
	2	HW#3 - your questions; exercise 9.1; accessible worlds; event semantics; lexical aspect	ch.9.3.2; *Chierchia & McConnell-Ginet 2000: 431-482
13	1	sums and parts; mereology: implementation	^Krifka 1998

Part III	**Getting real**		
week	day	topics	reading
13	2	HW#4 - your questions; pragmatics; speech acts; Grice's typology of meaning	*Levinson 1983: ch.5; *Levinson 2000: ch.1.1

14	1	Levison's three heuristics; GCI celebs; presupposition vs. backgrounding	*Levinson 2000: ch.1.3-1.4; *Chierchia & McConnell-Ginet 2000: 349-359
Fourth homework assignment out 04/15; due 04/22			
	2	triggering and projecting presuppositions; formalizing presupposition; accounting for projection	*Chierchia & McConnell-Ginet 2000: 359-381
15	1	discourse anaphora; donkey anaphora; E-type anaphora; dynamic semantics; unselective binding	*de Swart 1998: ch.6.1-6.4
	2	unselective binding (cont.); tense logic; Reichenbach; temporal anaphora; tense and aspect in DRT	Kamp, van Genabith, & Reyle ms. 71-121

****************!!!Final exam!!!****************
TUE 05/06/2008, 08:00 AM - 11:00 AM, BALDY 106

Bibliography[6]

Allwood, Jens S., Lars-Gunnar Andersson, & Östen Dahl. 1977. *Logic in linguistics*. Cambridge: Cambridge University Press.

Bach, Emmon W. 1989. *Informal lectures on formal semantics*. Albany, N.Y.: State University of New York Press.

Cann, Ronnie. 1993. *Formal semantics: An introduction*. Cambridge: Cambridge University Press.

Chierchia, Gennaro & Sally McConnell-Ginet. ²2000. *Meaning and grammar: An introduction to semantics*. Second edition. Cambridge, MA: MIT Press.

de Swart, Henriëtte. 1998. *Introduction to natural language semantics*. Stanford, CA: CSLI.

Davidson, Donald. 1980. *Essays on actions and events*. Oxford: Clarendon Press.

Dowty, David R. 1979. *Word meaning and Montague Grammar*. Dordrecht: Reidel.

Dowty, David R., Robert E. Wall, & Stanley Peters. ²1985. *Introduction to Montague Semantics*. Dordrecht: Reidel.

Grice, H. Paul. 1989. *Studies in the way of words*. Cambridge, MA: Harvard University Press.

Heim, Irene & Angelika Kratzer. 1998. *Semantics in Generative Grammar*. Malden, MA: Blackwell.

[6] All books are on reserve in the Undergrad Library; all book chapters can be downloaded from the online course reserve page for LIN443. The books and chapters have been reserved for LIN443; it is anybody's guess as to whether the library people will figure out that this course is cross-listed as LIN543.

Kamp, H., J. van Genabith, & U. Reyle. ms. Discourse Representation Theory. To appear in D. Gabbay & F. Guenthner (eds.), Handbook of philosophical logic. (http://www.ims.uni-stuttgart.de/%7Euwe/Papers/DRT.pdf)

Kamp, Hans & Uwe Reyle. 1993. *From discourse to logic*. Dordrecht: Kluwer.

Kamp, Hans & Christian Rohrer. 1983. Tense in Texts. In Rainer Bäuerle, Christoph Schwartze & Arnim von Stechow (eds.), *Meaning, use, and interpretation of language*. Berlin: de Gruyter. 250-269.

Koenig, Jean-Pierre. 2006. The interface between syntax and semantics. In Keith Brown (Editor-in-chief), *Encyclopedia of language and linguistics*. Second Edition. Amsterdam: Elsevier. 427-438.

Krifka, Manfred. 1998. The origins of telicity. In Susan Rothstein (ed.), *Events and grammar*. Dordrecht: Kluwer. 197-235.

Levinson, Stephen C. 1983. *Pragmatics*. Cambridge: Cambridge University Press.

---- 2000. *Presumptive meanings: The theory of generalized conversational implicatures*. Cambridge, MA: MIT Press.

McCawley, James D. 1981. *Everything that linguists have always wanted to know about logic but were ashamed to ask*. Chicago, IL: University of Chicago Press.

Montague, Richard. 1974. *Formal philosophy: Selected papers of Richard Montague*. Edited and with an introduction by Richmond H. Thomason. New Haven, CT: Yale University Press.

Parsons, Terence. 1990. *Events in the semantics of English*. Cambridge, MA: MIT Press.

Partee, Barbara H., Alice ter Meulen, & Robert E. Wall. 1990. *Mathematical methods in linguistics*. Dordrecht: Kluwer.