Benz, Anton

From optimality theory to error models: a case study of the comparative quantifier '*More than*'

In this talk we consider the scalar implicatures of numerals modified by the comparative quantifier '*more than*'. A key prerequisite for drawing the quantity implicature from '*three*' to '*not more than three*' in e.g. '*Nigel has three children*' is the assumption that the speaker knows the exact number of Nigel's children. This lead to the assumption that modified numerals as in '*Nigel has more than three children*' generate no implicatures as the comparative quantifier '*more than*' indicates that the speaker lacks sufficient knowledge for making a more precise statement. However, experimental results from (Cummins et al., 2012) show that scalar implicatures are available from modified numerals. For example, the estimated average number of people getting married is much higher in (1b) than in (1a):

(1) a) More than 90 people got married today.
b) More than 100 people got married today.

We start from Cummins (2013), who proposes an optimality theoretic model designed to account for the experimental findings of (Cummins et al., 2012). It is a one–sided production model with four constraints: Grice's quantity maxim, a markedness constraint for avoiding complex quantifiers, and constraints preferring rounded numbers and previously mentioned (*primed*) numerals. The input–output pairs are the speaker's intended meaning and its linguistic realisation. Implicatures are then calculated by inferring the speaker's meaning from output. This model has to assume that constraints are not ranked, which conflicts with the basic idea of optimality theory as the ranking of constraints is one of its key ingredients. We show that this model can be adapted to the framework of *error models* (Benz, 2012), avoiding the foundational problems.

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Two Geometric Models of Adjectival Modification

Reinhard Blutner & Merel de Groot, Universiteit van Amsterdam

A long-standing problem is how to combine the idea of prototype semantics with common wisdom of compositionality. Recently, two different models have been proposed for analyzing a simple instance of this problem: the combinatorial mechanism of adjectival modification (what color is a red nose/flag/bean?). The first model is based on Peter Gärdenfors' idea of conceptual spaces and uses a method called 'radial projection' in order to map a certain convex set (e.g. the set of all natural color values) to convex subsets (e.g. the sets of nose/flag/bean colors). The method uses a linear transformation along a straight line with a fixed origin in order to map the values of one convex set to the values of the other one. The second model is based on Paul Smolensky's idea of representing conceptual combinations by tensor products (an idea of linear algebra) and certain reduction operations in order to overcome the problem of combinatorial explosion inherent to the naive use of the tensor product. Operations such as circular convolution and simple multiplications have been proposed (Aerts, Blutner, Clark, Plate, Zadeh, and others). The surprising result is that both methods - though completely different both from the mathematical and the conceptual point of view - give very similar outcomes. Despite this basic result, I claim that the method of the reduced tensor product has conceptual advantages: it describes the shape of typicality and the composition of typicality functions, and it accounts for several puzzles of conceptual combination.

Colinet, Margot

From NPI to FCI reading of *any* in negative contexts through an analysis of focus.

The indefinites built on *any*- can be used as Negative Polarity Items or Free Choice Items:

1. Paul didn’t meet **anybody**. 2. You can invite **anybody** while I’m not here.

Roughly, NPIs are items that are licensed in the scope of a negative operator and FCIs are items that are used in contexts where the referent of the indefinite pronoun can vary among all the entities constituting its quantificational domain. From a semantic and pragmatic point of view, NPIs and FCIs are composed by an indefinite (like *something* in English) plus an anti-referential requirement, which says that all the entities in the quantificational domain must be taken as equivalent potential referents. This statement has been formulated in many different ways in the literature (starting with *widening* and *strengthening*: Kadmon and Landman, 1993). In English, where the sole item *any* covers the NPI and FCI uses and only the NPI reading is available in negative sentences. More generally there is a misleading common view according to which NPIs associate with negation while FCIs do not if ever they occur in negative sentences (see, Haspelmath, 1998’s cognitive map). But, in many languages, like French, NPIs and FCIs are morphologically different, their distribution crossover easily and particularly interestingly in negative sentences:

3. Paul n’a pas rencontré **qui que ce soit**.
`Paul didn’t meet anybody’ (there were nobody/*he met the Pope!)

4. Paul n’a pas rencontré **n’importe qui**.
`Paul didn’t meet just anybody’ (*there were nobody/he met the Pope)

In the scope of a negative operator, the indefinite component of NPIs associates with it while its anti-referential requirement escapes from its scope and the opposite scenario is observed for FCIs. The definition of NPIs and FCIs given above must be fine grained in order to explain this contrast. We claim that these items have the same composition but differ on the status of their components; more precisely the anti-referential requirement is a presupposition in NPI’s composition while it has an assertoric status in FCI’s composition. This claim can be supported by interesting data in English. The indefinite *any* can get the FCI reading in negative sentences when associated with a so-called focus sensitive particle or a particular intonation:

4.a. I didn’t meet **anybody**.
b. I didn’t meet **just anybody**.
c. I didn’t meet **ANYbody**.

Focus sensitive particles or intonational backgrounding are known to affect the informational status of their *prejacent*. According to these analyses, in the negative sentences in (5), the indefinite component of NPI-*any* is predicted to *project* (in the sense of Simons et al., 2011) while the anti-referential requirement will remain in the scope of the negation. Reversing the status of its components, the particle *just* or a particular focus turn the NPI-*any* into an FCI. Combining the semantic/pragmatic effects of focus sensitive particles and intonational backgrounding to the composition of *any*, we can explain its FCI uses in negative contexts. This supports our claim according to which NPIs and FCIs are composed by the same components that have different informational status.

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Aspectual no man's land: process predicates

Markus Egg, Humboldt-Universität zu Berlin

Topic of this talk is the aspectual class of *process predicates* like *dance*, *oscillate*, or *stay*. This class features in most aspectual classifications, but is usually only the aspectual no man's land that remains once stative and event predicates (e.g., *love* or *kill*, respectively) have been demarcated. Sometimes the class is even considered part of the stative or the event predicate class (Galton 1984; Moens and Steedman 1988). The term 'predicates' refers to verb (phrase)s and higher projections below the lowest inflectional phrase.

Aspectual tests for process predicates are compatibility with the progressive (as opposed to stative predivates) and with temporal *for*- but not *in*-adverbials (as opposed to event predicates). Due to its diversity, this class is hard to define, however. Defining them as *cumulative* and partially *divisive* (suitable sums and parts of entities in the extension of P are also P; Taylor 1977) would also apply to some non-process predicates, too, e.g., *to eat at least one apple*. Defining them as *indefinite change of state*, or an iteration of very small changes of state, e.g., of change of place in the case of movement verbs, would exclude process predicates like *stay* that exclude an (otherwise expected) change of state (Dowty 1979). Finally, *agentivity* can characterise some, but not all, process predicates (compare e.g. *watch* vs. the intransitive *roll*).

I define process predicates in terms of the *prevention* of a state of affairs that would take place otherwise, an intervention into the normal course of events, which leads to a denial of expectation. This intervention can prevent a change of state, e.g., for *stay*, or sustain a process that would otherwise come to a halt by itself, e.g., for *move* (i.e., the semantics of such process predicates is based on a pre-Newtonian view of mechanics). Such interventions are prototypically performed by conscious actors, which explains the intuition that process predicates are often agentive. (1) is a first attempt to formalise the semantics of process predicates P through *similarity between possible worlds*:

(1) For all e and w: $[\![P(e)]\!]^w = 1$ iff there is a predicate Q such that

(i) $[\![\neg\exists e'.Q(e')]\!]^w = 1$ for e' immediately following e

(ii) in all worlds w' ($w' \neq w$) maximally similar to w: $[\![\exists e'.Q(e')]\!]^{w'} = 1$ for an e' immediately following e

In prose, a Q-eventuality would take place in the natural course of events if the P-eventuality had not prevented it. This definition contrasts prevention and causation, which according to Dowty (following Lewis 1973) can be modelled in terms of similarity between possible worlds, too.

E.g., *stay* can be defined in this way as not terminating one's location in the proximity of a (contextually given) location (abbreviated here as a change of state with the poststate **be-away**′). Such predicates are cumulative and partially divisive, as desired:

(2) For all x, e, and w: $[\![\mathbf{stay}'(x)(e)]\!]^w = 1$ iff

(i) $[\![\neg\exists e'.\text{BECOME}(\mathbf{be\text{-}away}'(x))(e')]\!]^w = 1$ for e' immediately following e

(ii) in all worlds w' ($w' \neq w$) maximally similar to w: $[\![\exists e'.\text{BECOME}(\mathbf{be\text{-}away}'(x))(e')]\!]^{w'} = 1$ for an e' immediately following e

As it stands, the proposed analysis is a first approximation to the semantics of process predicates, which does not yet offer an account of many fine-grained lexical distinctions. For instance, Dowty (1979) observes that position verbs like *sit, stand*, *or* lie are on a cline between process and stative predicates, as indicated by their (in-)compatibility with the progressive:

(3) *The socks are lying/*lie under the bed.*

(4) *New Orleans lies/*is lying at the mouth of the Mississippi.*

In a similar vein, if movement is modelled as the prevention of coming to a standstill, then what is the difference between *march* and *march on*? I will discuss possible extensions of the analysis that can handle such fine-grained distinctions.

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Graben, Peter beim

Order effects in dynamic semantics

In a recent paper, Wang and Busemeyer (2013) discuss question order effects in terms of incompatible projectors on a Hilbert space. In a similar vein, Blutner (2012) presented an orthoalgebraic query language essentially relying on dynamic update semantics. In my presentation, I shall comment on some interesting analogies between the different variants of dynamic semantics (Blutner, 1996; Veltman, 1996; Gärdenfors, 1988) and generalized quantum theory (Atmanspacher et al., 2002; Baltag and Smets, 2011) to illustrate other kinds of order effects in human cognition, such as belief revision, the resolution of anaphors, and default reasoning that result from the crucial non-commutativity of mental operations upon the belief state of a cognitive agent.

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Homer, Vincent & Thommen, Tristan

Remarks on a Language with no Overt Negation

All current theories of n-words in European French (EF) (1) are incorrect: we show that in EF **(1.)** n-words are NPI indefinites (not negative quantifiers, *contra* e.g. [1], [2]), and **(2.)** there is no overt negation. Eventually, we do away with negative concord in EF (against all other theories).

1. Classic evidence for treating n-words as NPIs comes e.g. from the single negation (SN) reading of (2) and (3). We add novel and decisive evidence to that case. N-words, like NPIs, can be anti-licensed by the intervention of a strong quantifier. *Toujours,* when it means *always,* scopes below negation (written NEG), see (4) (otherwise it means *still*); the *always* reading is unavailable with an object n-word (5), due to intervention. Any theory of n-words as negative quantifiers is defeated by the unavailability of the $\text{TOUJOURS}_{\text{always}} \gg \text{NOTHING}$ reading. Our claim is further verified under *sans* 'without': in (6a), only an SN reading obtains; and (6b) is ungrammatical, due to a monotonicity reversal. So n-words must, at least sometimes and in fact always, be (strong) NPIs. As such, their acceptability depends on the *monotonicity of their environment,* not on some feature checking, as the contrast between (7a) and (7b) confirms (following current trends, e.g. [3]). That n-words are not negative (thus bear no negative feature) undermines [4]—which holds that n-words agree syntactically with an abstract negative operator—and, generally, the very idea of negative concord.

2. We claim that French has only one sentential negation ('NEG') and it is silent; when present, it *requires* an n-word in its scope (therefore n-words as fragmentary answers (8a) are not in fact problematic; (8b)-(8c) also follow): we show that generalization (9) holds. (10a) is only an apparent counterexample (it parallels (10b)): in fact *pas* is itself an n-word, it is not negative (no more than *ne,* whose presence signals that there is a sentential negation in the clause in which in appears). In effect, (i.) it belongs to a semantic natural class of degree adverbials (11), some members of which, *aucune-ment* and *nulle-ment*, are indisputable n-words; (ii.) like all other n-words, it is historically not negative (it means *step*); and (iii.) it can clearly lack negative force under *sans* 'without' (12a) and under *non* (12b). Again we disagree with [4], according to which EF has *two* negations, the abstract Op and *pas,* equipped with different features, such that *pas* cannot agree with n-words; the SN reading of (2) straightforwardly falsifies that view, tailor-made to explain (13a). The SN/DN ambiguity of (3) is due to the possibility of inserting a lower NEG in a dedicated position (against resumptive quantification, [5]). And we claim that a semantic explanation is needed for the obligatory DN reading of (13a)—insertion of two NEGs—based on the novel observation that all synonyms of *pas* (11) block an SN reading with another *clausemate* n-word (13b).

Conclusion. N-words are subject to two constraints: (α) *qua* NPIs, they need a licensing environment; and (β) they are in turn required to meet the needs of NEG (9). Although syntactic features are of no avail w.r.t. (α), one might be tempted to use them to derive (9) as the expression of a syntactic agreement. This is misguided: there is obviously a *semantic* component, gone unnoticed so far, in the relation between NEG and n-words, as revealed by (13a)-(13b). The ingredients necessary to derive (9) are (i.) NEG seen as a binding operator (a quantifier); (ii.) the specific *semantic* properties of n-words, investigated in this talk, which make them the only possible bindees of NEG.

(1) List of n-words: *personne, rien, jamais, nul, aucun, plus...*

(2) Je ne crois pas qu' il ait jamais fui.
I NE think PAS that he has ever fled
'I don't think that he ever fled.' (*^{ok}SN)*

(3) Personne n'aime personne.
SN: *'Nobody likes anybody.'*
DN: *'There is nobody who likes nobody.'*

(4) a. Il ne rit **toujours** [NEG] **pas.**
he NE laughs still NEG PAS
$\text{TOUJOURS}_{\text{still}} \gg \text{NEG}$

b. Il ne rit [NEG] **pas toujours.**
he NE laughs NEG PAS always
$\text{NEG} \gg \text{TOUJOURS}_{\text{always}}$

(5) Il ne fait toujours rien.
he NE does still anything
'He still does nothing.'

$[_{TP}$ il T [toujours $[_{NegP}$ NEG rien fait]]]
$*\text{NEG} \gg \text{TOUJOURS}_{\text{always}} \gg \text{ANY}$
$*\text{TOUJOURS}_{\text{always}} \gg \text{NEG} \gg \text{ANY}$

(6) a. Il est parti sans rien dire. ('he left without saying anything') (*^{ok}SN; *DN)*
b. *Il est parti non sans rien dire. (lit. 'he left not without saying anything')
c. Il est parti non sans dire quelque chose/*quoi que ce soit. ('he left not without saying something') [N.B.: *quoi que ce soit* is an NPI]

(7) a. Il est impossible qu' il ait jamais fui.
it is impossible that he has ever fled
'It is impossible that he ever fled.' (*^{ok}DN; ^{ok}SN)*
b. Il n'est pas impossible qu'il ait jamais fui. (*^{ok}DN; *SN)*

(8) —A: Qui est venu ? ('who came?')
a. —B: Personne. ('no one') LF: [NEG personne]
b. —B': *Qui que ce soit. (*'anyone') LF: *[NEG qui que ce soit]
c. —B": Marie. ($\neq$ 'not Marie') LF: *[NEG Marie]

(9) **Generalization:** No clause can contain NEG, the silent sentential negation, if it contains no n-word in the scope of NEG.

(10) a. Il n'aime pas Marie. ('he doesn't like Marie') LF: $[_{TP}$ il T $[_{NegP}$ NEG pas Marie aime]]
b. Il n'aime personne. ('he doesn't like anyone') LF: $[_{TP}$ il T $[_{NegP}$ NEG personne aime]]

(11) Synonyms of *pas: point, aucunement, nullement, en aucun cas.*

(12) a. Il est parti sans même pas dire au revoir. ('he left without even saying goodbye')
b. Il aime non pas Paris mais Bruxelles. ('he likes Brussels, not Paris')

(13) a. Il n'aime pas personne. *(*SN; ^{ok}DN)*
b. Il n'aime {nullement/aucunement/point/en aucun cas} personne. *(*SN; ^{ok}DN)*

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Jasinskaja, Katja

On the disambiguation of *but*

In this talk I will give an account of two factors that play a role in the disambiguation of the English connective *but* between a *corrective* (1) and an *adversative* reading, cf. (2) and (3). The pragmatic effect of the corrective reading is that some wrong element (Bill) is "replaced" by the correct element (Mary) in the hearer's representation of some situation. Corrective sentences in English require: (a) the presence of negation in the first conjunct of *but*; and (b) ellipsis of all linguistic material except the actual correction (Mary) in the second conjunct, as in (1). If the second conjunct does not undergo ellipsis (2), or if negation occurs in the second conjunct instead of the first (3), the corrective reading is lost: Mary does not "replace" Bill in the representation of the same praise event. Rather, the sentences simply state that one situation took place, while the other one didn't.

(1) John didn't praise Bill, but Mary.

(2) John didn't praise Bill, but he praised / did praise Mary.

(3) John praised Mary, but not Bill.

The central idea of the proposed analysis is that *but* signals that its conjuncts address a *question under dispute* (i.e. a question on which the conversation participants potentially disagree), and that the second conjunct of *but* must give a more informative answer to that question. The idea goes back to Anscombre and Ducrot (1977); however, the reformulation in terms of questions and answers, as I will show, is necessary for a uniform account of corrective and adversative uses.

In corrections like (1), the question under dispute is a *wh*-question *Who did John praise?* The speaker believes the answer "Mary" to that question, while the hearer believes the answer "Bill". It is this *wh*-question that licenses ellipsis of all the material except the short answer *Mary* in the second conjunct (Vicente, 2010). In contrast, the question under dispute in (2) and (3) is a *yes/no*-question: *Did John praise both Mary and Bill?* in (3) and *Did John praise neither Mary, nor Bill?* in (2). These questions do not license the same kind of ellipsis; the ellipsis in (3), I will argue along with Vicente (2010), is of a different kind, involving two distinct foci *not* and *Bill* rather than a single constituent focus on *not Bill*. (3) does not have a corrective reading because under exhaustive interpretation (Schulz and van Rooij, 2006) the positive proposition "John praised Mary" always gives a more informative answer to the question *Who did John praise?* by picking exactly one cell of the corresponding partition, whereas the negative answer "John didn't praise Bill" only excludes cells in which Bill is the object of praising, leaving it open who was actually praised. In contrast, the negative proposition gives a more informative answer to the question *Did John praise both Mary and Bill?* than the positive one, since the falsification of one conjunct is enough to falsify a conjunction, whereas verification of one conjunct is not enough to verify it.

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Krifka, Manfred

The semantics and pragmatics of response particles

My talk will be concerned with response particles like *yes* and *no*, or German *ja, nein* and *doch*. These particles can be used to react to assertions, and to answer polarity questions.

There has been a number of recent proposals, e.g. syntactic ones that treat them as elliptical clauses (e.g. Krahmer & Rawlins 2009), or semantic-pragmatic ones within a framework of truth-conditional semantics and of communication as a change of common ground. I will argue for the latter type of proposals, but I will point out shortcomings in recent works, like Farkas & Roelofsen (2011).

One problem is that non-negated and negated propositions have to be distinguished to capture the distribution and meaning of these particles, which cannot be done with a simple truth-conditional representation of propositions. I will argue that response particles refer to propositional discourse referents which, as structural entities, can be marked as negated. To consider a simple example:

(1) A: *John isn't happy (either). / Isn't John happy (either)?*
B: (i) *Yes, he is.* / (ii) *Yes, he isn't.* / (iii) *No, he isn't.* / (iv) *No, he is.*

I will argue that (1A) introduces two propositional DRs, p = 'John is happy' and q = ¬'John is happy', induced by the syntactic structure [$_{\text{NegP}}$ *-n't* [$_{\text{TP}}$ *John is happy*]] which involves two propositional constituents, NegP and TP. Independent evidence for that comes from (2):

(2) *Two plus two isn't five.* (a) *That* (= '2+2=5' *would be a contradiction.*
(b) *Every child knows that* (= ¬'2+2=5').

I assume that in (1) y*es* picks up a salient DR and asserts it, while *no* picks up a salient DR and asserts its negation. Due to bidirectional pragmatic optimization, certain reactions are dispreferred, especially to the question; e.g. (1B)(iv) is dispreferred because it involves double negation (not q, = ¬¬p, = p), and (ii) is dispreferred because its meaning can be expressed by the preferred interpretation of *no*, (iii). Non-sentential negation introduces only a non-negated DR, and the answer patterns are simpler:

(3) A: *John is unhappy.*
B: (i) *Yes, he is.* / (iii) *No, he isn't.*

The German particle *doch* presupposes a negated DR and negates that, hence expressing reading (1B.iv); as predicted, it is not possible in (3), and it blocks (1B.ii). In the talk I will also consider other systems, such as Japanese *hai* and *iie*, and Romanian *ba*. Furthermore, I will explain the use of response particles to questions with high syntactic negation, as in (4), which disallow answers (1B.ii) and (1B.iv).

(4) *Isn't John happy (too)?*

Another difference between languages is that response particles can stand for either propositions (as in German) or for full speech acts (as in English); this explains the following contrast:

(5) a. *Ist Hans glücklich? Falls ja, ist das gut, falls nein, müssen wir etwas tun.*
b. *Is John happy? If so / ? yes, that's good, if not / ?no, we have to do something.*

A Bidirectional OT analysis of Afrikaans Negation

Ryan Nefdt, Master of Logic, University of Amsterdam

November 27, 2012

Abstract

The study of negation in natural language has brought out some interesting features of the linguistic terrain. So-called negative concord languages are often cited as contravening the principle of compositionality of meaning as more than one negative element does not change the negative meaning of a sentence. In this paper, I investigate one such language, a Dutch-descended language spoken in Southern Africa, Afrikaans. This phenomenon is a departure from what we would expect given a first order logical understanding of negation. From a compositional point of view, negation would correspond to sentential negation $\neg$ and thus more than one negation results in a positive sentence as *per* double negation.In fact, many languages do operate in this way, we call these Double Negation languages. On the other hand, in Negative Concord languages this is quite different as two negative elements are required for one negative reading.

In this paper, I discuss negative concord in Afrikaans with relation to Optimality Theory (OT). I argue that de Swart's OT (2004) analysis falls short of accounting for Afrikaans negation facts and cannot characterise the language adequately in terms of other negative concord languages. I offer evidence from Afrikaans and Portuguese to show that her OT constraints and rankings do not capture certain negation facts of these languages.

I then discuss Zeijlstra's typology of negation and conclude that it does not capture the correct typology and rests too heavily on Minimalist underpinnings. Furthermore, it places Afrikaans in a privileged position as the only representative of a class of negation languages. I disagree with this conclusion based on the nature of the typology which in addition to describing Afrikaans as a unique member of a class of languages also includes a class of negation languages which have no overt semantically negative elements. I suggest that this contravenes the Jesperson cycle and offer arguments both theoretical and empirically based to refute this assumption.

My own analysis requires a principled distinction between the two Afrikaans negative markers and my OT analysis predicts a tripartite typology for negation in natural language based on this Afrikaans analysis. Afrikaans is thus considered to be part of a set of languages which have semantically negative

n-words but semantically non-negative negative markers (the set includes certain Eastern European languages such as Czech). I develop an OT constraint system that capture these distinctions and an alternative typology results from the ranking of these new constraints. Thus, three distinct groups of negation languages are identified. Double negation languages and two types of negative concord languages, Non-strict and A-type as show in the figure below.

Tripartite Typology of Negation	N-words negative	N-words non-negative
Negative Markers negative	DN languages	Non-Strict NC
Negative Markers non-negative	A-Type NC	NONE

Robering, Klaus

A Theory of Space Based on the Notions of Part and Convexity

January 2, 2013

Although geometry received an axiomatization already in the 3rd century BC, it was only at the turn from the 19th to the 20th century that Moritz Pasch, David Hilbert, and others gave axiomatic presentations of Euclidean geometry which were (nextly) unobjectionable from the viewpoint of formal logic. However, though these systems are (more or less) unobjectionable from the purely logical point of view, they have occasionally been criticized for being “unintuitive” and “arbitrary” (e.g., by Moritz Geiger and Otto Selz — both inspired by phenomenology). Hence the question arises whether there are formal theories of geometry which are more in accordance with our intuition of space and whose basic concepts can be justified by their cognitive roles for spatial intuition.

The present paper provides an outline of such a system based on two central ideas (besides some auxiliary notions of a merely technical character). The first idea is to use mereology as a basis for the geometric theory. This strategy has already been suggested in the 1920s by Stansisław Leśniewski. Leśniewski’s disciple Alfred Tarski, in a brief note from 1929, gave a sketch how to axiomatize Euclidean geometry within mereology by employing the ingenious idea of the Italian geometer Mario Pieri to use the notion of a sphere as the single properly geometric concept for the entire system of Euclidean geometry. Mereology, of course, provides to geometry the notion of part: one spatial region is a part of another one if it is completely included in the latter. Hence, for instance, the inner one of two concentric circles (of the same plane) is a part of the outer circle. The second central idea of the present account to geometry is to start from convexity (rather than from the more special notion of sphere). In recent years, it has been argued by Peter Gärdenfors that convexity is the property which distinguishes “real” (cognitive significant) properties, i.e., regions of quality spaces, from merely spurious ones (like, e.g., Goodmans *grue*). In the present context it is assumed that what holds true (according to Gärdenfors) for quality spaces is valid also for “real space”, i.e., that convex regions are cognitively more natural than non-convex ones.

Unlike Tarski, who used “non-atomistic” mereology for his axiomatization of geometry, I will adopt points as “atomic regions” (and, indeed, as convex ones). The convex hull of a spatial region is the smallest convex region in which the first region is contained as a part. The segment p_1p_2 determined by the points p_1 and p_2 is defined to be the convex hull of the mereological sum of these points. The usual criterion for convexity, then, is adopted as an axiom: If for each pair of points which are part of a region the segment determined by these points is a part of the region, too, then the region is convex. Mereology thus enriched is already sufficient to build up the theory of so-called convexity structures. More axioms will be added which will make it possible to embed geometrical structures fulfilling them into vector spaces.

Rudnicka, Ewa

Mapping Wordnets

The talk focuses on the results of the first stage of mapping between two huge lexico-semantic networks: plWordNet and Princeton WordNet. The mapping not only led to the construction of a big bilingual lexico-semantic resource, but also allowed to trace a number of contrasts in the content and structure of the two networks. Though many of them obviously concern English and Polish lexis (e.g. lexical and cultural gaps, different structuring of information), other are contingent on different methodology applied in the creation of both networks, and these are going to be our main interest here.

Wordnets are a kind of a huge electronic thesauruses, yet of a much more advanced structure, since they incorporate not only synonymy relations among words, which are grouped into synonym sets called synsets, but also semantic relations between senses, thus synsets themselves. These relations involve synonymy, antonymy, hyponymy/hypernymy, meronymy/holonymy, and fuzzynymy, to name the major ones. The first ever wordnet was created in 1980s at Princeton University and was an unprecedented attempt to integrate data gathered in the existing lexical resources such as traditional and electronic dictionaries as well as gained from corpora into one huge database (cf. Fellbaum 1998). The creation of Princeton WordNet stimulated further work in the area and subsequently similar databases have been created both for European and non-European languages, and among them for Polish - plWordNet (cf. Piasecki et al. 2009, Maziarz et al. 2012). The natural forthcoming step was to build a multi-lingual database called EuroWordNet (cf. Vossen 2002), within which several interlinked wordnets for European languages were created. Most of them were constructed on the basis of the so called ‘transfer method’ that is by a kind of translation of Princeton WordNet structure. Independently, plWordNet was developed by applying a unique corpus-based method.

Since plWordNet was not linked to EuroWordNet, the aim of our project is to map plWN on Princeton WordNet. Contrary to the previous translation-based approach we have decided to adopt a novel perspective that is to link two independent systems, not just merely translate PWN. The main challenge of this task resides in different philosophical, theoretical and methodological assumptions that lay behind the construction of PWN and plWN. Still, our idea is to link PWN and plWN synsets via hierarchically ordered, inter-lingual relations such as synonymy, hyponymy, meronymy, hypernymy, holonymy, near-synonymy and fuzzynymy. This is accomplished by means of a mapping procedure and is supported by a semi-automatic system capitalizing on the existing bilingual resources (cf. Rudnicka et al. 2012). So far the process of mapping has revealed a number of contrasts boiling down to lexico-grammatical and lexico-semantic differences between English and Polish, different methodology used for the construction of two networks and different theoretical assumptions concerning their structure. These specifically involve the structure and role of lexical unit and synset, the type and application of lexico-semantic relations, the topology and content of the networks, and the use of different relations to code the same conceptual dependencies.

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Spychalska, Maria

Differences in processing between superlative and comparative quantifiers

January 4, 2013

I discuss processing of so-called superlative quantifiers, such as *at most n* and *at least n*. Generalized Quantifier Theory defines those quantifiers as equivalent to comparative quantifiers, i.e. *fewer than n+1* and *more than n-1* respectively. Numerous differences have been, however, observed between comparative and superlative quantifiers involving their linguistic use, as well as the inference patterns in which they occur, and their processing (Koster-Moeller et al, 2008), (Geurts et al., 2010), (Cummins & Katsos, 2010). For instance it has been shown that the presumably logically valid inference in which from *at most n A are B* it is implied that *at most n+1 A are B* is, in general, not accepted by speakers (Geurts et al., 2010), (Cummins & Katsos, 2010). There is ample data concerning differences of processing of those quantifiers. It has been shown for instance that verification of sentences with superlative quantifiers requires more time than verification of sentences with respective comparative quantifiers (Koster-Moeller et al, 2008), (Geurts et al., 2010). Moreover, the processing of quantifiers is influenced by their monotonicity. It has been shown that although the downward monotone quantifiers *at most n* and *fewer than n* take a longer time to be verified than the upward monotone quantifiers *at least n* and *more than n*, they are actually falsified faster (Koster-Moeller et al, 2008).

Geurts (2007), (2010) proposes that whereas *more than n* and *fewer than n* have a conventional meaning defined in terms of the inequality relation, *at least n* and *at most n* have a modal component, and hence both *at most n A are B* and *at least n a are B* logically imply that *it is possible that there are exactly n A that are B*. In contrast, Cummins & Katsos (2010) propose that the considered linguistic phenomena can be better explained on pragmatic grounds. The authors show that people do not evaluate *at most n* and *exactly n-1* as equally semantically incoherent as cases of obvious logical incoherence. Consequently, Cummins et al. agree with Geurts that *at most n* and *at least n* both imply *it is possible that n* but they claim that this is a pragmatic rather than a logical inference, namely a so-called *clausal implicature*.

I present results of a sentence picture verification experiment, whose purpose was to test the predictions of the pragmatic and semantic theory with respect to the modal component in the meaning of superlative quantifiers. The experiment was designed to compare subjects' correctness and processing effort (measured as time taken to respond correctly) as depended on the the model in which the sentence is evaluated, i.e. whether it is pragmatically felicitous or not, and on the linguistic form in which the quantifier occurs.

If a sentence ϕ: *At most n A are B* logically implies ψ : *It is possible that there are exactly n*, then ϕ should be rejected in models in which there are fewer than n A that are B. If, however, ψ is a pragmatic inference from ϕ, then it should be defeasible and ϕ should remain true in the considered models. The presence of this kind of pragmatic inference (ψ) should however have some effect on subject's behavior. The hypothesis is that the superlative forms should be harder (in the sense of longer RT or higher mistakes ratio) compared to the comparative form, especially for those models which are pragmatically less felicitous. The models in which the number of the referred objects is equal to n mentioned in the quantifier are considered pragmatically felicitous.

In the experiment, sentences with the upward monotone (UM) quantifier *at least 3* and the downward monotone (DM) quantifier *at most 3*, as well as their logically equivalent but linguistically different forms were evaluated in 5 different models. The following linguistic forms (*Qforms*) were considered: superlative form *at most 3/ at least 3*, disjunctive (*n or fewer than 3/n or more than 3*), comparative (*more than 2/fewer than 4*), negative comparative *not more than 3/not fewer than 3* and the basic numerical form (*three*)

The models were varied with resect to the difference between the number of objects that have the property mentioned in the sentence and the upper (for the downward monotone quantifiers) or lower (for the upward monotone) bound of the set's truth-conditions that was implied by the quantifier, i.e. the numeral n for superlative, for disjunctive and for negative comparative form, and $n-1$ or $n+1$ for the comparative form: upward and downward respectively. There were 5 *basic categories of models (*Mforms*)*: with 1, 2, 3, 4 or 5 elements (out of a bigger set) that had a property mentioned in a sentence. The time of presenting a sentence was calculated based on the length of the sentence, to mirror the natural reading time. Since all the equivalent forms were evaluated in identical (with respect to the cardinalities) pictures it can be assumed that all the reaction time differences are result of processing differences that are linked to specific *Qforms*.

The analysis of subjects correctness showed that for the downward monotone superlative form (*at most 3*) subjects made significantly more mistakes in model 1 target (the infelicitous one) when compared to model with 3 targets: z=-3.392, p=.001, and marginally significantly more mistakes in models with 2 targets when compared to models with 3 targets: z=-2.324 p=.02. A similar effect was obtained for the disjunctive form of the downward monotone quantifier: subjects were significantly more correct when accepting this form in the models with 3 than with 1 object (z=-2,840 p=.005), but not compared to models with 2 objects (p=.058).

A repeated measures analysis of variance was conducted to investigate the influence of quantifier monotonicity, linguistic form (Qform) and a model ($2\times 4 \times 5$) on subjects time taken to respond correctly. Two of our factors were highly significant: Monotonicity and Qform (p=.000), but not the model. All interactions, however, turned out significant with $p < .001$. Pairwise comparisons for the Qform showed that only the negative comparative (*NegComp*) form was significantly slower evaluated than every other form ($p < .001$ for each comparison). The comparisons between other forms were not significant.

In order to investigate the RT differences between the evaluation of the different Qforms as dependent on the model, a RM analysis was conducted for each Mform (and Monotonicity) separately. The results supported our hypothesis that the differences in processing time between comparative and superlative quantifiers depend strongly on the model: this effect can be explained by extra pragmatic processes that are triggered in some models but not in other. Anova was significant for each model and each monotonicity. The results are especially interesting for the group of downward monotone Qforms. The effect of the Qform on RT in models with 1 target was significant ($F(3, 159) = 7.462$, $p < .001$ $\eta^2 = .123$), and pairwise comparisons show that it was the comparative form that was significantly faster evaluated than the superlative form ($p < .001$), and also compared to the negative comparative form ($p = .001$), but there were no other significant differences. In models with 2 targets ($F(2.195, 120.713) = 11.545, p < .001$, $\eta^2 = .173$) the pattern was similar, with the comparative form being evaluated faster than the superlative $p = .007$ and than the negative comparative $p < .001$. Additionally negative comparative form was significantly slower evaluated than the disjunctive form p=.008 but not compared to the superlative form.

The differences between the comparative and superlative form disappear, however, in so-called "exact" models, i.e. models with 3 targets ($F(1.540, 83.134) = 13.781$, $p < .001$, $\eta^2 = .203$): here only the negative comparative form was significantly slower evaluated than any other from: $p < .002$ for each comparison.

The results for the upward monotone forms, i.e. *at least n* and the equivalent forms fall under the same patter (details are discussed during the talk).

The results of our experiment provide evidence that processing of different quantifiers (comparative, superlative, disjunctive), depend highly on the model in which those quantifiers are verified/ falsified and not only on the linguistic form, with exception for the negative comparative form, which is significantly slower than any other form regardless of the model. This goes against the results reported so far that superlative quantifiers are processed in general slower than the comparative quantifiers. Especially the felicitous models (3 objects) showed no differences with respect to the RTs between the comparative, the superlative and the disjunctive form. The RTs start to diverge only for those models that are pragmatically less felicitous. The picture of the processing load that is linked to specific linguistic forms of given quantifiers turns out more complex than the literature has suggested so far.

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Umbach, Carla

Modification by similarity – the meaning of the German demonstrative *so*

It is widely agreed that German *so* is, first of all, a demonstrative expression and, like other demonstratives, has a deictic and an anaphoric use. The deictic use, which is in focus in this paper, has to be accompanied by a demonstration gesture. It is said to pick up "aspects of objects" (Ehlich 1987) which are used to modify the denotation of the expressions it is combined with. In the example in (1a) the height of the person the speaker points to is used to characterize Anna's height. In (1b) certain properties of the car the speaker points to are used to characterize Anna's car. Finally, in (1c) the manner of the fish-cutting event the speaker points to is used to characterize Anna's way of doing that. This interpretation of the demonstrative *so* raises two questions: (a) What does the demonstrative actually refer to?, and (b) How is it possible that a demonstrative acts as a modifier?

(1) a. (speaker pointing to a person): So groß ist Anna. 'Anna is that tall.'
b. (speaker pointing to a car): So ein Auto hat Anna. 'Anna has a car like this.'
c. (speaker pointing to someone dividing a fish):
So hat Anna den Fisch auch zerlegt. 'Anna cut the fish like that , too.'

One readily available answer to the above questions consists in assuming that the demonstrative refers to properties. That would mean, however, to employ a semantic framework based on property theory (cf., e.g., Chierchia & Turner 1988). This solution is unsatisfactory because it shifts the explanatory burden to the semantic framework. We will instead presuppose a standard semantic ontology, including individuals and events, but no properties as such, which leaves us with the problem of the referent of the demonstrative – if you cannot refer to degrees or properties or manner, what does the speaker refer to in the examples in (1a-c)? This problem must not be confused with Quine's negative view on reference in general, arguing that reference is inherently indeterminate (Quine 1960). Our problem in, e.g., (1b) is not to determine the object the speaker points to – we know in (1b) that it is the car and not, e.g., the rear spoiler, simply because *so* is combined with *Auto* ('car'), but we don't know how the demonstrative retrieves the relevant properties of the car.[1]

The standard theory of demonstratives is the direct reference theory, according to which certain singular terms refer directly, without the mediation of a Fregean Sinn (cf. Kaplan 1989). Nunberg (1993) proposed an elaboration of Kaplan's theory addressing the problem of so-called deferred uses, where the object referred to is not identical to the interpretation of the demonstrative.[2] Following Nunberg, the semantics of a demonstrative involves (i) a deictic component picking out a referent, (ii) an interpretation contributed to the proposition, and (iii) a relation between the referent and the interpretation, which need not be identity.

This theory offers a straightforward solution to the interpretation problem of the demonstrative *so*: (i) The referent of the demonstrative is the individual or event pointed to, (ii) the interpretation contributed to the proposition is the interpretation of the phrase modified by the demonstrative, and (iii) the relation between the referent and the interpretation is similarity. Thus, different from Nunberg's deferred uses, the relation between referent and interpretation is not arbitrary but instead fixed by the demonstrative expression – the meaning of the demonstrative *so* consists in establishing a similarity relation between the referent pointed to and the interpretation of the modified phrase – for example, in (1b), between the car the speaker points to and Anna's car.

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[1] The selection of relevant properties is constrained by the meaning of the noun but otherwise determined by the context.

[2] Someone may, for example, utter *This guy is usually an Italian.* while pointing at Benedict XVI, meaning that the one who is the pope is usually an Italian, cf. Elbourne (2008) who spelt out Nunberg's account in a formal framework.

For this idea to be productive, we need a notion of similarity which is not a semantic primitive. Assume that adjectives are one-dimensional, while (most) nouns are multi-dimensional. A "generalized measure function" is defined as a function from individuals to points a multi-dimensional space. In the one-dimensional/adjectival case a generalized measure function coincides with the measure function used as the denotation of gradable adjectives in Kennedy (1999), which takes individuals to degrees. In the multi-dimensional / nominal case it comprises multiple components which take individuals to values of the scales corresponding to the relevant dimensions (which may be proportional but also nominal or even binary).

The simplest notion of similarity is feature-identity: Two persons are similar in height iff their height is identical – two cars are similar with respect to color, size, and equipment iff their color, size, and equipment are identical, cf. (2a) and (3a) (where F is a generalized measure function). The meaning of the demonstrative *so* based on the feature-identity notion of similarity is shown in (2b)/(3b). Combining *so* with the adjective *groß* ('tall') yields (2c), which is the property of being equal in height to the referent of the demonstration (refDem). Combining it with the noun *Auto* ('car') (and assuming that the relevant dimensions are color, size, and equipment) yields (3c), which is the property of being a car similar to the referent of the demonstration with respect to the relevant car dimensions.[3]

(2) a. sim(x, y, f) iff f(x) = f(y)
b. [[*so*]] = λf λx. [f(x) = f(refDem)]
c. [[*so groß*]] = λx. [height(x) = height(refDem)]

(3) a. sim(x, y, F) iff $f_1(x)=f_1(y)$ & … & $f_n(x)=f_n(y)$ for all components f_i in F
b. [[*so*]] = λx. [F*(x) = F*(refDem)] where F* is a free variable
c. [[*so (ein) Auto*]] = λx. car(x) & [COL(x)=COL(refDem) & EQP(x)=EQP(refDem) & SIZE(x)=SIZE(refDem)]

The feature identity notion of similarity is the reason why Nelson Goodman called similarity "a pretender, an impostor, a quack" (Goodman 1972, p. 437). We will suggest a more elaborate notion of similarity based on closure operations on dimensions (as, for example, convexity in conceptual spaces, cf. Gärdenfors 2000) and a fuzzy notion of truth.

Interpreting the demonstrative *so* as conveying similarity instead of identity accounts for the intuition that it acts as a modifier without postulating reference to "aspects of objects". But this modification is only indirect, induced by the similarity requirement, and thus different in nature from, e.g., the intersection of predicate denotations.

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[3] Please ignore for the moment the position of the demonstrative, which is unusual for a nominal modifier.

Zeevat, Henk

Monitoring and Negation

Monitoring is the idea that formal properties of utterances can be explained by the following automatic process. The speaker simulates stochastic hearer interpretation during production and when the result does not match with his intended interpretation replaces simple forms by mre complicated ones in order to avoid misunderstanding. It is a simple form of bidirectional processing which can be applied to a large number of phenomena ranging from NP selection to optional case marking and word order.

With negation, there are two main semantic concerns subject to monitoring: that negation is expressed as such and that it is clear whether existential quantifiers are within or outside the scope of the negation (the corresponding problem with universal quantifiers can be explained away).

At the same time, there is a probabilistic bias against assuming unnecessary negations in interpretation. Expressions that only optionally express negations will therefore only do so if it cannot be avoided.

That is the universal part of a treatment of negation and it is free of any syntactic rules. E.g. Gothic —with a single expression *ni(h)* for negation— is full treated by the system: *ni(h)* expresses negation and its position deals with the scope problem. We will assume Dutch and German also do not need anything more than the basic system.

Since there is a bias against negation, however, expression constraints on negation can and will arise in languages: monitoring will nearly always fire. These constraints are of the form MAX(X_{neg},Y) and explain sentential negation marking on sentences in Afrikaans, and on verbs in Russian and French and predicate negation marking on verbs in English, Italian and Portuguese.

The rest of the action is in the lexicon. Exponents of negation can be characterised by three features: NEG (expressing negation), MAX (fulfilling the indicated max-constraint) and SCOPEX (expressing an existential in the scope of a negation). It will be shown that negation in a range of languages can be fully described with just these features.

Monitoring also directly connects with historical processes and the body of the paper will explain the emergence of the special functional items involved in marking NEG, MAX and SCOPEX in these languages, as well as the different instantiations of the max-constraint, by assming general grammaticalisation mechanisms, explaining e.g. that *nitsjewo* can end up meaning just EXISTENTIAL INANIMATE SCOPEX from the same source as the German *nix* EXISTENTIAL NEGATION INANIMATE SCOPEX or how *anybody* from EXISTENTIAL HUMAN can become EXISTENTIAL HUMAN SCOPEX/ The max-constraint is a proper production constraint and can be understood as a routinisation of an invariable effect of monitoring.

A comparison will be made of the current proposal with two bidirectional OT accounts of negation and the minimalistic typology of Zeijlstra.

Zobel, Sarah

Negated generic sentences

In the literature, the topic of negated generic sentences has so far been neglected. One more recent, brief discussion can be found in Carlson (2008): If it is assumed that a generic interpretation of a sentence like (1) is induced by a generic operator *Gen* (a "default quantifier"), Carlson argues i) that we expect the scope alternations between negation and *Gen* in (2) (which we do not find) and ii) that neither of the scope orderings express a meaning that is strong enough to capture the intuitive meaning of (1). Carlson argues that negated generic sentences do not allow for exceptions in the same way as positive generic sentences do, and therefore cannot be captured by negating a positive generic sentence.

(1) *Sheep do not eat meat.*

(2) a. $\neg$(Gen ϕ): 'It is not that case that "Sheep eat meat" usually holds.'
b. Gen($\neg\phi$): 'It is usually the case that "Sheep eat meat" does not hold.'

I believe Carlson oversimplifies the matter regarding the interaction between *Gen* and negation. The **aim of this talk** is (i) to investigate Carlson's claim regarding the scopal behavior of negation wrt. *Gen* for the commonly assumed dyadic version of *Gen* (Krifka et al. 1995), and (ii) to spell out and discuss the predicted interpretations relative to specific claims regarding the meaning of *Gen* (e.g. Drewery 1998, Greenberg 2007).

A modal semantics for Gen:

(3) $[\![F\text{s are }G]\!] = \forall w' \in B_w \forall x[F(x)(w')\&N_{F,G}(x)(w') \rightarrow G(x)(w')]$
(based on Drewery 1998)

(4) $[\![F\text{s are not }G]\!] =$
a. $\neg\forall w' \in B_w \forall x[F(x)(w')\&N_{F,G}(x)(w') \rightarrow G(x)(w')]$ (wide)
'It is not the case that all relevant non-exceptional Fs are Gs.'
b. $\forall w' \in B_w \forall x[F(x)(w')\&N_{F,G}(x)(w') \rightarrow \neg G(x)(w')]$ (narrow)
'For all relevant non-exceptional Fs: it is not the case that they are Gs.'

While the formalization in (4-a) is too weak, the formalization in (4-b) seems to come close to the meaning expressed by negated generic sentences. To discuss the adequacy of the second formalization, I investigate the tolerance of exceptions of negated generic sentences, and their uses in discourse (statement, denial, correction). In addition, English data will be contrasted with German data where different types of negation (*nicht* 'not' and negative quantifiers) are found.

(5) *Hunde haben keine Hände.*
dogs have no hands
'Dogs do not have hands.'

(6) *Hunde schwitzen nicht.*
dogs sweat not
'Dogs do not sweat.'

Scope: The scope of negation is frequently restricted with respect to different intensional/modal elements: e.g. deontic modals prefer to take scope under negation, while epistemic modals always scope above negation (Hacquard 2012). Hence, missing scope alternations between negation and *Gen* is per se not a good argument to dismiss the quantificational account of genericity.

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