

DGfS Annual Meeting, Bamberg 2008
AG 9: ‘Experimental Pragmatics/Semantics’

Jörg Meibauer, Markus Steinbach

Abstracts

David Restle
University of München

Underdetermination and enrichment in control constructions

From a semantic point of view, infinitive constructions like [*Peter asked/promised Mary*] *to come to the party* and its German equivalent are underdetermined structures under more than one aspect. On the one hand, the lack of a syntactic subject calls for the reconstruction of a “logical” subject. In our example we need to reconstruct the reference of the person whose coming-to-the-party is the content of the request/promise. On the other hand, the semantic relation holding between the referential arguments of the control predicates and the referential arguments of the embedded infinitives is underdetermined: In the German nominal control construction *die Freude zu gewinnen* (literally ‘the joy to win’) either the context or intervening facultative pronominal adverbs *darüber/daran/darauf* determines if the event of winning is temporally located before, at, or after the event of joy (cf. Restle 2006). The discussion in this paper will be confined to the first case of underdetermination, the interpretation of PRO.

Early research (cf. Rosenbaum 1967) was trying to get a grip on the problem of control interpretation with purely syntactic means (with the terms “subject/object control” stemming from this time), and failed. The options left nowadays are either semantic or pragmatic, as the dependencies of the control interpretation from context and stereotypes seem to suggest.

Proponents of the semantic view of control interpretation (e.g. Culicover & Jackendoff 2005) use coercions in order to transform *little John asked to go* into *little John asked to be allowed to go*. This view is problematic in light of the fact that we can not predict exactly when coercion is necessary and when it is not.

Proponents of more pragmatic views (e.g. Köpcke & Panther 2002) introduce special pragmatic roles and maxims in order to reconstruct logical subjects - pragmatic roles that seem to be idiosyncratic for control phenomena.

Besides the comparison of those general options we report on the results of a questionnaire which backs up the willingness for pragmatically induced control changes at least amongst younger speakers. Our new model will avoid the problems mentioned above in using an optimality theoretic device to enrich the conceptually underspecified semantic representation. This OT-account is also able to describe the differences in orientation strategy between German and English.

References

- Culicover, Peter W. and Ray Jackendoff (2005): *Simpler Syntax*. Oxford.
- Köpcke, Klaus-Michael and Klaus-Uwe Panther (2002): Zur Identifikation leerer Subjekte in infinitivischen Komplementsätzen - ein semantisch-pragmatisches Modell. In: *Folia Linguistica* XXXVI/3–4, 191-218.
- Restle, David (2006): *Kontrollnomina. Eine Untersuchung zum Verhalten attributiver Infinitivkonstruktionen im Deutschen* (Habilitationsschrift Universität München).
- Rosenbaum, Peter (1967): *The grammar of English predicate complement constructions*. Cambridge, MA.
- Abbott, B. (2004) Definiteness and indefiniteness. In Horn, L. R. and Ward, G. (eds.), *The Handbook of Pragmatics*. Oxford: Blackwell, 122-149.

Petra Burkhardt
University of Marburg

The hepatitis called ...: Electrophysiological evidence for enriched composition

Two phenomena are discussed that depend on enriched composition in order to understand ‘what is implicated’: reference transfer and inferential bridging. In reference transfer, a salient property of an individual can be used to refer to this person (the famous *ham sandwich* example). In bridging, inferential knowledge is required for proper discourse integration of an expression. These two phenomena differ in their usage of pragmatic knowledge: in bridging, inferential knowledge is used to *establish a dependency* between an expression and information in the discourse model in order to reach an overall coherent interpretation. Note that an utterance containing an inference-based expression can be interpreted in and of itself (e.g. the second sentence of (1)). In reference transfer, pragmatic knowledge is essential to reach a reasonable *interpretation of the expression itself*. Here, an isolated utterance that includes a reference transfer is semantically anomalous (e.g. *The hepatitis called this morning.*).

In the present paper, the time-course of enriched composition is investigated by means of event-related brain potentials (ERPs). Previous research on inferential bridging reported two ERP-components: a negative-going potential peaking around 400ms (N400) reflecting the ‘givenness’ of an expression in the discourse model (identity < inference < new expression) and a positive deflection peaking around 600ms (P600) for expressions that require the introduction of a new discourse referent (inferential and new expressions) (Burkhardt 2006). Experiment 1 manipulated the degree of the inferential relation between a critical NP (e.g. *the knife* in (1)) and the information provided by the context (underlined). Stimuli were presented in segments and time-locked to the onset of the critical NP. Despite the well-known observation that semantic predictability is reflected in the N400, the present manipulation only yielded a difference in the P600-component for the two more difficult inferences (*killed/discovered*). This suggests that the respective discourse representations must be updated towards a more specific event representation (e.g. the killing-event is in fact a stabbing-event) – while the instrument role in the ‘easy’ inference (*stabbed*) represents an implicit argument whose integration does not exert additional computation cost.

- (1) *Am Donnerstag wurde ein Busfahrer am Parkplatz erstochen / ermordet / entdeckt. Die Medien berichteten, dass **das Messer** offensichtlich deutliche Fingerabdrücke trug.*

On Thursday, a bus driver was stabbed / killed / discovered in the parking lot. The press reported that **the knife** obviously carried clear fingerprints.

Experiment 2 investigated referential processing of NPs denoting an individual (e.g. *the therapist*) vs. NPs requiring reference transfer (e.g. *the [person associated with] hepatitis*). Context sentences set the scene to license the transfer of meaning. Critical NPs were matched for length and frequency of occurrence. Results revealed a P600 for the reference transfer, supporting the idea that the positivity is a general index of enriched composition.

- (2) *Der Arzt fragt seine Helferin erneut, wer so früh angerufen hat. Die Helferin antwortet, dass **die Hepatitis / die Therapeutin** so früh angerufen hat.*

The doctor asks his assistant again who called that early. The assistant responds that **the hepatitis / the therapist** called that early.

These two studies suggest that enriched composition is discernible on the basis of ERP-signatures. The two phenomena – even though they differ in the particular underlying

processes, one thematically-driven, the other contextually-driven – have in common that they hinge on enriched composition, which is reflected in a positivity that taps a fairly late processing phase.

Natalie Klein, Whitney Gegg-Harrison, Rachel S. Sussman, Greg N. Carlson,
Michael K. Tanenhaus
University of Rochester, University of Wisconsin, Madison

Referential domains and the real-time processing of “weak definite” noun phrases

Definite NPs ostensibly select a uniquely identifiable discourse referent (recently, Roberts 2003). Lending credence to this generalization is the obligatory use of the definite article when the referent is semantically unique (e.g. superlatives, “the tallest mountain”), or when the speaker wishes to make it so (“It’s *the* reason, not *a* reason!”) (Abbott 2004). However, Carlson & Sussman (2005) and Carlson (2007) note a special class of nouns called “weak definites,” where this generalization does not hold. Take the weak definite “the radio”. For the statement, “Bill heard about the riot on the radio, and Mary did too” to be true, it is necessary that Bill and Mary heard about the same riot, but not necessarily via the same radio. The weak definite NP does not seem to refer to a unique discourse entity and contribute a truth-conditional meaning as an indefinite NP might. In a set of visual world studies, we show that this intuition holds in online reference interpretation. We also show that weak definites are not simply indefinites in disguise, since indefinites serve to establish discourse entities where weak definites do not.

In Experiment 1, participants saw a metal board with several magnetic ClipArt objects attached. Each half of the board was painted a different color, to visually invoke distinct referential domains (Brown-Schmidt 2005). Each color domain contained a magnetic person, as a potential agent, and a unique token of the critical object, as well as a distracter object. Participants heard short stories and were asked to use the magnets to enact the narrative. Critical trials included repeated mention of a weak definite NP, or of a semantically matched regular definite NP (e.g. “Rudy read the newspaper/book. This afternoon, Patty read the newspaper/book too.”).

As predicted, when participants enacted the narrative, they were significantly more likely to select a new token of the critical object when the object was a member of the weak definite noun class (thus remaining within the same referential domain as the newly mentioned agent). That is, participants were most likely to have Rudy and Patty read the same book, but different newspapers ($p < .001$). During the experiment, participants’ eye-movement data were collected with a head-mounted eye-tracker. Response-contingent analyses show that, when they chose the new token, participants were more likely to look at the old token of the critical noun in the regular definite condition than in the weak definite condition. In other words, controlling for behavioral response, participants made more frequent looks to the old book than the old newspaper when enacting “This afternoon, Patty read the book/newspaper.” Experiment 1 shows that, for a special class of nouns, reference to a unique discourse entity is not necessitated by the use of a definite NP. These data are consistent with the hypothesis that weak definite NPs do not establish a discourse entity, and are therefore not merely indefinites in disguise. Experiment 2 was designed to test this hypothesis explicitly by comparing weak definites to weak indefinites. The experimental setup was identical to that in Experiment 1. In Experiment 2, the stimuli used weak definite nouns, and manipulated whether participants heard each noun with an indefinite or definite article on the first-mention (e.g. “Rudy read *a/the* newspaper. This afternoon, Patty read the newspaper too.”). Participants were more likely to select the old token of newspaper when the first-mention was an indefinite NP.

These studies provide experimental evidence for a special class of weak definite nouns that do not refer uniquely, and show that these weak definites do not necessarily establish entities in the discourse. In this way, they are distinct from both regular definites and from indefinites. Eye-movement data confirm these major referential differences happen as the utterance unfolds.

References

- Abbott, B. (2004) 'Definiteness and indefiniteness' In Horn, L. R. & Ward, G. (eds.) *The Handbook of Pragmatics*. Oxford: Blackwell. 122-149.
- Brown-Schmidt, S. (2005). *Language Processing in Conversation*. Doctoral dissertation, University of Rochester.
- Carlson, G. and Sussman, R. (2005). Seemingly indefinite definites. In S. Kessler and M. Reis (eds.) *Linguistic Evidence: Empirical, Theoretical, and Computational Perspectives*: Mouton de Gruyter.
- Roberts, C. 2003. Uniqueness in definite noun phrases. *Linguistics and Philosophy* 26(3):287-350.

Daniele Panizza and Gennaro Chierchia
University of Trento, Harvard University

Two experiments on the interpretation of numerals

Numbers have (at least) two interpretation: a weak one (the 'at least' reading) and a strong one (the 'exactly' reading). There is a dispute on how such interpretations come about. The dispute centers around the following three theses

- (1) a. Numerical expressions are lexically ambiguous (e.g. Horn)
- b. Numerical expressions are underspecified (e.g., Carston, Breheny)
- c. Numerical expression have a weak interpretation that gets strengthened via a scalar implicature (Grice, early NeoGriceans, Chierchia)

The present paper addresses experimentally a factual claim pertaining to this debate. The claim is the following:

MAIN CLAIM: The strong interpretation of number words occurs preferentially in UE (upward entailing) contexts than in DE (downward entailing) ones. 'Preferentially' here means both 'more often' and 'with less of a processing cost'. Although theses similar to MC have been put forth in the literature, they still remain controversial since native speakers intuitions are arguably not sufficient to establish this claim. We address MC in two ways. First, we tackle the preference issue by means of an off-line questionnaire. then we address the processing cost issue through an eye tracking experiment.

In the first experiment participants had to read sentences containing a numeral determiner in the first clause, embedded in either a positive UE context or in a DE one (e.g.: UE: "John parked two cars in the garage and he parked a motorcycle in the courtyard" vs. DE: "If John parked two cars in the garage, he will park a motorcycle in the courtyard"). Participants were asked to choose a preferred paraphrase that disambiguated the sentence towards the weak or the strong construal of the numeral ("at least two cars" vs. "exactly two cars"). The results show a significant difference in the interpretation of numerals: subjects selected more often the strong value when the numeral was embedded in a UE context. The second experiment taps on line processing of numerals. Participants were asked to read the same sentences used in the first experiment in three circumstances: (i) with a neutral continuation, (ii) with a positive continuation (e.g.: If John parked two cars in the garage, he will park a third car in the courtyard"), and with a negative continuation (e.g.: "..., he will *not* park a third car in the courtyard"). Both continuations contain an ordinal linked to the substantive appearing in the first clause. Only the *positive* continuation, however, forces a strong interpretation of the numeral, which would occur in a DE context and hence be costly, according to MC. (While

the negative continuation may also appear to induce a strengthened interpretation, it can be shown that this is not so, and thus it provides an interesting control for our hypothesis). We found that the numeral in the first clause (for which participants showed a preference in choosing the “exactly N” meaning in the first experiment) were more difficult to read in the first-pass reading times in the UE condition as, presumably, processing of the scalar implicature takes place more often in such contexts. Furthermore, there were significant interactions in the second-pass reading times on the same region depending on continuation type. In the *positive* continuation, when people were forced to strengthen the numeral meaning, numerals were re-read more often when embedded in a DE context, whereas in the other two conditions the opposite pattern emerged. Overall, these results seem to support our main claim and the scalar approach.

Julia Holzgreffe, Heiner Drenhaus, Joanna Blaszczak
University of Potsdam

Context-dependency or default processing: An ERP study on scalar implicatures

I. The issue: We provide evidence from an event-related brain potentials (ERP) study that the generation of a scalar implicature depends upon previously processed context, and, moreover, that pragmatic processing is not a secondary process of speech comprehension but rather, it would seem, that discourse information is already integrated at an early stage of processing. The results of our study seem to favor the Neo-Gricean (default) view on the generation of scalar implicatures in that we find higher processing costs in so-called ‘lower-bound’ contexts (in which a scalar implicature is not licensed (cf. Horn 1984:13)) as opposed to ‘upper-bound’ contexts (in which a scalar implicature is available).

II. Theoretical background and aim of the study: There are two main approaches regarding the generation of scalar implicatures: there is the so-called Neo-Gricean viewpoint (cf., among others, Horn 1984, Levinson 2000) on the one hand, and the Relevance Theory-based approach (cf., among others, Carston 1998, Sperber & Wilson 1986/1995) on the other. Whereas the former postulate a default generation of scalar implicatures (e.g., the inference from *p or q* to *p or q but not both*), the latter claim that a scalar implicature is only generated when the generation is warranted by context. More precisely, whereas the latter consider the generation of a scalar implicature to be as an additional, non-autonomous and cost-intensive processing step, according to the former view, generating a scalar implicature is a relatively autonomous, context-insensitive, ‘low cost’ processing step. Contextual information is only considered in a secondary stage of processing. According to the default view, the integration into the discourse context leads to a cancellation of the scalar implicature whenever the discourse goal set by the interlocutors can be satisfied by the plain meaning of a scalar term (without the scalar implicature). Consequently, the Neo-Gricean analysis predicts – depending upon the nature of the cancellation process – either equal or higher processing costs in ‘lower bound’ contexts, while the Relevance Theory-based analysis instead predicts lower processing costs in ‘lower bound’ contexts compared to ‘upper bound’ contexts. These two different predictions have been tested by Breheny, Katsos and Williams (2006) in their self-paced reading study. They found longer reading times in the ‘upper bound’ condition which was interpreted as reflecting higher processing costs and hence to favor the Relevance Theory-based view on scalar implicatures. The aim of our study was to test the predictions mentioned above by using another experimental technique.

III. Experiment: Our experiment used the event-related potentials (ERPs) paradigm and focused on the processing of the German weak scalar term *oder* ‘or’. The critical phrases were presented in two different context conditions, ‘lower bound’ and ‘upper bound’. In a pilot

judgement study the material had proven suitable as ‘lower’ and ‘upper bound’ contexts, yielding, in the former case, an interpretation of the scalar term without scalar implicature (*p*, *q* or *both*) and, in the latter case, an enriched interpretation (*p* or *q* but not *both*).

VI. Discussion/Interpretation of the results: The first and most important result of our study is that the previously processed discourse context influences the primary processing of the scalar term, reflected by a remarkable difference in the waveforms of the grand average ERPs to the word *oder* ‘or’. The statistical analysis of the midline electrodes revealed a significant difference between the two context conditions in the time window 550 – 650 ms, caused by a late positivity for the ‘lower bound’ condition. This component is well-established in language processing research as P600, which is usually interpreted as an indicator for processes of syntactical reanalysis, but, more recently, also an indicator for pragmatic reanalysis (cf. Drenhaus et al. 2006). Irrespective of this question, the P600 clearly reflects higher processing costs in the ‘lower bound’ condition. This result is not in line with the findings of Breheny et al. (2006). Regarding the aforementioned predictions, it rather fits the default view on the generation of scalar implicatures.

References

- Breheny, R., Katsos, N. & Williams, J. (2006). Are Generalised Scalar Implicatures Generated by Default? An online investigation into the role of context in generating pragmatic inferences. *Cognition*, 100, 434-463.
- Carston, R. (1998). Informativeness, relevance and scalar implicature. In R. Carston & S. Uchida (eds.), *Relevance Theory: Applications and Implications* (pp. 179-236). Amsterdam: John Benjamins.
- Drenhaus, H., beim Graben, P., Saddy, D. & Frisch, F. (2006). Diagnosis and repair of negativ polarity constructions in the light of symbolic resonance analysis. *Brain and Language*, 96, 255-268.
- Horn, L. (1984). Toward a new taxonomy for pragmatic inference: Q-based and R-based inference. In D. Schiffrin (ed.), *Meaning, Form and Use in Context: Linguistic Applications (GURT '84)* (pp. 11-42). Washington D.C.: Georgetown University Press.
- Levinson, S. (2000). *Presumptive Meanings*. Cambridge, MA: The MIT Press.
- Sperber, D. & Wilson, D. (1986/1995). *Relevance: Communication and Cognition*. Oxford: Basil Blackwell.

Arjen Zondervan
Utrecht Institute of Linguistics

Effects of question under discussion and focus on scalar implicatures

This work presents experimental evidence for the claim that the contextual property that licenses or blocks scalar implicatures (SIs) is the Question Under Discussion (QUD) of the context, and the focus structure it gives rise to in the target sentence. Only if the constituent that contains the scalar term has focus, the SI will arise. This is in line with the exhaustivity approach of SIs by Van Rooij (2002). Two off-line experiments provide evidence for this claim, both for operator focus and bare focus.

While many researchers agree that SIs do not arise automatically with every scalar item, the properties of the contexts that license or block SIs are far from clear. It is well known that SIs disappear (or flip) in downward entailing environments and in certain modal contexts. However, also in non-downward entailing, non-modal contexts, the SI often is claimed to be absent, e.g. in the well-known example (1), where the numeral 2 is considered not to give rise to the and not more SI that numerals are normally associated with.

- (1) Q: “Who has 2 children?”
A: “John has 2 children.”

Van Rooij (2002) accounts for SIs by considering a sentence with a scalar term as an exhaustive answer to a question. He claims a covert exhaustivity operator (*exh*, similar to overt only) is applied to answers, which picks out the minimal elements of a set of sets.

Crucially, *exh* only applies to the set of sets of the term answer: the part of the sentence that actually answers the question, not to the presupposed part of the question. Therefore, in (1) *exh* only applies to the set of sets denoted by John, not to the numeral 2 (children). This explains the absence of the SI in (1). So according to Van Rooij, the presence or absence of an SI depends on the question the sentence is supposed to answer. I will adopt the term Question Under Discussion (QUD) for this (implicit or explicit) question. If we then follow Rooth's (1996) Question-answer congruence for focus: 'The position of focus in an answer correlates with the questioned position in *wh*-questions', we can conclude that SIs can only arise in the part of the sentence that has focus, as that is the constituent that answers the QUD. See e.g. (2a-b), where (2a) gets no SI, while (2b) does.

- (2) a. QUD: "Who has A or B?" b. QUD: "What does John have?"
 A: "JohnF has A or B." A: "John has A or BF."

Experimental studies seem to confirm the effect of QUD and focus on SIs: Without context, the percentage of SIs for adults is around 60% (see e.g. Noveck (2001)), but with a clear QUD that causes the constituent with the scalar term to get focus, SIs go up to 100% (e.g. Chierchia et al. 2001). However, a direct comparison of the effects of different QUDs and focus structures for one sentence (like (2a-b)) has never been made. I therefore conducted two experiments, using the Truth Value Judgment Task (TVJT), to check these predictions.

In Experiment 1 (N=31), I used the focus-sensitive operator *only* to force the right focus structure on the target sentence. Test sentences for the non-focused condition (QUD: Who has A or B?) were of the form *Only John has A or B*, in which the subject is the only possible focus. The focused condition sentences (QUD: What does John have?) were of the form *John has only A or B*, where the object is the only possible focus. Stories were created in which the QUD was made salient, e.g. by introducing a contrast set for the focused constituent only (see the appendix for example stories). The results of the experiment showed a significant difference ($p < .0005$) between the two conditions, with more SIs being calculated in the focused condition than in the non-focused condition. To control for a possible bias caused by e.g. presuppositional or monotonicity properties of *only*, in Experiment 2 (N=36) the right focus structure of the target sentences was created using an explicit *wh*-question. Example items are given in the appendix. Again, a significant difference ($p = 0.001$) was found that supports the effect of the QUD and focus on the calculation of SIs.

References

- Chierchia, G., S. Crain, M.T. Guasti, A. Gualmini and L. Meroni (2001). The acquisition of disjunction: Evidence for a grammatical view of scalar implicatures. In A. H.-J. Do et al. (eds.), *BUCLD 25 Proceedings*, 157-168.
- Noveck, I. (2001). When children are more logical than adults: Experimental investigations of scalar implicature. *Cognition* 78: 165-188.
- van Rooij, R. (2002). *Relevance Implicatures*. Ms., ILLC, Amsterdam, available at <http://semanticsarchive.net/Archive/WIyOWUyO/Implicfinal.pdf>
- Rooth, M. (1996). Focus, in S. Lappin (ed.), *The Handbook of Contemporary Semantic Theory*, Blackwell, London.

Daniel Grodner; Natalie Klein, Katie Carbary, Michael Tanenhaus
 Swarthmore College, University of Rochester

Experimental evidence for rapid interpretation of pragmatic 'some'

Scalar inferences (SIs) are commonly generated when a speaker uses a weak expression rather than a stronger alternative. One classic example is *some* as used in a partitive construction. For instance, *John ate some of the apples* implies that he didn't eat them all. How and when

do listeners compute SIs? One prominent proposal is that perceivers initially decode the literal content of a triggering expression in order to establish whether the SI should be generated in the present context (Sperber & Wilson 1995, Carston 1998). This view predicts that the pragmatic component of meaning is late arriving. An alternative is that SIs are part of the default meaning of triggering expressions (Chierchia 2004, Levinson 2000). On this view the SI is derived directly.

A number of recent results suggest that perceivers activate the literal meaning of the scalar expression prior to the SI. The majority of this evidence comes from full sentence verification judgments (Bott & Noveck 2004) or hinges on indirect measures of interpretation such as reading time (Breheny, Katsos & Williams 2005). These methods may obscure the compositional processes involved in incremental interpretation. An exception is Huang & Snedeker (H&S, 2006, submitted). These researchers used a visual-world task to examine the processing of scalar *some*. In a typical trial, participants were asked to *Point to the girl with some of the balloons* in the presence of a girl with 2 of 4 balloons (pragmatic target) and another girl with 3 of 3 balls (literal target). Individuals initially looked at both girls with no preference for the pragmatic target prior to the noun's point of disambiguation (POD). H&S argued that the literal interpretation left the referent ambiguous. In contrast, participants were able to identify the referent prior to POD for commands containing nonscalar *all*.

There are several potential problems with H&S' conclusion. First, there is no evidence that participants entertained the literal meaning of *some* prior to POD. Significantly, relative fixations to the two targets did not differ in the interval prior to *some* versus after. Second, *some* is not clearly associated with a SI when it appears in object position, especially when it is fully articulated. It is the partitive *of the* which signals the upper bounded interpretation. Note that *Click on the girl with some socks* does not imply that there are other socks in the discourse. By comparison non-scalar quantifiers provide sufficient information to identify the target before the partitive. Third, it is likely that the literal target (compatible with all) was more visually salient than the pragmatic target because it contained more items.

To address these concerns we conducted a visual world study that modified the H&S design in three critical ways. First, we introduced a competitor target that was not compatible with the literal meaning of *some*. Second, we replaced *some of the* with *summa* because this is its natural articulation in American English. The shortened first syllable also provides an earlier signal for the partitive so the cue to the timing of the SI is more comparable to critical information in our literal controls. Third, we included *nunna* as well as *alla* as literal controls. To establish a baseline for the auditory POD we also included a late disambiguation condition.

Contrary to H&S, we found convergence on the target for *some* in the ambiguous region and no evidence that the literal interpretation was favored early. Like H&S target identification (established as the point where proportion of looks to the target reliably exceeded chance) was faster for *all* than *some*. However, the interpretation of the SI for *some* was not delayed relative to literal *none*. These results suggest that (1) the SI associated immediately at the word "some" rather than after a delay, and (2) comparisons of literal and pragmatic interpretations need to take into account the complexity of task demands and the form of the referring expression. A second study (in progress) will also be reported. It compares the processing of contrastively focused SOME, where the upper-bound interpretation is presupposed rather than inferred. Here all parties agree that the upper-bounded interpretation should not be delayed.

Kerstin Börjesson
University of Leipzig

On the validity of empirical evidence supporting the *graded salience hypothesis*

In my talk, I want to point out a few potential weaknesses in Rachel Giora's empirical support of the graded salience hypothesis. The points I want to make concern the choice of testing material, on the one hand, and the general theoretical underpinnings, on the other.

In a number of articles, Rachel Giora has offered psycholinguistic evidence for the graded salience hypothesis, according to which the distinction of salient/non-salient meaning plays a decisive role in the interpretation process. More specifically, Giora argues that salience is a matter of degree, thus predicting that experimental results for highly, less and nonsalient, say, metaphorical meanings should differ. What is more, Giora assumes that cases of metaphor and idiom should differ in how salient their respective literal (compositional) and non-literal (non-compositional) meanings are. Looking at the experimental results regarding these questions, her assumptions seem to be born out.

However, there are a few critical points, two of which are given below, that can be made, which call into question the validity of these results. Thus, looking at some of the material Giora uses in her experiments, alternative explanations for the results are possible. For example, the fact that subjects had more difficulty interpreting the last sentence in (1) than in (2) may not (solely) be due to the non-salient nature of the non-literal reading intended in (1), but might result from the relative difficulty of resolving the anaphoric relations in the two examples (taken from Giora, Rachel (2002) 'Literal vs. figurative language: Different or equal?' *Journal of Pragmatics* 34, pp. 487–506; bold font my emphasis.).

- (1) a. Mary: My husband is terribly annoyed by his new boss. Every day he comes home even more depressed than he had been the day before. Somehow, he cannot adjust himself to the new situation.
b. Jane: Their bone density is not like ours.
- (2) Our granny had a fracture just from falling off a chair and was rushed to the hospital. I told my sister that I never had fractions falling off a chair. She explained to me about elders. She said: Their bone density is not like ours.

Another problem concerns Giora's classification of cases of idiom and metaphor. It is not clear on which basis she differentiates the one from the other. Rather, comparing examples for metaphor (e.g. break one's head) with those for idiom (e.g. on one leg as in He told me the whole story on one leg.) leads one to doubt whether what has been classified as metaphor might not just as well have been classified as an idiom and vice versa, since no clear definitions for the two concepts are offered. In light of this shortcoming, the different results Giora achieves for idioms and metaphors decrease somewhat in their significance.

The point I want to make is not that the graded salience hypothesis as such is flawed. Rather, from a theoretical view point it seems that the empirical evidence used to support this hypothesis is not as robust as it, possibly, would be, if a few more theoretical distinctions and considerations were taken into account.

Frauke Berger, Anja Müller, Michaela Schmitz, Barbara Höhle, Jürgen Weissenborn
University of Potsdam, Humboldt University Berlin

The acquisition of the additive focus particle *auch* ('also') in German

Our research reports on experimental group data of monolingual German learning children concerning the acquisition of the focus particle *auch*. Previous studies in this field using off-line techniques suggest that children up to school age still have difficulties comprehending sentences containing the focus particles like German *auch*, Dutch *ook* or English *only*. This

late receptive mastery stands in contrast to the early target-like production of focus particles already in children's first multi-word utterances. This temporal gap between production and comprehension points to an instance of productive mastery preceding receptive mastery.

We question this rather untypical acquisition pattern by providing new findings on the production and comprehension of sentences containing the additive focus particle *auch* by German learning children. More specifically, we investigate the processing of SVO-sentences containing *auch* in post-verbal position. This requires a set of alternatives either to the subject or the object. The identification of the focused constituent (**Domain of Application**) depends on prosodic information. In 1a) the preceding subject (*Toby*) is the DoA and the particle itself is accented. In 1b) the following object (*Puppe*) is the DoA and the particle is unaccented.

- (1) a. *[Toby]_{DoA} hat AUCH eine Puppe .* ' *[Toby]_{DoA} has ALSO a doll.*'
 'There are other people than Toby possessing a doll'
 b. *Toby hat auch [eine PUPPE]_{DoA}.* ' *Toby has also [a DOLL]_{DoA}.*'
 'Toby possesses a doll besides other things'

First, we addressed the question whether German children are able to produce these two types of focus structures adequately. We used a sentence completion task designed to elicit utterances with accented and with unaccented *auch*. The results showed that 28-month olds complemented the given beginning of a sentence significantly more often with an accented *auch* than with an unaccented *auch*-utterance. However, we did not observe that a child produced an accented *auch* in an unaccented *auch*-condition and vice versa. Although children seemed to be able to distinguish between both *auch*-contexts, these results suggest an advantage for the production of utterances containing the accented *auch* reflected by an earlier appearance and a more frequent correct use.

On comprehension side we questioned the claim of late receptive mastery by conducting an experiment in an eye-tracking paradigm. Four-year olds listened to SVO-sentences either containing the accented postverbal *auch*, the unaccented postverbal *auch* or no particle at all. Simultaneously, they were presented with a visual scene depicting the subject and object of the sentences as well as possible alternative sets. Children directed significantly longer fixations to the alternative set for the subject of sentences with the accented *auch*, as compared to sentences with an unaccented *auch* or with no *auch* at all. Similarly, children fixated the alternative set for the object of the sentence more often with sentences containing unaccented *auch* as compared to accented *auch*.

These results indicate that children as young as 4 years display more adult-like comprehension of sentences with the focus particle *auch* than indicated by previous studies. The children in our study seemed to be able to establish alternative sets of sentence constituents in the discourse model. Furthermore, they treated accent as a cue for determining the appropriate domain of application of *auch*. Taken together, our results challenge the assumptions of an early exhaustive mastery on production side as well as of a late receptive mastery on comprehension side. We will discuss our results in relation to previous studies and point out potential linguistic and extra-linguistic factors that might be responsible for the pattern of results.

Petra Schulz, Julia Ose
 University of Frankfurt/Main

Semantics and pragmatics in the acquisition of telicity

The goal of this study was to investigate children's knowledge of the syntax-semantics/pragmatics interface for telicity in German. As telicity can result either from

semantic or from pragmatic inferences, it provides a good testing ground for the question of whether ‘what is said’ is acquired earlier than ‘what is implicated’. Apart from inherently telic verbs such as *aufmachen* ‘open’ (1), there are so-called compositionally telic predicates, which result from adding to an atelic predicate (2a) a telic particle (2b) or a DP (2c) (cf. Krifka, 1989; van Hout, 1996):

- | | | |
|-----|---|--------------------------------|
| (1) | Sie hat die Tür aufgemacht. | ‘she has the door OPEN-made’ |
| (2) | a. Sie hat gegessen. | ‘she has eaten’ |
| | b. Sie hat (den Apfel) <u>auf</u> gegessen. | ‘she has (the apple) UP-eaten’ |
| | c. Sie hat <u>den Apfel</u> gegessen. | ‘she has the apple eaten’ |

Inherent telicity as in (1) is achieved via the lexical semantics of the verb and is thus an invariant part of the verb meaning. As for compositional telicity, two types of telicity markers have to be distinguished (van Hout, 1996, 1998; Schulz & Penner, 2002; Jeschull, 2007). Strong telicity markers such as telic verb particles (2b) entail telicity, i.e. they always invoke an event type shift from atelic to telic. Weak telicity markers such as quantized objects (2c) conversationally implicate telicity, i.e. they may or may not invoke an event type shift from atelic to telic. In sum, while (1) and (2b) are obligatorily assigned a telic reading, (2c) may be assigned an atelic or a telic interpretation.

If children understand the semantics and pragmatics of telicity in an adult-like manner, they will be able to differentiate between strong and weak telicity markers. Therefore, two sets of studies are reviewed assessing children’s and adults’ understanding of inherent telicity (Study 1) and of the two types of compositional telicity (Study 2). In both studies, a truth-value-judgment (TVJ) design was used: Each subject was shown several multi-picture-sequences depicting different events. In half of the trials the event was completed, in the other half it was incomplete, the latter one being the crucial condition. A *yes/no* question was asked to test whether subjects accepted the predicate for the kind of event depicted (e.g., *Did she open the box?*).

The first study tested 32 monolingual German speaking (L1) children (2;0 to 4;10), 17 early second language learners of German (eL2) (3;7 to 5;9) and 16 adults as a control group. The L1-children correctly rejected particle verbs for incomplete events by age 3, the eL2-children around the age of 4;9, after ca. 24 months of exposure to German. Thus, an adult-like interpretation of inherently telic predicates is achieved rather early in development.

In the second study 70 monolingual German speaking children in 2 age groups (3;0 to 4;0; 4;1 and 6;0) and 32 adults participated. The 3-year-olds as well as the 4-to-6-year-olds correctly rejected particle verbs as in (2b) for incomplete events in over 90 % of the cases. Transitive sentences as in (2c) were accepted for incomplete events 86% (3 year-olds) and 73 % (4-to-6-year-olds) of the time. This response pattern was on a par with the adults’ interpretation, allowing an atelic reading for a transitive sentence in 79% of the cases.

Taken together, the results from Study 1 and Study 2 suggest (a) that by age 3 children have mastered the semantics of telicity, and (b) that by age 4 they distinguish between strong and weak telicity markers. As for telicity, ‘what is said’ seems to be acquired only a little earlier than ‘what is implicated’. Future studies should substantiate these findings by testing the same group of children on both types of telicity.

Leah Paltiel-Gedalyovich
Ben-Gurion University of the Negev

Response uniformity distinguishes semantics from pragmatics: Evidence from Hebrew coordination and implications for interpreting child language data

This paper reports adult and child data from experiments testing Hebrew speakers' knowledge of the semantics and pragmatics of coordination. Adults show uniformity in judgments of semantic meaning, while judgments of the pragmatic implicatures vary. Children from the age of 5 show uniform adultlike knowledge of semantic, truth-conditional meaning, while the non-truth-conditional semantic and pragmatic meanings are not demonstrated even at the age of 9;6. I argue that it is uniformity which distinguishes semantics from pragmatics for adults. For children, it has been argued that earlier acquisition distinguishes semantics from pragmatics (e.g. Hyams, 1996). I argue that the distinction between semantic and pragmatic meanings in age of acquisition is a reflection of the relational complexity of these meanings, as measured by Halford, Wilson and Phillips' (1998) relational complexity metric, and not related to their belonging to semantics or pragmatics.

The (invariant) semantic meanings of the Hebrew coordinators investigated here are the truth-conditions of conjunction (*ve* /'and', *avall*/'but') and disjunction (*ol*/'or') and the non-truth-conditional contrast associated with *avall*/'but'. The (variable) pragmatic meanings investigated are the scalar quantity implicatures associated with the use of disjunction, and the pseudo-scalar quantity implicature associated with the use of *avall*/'but'. I predicted that adults would uniformly accept true coordinations and reject false coordinations and would uniformly reject use of *avall*/'but' where there is no contrast, as these are instances of invariant semantic meanings. By contrast, adults were predicted to be inconsistent in acceptance of uses of disjunction when conjunction is a true option and the use of *ve* /'and' when contrast is present, as these are instances of variable pragmatic meaning. Children were predicted to be adultlike from the age of 5 for truth conditional meaning since as ternary relations these are predicted to be attained by age 5. Conversely, the quaternary level non-truth-conditional contrast relation and scalar implicatures should be attained only by age 11 (Paltiel-Gedalyovich, 2003). However, the maturity of child behavior on the pragmatic tasks would be difficult to evaluate due to the variability of the adult responses.

I tested 17 mono-lingual Hebrew speaking adults and 141 monolingual typically developing Hebrew speaking children aged 2;7 to 9;6 on their knowledge of the truth-conditions, conventional non-truth-conditional meaning and conversational implicatures associated with the coordinators *ve* /'and', *avall*/'but' and *ol*/'or', using a variant of the Truth Value Judgment task (Crain and Thornton, 1998).

As predicted for semantic meaning, adults uniformly rejected false coordinations (98.7%) and accepted true coordinations (96.3%), and consistently rejected the use of *aval* in non-contrastive contexts (93.75%). Contrary to the prediction for pragmatic meaning, they consistently rejected true coordinations which violated the quantity implicature (97.1%). This uniform response for a pragmatic judgment is consistent with this being a Generalized Conversational Implicature (Levinson, 2000). The adults did show lack of uniformity in accepting such coordinations given an appropriate context (doubt), thus demonstrating the variability in pragmatic meaning (25.9%). Similarly, they inconsistently rejected the use of *ve* in contexts of contrast (50%).

Children from the age of 5 consistently rejected false coordinations and accepted true coordinations (97%), demonstrating adultlike knowledge of semantic meaning. However, even as old as 9;6 years children inconsistently accepted true coordinations which violated the quantity implicature (50.5%), demonstrating immature knowledge of the pragmatic implicature. Even the oldest children did not consistently reject the use of *aval* in non-contrastive contexts demonstrating immature semantic knowledge (26.5%). Since the adults' insistence on the use of *aval* in contrastive contexts was inconsistent, interpretation of the children's judgments of the use of *ve* in contrastive contexts is not possible.

These results support the use of response uniformity in distinguishing semantic from pragmatic meaning. Furthermore, analysis of the child data promotes the view that acquisition

of both semantics and pragmatics is influenced by relational complexity rather than semantics preceding pragmatics.

Vincenzo Moscati
University of Siena

Modality and negation. A subset configuration in the interpretation of multiple-operators sentences

In recent years the acquisition of scope ambiguities has been subject to many investigations (Musolino, 1998; Musolino at all. 2000) which have revealed that children often access non-adult interpretations of sentences with multiple logic operators. The results of other related studies also suggested that pragmatic factors such as the link with the discourse might play a crucial role in biasing children's interpretations (Musolino & Lidz 2004, Gualmini 2004, Husley at all. 2005, Noveck et all. 2007). To date, only sentences with negation and nominal quantifiers have been tested. In this study, we will look at another type of logic operators: modals. Modal verbs can be treated as quantifiers over possible worlds, and the same results found for nominal quantifiers could in principle be replicated. We conducted two experiments with English and Italian preschoolers looking at the interpretation of the modal *can* in combination with negation. In both experiments, we create a question-answer comprehension task where the target sentence was presented in a context of a story.

In the first study, conducted on 15 English children (4:0-5;5 – mean 4:9), children were presented with sentence (1), which was presented as an instruction to one of the characters of a story.

Then children were asked to answer (2).

- (1) 'The lion cannot be in the same cage as the tiger'
It is not possible for the lion to be in the tiger's cage Scope: **Not > Can**
- (2) 'Can the lion be in the tiger's cage?'

Sentence (1) expresses the meaning given in italics with inverse wide scope of negation on *can* and the only answer to question (2) consistent with this interpretation is 'no'. Children consistently give this answer (43 times out of 47 - 91%) showing i) an adult like behavior, ii) no preference for the isomorphic reading (see Musolino 1998).

The results of Experiment 1 suggest that children easily select inverse scope interpretations and in the next experiment we wanted to test if inverse scope is accessed also in sentences uniquely interpreted with surface-scope by adults. We tested Italian-speaking children (17 children; 4;7-6;3 - mean 5;5) on sentences which closely map the word order of the English sentence (1).

- (3) Il contadino può non dare le carote al leone
the farmer can not give the carrots to-the lion
the farmer may not give the carrots to the lion Scope: **Can > Not**

Although the linear order of (3) matches (1), the interpretation is the opposite, with negation taking narrow scope. When asked a question equivalent to (2), Italian children answered similar to English children (answering 'no' 41 times out of 59 - 69%) in contrast with the adult Italian control group (<10%). We control for *a denial bias*: children have no general preference for 'no' instead of 'yes'.

The overall pattern suggests that children have no problem in access inverse scope readings (exp.1) and that in the case of Italian (exp 2) they seems even to be biases toward such readings. We try to address the question of what is the nature of the deviance found in

Experiment II. One possibility is that Pragmatics plays a role. We added another experimental condition in order to test the QAR hypothesis proposed in Husley at all. (2005). According to this HP, the interpretation varies in function of the Question-Under-Discussion, which is made salient by the discourse. For this reason we changed the QUD. Again children answer ‘no’ (70%), showing that the manipulation of the QUD is not influent on children’s interpretation.

Those results, compared with similar findings documented in the literature (Moscati & Gualmini 2007) suggest that children always select the semantically stronger (in the sense of Crain, Ni & Conway 1994) interpretation, in accordance with the Semantic Subset Principle. This pattern does not exclude a role of pragmatics but can be accounted for by a version of the Principle of Charity (Wilson 1959) which might bias the interpretation toward the stronger reading.

Anja Müller, Petra Schulz, Barbara Höhle

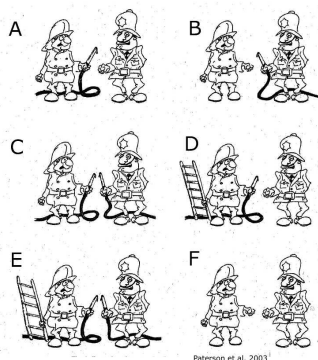
Humboldt University Berlin, University of Potsdam, University of Frankfurt/Main

Pragmatic children: How children interpret sentences with and without *only*

Challenging previous accounts of children’s comprehension of focus particles (FP), two experiments investigated how German-speaking children interpret sentences with and without *nur* ‘only’. Paterson et al. (2003) found that English children up to age 12 interpreted sentences with *only* not in an adult-like fashion. In their study children interpreted sentences with *only* in the same way as sentences without *only*. Paterson et al. argued that these errors were caused by ignoring the set of alternatives. They attributed this performance to a less well-developed pragmatic knowledge.

To examine these effects in a closely related Germanic language, we replicated the Paterson-study in German. Thirty 6-year-olds and 30 adults participated in a picture-matching task, employing 6-picture-tabloids (as below) and one of three sentence-types:

- (1) Der Feuerwehrmann hält einen Schlauch. The fireman is holding a hose.
- (2) Der Feuerwehrmann hält *nur* einen Schlauch. The fireman is *only* holding a hose.
- (3) *Nur* der Feuerwehrmann hält einen Schlauch. *Only* the fireman is holding a hose.



All participants interpreted sentence (1) correctly, by selecting the pictures A, C, D and E. To *nur*-sentences, children gave significantly more incorrect responses than adults. When presented with sentences (2) and (3) children did not give the expected responses (pictures A, D, and A, C, respectively), but again selected the pictures A, C, D and E. This result indicates that also German-speaking 6-year-olds ignore the set of alternatives. These findings support Paterson et al.’s account.

However, do these findings really indicate that children have not the pragmatic abilities to evaluate a felicitous set of alternatives?

We argue that the results of Experiment 1 have to re-examined: The reaction score of test sentence (1) was based on a semantic interpretation, since accepting pictures A, C, D, and E was counted as targetlike. Semantically, (1) is true if a fireman is holding a hose, thus allowing that he is holding something else (D,E) or that somebody else is holding a hose, too (C,E). Pragmatically, pictures C, D, and E represent a violation of the Gricean maxim of Quantity, because they contain more visual information than is named in sentence (1). That means that the test sentences 1 were underspecified with respect to the presented pictures.

In Experiment 2 we examined whether children are sensitive to this kind of underspecification in test sentence (1). If children consider the different numbers of elements not mentioned in the test sentences we expect them to judge the pictures A, C, D, E in a different way. In a truth-value-judgment-task design, thirty 6-year-olds and 30 adults were shown one of the pictures and asked whether it matches the given sentence. Children as well as adults judged picture A to be the best match for the test sentence, followed by picture C, D and E. The more elements there were that were not mentioned in the test sentence the worse the sentence was rated as matching the picture. This result indicates that children are pragmatically highly competent in obeying Grice's maxim of quantity. Further, the observed sensitivity to the information not mentioned in the test sentence indicates that children are aware of the information which constitutes the set of alternatives. This suggests that the observed failure of the children in Experiment 1 does not result from their inability to construct the set of alternatives. Possible reasons for children's non-target-like reactions to sentences with FP and methodological consequences for further experiments will be discussed.

Katharina Rohlfing
University of Bielefeld

Meaning in objects?

It is commonly assumed that a symbol is autonomous when it can be flexibly applied (Kauschke, 2000). Transferring this assumption to language acquisition means that a child displays her or his knowledge about a specific symbol, when she or he uses it beyond specific contexts such as action sequences or routines. Clearly, this view stands for an attempt to separate semantic from pragmatic knowledge, and it seems obvious that such knowledge can be tested in adults under experimental conditions. However, to show the presence of such semantic autonomy in the absence of contextual cues is difficult in studies with children.

I would like to exemplify these difficulties on children's lexical knowledge about spatial prepositions such as ON or UNDER. Various studies have shown that when two-years-old children are told to put one object ON or UNDER another one, their answer is often influenced by the presented objects. In her pioneering work, Clark (1973) proposed that when one of the objects is a container, children will put something into it; when an object offers a horizontal surface, children are inclined to put the other object on it. Since this study, it has been argued that children's responses in such situations are actually not based on meaning but rather on what was possible given the objects included in the study (see also Rohlfing, 2006). To characterize such behavior, the notion of 'nonlinguistic strategies' was introduced (Clark, 1973). These strategies have been discussed as a form of pragmatic behavior proceeding semantic knowledge competence. Clark (1973, p. 177) differentiates between a stage where infants rely on "nonlinguistic strategies plus partial semantic knowledge of the words; a transition stage; and a stage where they rely on full semantic knowledge of the words".

I would like to argue that these strategies should be viewed as contributing to semantic knowledge. My argument is based on evidence from studies with (a) adults showing that even adults' lexical knowledge is influenced by presented objects and (b) children showing that cologically valid objects do not permit to balance relational possibilities. They simply restrict the answers, and children are, indeed, guided by objects presented to them. This admission provides support for the idea proposed by Sinha (2007; originally by Lotman, 1984) according to which material objects are a semiotic system as well and contribute to the „semiosphere“. Children are good learners because they are biased towards certain solutions (Dabrowska, 2004).

References

- Clark, E. V. (1973): Non-linguistic strategies and the acquisition of word meanings. *Cognition* 3: 161-182.
- Dabrowska, E. (2004): *Language, mind and brain. Some psychological and neurological constraints on theories of grammar*. Washington, D.C.:Georgetown University Press.
- Kauschke, C. (2000): Der Erwerb des frühkindlichen Lexikons. Eine empirische Studie zur Entwicklung des Wortschatzes im Deutschen. Tübingen: Gunter Narr Verlag.
- Lotman, Y. M. (1984): O semiosfere. *Sign Systems Studies (Trudy po znakovym sistemam)* 17: 5-23.
- Rohlfing, K.J. (2006): Facilitating the acquisition of UNDER by means of IN and ON — a training study in Polish. *Journal of Child Language* 33: 51-69.
- Sinha, C. (2007): *Intersubjectivity, normativity and reference*. Paper presented at the 10th International Conference for Cognitive Linguistics (ICLC 2007), Kraków, Poland, 16. – 20. Juli.

Robert Kurtz and Ronnie Wilbur
Purdue University

The development of conversational competence in children with specific language impairment

Research on the development of conversational skills suggests that children's awareness of rules described in terms of Grice's maxims develops unevenly, competence with the maxims of quality and manner being demonstrated earlier than with those of relation and quantity. It remains to be shown, however, whether very young children's difficulty complying with the latter two actually reflects lack of understanding of the maxims themselves, or whether toddlers simply lack the linguistic sophistication necessary to exhibit competence with them. Thus, it remains uncertain whether the maxims are present pre-linguistically, or whether they emerge as part of language development.

This study examined the ability of preschool children with specific language impairment (SLI), whose cognitive development was within normal limits, but whose language development lagged behind that of their peers. Two adult raters viewed videotapes of spontaneous, one-on-one conversations between four children with SLI and adult examiners, compared with similar conversations involving four typically-developing children of similar age. The raters identified occurrences of what they judged to be violations of conversational rules and assigned each violation to a category based on a system developed by Bishop and Adams (1989).

The children with SLI produced a significantly higher frequency of violations than their peers in the control group. All but two of the violations identified by the adult raters can be analyzed as falling under the Gricean maxims of relation and quantity, consistent with results of earlier studies of younger, typically-developing children.

If children with SLI display a pattern of violations similar to that of younger, typically developing children of similar linguistic ability, it stands to reason that compliance with the maxims of relation and quantity are strongly linked to language development. If these children perform better than younger, language-matched controls, but below their more language-proficient age mates, it would suggest that cognitive maturation plays a role. While our study confirms that children with SLI exhibit lower competence compared their typically developing peers, further research including younger, language-matched control subjects is required to determine how children with SLI compare to this population.

Hans-Christian Schmitz
University of Frankfurt/Main

Free creation of intensional contexts

1. Modal enrichment: Recipients do not always understand speakers literally but perform operations of meaning enrichment. One type of meaning enrichment – which is not mentioned so often – is the creation of an intensional context for interpretation like in the following example:

- (1) A: *Wie spät ist es?* B: *Es ist 5 nach 3, meine Uhr geht aber 5 Minuten vor.*
 (A: *What time is it?* B: *It's 5 past 3, but my watch is 5 minutes fast.*)

In an experiment 42 subjects are asked to interpret B's answer. 36 subjects (85.7%) understand that it is 15:00h; only 6 subjects (14.3%) interpret the answer literally as meaning that it is 15:05h. The majority of subjects perform an operation of modal enrichment: They apply a modal operator (by-speaker's-watch) to the first conjunct of B's answer. Thus, they interpret it in the sense of "By my (B's) watch it's 5 past 3". Since B also says that his watch is 5 minutes fast, the subjects conclude that it is (exactly) 3 o'clock. Further experiments show that recipients can generate and apply different kinds of modal operators. The generation and application of modal operators is context dependent, but even in example (1) it does not depend on the occurrence of "aber" (but).

2. Bottom-up generation of implicatures: A cooperative speaker wants to be understood. He must anticipate possible meaning enrichments which might be carried out by the recipient. The recipient wants to understand the speaker. He can only carry out meaning enrichments that can be anticipated (even be intended) by the speaker. It must be clear in advance what kinds of meaning enrichment operations can be carried out; the set of enrichment operations that can be performed is restricted. We can take these operations into account when we construct meaning representations with feature structures in which both literal meanings and the applicability of enrichment operations are specified.

3. Controlling enrichment: In a given situation, an operation of meaning enrichment might be only optional but not obligatory for the recipient. In such a situation, a speaker cannot be sure whether the recipient will perform this operation or not; and the recipient cannot be sure whether he should perform it or not. In order to assure that he is properly understood the speaker must control which enrichment operations are performed. Some words – among them "tatsächlich" (in fact) – serve the purpose of controlling meaning enrichment:

- (2) A: *Wie spät ist es?* B: *Tatsächlich ist es 5 nach 3, meine Uhr geht aber 5 Minuten vor.*
 (A: *What time is it?* B: *In fact, it's 5 past 3, but my watch is 5 minutes fast.*)

42 subjects are asked to interpret B's answer of example (2). Only 2 subjects (4.8%) perform an operation of modal enrichment and understand that it is (exactly) 3 o'clock. The majority of 40 subjects (95.2%) interpret the answer literally. Further experiments show that the interpretation does neither depend on a specific accentuation pattern nor on the occurrence of "aber" (but). Moreover, it does not depend on the 'naturalness' of the answers. The difference between the interpretations of examples like (1) and (4) only depends on the occurrence of "tatsächlich". However, "tatsächlich" does not have a direct truth-conditional impact on the answer sentences – "It's 5 past 3" and "In fact (tatsächlich), it's 5 past 3" have the same literal meaning. "Tatsächlich" just blocks the performance of a modal enrichment operation. This can be easily specified within a feature structure like that mentioned above in which the applicability of a modal enrichment operation is blocked.

More 'linguistic' accounts that try to explain the blocking-effect by specifying a direct impact of "tatsächlich" on the literal truth-conditions of sentences fail in interpreting sentences that contain modal operators besides "tatsächlich" like, e.g., "Peter believes that it is in fact (tatsächlich) 5 past 3" or "In fact (Tatsächlich) Peter believes that it is 5 past 3". The meaning of "tatsächlich" is taken to be an example for the interdependency of semantic and pragmatic interpretation and the permeability of the semantics-pragmatics boundary.

Eleni Kriempardis
University of Cambridge

Are implicatures more than a type of communicated content?

Starting from Grice's notion that 'saying' is to be understood as closely related to conventional meaning, the distinction between 'what is said' and 'what is implicated' is usually discussed as a distinction between two types of communicated *content*. The main argument against the Gricean picture is that pragmatic principles are necessary not only to derive 'what is implicated', but also its logical input, ie 'what is said' itself. What Relevance Theory (Sperber & Wilson 1986/1995; Carston 2002) advocates, therefore, is a general inferential mechanism that is used to derive both types of content. In the present paper, I argue that the focus on inferential strategies has had a paradoxical effect on the debate: it has not been emphasised enough that the concept of 'implicature' is (at least) as much about pragmatic strategies as it is about a certain type of content. I aim to illustrate how this has made it difficult to develop a notion of 'what is said' that is pragmatic but characterised just as independently (from what is PCI-implicated) as one would wish (eg Levinson 2000: 198). I will propose such a characterisation of 'what is said' as well as a (vaguely Gricean) overarching needs-based principle of interpretation that applies both to utterances with and without particularised conversational implicatures (PCIs) and indicates when a PCI is needed. The focus on inferences that characterises the Neo- and Post-Gricean pragmatic debate has two aspects that are particularly relevant to the present issue. First, it engenders discussions about logical properties of propositional units that permit inferences. Second, the cognitive processing level and the reflective level of utterance interpretation are not distinguished consistently. However, if the reflective level is conceptualised as a level at which speakers and hearers can negotiate (and learn) what may reasonably be meant by making a particular utterance in its context, not all aspects of the semantics/pragmatics discussion that theorists are concerned with are necessarily relevant. What matters instead is that speakers and hearers share a repertoire of pragmatic principles that tell them a) what can be intended to be conveyed by a particular utterance in its context and b) what the speaker can be taken to have committed himself to.

It is compatible with this set-up that implicature strategies can be applied twice: once to reach an understanding of a pragmatic 'what is said', and once to infer additional implicit assumptions, where necessary. Due to further constraints, both enriched scalars and metaphorical expressions belong to the former level. What is important, however, is that this does not mean that one principle is responsible for the interpretation of both 'what is said' and 'what is PCI-implicated' as is the case for Relevance-theoretic explicatures and implicatures. Strategies of interpretation that are responsible for the pragmatic 'what is said' are all lexeme-based while PCIs require the availability of auxiliary assumptions to be derived. This distinction has significant social implications. If it can be demonstrated that the notion of pragmatic 'what is said' is sufficiently restricted by generally valid principles, it is capable of doing the job that Cappelen & Lepore (2005; 2007) require of their 'semantic content'. As with Bach's 'implicature' (1994), their concern that a slightly richer notion will lead to indeterminable entities can be shown to be unwarranted, *as long as* the relevant notion is consistently understood as suitably restricted by shared principles at a reflective level.

Nausicaa Pouscoulous
Max Planck Institute for Evolutionary Anthropology, Leipzig

Experimental evidence on the implicit/explicit distinction

When a speaker utters a sentence such as (1): “Daniel kicked the glass over and it fell on the floor”, the hearer may infer that Daniel broke the vase but this wasn’t explicitly stated, most linguists agree it was conveyed implicitly – that it is an implicature. Unfortunately, the distinction between what is explicitly said and what is implied is not always clear-cut. It was first assumed that semantic processes allowed us to access the explicit part of meaning, while pragmatic ones would retrieve the intended implicit meaning. In recent years this view has been questioned by several theoreticians (Levinson, 2000; Récanati, 2004; Sperber and Wilson, 1986/1995 amongst many others), who claim that some pragmatic inferences play a crucial role in the derivation of the explicit meaning of an utterance (‘what is said’). For such cases, at the interface between pragmatics and semantics, it is difficult to decide whether they are part of ‘what is said’ or implicitly communicated.

Of particular interest are scalar inferences, which have been studied empirically more extensively lately (Bott and Noveck, 2004; Breheny et al., 2006; Noveck, 2001; Papafragou and Musolino, 2003). These arise when a speaker’s use of a term such as ‘some’ indicates that he couldn’t have used a more informative term from the same scale, like ‘all’. For example, if someone says, (2): “Some of the children are in the classroom”, the hearer is entitled to infer that *not all* of the children are in the classroom. It is important to note that the quantifier ‘some’ is logically compatible with the stronger ‘all’, for if it turned out that ‘all’ the children were in the classroom, the sentence with ‘some’ would still be true, if misleading. Hence, the scalar expression ‘some’ may be interpreted in two different ways: either with its literal, semantic meaning, which is compatible with ‘all’, or with an inference-driven, pragmatic reading, which excludes ‘all’. Another scalar expression that licenses such inferences is the disjunction (‘or’) and conjunction (‘and’), as in (3): “Mummy or Daddy is picking up Molly from school” (not *both* of them).

In order to investigate whether scalar inferences are part of the explicit or implicit meaning of an utterance we used an experimental paradigm first established by Gibbs and Moise (1997) (and replicated in Nicolle and Clark, 1999) and which they used to test other pragmatic inferences. In two experiments, we studied whether subjects understood scalar inferences such as those linked to (2) and (3) as being part either of ‘what was said’ by an utterance (its explicit meaning) or implicitly communicated. According to Récanati’s ‘availability principle’ (2004) we have pre-theoretical intuitions of which parts of meaning are explicit and which are implicit. Thus a classification such as the one established by the answers of naïve subjects to our questionnaires should be representative of what belongs to ‘what is said’ and ‘what is implicit’. Given a sentence with a scalar inference subjects were asked, in Experiment 1, to choose between two possible paraphrases (one conveying the literal meaning of the utterance and the other the inference), the one that better paraphrased what was explicitly said. It was overwhelmingly found that subjects consider scalar inferences as being part of the explicit meaning of the utterance or ‘what is said’. In experiment 2, we wanted to ensure that these results were not an artifact of the design. Therefore we change slightly the instruction (introducing an example) in order to be able to compare subject’s intuitions on scalar inferences and their responses for clear cases of particularized implicatures. For instance, for the sentence (1), we used “Daniel made the vase fall” as a paraphrase of the explicit meaning, while for the implicature we put “Daniel broke the vase”. For implicatures such as (1), participants rightly chose the explicit paraphrase around 90%, thereby showing that they can distinguish between ‘what is said’ and what is implicated. But for scalar inferences they still overwhelmingly preferred the implicit paraphrase.

We take these data to show that scalar inferences, unlike particularised implicatures, are understood by subjects as part of the explicit meaning of an utterance. If we are to take Récanati’s ‘availability principle’ seriously we should thus consider them as part of ‘what is

said'. Such a conclusion bears important consequences for the current theoretical debates both on scalar inferences and on the explicit/implicit distinction more generally.

Judith Degen
University of Osnabrück

Theoretical implications of experimental evidence on scalar implicature processing

Experimental research investigating the default nature of scalar implicature processing has been viewed as a means of resolving the long-standing debate between Neo-Griceans and Relevance Theorists (Noveck and Posada (2003)). I argue that this view is based on a misconception about the relation between the involved theories (Neo-Griceanism vs. Relevance Theory) and the empirically testable models (the Default vs. the Context-Driven model).

Current experimental research on scalar implicature processing is yielding substantial support for the Context-Driven over the Default account of scalar implicatures (Noveck and Posada(2003), Breheny et al. (2006)). What are the theoretical implications of this evidence? Since the Context-Driven model is taken to be on par with Relevance Theory and the Default model with Neo-Gricean accounts, it is concluded e.g. by Noveck and Posada (2003) that the current support for the Context-Driven model provides evidence for Relevance Theory and against Neo-Griceanism in general.

I argue against the assumption that being a Neo-Gricean implies defending a Default notion of scalar implicatures. Although certain Neo-Gricean accounts (e.g. Levinson (2000)) explicitly endorse the Default model, this is not necessary for Neo-Griceanism in general. A Context-Driven Neo-Gricean account may (very informally) look as follows: for every potential implicature trigger encountered in a given utterance, check whether its use is indeed only attributable to a clash between the maxim of Quantity-1 and one of the Quality maxims. If it is (as in example (1)), generate the implicature. If its use may be attributable to another maxim (e.g. to Quantity-2 in example (2)), do not generate the implicature.

- (1) [A mother goes shoe-shopping with her sons who argue about wanting both white and blue sneakers although it is clear they will only get one pair each.]
Mother: I will buy you blue or white sneakers! – (but not both.)
- (2) [A very generous mother, whose main goal is to make her children happy, goes shoe-shopping with her sons.]
Mother: I will buy you blue or white sneakers. – (and possibly both)

Thus we arrive at a Gricean interpretation of scalar implicature processing that is in line with the current experimental evidence.

Consequently, only some Neo-Gricean accounts are undermined by the current empirical evidence, not, however, the Neo-Gricean approach in general. Thus, contrary to what has been claimed, experimentally testable predictions are largely divorced from the theoretical debate. The question of Default is not suited to settle the debate between Neo-Griceanism and Relevance Theory.

References

- Breheny, R., N. Katsos, and J. Williams (2006). Are generalised scalar implicatures generated by default? An on-line investigation into the role of context in generating pragmatic inferences. *Cognition* 100, 434–463.
- Levinson, S. C. (2000). *Presumptive Meanings - The Theory of Generalized Conversational Implicature*. The MIT Press.
- Noveck, I. and A. Posada (2003). Characterizing the time course of an implicature: an evoked potentials study. *Brain and Language* 85, 203–210.

Frank Liedtke
University of Düsseldorf

Trigger or enrichment: On the proper treatment of what is said

Following the traditional, Gricean account of utterance-meaning, there are two aspects of each utterance which are relevant for grasping what the respective speaker has communicated: the conventional meaning of the words uttered (what has been said) and the conversational implicatures (what has been implicated). Within this account however, *saying* is not restricted to conventional semantic aspects alone, but it contains pragmatic ingredients too. These components make possible the specification of reference, the resolution of indexicals and the disambiguation of ambiguous expressions, and together they constitute the pragmatic *saturation* of what is said.

It was since the eighties of the last century (Searle, Sperber/Wilson) that the problems and deficiencies of this account have been recognized. Not only reference assignment and disambiguation, which are triggered “bottom up” via the use e.g. of indexical expressions, but also further contextual information is held to be undispensible for determining a representation of what is said by an utterance. Typically this information is added “top down” to what has been literally expressed. In spite of its non-literal character, it is treated as having been communicated or *said* by the speaker. This second type of pragmatic intrusion is called *free enrichment*. The position which consists in claiming that not only saturation, but also free enrichment plays a constitutive role in building up an instance of what-is-said, is called the contextualist position, and it is held roughly by authors like Bach, Levinson, Récanati et al. Most authors claim that the process of free enrichment is inferential in nature (implicature, generalized conversational implicature, explicature). In contrast, Récanati holds that these processes are associative in nature, not inferential, and that they arise locally, incrementally in the course of the production of an utterance. (Récanati 2004)

Integrating enrichment into what-is-said has some consequences which are relevant to the cognitive side of communication. Indeed this strategy leads to some methodological problems. The first problem concerns the cognitive status of pragmatic processes and their results. Saturation and enrichment are primary pragmatic *processes* which *result* into what-is-said. Furthermore, the former processes are said to be sub-doxastic, the latter results are called available or conscious for the communicants (Récanati 2004, 14) This distinction between unconscious processes and conscious results seems stipulative, it is not clear whether the former are subdoxastic and the latter are conscious by definition or if this is a matter of contingent facts.

The second methodological problem arises if one wants to distinguish the two types of primary pragmatic processes, saturation and enrichment, from each other, or if one wants to distinguish primary pragmatic processes from secondary ones (conversational implicatures). Figurative speech for example is held to be a species of what-is-said by Récanati, but there are cases of irony which are to be treated best as cases of conversational implicature.

In order to face these problems, I want to test the intuitions of language users about the scope and the nature of what-is-said. Written and recorded oral dialogues will be presented to native speakers of German. In a second move, the recipients of the dialogue will be asked what one or both participants of the dialogue have *said*. The scope of possible answers provides some evidence concerning the question whether one may include pragmatic enrichment into the realm of what-is-said, and if one may, what exactly is to be included and what not.

References

Récanati, François, *Literal Meaning*, Cambridge, 2004.