

Linguistics 661, Issues in Semantics

Alexander Williams, 3 April 2007

Chierchia on Scalar implicature

1 Classical scalar implicature

- When a speaker says that w , we often take him to mean that he believes s to be unjustified or false, where s is a statement ‘stronger’ than w .
- It is often taken as necessary (Gazdar 1979) that the ‘stronger’ statement s asymmetrically entail the ‘weaker’ statement w .

- Classical scalar implicature is *global*.

The stronger statement from which the speaker implicitly withholds his commitment, or which he implicitly *denies*, is an alternative to the *entire content* of what he says explicitly.

- Since classical implicature is global, only the global semantic context matters in determining the implicature, not the local context.

For instance, if $\phi = F(G(\psi))$ and ψ includes scalar terms, the choice of scalar alternatives to ψ depends on the monotonicity of the context $F(G(\dots))$: increasing or decreasing. It does not depend on the monotonicity of the context $G(\dots)$.

2 Chierchia’s revision

- Empirical claims

1. Scalar implicatures are in fact **local**, not global.

What is denied in the implicature is not just a stronger alternative to the entire content of what the speaker says, but a stronger alternative for *each truth-evaluable constituent* of what is said.

Suppose that S says p ; $p = f(w)$; s is a ‘scalar alternative’ to w ; and $f(s) \Rightarrow f(w)$, but not conversely. For the classical Gricean, the (quality-over-quantity) implicature associated with saying p will involve denying, or withholding commitment from, $f(s)$, so at most: $\neg f(s)$.

But for Chierchia, the implicature will involve denying s , the stronger alternative to the *embedded* statement: $f(w \wedge \neg s)$.

2. Local context matters in a very particular way: “ordinary scalar implicatures are systematically suspended in the very contexts that license elements like *any*.”

That is:

If the context ψ in ϕ licenses NPis, then any local implicatures associated with ψ do not become, or become part of, the scalar implicatures associated with ϕ .

Thus an NPI context is an island for embedded scalar implicatures.

NPis are *not* licensed globally. Being in the context of a single Decreasing function is sufficient to license an NPI. It is not necessary that the context of the NPI be *globally* decreasing.

- (1) a. Everyone who doesn't smoke a(ny kind of) pipe is healthy.
b. \Rightarrow Everyone who doesn't smoke is healthy.

For Chierchia, embedded implicatures are similar. The presence of a single decreasing function in the semantic derivation blocks any scalar implicatures in its scope from ‘projecting,’ even if their context is *globally* increasing.

3. Scalar terms in **nonmonotonic** contexts trigger the ‘same’ implicatures as they do in monotone increasing contexts.

- (2) Billy kissed most of the girls.
 \rightsquigarrow Billy didn't kiss all of the girls.
- (3) Exactly two boys kissed most of the girls.
Chierchia: \rightsquigarrow Exactly two boys kissed most but not all of the girls

- Theoretical claims

1. Each node in the derivation has (at least) two semantic values:

- (a) Plain Value

Familiar truth-conditional content of assertion

$[[\cdot]]$

- (b) Strong Value

Plain value plus scalar implicatures (in particular, the negation of a stronger scalar alternative to the plain value)

$[[\cdot]]^S$

2. Lexical items include information about their scalar alternatives: “Knowledge of scales is part of our knowledge of the lexicon.”

3. Scalar implicature is “calculated” at **each** node of type $\langle t \rangle$.

“First we introduce implicatures at any scope site. . . .”

4. The implicature is the negation of a proposition derived by substituting scalar terms with their alternatives, which asymmetrically entails the Plain Value.

5. Constraint on strong values: “the strong value cannot become weaker than the plain value.”

“...Second we impose a general condition on application that filters out implicatures whenever they lead to a weakening of information content (by local comparison with plain meanings).”

Thus ‘embedded implicatures’ calculated in a context dominated by *no* Decreasing functions are preserved at the root.

But the appearance of a decreasing function in the derivation *erases* any embedded implicatures, and introduces a new implicature at that node.

2.1 Mechanics of the theory

1. $\llbracket \alpha \rrbracket$: the “plain” semantic value for α

2. At any node α , there is a set of scalar alternatives to α , $\text{Alt}(\alpha)$, formed by all possible substitutions for scalar terms.

$\text{Alt}(\alpha)$, for $\alpha \in \langle \tau \rangle$: the set of scalar alternatives to α :

(a) If α is lexical, but not a member of a scale:

$$\text{Alt}(\alpha) = \{\llbracket \alpha \rrbracket\}$$

(b) If α is lexical, and a member of a scale Σ :

$$\text{Alt}(\alpha) = \{\omega \in \tau : \omega \in \Sigma\}$$

(c) If $\alpha = [\beta_{\langle \sigma, \tau \rangle} \gamma_{\sigma}]$

i. If $\text{Alt}(\beta)$ is a singleton:

$$\text{Alt}(\alpha) = \text{APPLY}(\{\llbracket \beta \rrbracket\}, \text{Alt}(\gamma))$$

ii. Otherwise:¹

$$\text{Alt}(\alpha) = \text{APPLY}(\text{Alt}(\beta), \{\llbracket \gamma \rrbracket\})$$

APPLY(A, B) takes a set A of functions in $\langle b, c \rangle$, and a set of arguments B in $\langle b \rangle$, applies each function in A to each argument in B, and outputs the set of all the results.

3. StrongerAlt(α) = The weakest member of Alt(α) that asymmetrically entails $\llbracket \alpha \rrbracket$, if there is one; and falsity otherwise.²

4. StrongValue(α)

(a) If α is lexical:

$$\text{StrongValue}(\alpha) = \{ \llbracket \alpha \rrbracket \}$$

(b) For $\alpha \in \langle t \rangle$:

StrongValue(α) is a superset of :

$$\{ p \wedge \neg \text{StrongerAlt}(\alpha) : p \in \text{StrongValue}(\alpha) \}$$

(c) If $\alpha = [\beta_{\langle \sigma, \tau \rangle} \gamma_{\sigma}]$

i. If β is **not** Downward Entailing

$$\text{StrongValue}(\alpha) = \text{APPLY}(\text{StrongValue}(\beta), \text{StrongValue}(\gamma))$$

ii. If β is Downward Entailing

$$\text{StrongValue}(\alpha) = \{ \llbracket \text{StrongValue}(\beta) \rrbracket(\llbracket \gamma \rrbracket) \wedge \neg \text{StrongerAlt}[\llbracket \beta \rrbracket](\text{Alt}(\gamma)) \}$$

The crucial clause is the last one. It says that, when you enter an argument γ into a downward entailing function β , the Strong Value of the result is formed by adding the negation of a stronger alternative to $\llbracket \beta \rrbracket(\llbracket \gamma \rrbracket)$, from among the alternatives formed by substituting for scalar terms in γ .

Importantly, this negated alternative proposition is not necessarily built up from the Strong Values of γ 's parts!

¹I have no idea why the Alt-set of β does not apply to *to the Alt-set* of γ , in this case. Is this just an error?

²It's not clear to me that Chierchia means to exclude the case where there is more than one 'weakest' alternative, neither one of which entails the other.

Chierchia provides a label for the distinction:

“Let us call the ordinary implicatures associated with a scalar term just in virtue of its position on a scale, the *direct* implicatures [. . .]. We will instead call “indirect implicatures” those introduced by a scalar term in interaction with a higher negative element.”

3 Embedded implicatures?

- How do we understand (4) in a ‘neutral context’?

(4) John is certain that most of the students cheated.

1. Classical Gricean implicature:

(5) John is not certain that all of the students cheated.

More precisely: The speaker regards as false or unjustified the stronger statement that: John is certain that all students cheated.

2. Chierchian implicature:

(6) John is certain that not all of the students cheated.

In my opinion, the judgment of the classical view is clearly correct, and that of Chierchia is clearly wrong.

- Chierchia regards as “odd” the expectation, deriving from the classical theory, that we should get a ‘not all’ implicature when John says (7a), but not when someone reports what John says by saying (7b).

(7) a. Most of the portraits are fakes.
b. John believes that most of the portraits are fakes.

This reservation is hard to take seriously. In general, propositional attitude verbs are **not** simply devices for quotation, and Chierchia surely knows this.

Notoriously, a speaker can even describe the content of someone’s attitudes in terms to which they would not assent. How the speaker describes the contents of X’s attitudes depends on the purposes of the speaker, not on X himself.

More obviously, different verbs emphasize different aspects of the attitude: compare **believe to be certain**. These differences will influence what *further* inferences hearers will make about other details of the subject’s mental state.

- Let's consult our judgments about *know*.

(8) John knows that most of the portraits are fakes.

1. Classical theory:

- (a) Presupposition: Most of the portraits are fakes
- (b) Implicature:

(9) It's not true that John knows that all the portraits are fakes.

More precisely, the speaker regards as unjustified or false the stronger statement that: John knows that all of the portraits are fakes.

2. Chierchia:

- (a) Presupposition:
 - i. Calculated from the plain value: Most of the portraits are fakes
 - ii. Calculated from the embedded implicature: Not all of the portraits are fakes
- (b) Implicature:

(10) John knows that most but not all of the portraits are fakes

Chierchia's judgment again seems wrong to me.

It's certainly *possible* that one might take the speaker of (8) to mean (10), but I don't think that should be considered the 'general' or 'normal' case, much less the output of the semantic theory.

- Consider another factive verb, *surprise*, which lacks *know*'s characteristic emphasis on justification.

(11) It surprised the teacher that most of the students attended the study session

Here I find it natural to infer (or perhaps, to accommodate the presupposition that) *not all* of the students attended the study session.

And yet it would be quite *unnatural* to also infer that this stronger proposition is the object of the teacher's surprise. Most likely it would be even more surprising if *all* the students attended!³

- Another simple example.

Assume that there is a scale $\langle \text{warm, hot} \rangle$, such that everything that's hot is also warm, but not vice versa.

³It seems that Yael Sharvit and John Gajewski have a forthcoming WCCFL presentation that is relevant to this discussion—though, it's not clear to me that their judgments are right either.

- (12) Everything is warm.
- a. LF: [Everything [x is warm]]
 - b. Classical implicature: ‘Not everything is hot’
(+ ‘Everything is warm’ \rightarrow ‘Some of the warm things are not hot’)
 - c. Chierchian local implicature:
‘Everything is not hot.’
(+ ‘Everything is warm’ \rightarrow ‘Everything is warm but not hot’)

What are the facts? I’m not certain, but in my judgment is that Chierchia is wrong again.

Now a curious wrinkle. When the subject quantifier is decreasing, the classical and Chierchian predictions are identical:

- (13) Nothing is hot.
- a. LF: [Nothing [x is hot]]
 - b. Classical implicature: ‘It’s not true that nothing is warm’ = ‘At least one thing is warm’
(+ ‘Nothing is hot’ = ‘Some things are warm but nothing is hot’)
 - c. Chierchian local implicature:
‘It’s not true that nothing is warm.’ ...

- Chierchia discusses scalar terms in the scope of disjunction:

(14) Mary is either working on a paper or seeing some of her students

(15) To control the deer population, they will either sterilize some of the does, or introduce wolves.

Recall Sauerland’s discussion of this issue, which is more thorough.

- Important general point:

Chierchia often cites as evidence for his conclusions the judgment that statement w **can** be used to implicate that $\neg s$.

But this is not sufficient evidence, if the conclusion is that $\neg s$ is a *generalized* conversational implicature of p . For that one needs the judgment that contexts where use of w does not implicate $\neg s$ are somehow unusual.

And of course if $\neg s$ is supposed to be *conventional* scalar implicature of p , as Chierchia seems to suggest, we demand even stronger evidence!

4 Implicatures in nonmonotonic contexts?

- Chierchia judges that the implicated negation of a scalar alternative is possible even in a nonmonotone context.

Consequently the “Strength Condition” is delicately stated:

Each truth evaluable node is associated with the denial of its Strong Value as an implicature, **unless** the Plain Value entails the Strong Value.

When neither entails the other, therefore, there is nevertheless an implicature that the Strong Value is false.

- But what are the facts?

(16) Exactly two guests danced or made a toast.

1. Classical theory: no scalar implicature

Facts: Toasters = { Al }, Dancers = { Al, Carla } [True]

2. Chierchia:

(17) Exactly two guests danced or made a toast but not both.

Facts: Toasters = { Al }, Dancers = { Al, Carla }

Chierchia’s prediction: Misleading statement, because implicature is false.

To me, Chierchia’s prediction is clearly and wildly wrong.

- In any case, recall our reservations: The mere possibility of a certain implicature is not evidence that it is a *generalized* implicature, much less a conventional implicature, determined by the grammar and the lexicon.

5 Global monotonicity, or local?

- If it turns out that there are no local implicatures, then the question of whether local implicatures are locally cancelled by Decreasing functions is moot.
- However, if the phenomenon of local implicature is real, then the question needs to be examined—see your homework.

6 General theoretical anxieties

1. Since embedded implicatures are erased at the appearance of a Decreasing function, the calculation of Strong Values is not monotonic.

That is, if ψ is a constituent of $\phi = P(\psi)$, the Strong Value of ϕ may, nevertheless, not include the Strong Value of ψ .

Since the Strong Value of $P(\psi)$ needn't be built up from the Strong Value of ψ , the derivation of Strong Values is not compositional in the strongest sense of the term.

In particular, the noncompositionality appears in this way. When node $\alpha = [\beta_{\langle c,b \rangle} \gamma_{\langle c \rangle}]$, and β is a decreasing function, the Strong Value of α depends not on the Strong Value of γ , but rather on the set of its scalar alternatives. Thus the derivation of Strong Values relies on 'outside resources,' information other than Strong Values themselves.

That said, it is true, as Chierchia boasts, that the derivation proceeds in step-by-step fashion, without any radically nonlocal monkey-business.

2. "Unlike the focus value of a sentence, its scalar value is not accessible to operators. It is used for local comparison with the plain value."

This is not ideal. In the ideal case, one wants to incorporate into Semantic Values only such content as is used by some other semantic process. This goes in favor of Rooth's (1985) postulation of "focus values."

- (18) a. Al **only** introduced BOB to Carl.
b. Al **only** introduced Bob to CARL.

3. How do we now capture the fact that scalar implicatures are not absolutely conventional?