Scalar implicatures in non-monotonic environments

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Summary

Scalar implicatures (SIs) have been traditionally analyzed as pragmatic inferences that arise after semantic computation. Recent studies, however, have presented various challenges to this classic analysis; for instance, it has been claimed that SIs can be interpreted within the scope of various semantic operators (Chierchia, 2004, 2006; Chierchia et al., 2011). These observations motivate a grammatical analysis of SIs: SIs are derived during or before semantic computation. Among various kinds of evidence for the grammatical approach to SIs, especially convincing one is SIs embedded in non-monotonic (NM) environments, which post-semantic analyses have difficulty deriving (Chierchia, 2004; Chierchia et al., 2011). This paper introduces new examples of NM operators that allow SIs to be embedded in their scope, and I thereby provide further empirical support for the grammatical analysis. On the other hand, I will also show that not all NM operators behave in the same way with respect to SI-embedding. It will turn out that Strawson non-monotonicity (SNMity) is required to embed SIs in the negative component of NM environments; i.e. SI-embedding is unavailable if the NMity can be decomposed into monotonic assertion and monotonic presupposition.

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Among various kinds of evidence for the grammatical approach to SIs, especially convincing one is SIs embedded in non-monotonic (NM) environments, which post-semantic analyses have difficulty deriving (Chierchia, 2004; Chierchia et al., 2011). This paper introduces new examples of NM operators that allow SIs to be embedded in their scope, and I thereby provide further empirical support for the grammatical analysis. On the other hand, I will also show that not all NM operators behave in the same way with respect to SI-embedding. It will turn out that Strawson non-monotonicity (SNMity) is required to embed SIs in the negative component of NM environments; i.e. SI-embedding is unavailable if the NMity can be decomposed into monotonic assertion and monotonic presupposition.

A new example of NM operators that allow SI-embedding is a Japanese restrictive particle, *dake*. Under the context in (1), the disjunction, *ka*, in (2) is exclusively interpreted in both the prejacent (2a) and exhaustification (2b) of *dake*.

(1)   Context: Every morning, a dining hall provides an apple and a banana to each student. Mary is a small girl and does not eat much, so she eats only one of the fruits. (What she eats depends on each day.) The other students eat both.

(2)   Mary-dake ringo ka banana-o   tabe(-te), hoka-no   hito-wa   ryoohoo tabe-ru.
        Mary-only apple or banana-ACC eat-CONJ other-NOM person-TOP both   eat-PRES
        'Only Mary eats the apple or the banana, and the others eat both.'
    a.   Prejacent: Mary eats the apple or the banana.
    b.   Exhaustification: It is not the case that the others eat either the apple or the banana. (They may eat both.)

The disjunction is negated in the exhaustification (2b). If it were inclusive, then the individuals other than Mary must eat neither the apple nor the banana, and thus, it would cause a contradiction with the second half of (2) ('the others eat both the apple and the banana.'). The felicity of (2) indicates exclusiveness of the disjunction: the negation of exclusive disjunction leaves it possible that the other people eat both the apple and the banana. Note that there is no stress required on the disjunction. We can obtain the same result with a French restrictive particle *seul(ement)*.

While *dake* and *seul(ement)* allow SIs in its exhaustification, this is not possible with the English restrictive particle, *only*.

(3)   a.   #Only Mary eats the apple or the banana. The others eat both.
        b.   Only Mary eats the apple or the banana. The others eat an orange.

(3a) shows a contradiction between the exhaustification of *only* and the second sentence, unless the disjunction is stressed. On the other hand, (3b) is felicitous, where the people other than Mary take a third option, neither an apple nor a banana. These examples indicate that the disjunction is inclusively interpreted in the exhaustification of *only*. Note that the disjunction seems exclusively interpretable in the prejacent: the natural interpretation of (3b) is that Mary eats an apple or a

banana and not both. Also note that another Japanese restrictive particle, *sika*, behaves in the same way as *only*, so we cannot simply attribute the contrast between (2) vs. (3a) to cross-linguistic variations of disjunction etc.

(4) a. #Mary-sika ringo-ka banana-o   tabe-zu, hoka-no   hito-wa   ryoohoo tabe-ru.
        Mary-only apple-or banana-ACC eat-NEG other-NOM person-TOP both   eat-PRES
        'Only Mary eats the apple or the banana, and the others eat both.'
     b. Mary-sika ringo-ka banana-o   tabe-zu, hoka-no   hito-wa   mikan-o
        Mary-only apple-or banana-ACC eat-NEG other-NOM person-TOP orange-ACC
        tabe-ru.
        eat-PRES
        'Only Mary eats the apple or the banana, and the others eat an orange.'

One important remark here is that what prevents SI-embedding in the exhaustification of *only*/*sika* is not their Strawson downward entailingness (SDEness) (von Fintel, 1999). While Chierchia (2004, 2006) argues that SIs are prohibited wherever negative polarity items (NPIs) are licensed, this is not a necessary anti-licensing condition of SIs. This claim is exemplified by *almost*, whose negative meaning is presuppositional (Ducrot, 1973; Horn, 1996).

(5) Context: John is a faculty member of the department of linguistics in some university. John usually teaches either "Syntax" or "Semantics" in fall. (He does not want teach both because he wants to have time for his research.) Another faculty member, Mary, teaches the other course. As usual, it was planned that John and Mary would teach the two courses this fall. However, Mary got in a traffic accident and was seriously injured. She was no longer able to teach any class. Accordingly, John had to teach both. Suppose that it is December now. Someone just asked you whether John taught either "Syntax" or "Semantics" (and not both) as usual.

(6) a. #John almost taught "Syntax" or "Semantics". But he had to teach both.
     b. John almost taught "Syntax" or "Semantics" and not both. But he had to teach both.

Almost is not SDE (nor does it license NPIs). Thus, if SIs are only prohibited in SDE environments, the disjunction in (6a) would be exclusively interpretable even in the negative presupposition. The infelicity of (6a) (without stress on *or*) indicates that the exclusive reading is unavailable. (Note that the sentence becomes felicitous if the exclusiveness is explicitly expressed by *and not both* (6b), so it is just the SI that is prohibited in the sentence, not the exclusive reading in general.)

The correct generalization is that (i) SIs are prevented if their application would result in a weaker meaning, and (ii) this "weakness" is independently evaluated in assertions and presuppositions. This is predicted by Sharvit and Gajewski (2008, 2012)'s analysis: the literal and exhaustive meanings of scalar items are computed in parallel through compositional semantics, and the exhaustive meaning is selected as the assertion and/or presupposition of sentences unless it is weaker than the literal version of assertion/presupposition. Sis strengthen the presupposition (= prejacent) of *only*/*sika* while they would weaken the assertion (= exhaustification). Thus, SIs only apply to the prejacent and not to the exhaustification. The opposite pattern is obtained with *almost*.

Why do *dake* and *seul(ement)* allow SIs in their exhaustification? I propose that this is because they assert both the prejacent and the exhaustification (i.e. they are SNM), and thus, these two components of meaning cannot be strengthened independently. This proposal is supported by an

enhanced version of presupposition test. Consider (8) and (9) under the context in (7).

(7)   Context: You already know that every boy other than John got into mischief. It just turned
        out that John also did it.

(8)   #Because John got in mischief as well, it is not the case that only John is a good boy.

(9)   a. John-datte itazura-si-tan-dakara,   John-dake ii-ko-na   wakejanai.
            John-also mischief-do-PST-because John-only good-child-COP it.is.not.the.case
        b. #John-datte itazura-si-tan-dakara,   John-sika ii-ko-de-nai
            John-also mischief-do-PST-because John-only good-child-COP-NEG
            wakejanai.
            it.is.not.the.case
        'Because John also got in mischief, it is not the case that only John is a good child.'

The sentences above consist of a *because*-clause and the negation of *only*, *dake*, and *sika*. The *because* clauses imply that John is not a good boy/child. Therefore, people are encouraged to negate the prejacent (= John is a good boy/child) in order to avoid contradiction. If a restrictive particle presupposes its prejacent, however, the inference must be preserved under negation, and thus, it necessarily causes a contradiction with the *because* clauses. *Only*, which presupposes its prejacent, in fact exhibits a contradiction in (8). We obtain the same result with *sika* (9b), which also prohibits SIs in its exhaustification. *Dake*, on the other hand, does not show any contradiction (9a). This indicates that the prejacent of *dake* is not presupposed. Note that *seul(ement)* shows the same result as *dake*, and thus, *seul(ement)* does not presuppose its prejacent, either.

    We can use the same technique to test whether the exhaustification is presupposed or not.

(10)   Context: You already know that John volunteered. It just turned out that another boy, Bill,
        also did it.

(11)   Because Bill also volunteered, it is not the case that only John is a good boy.

(12)   a. Bill-mo volunteer-si-tan-dakara,   John-dake ii-ko-na   wakejanai.
            Bill-also volunteer-do-PST-because John-only good-child-COP it.is.not.the.case
        b. Bill-mo volunteer-si-tan-dakara,   John-sika ii-ko-de-nai
            Bill-also volunteer-do-PST-because John-only good-child-COP-NEG
            wakejanai.
            it.is.not.the.case
        'Because Bill also volunteered, it is not the case that only John is a good child.'

In (11) and (12), the content of the *because* clause is changed such that it leads to a contradiction with the exhaustification (= everyone other than John is not a good boy/child). Thus, if the exhaustification is presupposed and preserved under the negation, the sentence would be infelicitous. The result is that none of the three particles shows infelicity, which indicates that their exhaustifications are all at issue. (Again, *seul(ment)* behaves in the same way as *dake*.) Therefore, the enhanced negation tests suggest *dake* and *seul(ement)* assert both their prejacent and exhaustification (i.e. SNM) while *only* and *sika* assert their exhaustification and presuppose their prejacent (i.e. SDE). This contrast in presupposition, together with Sharvit and Gajewski's analysis, explains why *dake* and *seul(ement)*, but not *only* or *sika*, allow SIs in their exhaustification.

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