

A Cognitive Constraint on Negative Polarity Phenomena

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A Cognitive Constraint on Negative Polarity Phenomena*

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1 INTRODUCTION

We seek to analyze the distribution of NEGATIVE POLARITY ITEMS (NPIs) like *any* and *ever* in (1) and (2) by combining semantic and cognitive constraints.

- (1) Chrysler dealers don't *ever* sell *any* cars *anymore*. (Ladusaw 1980:1)
- (2) Before I *ever* buy *any* land again, I'll study the market.

Despite some criticisms, we think the formal-semantic approach of Ladusaw (1979, 1980), who claims that NPIs may occur only in the scope of DOWNWARD ENTAILING (DE) expressions, remains one of the best descriptions of the distribution of NPIs. However, the DE condition is under-restrictive and should be supplemented with a cognitive constraint like that applied to the word *but* by Blakemore (1987). NPIs and *but* require the clause containing them to be processed in a context where it will contradict some current assumption. This idea is easily modeled in RELEVANCE THEORY (Sperber and Wilson 1986), which posits a human information processing system with a database of assumptions called the COGNITIVE ENVIRONMENT (CE) and a processing unit called the CENTRAL SYSTEM. The required contradiction arises when an input sentence being processed in the central system conflicts with propositions in the CE. We call this state of affairs the COGNITIVE STRUCTURE OF NEGATION (CSN) and view NPIs and *but* as signals warning the central system processor to expect CSN to arise when the clause containing these signal-words is examined.

Ladusaw's DE theory has drawn criticism from Linebarger (1980, 1987). We show, however, that Linebarger's alternative analysis makes innumerable false-positive predictions, leaving Ladusaw's approach the best available.

Our analysis of ADVERSATIVES like *doubt*, *regret*, *be sorry*, and *be surprised* leads to a new theory of compartmentalization of information in the CE.

- (3) He'll regret that he was *ever* born.

Since *regret* is factive, the speaker takes the complement in (3) to be true. Thus, if CSN licenses *ever*, it is not because the complement of (3) contradicts the speaker's beliefs. Rather, CSN arises in an insulated representation of an alternate possible world. We implement this idea with a tree-structured CE.

Finally, we provide compelling evidence for the CSN analysis of NPI distribution by showing that it automatically predicts the otherwise problematic incompatibility of NPIs with METALINGUISTIC NEGATION, as in (4).

- (4) The agency [= CIA] doesn't 'whack [= kill] (*#any*) pinko troublemakers'—it neutralizes anti-American influences.

A straightforward analysis of the latter phenomenon combined with the CSN approach suffices to make the prediction fall out.

2 CONCEPTUAL AND COGNITIVE CONSTRAINTS ON NPI DISTRIBUTION

We begin by examining the semantics of a representative NPI, *ever* and a representative NPI trigger, *before*. We claim that there are two conditions on NPIs: one is Ladusaw's DE condition, and the other is the need for CSN.

2.1 THE DOWNWARD-ENTAILMENT (DE) CONDITION. First we adopt Ladusaw's DE condition (1979, 1980), which captures the fact that NPIs like *ever* appear strictly inside of the scope of triggers like *before*, as in (5):

- (5) a. I sent a donation **before** I was *ever* asked to.
b. #I *ever* sent a donation **before** I was asked to.

Ladusaw proposes (6) as a necessary (but *not* sufficient) condition on NPIs:

(6) THE DOWNWARD-ENTAILMENT (DE) CONDITION

- a. A negative-polarity item is acceptable only if it is interpreted in the scope of a downward-entailing expression. (Ladusaw 1980:13)
b. An expression is downward-entailing if and only if it licenses inferences in its scope from supersets to subsets.

The condition in (6) correctly admits the NPIs in (7)–(9):

- (7) a. Mary isn't a man. →
b. Mary isn't a father. [⇒ *not* is DE.]
c. Chrysler dealers don't *ever* sell *any* cars *anymore*. [= (1)]
(8) a. They run away **before** men come. →
b. They run away **before** fathers come. [⇒ *before* is DE.]
c. **Before** I *ever* buy *any* land again, I'll study the market. [= (2)]
(9) a. **If** a man comes, we will be saved. →
b. **If** a father comes, we will be saved. [⇒ *if* is DE.]
c. **If** I *ever* see you around here again, I will call the police.

Note that the denotation of *father* is a subset of that of *man*. If a sentence with the word *man* entails a sentence like the first except that *father* replaces *man*, then *man/father* is in the scope of a DE expression. Thus, since the (a) sentences in (7)–(9) entail the (b) forms, *not*, *before*, and *if* are DE. The DE condition therefore admits the NPIs in the (c) sentences. See Ladusaw's work (1979, 1980) for demonstrations of the DE approach's capacity for subtle distinctions between environments that do allow NPIs and those that don't.

However, Ladusaw does not explain cases where NPIs are unacceptable, even though they occur in the scope of a DE expression, as in (10) and (11):

- (10) #He brushed his teeth **before** he *ever* went to bed.
(11) #**If** he *ever* takes *any* medicine, he will feel better.

We therefore propose the CSN condition to filter out infelicitous NPI usages which aren't caught by the DE condition.

2.2 THE COGNITIVE STRUCTURE OF NEGATION (CSN) CONDITION. We next motivate our cognitive constraint and implement it in relevance theory.

2.2.1 THE NEED FOR A CONTRASTIVE ASSUMPTION. Consider (12):

(12) I lost my ticket before I (*ever*) got to the station.

The sentence has the same truth conditions with or without *ever*, which suggests that *ever* fulfills some pragmatic function. We claim that it is to intensify order-of-event readings, as in the detective-story-like exchange in (13):

(13) Suspect: I met her and decided to accompany her here.

Detective: According to the station master, you had already purchased a ticket the day before. **So I submit that you were coming here before you *ever* met her!**

Now, if one bothers to use the order-of-events intensifier *ever*, there must be room for doubt about the event sequence. Consider (14)–(16), for which no contrasting assumptions about the temporal sequence are readily accessible:

(14) #He brushed his teeth before he *ever* went to bed. [= (10)]

(15) #He was quite a playboy before he *ever* got married.

(16) #Jane took it down before she *ever* forgot it.

All seem inappropriate, because the contrastive assumptions ‘brushing one’s teeth after going to bed,’ ‘becoming a playboy after getting married,’ and ‘taking it down after forgetting it’ run counter to normal experience and are thus hard to access. We can test this explanation by controlling the discourse context. For example, (14) above seems quite natural when interpreted in a context like (17):

(17) The accused’s alibi depends on the preposterous claim that he brushed his teeth while in bed; however, the eye-witness testimony of the butler proves that **he brushed his teeth before he *ever* went to bed.**

In (17) the desired contrastive assumption, which is usually counter-intuitive, is easily accessible, making (14) appropriate. Similar observations hold for (15) interpreted in the context in (18):

(18) A: I heard he became a playboy only after getting married.

B: No, no, **he was quite a playboy before he *ever* got married.**

Probably (16) is irreparable, because the required contrastive assumption ‘taking it down after forgetting it’ would never be accessible in any reasonable context. The foregoing contrasts are expected on our analysis, so these observations support the claim that *ever* requires a contrastive assumption.

We believe this generalization extends to other NPIs and triggers. Note, for instance, that (11) improves if made subjunctive, as in (19).

(19) If he *ever* took *any* medicine, he would feel better. [cf. (11)]

Here the unrealis effect of the subjunctive provides the contrastive assumption.

Givón observes that negation requires the same sort of contrastive assumption as found with *ever*: "... negatives are uttered in a context where corresponding affirmatives have already been discussed, or else where the speaker assumes the hearer's belief in—and thus familiarity with—the corresponding affirmative" (1978:109). Consider (20) and (21), where the (a) and (b) phrases are literal and metaphorical readings respectively:

- | | | |
|-------------------------|------------------------------------|------------|
| (20) John is a fox. | a. 'John is a canine fox.' | False |
| | b. 'John is a cunning person.' | True/False |
| (21) John is not a fox. | a. 'John is not a canine fox.' | True |
| | b. 'John is not a cunning person.' | True/False |

If *John* is a human being, (20a) is certainly false, while (21a) is true. In contrast, human beings may or may not be cunning, so the truth values of the (b) sentences could go either way. Now, although (21a) is definitely true, it is pragmatically infelicitous. Givón's claim readily explains this: for a negative proposition like (21a) to be appropriate, the contrastive assumption in (20a) must have been previously stated or assumed. However, we can scarcely expect (20a) to be true. In contrast, (21b) is pragmatically felicitous, because the corresponding affirmative, (20b), is plausible as a contrastive assumption.

Finally, recall the well known difference between *and* and *but*, seen in (22):

- (22) He is a guitar virtuoso, *but*/?*and* he can't play chords.

Truth-functionally, *and* and *but* are equivalent, but the latter additionally indicates that the clause it introduces will contrast with current assumptions.

2.2.2 THE DEFINITION OF THE CSN CONDITION. We model the need for a contrastive assumption with the CSN condition, to be defined next.

Recall that relevance theory, set forth by Sperber and Wilson (1986), uses a device called the central system, which processes input sentences and alters the CE, a database of assumptions. The speaker's intention is to modify the hearer's CE by causing additions or deletions of assumptions. Such changes, called CONTEXTUAL EFFECTS, may result from using new information for contextual implication or for contradicting and removing existing assumptions.¹ Hearers process utterances to achieve optimal RELEVANCE, the most favorable balance of maximal contextual effects for minimal processing effort.

Blakemore (1987) distinguishes CONCEPTUAL and PROCEDURAL semantics. The former concerns traditional, truth-conditional meaning, while the latter describes how linguistic form constrains the computation of utterance interpretation. For instance, Blakemore would analyze *and* and *but* as having a shared conceptual semantics, while differing in procedural semantics. *But* carries an additional processing directive: "the hearer is instructed to process the proposition *but* introduces in a context in which she can derive a proposition logically inconsistent with one assumed to have been derived from the proposition expressed by the utterance of the first clause" (Blakemore 1987:130).

We claim (Yoshimura 1992, 1993) that NPIs, negation, and *but* all share roughly this procedural semantics. Formally, let a COGNITIVE STRUCTURE be a pair (φ, E) , where φ is the proposition most recently input to the central system, and E is a state of the CE. CSN is a special type of cognitive structure:

- (23) THE COGNITIVE STRUCTURE OF NEGATION (CSN)
 $(\varphi, \{\dots, \psi, \dots\})$ where φ and ψ lead to a contradiction.

What we previously called the contrastive assumption corresponds to ψ . We may now define the CSN condition on NPIs, as in (24):

- (24) THE COGNITIVE STRUCTURE OF NEGATION (CSN) CONDITION
 A negative polarity item is acceptable only if the clause containing it is processed in the cognitive structure of negation.

But may be similarly analyzed as requiring CSN, so we have an opportunity to check a prediction. Manipulating the discourse to promote or suppress CSN should either make *but* and NPIs simultaneously acceptable or else cause both to be rejected. This is exactly what we find in (25)–(27):

- (25) a. John says he washed up before retiring for the night. (#*But*) **he brushed his teeth before he (#*ever*) went to bed.**
 b. John says he finished washing up while in bed. *But* **he brushed his teeth before he *ever* went to bed.** [cf. (10)]
- (26) a. We hope for his recovery. (#*But*) **if he (#*ever*) takes (#*any*) medicine, he will feel better.**
 b. We wish him only pain and suffering. *But* **if he *ever* takes any medicine, he will feel better.** [cf. (11)]
- (27) a. I hear you often come around here. (#*But*) **if you (#*ever*) come this way, be sure to visit me.**
 b. I know you rarely come around here. *But* **if you *ever* come this way, be sure to visit me.**

In this section we have sought a concrete definition for our second condition on NPIs. We found a useful foundation in the notion of CSN and observed that this approach led to convergence with analyses of negation and *but*.

3 LINEBARGER'S PROPOSAL

Let us digress from our own analysis to compare it with that of Linebarger (1980, 1987), Ladusaw's main critic. She proposes a popular theory which maintains basically that an NPI is licensed provided the logical form of the clause that contains it implies a NEGATIVE IMPLICATUM (NI), a proposition in which the NPI is in the immediate scope of a negation.² Consider (28):

- (28) a. If he *gives a damn* about his cat, he'll take it to the vet.
 b. $\varphi \rightarrow \psi \vdash \neg\psi \rightarrow \neg\varphi$
 c. If he doesn't take his cat to the vet, then he doesn't *give a damn* about it.
 (Linebarger 1987:380)

The acceptability of the NPI *give a damn* in the antecedent clause of (28a) supposedly stems from the fact that (28a) and the law of contraposition (28b) entail (28c), in which the NPI is in the direct scope of *not*.

However, (28) illustrates a fatal flaw in Linebarger's theory, its propensity for false-positive predictions. Since the consequent clause of (28a) also comes to be negated in the implicatum in (28c), it is falsely predicted that NPIs should be permitted in the consequent clause too, as in (29):

(29) #If he *gives a damn* about his cat, he'll *ever* take it to the vet.

Indeed, the availability of NIs corresponds at best only sporadically to the felicity of NPIs. For instance, (30) lists entailments which should license all of the infelicitous NPIs in (31), according to Linebarger's theory:

- (30) a. $\varphi \vdash$ i. $\neg\neg\varphi$, ii. $\varphi \vee \neg\varphi$
 b. $\varphi \wedge \psi \vdash$ i. $\neg(\neg\varphi \vee \neg\psi)$, ii. $\neg(\varphi \rightarrow \neg\psi)$, iii. $\neg(\psi \rightarrow \neg\varphi)$
 c. $\varphi \vee \psi \vdash$ i. $\neg(\neg\varphi \wedge \neg\psi)$, ii. $\neg\varphi \rightarrow \psi$, iii. $\neg\psi \rightarrow \varphi$
 d. $\varphi \rightarrow \psi \vdash \neg(\varphi \wedge \neg\psi)$ [N.B., should license (29)]
 e. $\forall x(\varphi \rightarrow \psi) \vdash \neg\exists x(\varphi \wedge \neg\psi)$
 f. $\exists x(\varphi \wedge \psi) \vdash$ i. $\neg\forall x(\varphi \rightarrow \neg\psi)$, ii. $\neg\forall x(\psi \rightarrow \neg\varphi)$
- (31) a. #He has *ever* had *any* luck. [N.B., should be licensed by (30a)]
 b. #He has *any* money and he likes to buy things. [by (30a,b)]
 c. #Either John has *any* money or Bill does. [by (30a,c)]
 d. #All people have *ever* visited Japan. [by (30a,e)]
 e. #Some people have *ever* visited Japan. [by (30a,f)]
 f. #Some people who have *ever* visited Japan liked it. [by (30a,f)]

Linebarger recognizes the problem but not its extent. She limits her attention to parts of (30a–c), saying "Since I do not have a satisfactory account of this, I prefer to exclude these cases by pure stipulation at this point: [i in (30a–c)] may not serve as NIs" (1987:348). This attempt to solve the problem with a finite roster of unusable entailments is obviously futile. Linebarger's statement fundamentally ignores the infinity of logical implication. For instance, any of the entailments schematized in (32) would suffice to license every NPI in (31):

(32) $\varphi \vdash \neg\neg\varphi, \neg\neg\neg\neg\varphi, \neg\neg\neg\neg\neg\neg\varphi, \dots$

The failure to take the infinity of logical implication into account also manifests itself in Linebarger's focus on a few well known entailments. This fosters the impression that one need consider only a small, comfortably tractable set of NIs. Rather, one should envisage an infinity of entailments strewn with problematic NIs like (33), seldom if ever mentioned in traditional logic studies:

- (33) a. $\varphi \vdash \neg\varphi \rightarrow \varphi, (\psi \rightarrow \neg\varphi) \rightarrow \neg\psi$ [N.B., should license (29), (31)]
 b. $\varphi \wedge \psi \vdash \neg\varphi \vee \psi$ [N.B., should license (31b)]

Only then is it apparent just how intractable a task it is to constrain Linebarger's theory in a way that achieves anything approaching empirical adequacy.

In sum, we must reject as inaccurate the leading idea of Linebarger's theory, that the distribution of NPIs is predictable on the basis of the availability of NIs. Though Linebarger does isolate flaws in Ladusaw's approach,³ it is still the latter's theory that best approximates the facts about NPI distribution.

4 ADVERSATIVE PREDICATES

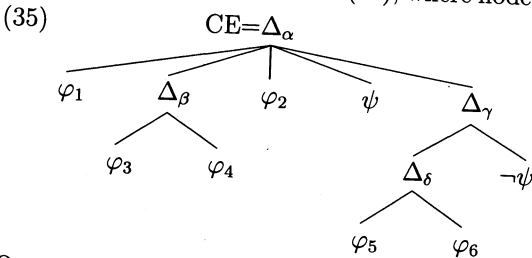
It is not immediately obvious how to apply the CSN constraint to NPI-licensing adversative predicates like *doubt*, *regret*, *be sorry*, and *be surprised*. For instance, *regret* is factive, so the speaker assumes its complement clause to be true. How then could there be a conflict with information held in the CE? CSN arises for adversative verbs, but it may be in a representation of an alternate possible world or of the beliefs of another person. To handle such cases we propose that the CE is not a simple set, but rather a structured database, with recursively embedded sub-databases representing things like possible worlds and the beliefs of others. Processing adversatives activates sub-databases, and CSN arises within these substructures. Thus, the study of CSN leads to new conjectures about compartmentalization of information in the CE.

4.1 A NEW VIEW OF THE COGNITIVE ENVIRONMENT. We assume henceforth that the CE takes the structure described in (34):

(34) COGNITIVE ENVIRONMENT (CE)

The CE is a tree-structured database, where interior nodes are recursively embedded sub-databases, and leaves are propositions.

Such a structure takes the form in (35), where nodes marked Δ are databases:



One purpose of this tree structure is to use subordinated databases to segregate information and so prevent clashes. For example, suppose the CE represents two possible worlds, one where ψ obtains, and one where it does not. If the information about these two worlds mingles, the contradiction $\psi \wedge \neg\psi$ will arise, and either ψ or $\neg\psi$ must be ejected from the CE to restore consistency. Thus, the CE would not represent the two possible worlds adequately. On our view, information about two possible worlds can be kept separate in distinct databases, as in (35). Information within a database must be consistent, but clashes across database boundaries do not cause a proposition to be rejected.

The tree-structured CE also lets us model default effects. The root database lists one's own beliefs, while sub-databases describe possible worlds and

the like. When one considers a possible world, its database becomes CURRENT, determining what propositions are available for reasoning, according to (36):

(36) DYNAMIC AVAILABILITY

All propositions in the current database are available for reasoning. A proposition in an ancestral database is available unless it contradicts available propositions with priority; one proposition takes priority over another iff the former's database is a descendant of the latter's. No other propositions are available.

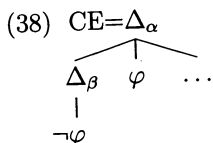
Let Δ_γ in (35) be current: $\neg\psi$, φ_1 , and φ_2 are then available. Since Δ_β and Δ_δ are not ancestors of Δ_γ , $\varphi_3, \dots, \varphi_6$ are unavailable; ψ would be available, if it did not contradict $\neg\psi$. One plausible result is that when one considers one's own assumptions, the root database is current, and no information about alternative worlds from descendant databases is available for reasoning. Now consider desiderata for the treatment of possible worlds. For semantic analysis, one typically deals with minimally distinct alternative worlds, where most assumptions from the real world are simply carried over. For instance, Dowty (1979:91ff.) paraphrases forms like φ causes ψ as 'in a world like the real world except that φ doesn't hold, and any minimal changes needed to accommodate the falsity of φ have been made, ψ would not obtain.' Our approach allows for a simple, procedural model of the relation between the real and possible worlds called for here. The database for the possible world would be current and contain $\neg\varphi$. Propositions in the root database would then be available, unless they contradict $\neg\varphi$. Thus, one's assumptions about the possible world automatically mirror those about the real world, except for minimal discrepancies. The fact that our revised CE provides the basis for a simple, procedural rendering of the notion of minimally different possible worlds like that which underlies the analysis of causation is a major argument in favor of our proposal.

4.2 ADVERSATIVE PREDICATES AND CSN. Now we combine the CSN condition and the new, structured CE. Consider *regret* and *be sorry*. Both predicates are factive, so the speaker commits to the truth of the complement. The hearer may also believe the complement clause, as is surely the case in (37).

(37) I know you know that John loves Mary. I **regret/am sorry** that he ever met *anyone* like her.

Where then is the contradiction required by the CSN condition on NPIs?

We believe uttering *X regrets/is sorry that φ* gives rise to a CE like (38).



Since *regret* and *be sorry* are factive, the speaker regards the complement φ as true; thus φ must reside in the speaker's root database, Δ_α . Furthermore,

these predicates carry a procedural instruction to build a new sub-database, Δ_β , containing only $\neg\varphi$. The new database represents a possible world where all of the speaker's assumptions carry over, except for those made unavailable by the presence of $\neg\varphi$. Obviously this is reminiscent of the foregoing causative analysis. The conceptual meaning of the sentence *X regrets/is sorry that φ* is then that *X* prefers the world described in Δ_β to that in Δ_α .

Since the procedural instructions for *regret* and *be sorry* cause a sub-database containing $\neg\varphi$ to be built, the predicates in effect create the contradiction that the CSN constraint requires for licensing NPIs. Specifically, φ will be in the central system, and $\neg\varphi$ will have been inserted into the current database, the new Δ_β . Since *regret* and *be sorry* are factives, their complement φ will naturally reside in the root database, but our new tree-structured CE will allow φ and $\neg\varphi$ to co-exist under separate nodes. Thus, we predict that CSN will arise, while still allowing for factivity.

The remaining two adversative predicates, *doubt* and *be surprised*, may be similarly analyzed. Both allow NPIs in their complements, and (39) shows that their complements need not contradict the speaker or hearer's own beliefs.

- (39) Not knowing her shocking behavior the way we do, John **doubts/is surprised** that Mary *ever* said *anything* like that.

Just as with *regret* and *be sorry*, it is not immediately obvious how CSN could arise to license the NPIs in (39). However, a close examination of the word meanings of *doubt* and *be surprised* will indicate a solution.

Sentences with *doubt* and *be surprised* clearly describe the contradiction of assumptions held by the designatum of the subject NP. *X doubts that φ* simply means that φ contradicts the assumptions of *X*, while *X is surprised that φ* means that *X* previously held beliefs contradicted by φ , though *X* subsequently adopted φ as a new assumption.⁴ Now, information about the beliefs of other persons is contained in the CE in the form of embedded sub-databases. Consequently, given our model, the word meanings of *doubt* and *be surprised* actually tell us that the state of CSN is arising with respect to the complement clause of the adversative predicate and the sub-database where the assumptions held by the designatum of the subject are stored. Thus, a careful examination of *doubt* and *be surprised* shows that our new notion about compartmentalization of information in the CE combines with the CSN condition to predict the compatibility of NPIs with these adversative predicates without need of further stipulation.

5 METALINGUISTIC NEGATION

Now let us turn to a procedural-semantic analysis of metalinguistic negation. We propose that utterances with metalinguistic negation have no conceptual-semantic content; their meaning amounts to a procedural instruction to the cognitive processor. This analysis is motivated by the fact that it automatically

explains the unacceptability of NPIs in the scope of metalinguistic negation, a long-standing problem for most approaches.

5.1 THE BASICS OF METALINGUISTIC NEGATION. For Horn, metalinguistic negation is an "extended use of negation as a way for speakers to announce their unwillingness to assert something in a given way, or to accept another's assertion of it in that way" (1985:135). Metalinguistic negation allows no NPIs. It takes variable forms, one involving stylistic correction, as in (40):

- (40) A: So, you even [mĩʸinijd] to buy ice.
 B: I didn't [mĩʸinij] to buy (#*any*) ice—I [mænijd] to buy it.

Metalinguistic negation can also alter connotation, as in (41) and (42):

- (41) A: The agency whacks pinko troublemakers.
 B: The agency doesn't 'whack (#*any*) pinko troublemakers'—it neutralizes unpatriotic influences.
 (42) A: You resemble him. You are his daughter, aren't you?
 B: I'm not his daughter (#*at all*)—he's my father.

5.2 LINEBARGER ON METALINGUISTIC NEGATION. Linebarger (1980) analyzes metalinguistic negation as the negation of a semantic operator TRUE. Consider the denial in (43), where SMALL CAPS indicate rising intonation:

- (43) #She DID NOT *lift a finger* to help. (Linebarger 1980:89)

To explain the impossibility of NPIs here, Linebarger posits (44) as the logical form of (43); -TRUE(...) means roughly 'The sentence ... is not true':

- (44) -TRUE(*she lifted a finger* to help) (ibid.:89)

Now TRUE separates the negation and the NPI. Consequently Linebarger's NPI constraint rules out (43).

Linebarger's approach incorrectly predicts that metalinguistic negation should invert truth values. Consider (45)–(47), corresponding to (40)–(42):

- (45) -TRUE(I [mĩʸinijd] to buy (*any*) ice) [cf. (40)]
 (46) -TRUE(the agency 'whacks (*any*) pinko troublemakers') [cf. (41)]
 (47) -TRUE(I am his daughter (*at all*)) [cf. (42)]

For (45)–(47) to be true, each parenthesized formula must be false. However, (40)–(42) have no such readings. Indeed, metalinguistic negation does not alter truth conditions. In contrast, we view (43) as an echoic response using truth-functional negation; the NPI fails because it would not have been licensed in the prior, affirmative utterance which the denial in (43) is presumed to echo.

No analysis we know has successfully explained the lack of NPIs in metalinguistic negation. However, our procedural approach overcomes this difficulty.

5.3 A PROCEDURAL VIEW OF METALINGUISTIC NEGATION. Since metalinguistic negation doesn't affect truth values, it needs no conceptual-semantic content. Instead, its procedural content is a warning to the cognitive processor

that a previous utterance is problematic. This begins an inference process to find a relevant modification of the CE. This can be rendered as in (48):

(48) METALINGUISTIC NEGATION

(\emptyset , {...}): There is a problem in the target utterance, i.e. the negatum of the input sentence.

The symbol \emptyset represents an empty conceptual-semantic content. Relevance theory dictates that a search for implicata be initiated in the quest for optimal relevance. The reasoning process will be aided by the procedural instruction in (48), which partially identifies the goal of the speaker. The search for implicata will also be constrained by the explanatory, follow-up comment that usually accompanies metalinguistic negation, e.g. *he's my father* in (42). This reasoning process eventually yields implicata like 'you have a low-prestige accent' in (40), 'CIA agents must watch their mouths' in (41), and 'I am not merely another person's child' in (42).

The foregoing analysis of metalinguistic negation interacts with our conditions on NPI occurrence to predict automatically that the two phenomena are incompatible. Recall that NPIs may occur only in cases of CSN, where the conceptual-semantic content of the NPI-bearing clause gives rise to a contradiction with the contents of the CE. Now, if utterances with metalinguistic negation have empty conceptual-semantic contents, it follows straightforwardly that the sort of contradiction that constitutes CSN simply cannot arise. Hence, metalinguistic negation cannot provide an environment in which it is possible for NPIs to occur. Since the problematic incompatibility of NPIs and metalinguistic negation is predicted without the need for any additional stipulations, this constitutes motivation for the present approach.

6 CONCLUSION

Hopefully this paper contributes to research on NPIs in four ways. Combining our CSN condition with Ladusaw's DE condition produces a more refined description of NPI distribution. Pointing out Linebarger's failure to take into account the infinity of logical implication and all the false-positive predictions to which this gives rise underscores the superiority of Ladusaw's approach. Application of the CSN approach to adversatives opens the way to new inquiries about the structure of the CE. Finally, offering a new, procedural-semantic analysis of metalinguistic negation that interacts with the CSN condition to predict automatically that metalinguistic negation does not license NPIs brings to light new evidence for the present analysis of NPI distribution.

NOTES

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¹Our presentation of relevance theory is necessarily abbreviated. In a fuller treatment of the theory, the CE ought to record the strength of confidence in each assumption. Furthermore, contextual effects should include the altering of the strength of one or more assumptions. These considerations would lead one to view the CE as some kind of fuzzy set. However, to simplify the discussion below, we entirely omit any mention of the strength of assumptions, and thus avoid the formal complications that would be entailed by the introduction of fuzzy-set theory. Restoring the notion of the strength of assumptions should not, however, pose any real difficulties for the present approach.

²Note that $\varphi \vdash \varphi$, so the relevant scope relation may arise in the clause's own logical form. For precise definitions, see Linebarger's immediate scope constraint (1987:338) and her negative implicatum theory (ibid.:346).

³See our review (Yoshimura 1993) of Linebarger's (1987) objections; we find some ill-founded or questionable, but others are genuine problems.

⁴Space constraints force us to ignore certain subtleties of meaning here.

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