

NEGATIVE POLARITY AND GRAMMATICAL
REPRESENTATION

0. INTRODUCTION

An issue of long standing in generative grammar is the question of how grammatical processes interact with meaning. To what extent is the functioning of language as a formal system independent of the meanings which it expresses? And given the view of language as mapping from some representation of sound to some representation of meaning, what is the nature of this latter representation? Over the years, the phenomenon of 'negative polarity' has frequently been invoked as a source of evidence bearing on these questions. My purpose in this paper is to consider the extent to which negative polarity items in English do in fact provide us with a window on the interaction between grammar and meaning. In particular, I will consider the possible evidence that these expressions may provide about the nature of the semantic representations furnished by sentence-grammar.

A basic assumption of many approaches to grammar is that a speaker's knowledge of his language represents an autonomous system that interacts with, but is distinct from, other cognitive systems. Thus within such a theory a distinction is made between aspects of sentence meaning which are entirely specified by the grammar and those aspects of meaning which are the product of interaction between linguistic and non-linguistic knowledge. On this account, representations of meaning computed by grammatical rule stop short of a full characterization of sentence meaning, just as phonological representations generated by the grammar represent abstractions away from the phonetics of the utterance.

In the '(Revised) Extended Standard Theory' (REST), the contribution of sentence grammar to meaning is expressed at the level of 'LF'. This level of LF is a grammatical object rather than an interpretation or a translation into the vocabulary of some other system; aspects of meaning that are grammatically determined are expressed grammatically: binding by coindexation, scope by movement, and so forth. LF functions as the input to further interpretive processes, and also as a level of grammatical representation at which to state well-formedness constraints. Well-formedness constraints that are more 'semantic' than LF – that is, that

invoke aspects of meaning not expressed at LF – cannot be stated within sentence grammar, on this account. A strong variant of this position is considered in Hornstein (1984):

To explain what competent, mature, native speakers know about their language, it is unnecessary – and indeed quite misleading – to postulate a level of semantic representation halfway between the syntax of the sentence and the pragmatics of the utterance. [1984, p. 2]

The most compelling evidence for LF as a syntactic level of representation is furnished by cases of parallelism with unarguably syntactic processes. Thus the existence of LF as a level of grammatical representation has been supported by evidence that the quantifier-variable relationship is subject to the same constraints as the relationship between an overtly moved *wh*-expression and its trace (Chomsky, 1977; Kayne, 1981; May, 1977; Rizzi, 1982).

Needless to say, neither this general view of the relation between grammar and meaning, nor this particular characterization of the grammatically generated representation of meaning, is universally accepted. Generative semanticists, for example, argued emphatically against such distinctions between linguistic form and content. More recently, investigators within the framework of Montague grammar have argued for a much greater parallelism between syntactic and semantic function, and for the role of model-theoretic semantics as part and parcel of sentence grammar.

Over the years, many of these arguments concerning the relation between grammar and meaning have turned on grammatical phenomena which seemed to be constrained semantically. One phenomenon to surface regularly in these discussions is that of polarity sensitivity: across many languages, certain expressions appear to require (as a first pass at description, to be refined below) the presence of a negation. The unacceptability of polarity expressions in other environments (as in (1) below) has, to many ears, the ring of ungrammaticality as distinct from semantic or pragmatic anomaly, suggesting to many that the constraints on their distribution ought to be expressible within sentence grammar.

- (1)(a) George didn't eat **any** breakfast today.
 (b) *George ate **any** breakfast today.

In this paper, I argue that the distribution of negative polarity items in English reflects an interplay between syntax and pragmatics, with no apparent role for a level of 'pure' semantic representation. Rather, I argue, there is a grammatically-stated contextual requirement on negative polarity items which is used quite freely by speakers of English to

induce negative implicature. Since this contextual requirement requires precisely the information available at LF (i.e. information about quantifier scope but not information about truth-conditional meaning), it provides indirect support – although not direct evidence of the sort outlined above – for the claim that LF plays a role in grammatical processes.

This view of negative polarity is contrasted with a proposal by William Ladusaw (1980, 1983) within the framework of Montague grammar. Ladusaw argues that a purely grammatical account of polarity licensing is possible, but only if the semantic representations generated by the grammar express not merely the scope, binding, thematic relations, and so forth of a given sentence, but also its truth-conditional meaning; a grammar which computes not merely LFs but also interpretations will be able to evaluate the well-formedness of sentences containing NPIs.

Negative polarity may thus provide one interesting test case for evaluating rather different views of the semantic commitments of sentence grammar.

1. PRELIMINARIES

This section provides a brief introduction to the data of negative polarity in English and to previous analyses of the phenomenon.

1.1. *Survey of NPIs and licensing expressions*

The class of negative polarity items (NPIs) is quite large, including the determiner ‘any’;¹ the adverbs ‘ever’, ‘anymore’, ‘yet’, ‘in years’, ‘much’, ‘too’;² ‘until’;³ NPs such as ‘a red cent’, ‘a thin dime’; verbs and verb phrase idioms such as ‘budge (an inch)’, ‘lift a finger’, ‘have a hope in hell’, ‘cut (any) ice’, ‘bat an eyelash’, ‘hold a candle to’, and so forth. These expressions are acceptable in negative sentences such as the (a) sentences below, and unacceptable in the positive (b) counterparts. The asterisks assigned below do not reflect the possibility of acceptable literal readings of NPIs such as ‘lift a finger’.

- (2)(a) John didn’t know **any** French.
- (b) *John knew **any** French.
- (3)(a) Mary didn’t **lift a finger** to help Bill.
- (b) *Mary **lifted a finger** to help bill.
- (4)(a) There hasn’t been an accident **in years**.
- (b) *There has been an accident **in years**.

- (5)(a) I haven't **ever** met Mr. Smith.
 (b) *I have **ever** met Mr. Smith.
 (6)(a) They don't **much** like us.
 (b) *They **much** like us.

There are configurational restrictions on the relation between an NPI and the licensing negation; loosely, that the negation must c-command the NPI:

- (7)(a) John didn't invite **any** students.
 (b) ***Any** students weren't invited by John.

In addition to overt negation, a number of other expressions license NPIs in English, some of which are exemplified below.

- (8) *Few*
 (a) Few people have **any** interest in this.
 (b) *Some people have **any** interest in this.
- (9) *Too*
 (a) John is too tired to **give a damn**.
 (b) *John is tired enough to **give a damn**.
- (10) *Only*⁴
 (a) Only John has a **hope in hell** of passing.
 (b) *Even John has a **hope in hell** of passing.
- (11) *Adversative predicates*
 (a) He refused to **budge an inch**.
 (b) *He promised to **budge an inch**.
 (c) She was surprised that there was **any** food left.
 (d) *She was sure that there was **any** food left.
 (e) I'm sorry that I **ever** met him.
 (f) *I'm glad that I **ever** met him.
 (g) I doubt he **much** likes Louise.
 (h) *I think he **much** likes Louise.
- (12) *Antecedent of conditional*
 (a) If you steal **any** food, they'll arrest you.
 (b) *If you steal food, they'll **ever** arrest you.
- (13) *Comparatives*
 (a) He was taller than we **ever** thought he would be.
 (b) *He was so tall that we **ever** thought he would bump his head.

(14) *Relative clauses headed by a universal quantifier*

- (a) Everyone who knows a **damm thing** about English knows that it's an SVO language.
- (b) *Someone who knows a **damm thing** about English knows that it's an SVO language.

(15) *Questions*

- (a) Have you **ever** met George?
- (b) *You have **ever** met George.
- (c) Who **gives a damm** about Bill?
- (d) *Bob **gives a damm** about Bill.

It is generally agreed that NPI acceptability varies considerably as a function of the inherent 'strength' of the NPI. Weak NPIs such as 'any' are acceptable in a much wider range of environments than 'strict' NPIs such as 'until' or 'in weeks'.

1.2. *Two early accounts of negative polarity*

Because sentences containing unlicensed NPIs strike many speakers as ungrammatical, it has frequently been argued that their distribution should be captured by grammatical rule.

In his important study of negation, Klima (1964) proposed a suppletion rule deriving NPIs from underlying positive counterparts; 'any', for example, was derived on this account from 'some'; 'yet' from 'already'; 'anymore' from 'still'. The rule applies to expressions preceded and commanded by an overt negation or by an overt negation or by an 'affective' element; all expressions licensing NPIs, including those illustrated in (8)–(15) above, are assumed to bear the lexical feature specification [+affective]. Even apart from the intrinsic undesirability of a rule as powerful as Klima's 'some-any' rule, this analysis confronted a number of difficulties: not all NPIs have positive counterparts, for example; and some contexts allow both NPIs and their positive counterparts, although with different meaning (Bolinger, 1960; R. Lakoff, 1969). And, of course, to label certain expressions as 'affective' leaves unanswered the question of why they trigger negative polarity expressions.

C. L. Baker's account of polarity licensing (1970a, b) addressed these problems. He observed that positive polarity expressions such as 'still', which are generally unacceptable in negative contexts such as in (16) below, nevertheless may appear in sentences such as (17).

- (16) *Someone isn't **still** holed up in this cave.
 (17) You can't convince me that someone isn't **still** holed up in this cave.

Baker proposed that the positive polarity expression is licensed by the entailment from (17) to (18) below.

- (18) I firmly believe that someone is **still** holed up in this cave.

Similarly, licensing expressions for NPIs such as those in (8)–(15) above license NPIs by virtue of negative entailments; for example, 'too' is a licensing expression because of entailments such as that from (19) to (20).

- (19) [= (9)(a)] John is **too** tired to **give a damn**.
 (20) John doesn't **give a damn**.

Baker's proposal is as follows.

- (21)(a) Negative-polarity expressions are appropriate in structures within the scope of negations, whereas affirmative-polarity items are appropriate elsewhere. [This part of the rule is to be 'virtually identical with the unidirectional rules of Klima and Jackendoff'; that is, the scope of negation is to be defined over surface structure.]

- (b) Given semantic representations P_1 and P_2 satisfying the following conditions:

$$(A) P_1 = X_1 YZ_1 \text{ and } P_2 = X_2 YZ_2$$

where Y is itself a well-formed semantic representation;

$$(B) P_1 \text{ entails } P_2;$$

then the lexical representation appropriate to Y in P_2 [by (a)] is also appropriate to Y in P_1 .

The essence of Baker's (1970a) analysis, then, is that NPI licensing is a two-stage process: either the sentence containing the NPI must contain an overt negation c-commanding the NPI, or else the NPI must be licensed by entailment.

Licensing-by-entailment is a Rube Goldbergian but not entirely counterintuitive process: the proposition P asserted by the sentence containing the NPI must entail some other proposition P' in whose lexical representation the requisite S(urface)-structure relationship between NPI and overt negation obtains. Thus part (a) licensing, by overt negation in S-structure, represents the paradigm case; part (b) licensing is derivative.

Note, however, that no appeal is made here to any *lexical decomposition* of part (b) triggers to provide the licensing negation. Derivative licensing involves a relationship between two ⟨sentence, proposition⟩ pairs, not a factoring out of negations implicit in the sentence containing the NPI.

The possibility that constraints on the distribution of NPIs might be semantic – since, in Baker’s account, NPIs may be licensed either by an S-structure criterion or by logical entailment – suggested to some investigators that grammatical processes are not to be distinguished from semantic or even pragmatic ones. G. Lakoff (1972), for example, draws the following conclusions from Baker’s conjecture:

For linguistics, its consequences are remarkable, since it claims that the *distribution of morphemes* is determined not simply by which other elements and structures are present in the same sentence, or even in a transformational derivation of that sentence, but in addition by logical equivalences . . . Baker’s conjecture would, if correct, show that there was a relation between grammaticality and logical equivalence. [1972, p. 598]

The interaction between meaning and NPI acceptability is interesting because of the impression of ungrammaticality that is associated with unlicensed NPIs, as in the unacceptable sentences of (1)–(15) above. *If* the full range of NPI licensing is to be expressed within sentence grammar, then sentence grammar must make use of a vocabulary that is semantic enough to express these constraints, whatever they turn out to be. What remains to be determined is the feasibility, and the desirability, of treating polarity licensing as a purely grammatical phenomenon.

In the following two sections I will argue for a reformulated version of Baker’s two-stage theory; in particular, I will argue that NPIs are grammatically marked to occur in the immediate scope of negation, as defined not on S-structure but on LF; and that the acceptability of such expressions in other environments is determined by conditions on use which are largely extragrammatical. Under this account, then, only part (a) is a sentence-grammar process. In Sections 4 and 5, this account is contrasted with Ladusaw’s proposal, which attempts to bring virtually all cases of NPI licensing into the domain of sentence grammar.

2. A ‘DERIVATIVE LICENSING’ ANALYSIS OF NEGATIVE POLARITY

My account of negative polarity maintains the basic structure, but not the specifics, of Baker’s conjecture: a paradigm case, analogous to his part (a); and, analogous to his part (b), a mechanism for the licensing of NPIs in sentences which, one might say, *allude* to this paradigm case. In this

negations: (26), for example, is ambiguous between the readings paraphrased in (27a) and (27b) below.

- (26) George doesn't starve his cat because he loves her. *Ambiguous*
- (27)(a) 'It's not because he loves her that George starves his cat; it's because ...'
- (b) 'It's because he loves her that George doesn't starve his cat.'

Under the semantic feature approach in Lasnik (1975), this ambiguity was expressed by the same mechanism as quantifier-negation ambiguities: the optional assignment of the feature '+negated' to 'because'-clauses in the *S*-structure scope of negation. It is less clear how best to express this ambiguity within a framework in which scope information is expressed configurationally, at a predicate calculus-like level of representation such as LF. (It is argued in Linebarger, 1980a, that the two readings cannot be correlated with, for example, VP versus *S* attachment of the 'because'-clause; and that NPIs in 'because'-clauses provide further evidence against the semantic feature approach to scope.) In the discussion below, I will make the simplifying but perhaps dubious assumption that 'because' is a logical operator parallel to negation and quantifiers, and hence that it is raised by QR. The scope ambiguity of (26) arises, on this account, out of the availability of alternate mappings to (28) and (29). In the former, the negation has wide scope over 'because' and its two arguments; in the latter, the scope of negation is restricted to the matrix clause.

- (28) not because ([George starves his cat], [he loves her]) = (27a)
- (29) because ([George doesn't starve his cat], [he loves her]) = (27b)

In the discussion to follow, these two readings will be expressed by the more transparent notation below. (The second propositional argument of 'CAUSE' expresses the result and corresponds to the material in matrix clause.)

- (30) NOT CAUSE ([he loves her], [George starves his cat])
'George's love of his cat is not the cause of his starvation of the cat.' = (27a)
- (31) CAUSE ([he loves her], [NOT [George starves his cat]])
'There is a causal link between George's love for his cat and his not starving the cat.' = (27b)

In the following, (30) is referred to as the 'wide scope reading' of such

sentences, and (31) as the 'narrow scope reading'. (See Note 7 for discussion of scope ambiguities between 'because' and quantifiers which might be taken as support for this treatment of 'because'.)

Since the distinction between the wide scope and narrow scope readings plays an important role in the arguments below, it may be useful to review the sorts of tests that may distinguish between them.

Intonation. One candidate is, of course, intonation. However, intonational properties do not dependably differentiate wide from narrow scope. It is sometimes suggested that the narrow scope reading requires an intonational break between the matrix clause and the 'because' clause. This is clearly incorrect. Consider, for example, (32b) as a reply to (32a):

- (32)(a) Why did Louise not answer the telephone when we called?
 (b) Louise didn't answer the telephone because she was asleep.

An intonational break before the 'because' clause in (32b) would clearly be inappropriate. What the intonational break seems to correspond with is a distinction between what we might call 'one-assertion' and 'two-assertion' sentences with 'because' clauses. (32b) as used in the discourse above is an example of the former, while a comma brings out the two-assertion reading:

- (33) Louise didn't answer the telephone, because she was asleep.

In (33), two assertions are made: that Louise didn't answer the telephone, and that the reason for this was that she was asleep. Such two-assertion sentences will be ignored in the discussion below; the point to be made here is simply that the narrow scope reading does not *require* an intonational break (with comma as its orthographic reflex).

Similarly, intonational cues do not invariably signal the wide scope reading, although it is fairly common for sentences with negated 'because'-clauses to be associated with the attraction to focus intonational contour. However, this need not be the case, especially if the negation is furnished by an element other than 'not', as in (34):

- (34) Nobody eats mousse because it's health food.

The same ambiguity obtains in (34) as in (26). It may have the pragmatically more natural wide scope reading represented in (35a) or the more implausible narrow scope reading of (35b). The wide scope reading clearly does not require any marked intonation, although it may be associated with AtF intonation.

- (35)(a) NOBODY_x CAUSE ([it's health food], [x eats mousse])
 'There is no one who eats mousse under the impression that it

will benefit his/her health.’ (Rather, it is consumed for pleasure alone.)

- (b) CAUSE ([it’s health food], [NOBODY_x (*x* eats mousse)])
 ‘The reason why no one eats mousse is that it is a health food.’
 (And hence, perhaps, is as unpalatable as certain other health foods.)

Thus we cannot appeal to intonation to disambiguate the wide and narrow scope readings in all cases. There are, however, more accurate diagnostics, three of which are considered below.

Tags. It is observed in Carden (1973) and Jackendoff (1972) that positive tag questions and ‘neither’-tags are sensitive to the scope of negation. These tags are acceptable only if the negation has widest scope. Thus affixing a tag question to (22) above removes the ambiguity between ‘not’ and ‘many’; in (36), ‘many’ must be interpreted as negated.

- (36) He didn’t answer many questions, did he?

The same effect holds in sentences with negations and ‘because’-clauses: (26) loses its ambiguity, and only the wide scope reading is possible in (37) below.

- (37) George doesn’t starve his cat because he loves her, does he?

In contrast to (26), (37) cannot be paraphrased as ‘the reason why George doesn’t starve his cat is that he loves her’. This follows presumably, from the requirement that negation be assigned widest scope in sentences with positive tags.

But because A second diagnostic of the wide scope reading is the continuation ‘but because . . .’, which is only appropriate if the ‘because’ clause is negated. Thus (38) has only the reading in which George does starve his cat.

- (38) George doesn’t starve his cat because he hates her, *but because* she weighs more than the microprocessor.

NPIs in the ‘because’ clause. Finally, the presence of an NPI in the ‘because’ clause is possible only on the wide scope reading: (39) below cannot be associated with the (more plausible) narrow scope reading under which George does not starve the cat.

- (39) George doesn’t starve his cat because he has **any** love for her.

I will defer until Section 2.3 discussion of the interesting determinants of NPI acceptability in this position. What is of immediate relevance here is

that NPIs in the ‘because’ clause serve as a diagnostic of wide scope negation.

This concludes our preliminary sketch of the logical properties of ‘because’-clauses. Because the semantic consequences of the wide scope/narrow scope ambiguity are so striking, these structures provide the ideal medium in which to observe NPIs. In Section 2.2, an examination of NPIs in the matrix clause leads to a reformulation of part (a), the paradigm case of NPI licensing. In Section 2.3, NPIs in the ‘because’ clause provide the basis for a first pass at part (b), the derivative licensing mechanism.

2.2. Part (a): the paradigm case

Recall that part (a) of Baker’s rule licenses NPIs in the *S*-structure scope of negation, defined somewhat anachronistically here as the *c*-command domain of ‘not’ or some other overt negation. However, it has been widely observed that NPI acceptability varies in clauses embedded under a negation; the comparison between (40) and (41), which will not be discussed further until Section 5.2, suggests that part (b) would need to be restricted further, to license NPIs *c*-commanded by a negation *in the same clause*.

- (40) He didn’t say that the car would **budge an inch**.
 (41) *He didn’t add that the car would **budge an inch**.

However, it appears that even this further restriction will not suffice; and that, in fact, no *S*-structure restriction can express the adjacency to negation that defines negative polarity.

2.2.1. *NPIs in the matrix clause of causal sentences*. As the object of our manipulations in this section, consider the negated ‘because’ sentence (42) below, which is ambiguous between the wide scope reading, in (43a), and the narrow scope reading, in (43b).

- (42) He didn’t move because he was pushed.
Ambiguous between readings (43a) and (43b).
 (43)(a) NOT CAUSE (he was pushed, he moved)
 ‘His moving wasn’t caused by his being pushed.’
 (b) CAUSE (he was pushed, NOT [he moved])
 ‘His not moving was caused by his being pushed.’

As (44)–(47) demonstrate, only the wide scope reading is available when

we insert a positive tag question, an NPI in the 'because' clause, or the continuation 'but because . . .':

- (44) He didn't move because he was pushed, did he?
Unambiguous: only has wide-scope reading (43 a)
- (45) He didn't move because **anyone** pushed him.
Unambiguous: only has wide-scope reading (43 a)
- (46) He didn't move because he was pushed, but because he fell.
Unambiguous: only has wide-scope reading (43 a)

Thus the narrow scope reading drops away in (44)–(46).

Observe, however, the effects of inserting an NPI into *the matrix clause* of (42):

- (47) He didn't **budge an inch** because he was pushed.
Unambiguous: has only reading (43 b)
 'It was because he was pushed that he didn't **budge an inch.**'

Here it is the wide scope reading which drops away. In (47), only the narrow scope reading is available. This is confirmed by the three diagnostics for wide scope negation, all of which render (47) unacceptable:

- (48) *He didn't **budge an inch** because he was pushed, did he? (*tag question*)
- (49) *He didn't **budge an inch** because **anyone** pushed him. (*NPI in 'because'-clause*)
- (50) *He didn't **budge an inch** because he was pushed, but because he fell. (*'... but because ...' continuation*)

Since these three sentences differ from their counterparts in (44)–(46) only by virtue of containing an almost synonymous NPI, the presence of this NPI must be the source of their unacceptability.

It seems, therefore, that the same negation cannot license the NPI 'budge an inch' and at the same time take the 'because'-clause in its scope. On an *S*-structure account of the scope of negation, we are hard-pressed to account for this. The NPI 'budge an inch' is indisputably in the scope of negation in either the wide or narrow scope reading of (47); it is, after all, immediately preceded and c-commanded by a negation in the same clause.

Why, then, does the presence of the NPI render these sentences unacceptable? Consider the representations assigned to the unacceptable wide scope reading and the acceptable narrow scope reading. (For clarity, these paraphrases omit the NPI.)

- (51)(a) *Wide scope*:
 *NOT CAUSE (he was pushed, he **budged an inch**)
 ‘His moving wasn’t caused by his being pushed.’
- (b) *Narrow scope*:
 CAUSE (he was pushed, NOT [he **budged an inch**])
 ‘His not moving was caused by his being pushed.’

An obvious difference between these two readings is that in (51a), the representation corresponding to the unacceptable wide-scope reading, the negation operator is not immediately adjacent to the second argument of CAUSE, the clause containing ‘budge an inch’; the predicate CAUSE intervenes, in the notation adopted above. The possibility to be considered here is that this ‘distancing’ of the negation operator from the clause containing the NPI prevents it from licensing the NPI; perhaps NPIs must be not merely in the scope of the negation operator, but in its *immediate* scope, in some predicate calculus-like representation such as that used in (43) to express the different readings. Such a restriction cannot be expressed over *S*-structure, since at *S*-structure nothing intervenes between ‘not’ and ‘budge an inch’: they are adjacent.

And while there is little other motivation for considering ‘because’ as an operator at LF, raised analogously to quantifiers, this assumption receives some motivation from the well-documented scope ambiguities among such adverbials and other logical elements.⁷

Leaving aside these questions concerning the proper representation of adverbials, we will see below and in Section 3 that the interaction between quantifier scope and NPIs provides further evidence that the relevant restriction of NPIs must be stated at LF rather than at *S*-structure.

In the light of the preceding discussion, part (a) of Baker’s NPI licensing rule may be reformulated as follows.

(52) PART (A): THE IMMEDIATE SCOPE CONSTRAINT (ISC)

A negative polarity item is acceptable in a sentence *S* if in the LF of *S* the subformula representing the NPI is in the immediate scope of the negation operator. An element is in the immediate scope of NOT only if (1) it occurs in a proposition that is the entire scope of NOT, and (2) within this proposition there are no logical elements intervening between it and NOT.

‘Logical elements’ here corresponds roughly to propositional operators; it will be left unspecified beyond the inclusion of quantified NPs and quantificational adverbs as well as the causal predicate lexically expres-

sed by ‘because’. This statement of the ISC is refined somewhat in Section 3, where further supporting evidence is presented.

It is important to note that NPIs in the ‘because’ clause itself (as in (45) above) do not satisfy the ISC, and thus will have to be placed in the category of part (b) licensees. This might seem like a genuine counterexample, since it forces us to claim that such clearly acceptable occurrences of NPIs as in (45) above are not licensed by the ISC. However, I argue in the following section that the licensing of NPIs in this position – in the ‘because’ clause following a matrix clause negation – is in fact highly sensitive to negative implicature, and reflects with particular transparency the mechanism of part (b) licensing.

Before proceeding to part (b), however, two issues remain to be clarified. Section 2.2.2 examines the interaction between quantifier scope and the ISC in ‘because’ sentences; Section 2.2.3 rejects an alternate account of the unacceptability of sentences such as (48)–(50) which motivated the ISC.

2.2.2. *Interaction with quantifier scope.* One interaction between NPI licensing and quantifier scope arises when there is a quantificational NPI in the matrix clause of a sentence with a negated ‘because’-clause. Such an NPI is acceptable in the event that it is assigned wide scope with respect to CAUSE; thus (53) below is acceptable because of the possible reading (54a); (54b) is not a possible reading.

(53) He didn’t commit **any** of those crimes because he was drunk.⁸

(54)(a) NOT Ex CAUSE [he was drunk, he committed *x*]
where x = one of those crimes

‘There was no crime that he committed due to drunkenness.’

(b) NOT CAUSE [he was drunk, [Ex [he committed *x*]]]
where x = one of those crimes

‘It wasn’t because he was drunk that there were crimes committed by him.’

When this reading in which ‘any’ has wide scope is implausible or unavailable, however, then the negative must be assigned narrow scope with respect to the ‘because’-clause in order for the NPI to be acceptable. In (55) below, the requisite wide scope reading seems quite odd: ‘there isn’t any amount of hair such that John’s possession of it is attributable to his taking hormones’; the preferred reading of (55) is therefore the narrow scope reading, that John is bald as a result of his medication.

- (55) John doesn't have **any** hair on his head because he takes hormones.

Thus (55) on its most natural reading may not be followed by a positive tag, nor by a 'because' clause containing NPIs, as (56a) demonstrates. (The acceptability of (56b) shows that in the absence of this matrix NPI the negated 'because'-clause reading is acceptable.)

- (56)(a) *John doesn't have **any** hair on his head because he has **ever** taken hormones.
 (b) John doesn't have hair on his head because he has **ever** taken hormones.

Similarly, VP-idiom NPIs such as 'budge an inch' cannot satisfy the ISC by this route, since they are not quantifiers or other logical operators and thus cannot be raised out of the 'because'-clause. Hence the unacceptability of (48)–(50).

2.2.3. *Positive implicata: an alternative explanation?* It may be worthwhile to pause at this point in order to reject one obvious candidate for an explanation of the unacceptability of (48)–(50). It might be suggested that the NPI in these sentences is unacceptable because the wide scope reading required by tags and the other wide scope diagnostics gives rise to the implicatum – to sidestep until later sections the distinctions among entailment, presupposition, implicature, and so forth – that the matrix clause is true, although one particular causal link is being denied.⁹ It might be suggested that it is the positive implicatum 'he budged an inch' that is the source of this unacceptability in the wide scope reading of (47), and that we need not consider the LF adjacency between NPI and negation but need only make some such stipulation as:

- (57) A negative polarity item may not occur in a sentence *S* if *S* has a 'positive' implicatum.

However, this explanation¹⁰ seems incorrect given the acceptability of NPIs in sentences such as (58)–(60) below, which seem to have clear positive implicata.

- (58) Factive adversatives ('surprised', 'regret' etc.)
 I'm surprised that he **budged an inch**.
 (Implicatum: '*He **budged an inch**.')
- (59) Only John has a **hope in hell** of succeeding.
 (Implicatum: '*John has a **hope in hell** of succeeding.')

- (60) John doesn't **lift a finger** around the house **anymore**.
 (Implicatum: '*John used to **lift a finger** around the house.')

Thus as an alternate explanation for the unacceptability of (48)–(50), the 'no-positive-implicata' restriction, as stated above, is inadequate.

Summary. These data suggest that part (a), the 'paradigm case' of NPI licensing, must be stated at a level such as LF at which the relative scope of logical elements is explicitly represented. In Section 3, the ISC is further motivated by consideration of the interaction among negation, NPIs, and quantifiers. Before considering the ISC in greater detail, however, the process of second-stage, part (b), licensing will be examined in connection with the limited data set considered above: the interaction among NPIs, negation, and 'because'-clauses.

2.3. Part (b): derivative licensing

We turn now to part (b), the derivative licensing mechanism. As above, the discussion is largely restricted to the limited data base of sentences with negated 'because'-clauses. Given the richness of the data that must be accounted for by part (b) – including not only (8)–(15) but the ISC violations detailed above – this restricted focus may try the reader's patience. I wish, however, to delay consideration of the full data set until the two analyses of negative polarity (mine and Ladusaw's) have been presented, so that they may be compared against these data.

Recall that in the analysis of Baker (1970a), derivative licensing turns upon an *entailment* relation between two sentences. The sentence containing the NPI (henceforth, the 'host sentence') must express some proposition *P* which entails a second proposition *P'* in whose lexical representation the *S*-structure conditions of part (a) obtain. As indicated above, no appeal is made to lexical decomposition under this account: negative polarity licensing involves the relationship between two (sentence, proposition) pairs.

In the discussion below, I will argue that the relation between the host sentence and its negative implicatum (henceforth, 'NI') *must not be restricted to logical entailment*; that in a significant set of cases the host sentence implicates rather than entails its NI. (For ease of exposition, I will speak of the host sentence entailing/implicating NI, but this is to be taken as shorthand for the more complex relation specified above.)

2.3.1. *Licensing by implicature in 'because' clauses.* Baker's part (b) is both too weak and too strong. It is too weak because not every negative

entailment licenses NPIs. And it is too strong because the required implicatum is in many cases an implicature rather than an entailment.

The first difficulty is observed in Baker (1970b), who notes that formulating part (b) in terms of entailment leads to a host of false predictions. Not all sentences with negative entailments allow NPIs. Since P entails 'NOT NOT P ', for example, NPIs should be licensed in simple positive sentences like (61a) below on the basis of the entailment from it to (61b); since ' $P \vee Q$ ' entails 'NOT((NOT P) & (NOT Q))', and ' $P \& Q$ ' entails 'NOT((NOT P) \vee (NOT Q))', NPIs should be acceptable in conjoined positive sentences; and so forth.

- (61)(a) John has (***ever**) been there \rightarrow
 (b) It's not the case that John hasn't (**ever**) been there.

Thus part (b) licensing cannot be stated as a simple requirement that the host sentence logically entail its NI, since there are many sentences with negative entailments which nevertheless fail to license NPIs.

However, the entailment account is faced with a more serious difficulty than that posed by these trivial entailments: such an account will prove far too strict, because in a great many cases it is clear that implicature, and not entailment, is critical to the licensing of NPIs. One such case will be considered in this section, the licensing of NPIs in negated 'because'-clauses, as in (62) below:

- (62) I didn't help him because I have **any** sympathy for urban guerillas.
 (63) NOT CAUSE ($[Ex$ (I have x)], I helped him)
where x = sympathy for urban guerillas

(As indicated above, the representation of 'because'-clauses by means of this predicate 'CAUSE' in LF is employed here for clarity, and no claim is intended about the properties of LF other than the relevant scope relations among the negation, the 'because' clause, and the NPI.)

Under the reformulation of part (a) as the Immediate Scope Constraint, these NPIs must be licensed derivatively, since the predicate 'CAUSE' intervenes between the negation and the NPI. Thus (62) must have some relation to a licensing proposition expressible in a sentence whose LF satisfies the Immediate Scope Constraint. My claim here is that this relationship is one of implicature, not entailment.

'Implicature' is used here in the sense of Karttunen and Peters (1979):

If the uttering of a sentence ϕ in a given context licenses the inference P even though the proposition P is something over and above what the speaker actually says, then $P \dots$ is an IMPLICATURE of the utterance of ϕ . Grice discusses two kinds of implicatures: CON-

VERSATIONAL and CONVENTIONAL. The former sort is ultimately connected with his notion of cooperative conversation . . . CONVENTIONAL implicatures [e.g., the implicatures associated with *even* and *only*] arise not from the interplay of what is said with conversational maxims but from the conventional meanings of words and grammatical constructions that occur in the sentence . . . [A difference between conversational and conventional implicatures] is that conventional implicatures are NOT CANCELABLE; it is contradictory for the speaker to deny something that is conventionally implicated by the sentence he has uttered. Conversational implicatures can always be prevented from arising by being explicitly disavowed. (p. 2)

We begin by examining certain implicatures which arise from negated 'because'-clauses even in the absence of NPIs. (64) below has two readings depending upon the relative scopes of NOT and CAUSE; the reading in which negation has narrow scope with respect to the 'because'-clause – that is, the reading (65), in which NOT is associated only with the matrix clause – will be ignored here, since NPIs are never allowable in the 'because'-clause when the negation operator has such limited scope. It is only when the negation operator has wide scope, as in (66), that there is even the possibility of NPIs in the 'because'-clause.

- (64) I didn't help him because I sympathize with urban guerillas.
 (65) CAUSE [I sympathize with urban guerillas, NOT [I helped him]]
 'It was because I sympathize with urban guerillas that I didn't help him.'
 (Plausible context: 'him' is a pursuing FBI agent)
 (66) NOT CAUSE [I sympathize with urban guerillas, I helped him]
 'It wasn't because I sympathize with urban guerillas that I helped him.'
 (Plausible context: 'him' is the guerilla)

Notice that when (64) has the wide scope reading – that is, when it is a negation of a causal link between two propositions – it is left open whether or not the speaker believes that the first propositional argument of CAUSE ('I sympathize with urban guerillas') is in fact true. Thus (64) with the wide scope reading is compatible with explicit affirmation of the truth of this proposition, as in the paraphrase (67a), by a refusal on the part of the speaker to commit himself to its truth or falsity, as in (67b), or by an explicit denial of its truth, as in (68).

- (67)(a) Although I do sympathize with urban guerillas, that wasn't the reason I helped him. I helped him because he's my brother.
 (b) I don't know whether or not I sympathize with urban guerillas,

but the issue is irrelevant: the reason I helped him is that he's my brother.

- (68) Whatever the reason was for my helping him, it wasn't that I sympathize with urban guerillas; I *don't* sympathize with them.

Thus one possible way in which the causal link between the two propositions could fail to hold is if the first propositional argument ('I sympathize with urban guerillas') is simply false. In that case, it certainly cannot be the cause of the second argument ('I helped him'): it seems reasonable to assume that '*P* because *Q*' expresses a stronger claim than material implication, and hence that it is not true if *Q* is false. However, as demonstrated by (67)–(68), the wide scope reading of (64) is compatible with the truth, falsity, or uncertain status of the proposition 'I sympathize with urban guerillas'. The falsity of this proposition is one implicature that may arise, but it is clearly cancelable.

However, let us return to (62). The presence of the NPI in the 'because'-clause renders the sentence unacceptable unless it has this additional implicature that the proposition in the 'because'-clause is false, as well as that it is not the cause of the proposition in the matrix clause. That is, (62) must be interpreted in the sense (68). Thus consider the contradictoriness of (62) with the continuation below; here the licensing implicature NI is explicitly denied, and the NPI is therefore unacceptable.

- (69) *I didn't help him because I have **any** sympathy for urban guerillas, although I *do* sympathize with urban guerillas.

Another circumstance under which this potential implicature may be removed, rendering the NPI unacceptable, is when such an implicature (i.e. the implicature that the first propositional argument of CAUSE is itself false, not merely that it is not the cause of the second argument) would conflict with known facts about the world. Thus (70) below sounds perfectly acceptable, since (on the relevant side scope reading) it simply denies that eyes are the cause of dogs' hearing; in contrast, (71) sounds unacceptable, since the NPI *requires* this additional but factually incorrect and therefore implausible implicature that dogs lack eyes. (Obviously, the asterisks assigned here and throughout this paper are intended to reflect acceptability, not necessarily grammaticality.) But, as (72) demonstrates, NPIs may occur in the 'because'-clause, as long as this additional implicature is available. Thus (71) uttered by a speaker who

believes for some reason that dogs do lack eyes would not strike the hearer as containing an unlicensed NPI, as long as the hearer is aware of this belief on the part of the speaker,

- (70) Dogs don't hear because they have eyes. They hear because they have ears.
 (71) *Dogs don't hear because they have **any** eyes. They hear because they have ears.
 (72) Dogs don't hear because they have **anything** we don't. Like us, they have ears.

Hence the unacceptability of (73) below, noted in Williams (1974), which stems from the fact that in order for the NPI in the 'because'-clause to be licensed, the sentence must implicate (74), and (74) is simply false.

- (73) *Grass isn't green because it has **any** chlorophyl.
 (74) Grass doesn't have **any** chlorophyl.

The acceptability of the formally indistinguishable (75) demonstrates that there is nothing structural to account for the unacceptability of (73).

- (75) Grass isn't green because it has **any** green paint in it, for heaven's sake!

Thus the licensing NI is in this case an implicature rather than an entailment of the host sentence. This implicature is optional, i.e. cancelable, in sentences without NPIs. For example, (64) above may be followed by (67a) or (67b), which cancel the NI, without oddness; it is only the presence of an NPI that renders this negative implicature obligatory.

Although we have considered only the restricted data set of 'because'-sentences, it is clear that implicature plays an important role in the licensing of NPIs, and hence that truth-conditional meaning alone is insufficient to predict NPI acceptability.

2.3.2. *Part (b): a reformulation.* As noted above, consideration of the full range of part (b) data (a subset of which is exemplified in (8)–(15) above) will be deferred to Section 5, where my account and Ladusaw's may be compared against it. In this section, however, I will go somewhat beyond the data of negated 'because'-clauses in order to lay out my own proposal concerning part (b) and negative polarity licensing generally. My account is termed the 'NI account' in the discussion following.

The proposal I wish to make is as follows.

PART (B).

(i) **Expectation of negative implicatum is itself a conventional implicature.** A negative polarity item contributes to a sentence *S* expressing a proposition *P* the conventional implicature that the following two conditions are satisfied.

(ii) **Availability of negative implicatum.** There is some proposition NI (which may be identical to *P*) which is implicated or entailed by *S* and which is part of what the speaker is attempting to convey in uttering *S*. In the LF of some sentence *S'* expressing NI, the lexical representation of the NPI occurs in the immediate scope of negation. In the event that *S* is distinct from *S'*, we may say that in uttering *S* the speaker is making an *allusion* to *S'*.

(iii) **NI strengthens *P*.** The truth of NI, in the context of the utterance, virtually guarantees the truth of *P*.

These three clauses are considered in turn below.

On (i): The contribution of NPIs to sentence meaning seems appropriately characterized as conventional implicature given its non-cancelability and its non-detachability from specific lexical items. (On the latter point, note that 'budge' is an NPI while 'edge' is not, although both arguably express very slight movement; 'some' and 'any' have both, of course, been represented as existential quantifiers, although not uncontroversially; and so forth). Removal of the expected negative implicature, as in (69) above in which the licensing NI 'I don't have any fondness for urban guerillas' is explicitly cancelled, has the same contradictoriness that we find in other denials of conventional implicature such as 'Only John was at the party – and even he wasn't there'.

The issue of inheritance is beyond the scope of this paper. However, this conventional implicature contributed by NPIs seems to be associated with the entire clause containing the NPI and its 'trigger'. Verbs of propositional attitude such as 'believe' or 'say' appear to function as 'plugs': 'John believes that Mary didn't come to his aid because she had any sympathy for urban guerillas' seems to attribute to John, rather than to the speaker, the NI that Mary does not sympathize with urban guerillas.

On (ii): I follow the spirit although not the wording of Baker (1970a) in suggesting that NPIs may cause the host sentence to make *allusion* to some other sentence or sentences in whose LF the basic contextual requirement of the NPI (the ISC) is satisfied. (See, for example, the discussion of 'evocational processing' in Sperber and Wilson, 1981.)

In a sense, then, it is more accurate to say that the NPI triggers the implicature, rather than being triggered by it. The presence of the NPI in the 'because'-clause of (62) signals to the hearer that among the implicata of the host sentence there is some negative proposition which 'justifies' the use of the NPI.

In contrast of Baker's (1970a) proposal, we do not require the NI

alluded to by the use of an NPI to be an entailment of the host sentence. As we have seen above in connection with negated 'because'-clauses, the NI may be a conversational implicature, one which is cancelable in the absence of NPIs.

It is suggested in Horn (1985) that 'strict' NPIs require that the host sentence conventionally rather than conversationally implicate some appropriate NI. Thus it may be that NPIs are inherently 'weak' or 'strict' ('strong'), as observed above, and that they contribute correspondingly weak or strong conventional implicatures to the host sentence: a strict NPI may require a stronger relationship between the host sentence and its NI.

But *must* the NI be an implicature rather than an entailment of the host sentence? A cleaner story could be told if it were possible to restrict NI to implicatures of the host sentence. If entailments of the host sentence also play a role in NPI licensing, then we must deal with the problem of 'trivial entailments' such as these:

(76) 'Double negative' entailments which do not serve as NIs:

$$P \rightarrow \text{NOT NOT } P$$

$$P \vee Q \rightarrow \text{NOT (NOT } P \ \& \ \text{NOT } Q)$$

$$P \ \& \ Q \rightarrow \text{NOT (NOT } P \ \vee \ \text{NOT } Q)$$

Clearly we do not want a theory which incorrectly predicts the occurrence of NPIs in simple positive sentences, on the basis of the entailment of the double negative. Restricting part (b) licensing to implicature, to NIs which express something over and above what is actually asserted, would rule out these trivial entailments as potential NIs. And the licensing of NPIs in negated 'because' clauses, as we saw above, is by an implicature rather than an entailment of the host sentence.

However, this limitation seems untenable. For example, consider the licensing of NPIs outside the focus of 'only', as in (10) above. The most plausible candidate for an NI associated with 'Only John has **a hope in hell** of passing' is perhaps 'Whoever is not John does not have **a hope in hell** of passing'. But this virtually paraphrases the truth-conditional meaning of this sentence under a widely accepted analysis of 'only'¹¹ and in a variety of other cases (particularly conditionals and related structures), the contribution of the NPI seems to me to be a matter of *emphasizing* the negativity of an entailment of the sentence. For example, the NPI in (14a) above, 'Everyone who knows **a damn thing** about English knows that it's an SVO language', has the effect, on my analysis, of 'highlighting' the contrapositive entailment: 'Everyone who doesn't

know that English is an SVO language doesn't know **a damn thing** about English'. The appropriateness of this highlighting affects NPI acceptability, and depends upon pragmatic factors to be considered in Section 5.

But including entailments of the host sentence in the class of NIs¹² leaves us with the question of why one set of entailments – specifically, the double negations introduced in (76) – fail to trigger NPIs. As observed in Section 2.2.3, the mere presence of a positive implicatum is insufficient to prevent NPI licensing, so we cannot rule out NOT NOT *P* as NI of a sentence *S* which asserts *P* merely on the basis of a conflict with the positive assertion made by *S* itself. Since I do not have a satisfactory account of this, I prefer to exclude these cases by pure stipulation at this point: the entailments specified in (76) may not serve as NIs.

On (iii): The arbitrariness of this exclusion, however, contrasts with the ability to the NI theory to exclude many other negative implicata as NPI licensors.

Clause (iii) represents almost the converse of Baker's proposal. The claim here is that the relevant negative implicature 'strengthens', in some sense, what is actually asserted in the host sentence. Consider, for example, the NI which (I have argued) licenses the NPI in (62): 'I don't have any sympathy for urban guerillas'. Thus if I am not sympathetic to urban guerillas, then the truth of (62), 'I didn't help him because I have any sympathy for urban guerillas', is assured: sympathy for guerillas cannot be the cause of my rendering aid. But, as demonstrated above, the truth of NOT CAUSE (*P*, *Q*) is no guarantee of the truth of this negative implicature NOT *P*.

The requirement that NI 'strengthen' *P* excludes as NI many negative implicatures which may arise. Several such cases are considered here: 'even', sarcasm, lies, contextually inferred surprise, and counterfactuals.

Even. Given the negative implicature (78b) induced by 'even' – on the assumption that (78a) asserts (79) and implicates (78b), following Horn (1969), and Fauconnier (1975a, b) – one might ask why NPIs are not licensed by this negative implicature associated with 'even'.

- (78)(a) Even John moved/***budged an inch**, when the bus driver ordered us to make room in the bus.
- (b) John was, of the passengers, the most likely to not move/**budge an inch**.
- (79) John moved, when the bus driver ordered us to make room in the bus.

The answer, on this account, is that the truth of the NI is no way guarantees the truth of what is asserted by the host sentence: (78b) might well be true and (79) false. In fact, that would be the normal state of affairs. Thus the NI does not ‘strengthen’ the host sentence and NPIs are not acceptable in (78a).

Sarcasm. Similarly, the requirement that the NI strengthen the host sentence rules out sarcasm as appropriate negative implicature. Even if (80a) is uttered in a tone and context from which (80b) is easily inferred, its NPI-containing counterpart, (81), is unacceptable because the truth of (80b) certainly does not guarantee the truth of (80a) taken literally.

- (80)(a) I’m sure George has friends in Ulan Bator.
 (b) I’m sure George doesn’t have **any** friends in Ulan Bator.
 (81) *I’m sure George has **any** friends in Ulan Bator.

Lies. It was observed in Linebarger (1980a), and also pointed out by a referee, that speakers may not employ NPIs to indicate that they are lying. Clearly there would be considerable social usefulness for such a mechanism by which one could signal indirectly that ‘*P*’ is to be taken as meaning ‘NOT *P*’. But although (82a) uttered with a look of boredom may convey (82b), (83) is nevertheless unacceptable.

- (82)(a) Yes, I have free time to hear about your trip to Cleveland.
 (b) No, I don’t have **any** free time to hear about your trip to Cleveland.
 (83) *Yes, I have **any** free time to hear about your trip to Cleveland.

As above, (82b) is ruled out as a licensing implicature for the NPI in (83) because the truth of (82b) does not in any way guarantee the truth of (83). I assume, as above, that (83) and (82a) assert virtually the same proposition, since polarity ‘any’ represents an existential quantifier (see references in Note 1). In fact, the host sentence and its would-be NI contradict one another.

Contextually inferrable surprise. Below we see two cases of sentences which, because they express surprise or disappointment, may be used to implicate a negative proposition, but one which fails to ‘strengthen’ the host sentence.

As pointed out by an anonymous referee, (84a) may be used to implicate (84b), but (84c), its otherwise synonymous counterpart containing ‘any’, is nevertheless unacceptable.

- (84)(a) Someone came to my birthday party!

- (b) I expected that there would not be **anyone** at my birthday party.
- (c) ***Anyone** came to my birthday party!

As above, (84a)/(84c) is not strengthened by the negative implicature, since the truth of (84b) certainly does not guarantee its truth. The negative expectations may prove to be accurate.

Similarly, (85a) may be used to implicate (85b); but (85c) is nevertheless unacceptable. Again, the would-be implicatum (85b) contradicts rather than supports the host sentence (85c).

- (85)(a) But I thought that wine would be served.
- (b) There isn't **any** wine being served.
- (c) *But I thought that **any** wine would be served.

Counterfactuals. Finally, the fact that NPIs are not licensed in the consequent clause of counterfactuals is accounted for by clause (iii). The fact that (86a) implicates (86b) does not license the NPI in (86c), since the truth of (86b) does not guarantee the truth of (86a).

- (86)(a) If you were rich, you would have friends.
- (b) You don't have **any** friends.
- (c) *If you were rich, you would have **any** friends.

2.4. Summary of Section 2

A preliminary analysis of NPIs has been developed here on the basis of a limited data set: the interaction among NPIs, negation, and 'because'-clauses. The major claims are summarized below.

First, an interesting locality condition emerges when we consider the relationship between an NPI and a negation: the paradigmatic environment for an NPI appears to be neither the c-command domain of negation at *S*-structure, nor simply the scope of negation at LF. Rather, it appears that NPIs are sensitive to whether or not the negation operator is *immediately* adjacent in LF.

Second, in the example considered here, we have seen that the acceptability of an NPI in a negated 'because'-clause cannot be predicted on the basis of the truth-conditional meaning of the host sentence. The negative proposition which appears to license the NPI in this case represents a normally cancelable implicature of the host sentence.

Third, the relationship between parts (a) and (b) is argued to be as follows. The Immediate Scope Constraint represents a lexically-stated contextual feature of NPIs; it is part of English speakers' knowledge of

their language that these expressions ‘belong’ in the immediate scope of negation. An NPI contributes to the sentence in which it occurs the conventional implicature that the speaker is employing the host sentence in order to convey some proposition NI which may be expressed by a sentence in whose LF the NPI is immediately adjacent to an overt negation; the truth of NI need not follow from the truth of *P*, although the converse may turn out to be true: NI must strengthen the host sentence, in the sense that in the context of the utterance the truth of NI guarantees the truth of the host sentence. On this account, then, ‘un-triggered’ NPIs may be used by the speaker to allude to a negative sentence; or, perhaps more accurately, we may think of NPIs as triggering the allusion, in that they contribute to the host sentence the conventional implicature that an appropriate NI is available.

This account of negative polarity licensing is developed in more detail in the following sections. In Section 3, I argue that quantificational sentences provide additional evidence for my reformulation of Baker’s part (a) as the Immediate Scope Constraint. In Sections 4 and 5, the implicature-based account of part (b) sketched above is fleshed out in more detail, and contrasted with Ladusaw’s claim that the distribution of negative polarity items may be accounted for on the basis of truth-conditional meaning alone.”

3. FURTHER EVIDENCE FOR THE IMMEDIATE SCOPE CONSTRAINT

Recall that the ISC was motivated above by consideration of sentences in which the negation of a ‘because’-clause in the scope of negation appears to distance the NPI from a negation immediately preceding it in *S*-structure. The logical scope of the negation operator appears to be critical to NPI acceptability, thus supporting (although indirectly) the existence of LF as a level of grammatical representation.

In this section, the ISC is considered in more detail. Section 3.1 concerns further evidence for the ISC arising out of the interaction among NPIs, quantifiers, and negation. In Section 3.2, the occurrence of NPIs in AtF and denial sentences, a potential counterexample to the ISC, is considered.

3.1. *Further evidence for the ISC: NPIs in quantificational sentences*

In (87) and (88) below, a universal quantifier (either ‘every’ or free-choice ‘any’) is negated, assuming LFs as indicated. For clarity, predicate

calculus-like representations are employed here, rather than simple adjunction of lexical items.

- (87) John didn't give money to every charity.
 NOT Ax (John give money to x)
where $x = a$ charity
 'It wasn't every charity that John gave money to.'
- (88) John didn't give money to just any old charity.
 NOT Ax (John gave money to x)
where $x = a$ charity
 'It wasn't every charity that John gave money to.'

These sentences are modified to become (90) and (91) below by replacing 'money' with the NPI 'a red cent':

- (89) John didn't give **a red cent** to charity.
 NOT (John gave-**a-red-cent**-to charity)
- (90) *John didn't give **a red cent** to every charity.
 NOT Ax (John gave-**a-red-cent**-to x)
where $x = a$ charity
 *'It wasn't every charity that John gave **a red cent** to.'
- (91) *John didn't give **a red cent** to just any old charity.
 NOT Ax (John gave-**a-red-cent**-to x)
where $x = a$ charity
 *'It wasn't just any old charity that John gave **a red cent** to.'

The contrast between (89) and the unacceptable results of this modification, (90)–(91), suggests that it is the presence of the intervening universal quantifier that renders the NPI inappropriate. For reasons to be discussed shortly, 'a red cent' is not treated here as a quantified expression, but rather as forming a unit with 'give', roughly synonymous with 'contribute'. Note also that some speakers may find (90) and (91) acceptable, because they are able to assign to them a reading in which the universal quantifier has wide scope with respect to the negation operator; but this reading is in any case irrelevant to the discussion, and will be ignored below.

The unacceptability of (90) and (91) provides additional support for the notion that NPIs are sensitive to the proximity of negation at LF. These cases in English represent an echo of the locality requirements of 'personne' in French (Kayne, 1981) and 'nessuno' in Italian (Rizzi, 1982), albeit one muddled by implicature. The impossibility of certain readings for sentences like (90) is also observed in Carden's 1973 study of quantifier dialects; he proposes a deep structure in which the negation

and the NPI are clausemates, the generative semantics equivalent of the ISC.

Recall from the discussion of sentence (62) that a sentence may appear to violate the ISC if an NPI which is itself a quantifier is assigned wide scope with respect to 'because', the other operator 'competing' for adjacency to negation. The same effect is observable in (93) below: negation of 'every party' does not necessarily result in unacceptability of the NPI quantifier 'any'.¹³ The negated-universal-quantifier reading is presented without additional quantifiers in (92), for scrutiny under somewhat lighter processing demands.

- (92) She didn't wear earrings to every party.
 NOT Ax (she wore earrings to x)
where $x = a$ party
 'It wasn't every party that she wore earrings to.'
- (93) She didn't wear **any** earrings to every party.
 (94b) *below not a possible reading.*
- (94) READINGS IN WHICH NEGATION HAS WIDEST SCOPE:
- (a) Only reading available for (93):
 NOT $Ex Ay$ (she wore x to y)
where $x = earrings$, $y = a$ party
 'There are no earrings that she wore to every party.'
- (b) Not available for (93):
 NOT $Ay Ex$ (she wore x to y)
where $x = earrings$, $y = a$ party
 *'It wasn't to every party that she wore **any** earrings.'

The impossibility of (94b) as a reading for (93) reflects the ISC: the universal quantifier intervenes between the negation and the NPI. But (94a) is a possible reading for this sentence because 'any earrings' is in the immediate scope of negation. This wide scope reading is pragmatically available in this sentence; and hence (93), in contrast to (90) and (91), sounds acceptable. No comparable reading with wide scope for 'a red cent' seems available in (90) or (91); that is, neither can be paraphrased 'There is no one sum of money that he gave to every charity'. (Again, the possibility of a reading in which the universal quantifier has wide scope with respect to the negation operator will be ignored.)

Substitution of 'clean clothes' for 'earrings' makes this wide scope reading somewhat less available; it is unnatural to associate with (95) the reading 'there were no clean clothes that he wore to every party' ('clean clothes' representing, perhaps, a cross between an object and an event).

(95) *He didn't wear **any** clean clothes to every party.

As a result, (95) sounds correspondingly less acceptable, except on the (irrelevant) reading in which 'every party' has wide scope over the negation.

A deliberate play on the Immediate Scope Constraint may be observed in a bumper sticker seen on a Maryland car: 'I don't **give a damn** about the whole state of Maryland – I'm from the Eastern Shore'. The ISC forces the first clause to be given an interpretation in which 'whole', which functions roughly as a universal quantifier, has wide scope with respect to negation, as in (96):

(96) Ax NOT [I **give a damn** about x]
where $x = a$ part of the state of Maryland
 'It's true of the whole state of Maryland that I don't **give a damn** about it.'

But the second clause suggests a different interpretation, and forces a reconstrual under which the ISC is in fact violated, since the universal quantifier intervenes between the negation and the NPI:

(97) NOT Ax [I **give a damn** about x]
where $x = a$ part of the state of Maryland
 *'It's not true of EVERY part of the state of Maryland that I **give a damn** about it – I only care about the Eastern Shore.'

The oddness that results from this ISC violation is clearly intentional.

Thus quantificational sentences provide additional evidence that the paradigmatic adjacency between an NPI and the negation operator cannot be stated on *S*-structure, since in all the cases observed above the unacceptable NPI is preceded, c-commanded, and in the same clause with 'not'. In some cases, NPIs are acceptable even though a logical operator intervenes; the case of intervening 'because' was discussed in Section 2.3, and intervening quantifiers are considered in Section 5 below. Additional cases of operators intervening between an NPI and an overt negation are discussed in Linebarger (1980), where the question of whether the ISC allows one to dispense with *S*-structure restrictions is also discussed (see also Safir, 1982, on this point).¹⁴ A parallel suggestion was made with regard to positive polarity items in quantified sentences in Kroch (1979): 'several' and 'some', according to Kroch, may occur in the scope of negation, but not in its immediate scope.

It should be noted that other NPIs do sometimes appear in the non-immediate scope of negation, when certain quantifiers intervene; for

example, multiple NPIs are generally acceptable, as in (98):

- (98) He hasn't **ever budged an inch** for **anyone**.

The ISC could be generalized to allow NPIs to function as extensions of negation: occurrence in the immediate scope of existential 'any', that is, would license an NPI in and of itself. But some sentences with multiple NPIs seem unacceptable; compare (99) and (100). Only (99) allows the negative polarity reading of 'too quickly', and can be taken to mean either that 'he did not move with EXCESSIVE quickness' or that 'he moved rather slowly'. In (100), 'too quickly' can only be taken as meaning 'excessively quickly'; the NPI usage drops out.

- (99) He didn't move **too** quickly.
 (100) *He didn't **budge an inch too** quickly.

'Too' appears generally to be a 'strict' polarity item, and thus its unacceptability (*qua* NPI) in (100) presents no problem if sentences with multiple NPIs are analyzed as part (b) cases.

3.2. *Denial, metalinguistic negation, and the ISC*

If the ISC is taken as a sufficient, although not necessary, condition on the acceptability of NPIs, then NPIs occurring in the immediate scope of negation in LF should invariably prove acceptable. One consequence of this approach is that (101)–(102) below are potential counterexamples:

- (101) *John DID NOT **budge an inch**.
 (102) *John didn't manage to solve **ANY** of the problems – he managed to solve **ALL** of them. (Horn, 1985, p. 134)

Spoken with rising 'denial' intonation, (101) and (102) are unacceptable despite the fact that the NPIs seem to be in the immediate scope of negation.¹⁵ In Linebarger (1980) it was argued that these sentences are in fact ISC violations. In the case of simple denials, this approach required the introduction of the embarrassingly convenient intervening operator 'TRUE' which is the focus of the negation and thereby induces an ISC violation. This approach seems not only unmotivated but also, perhaps, futile. Horn (1985) argues that the metalinguistic usage of negation in such sentences should be distinguished from true logical negation. He observes that if 'denial' negation is treated as simply another occurrence of the logical operator NOT, then I am forced to assign to (103) the representation (104):

- (103) **SOME** men aren't chauvinists – **ALL** men are chauvinists.

- (104) NOT TRUE (some men are chauvinists) . . . (Horn, 1985, p. 144)

Therefore, I think that it is appropriate to set aside the challenge to the ISC posed by this class of cases, in the absence of an adequate treatment of their logical structure. Furthermore, such cases appear to present equal difficulty to my analysis and to Ladusaw's, since both theories predict NPI acceptability in the immediate scope of negation; although, of course, for different reasons.

Ladusaw (1983) points out that the unacceptability of NPIs in sentences like (101)–(102) argues against the claim in Linebarger (1980) that the ISC is a sufficient condition on NPIs. Although, as noted above, it is difficult to determine whether (101)–(102) are ISC violations because it is not clear what sorts of LFs should be assigned to them, I agree, nevertheless, that it may be the case that occurrence in the immediate scope of negation is not a sufficient condition on NPI acceptability.

However, the distinction between parts (a) and (b) of the NI account need not be conceived in such 'procedural' terms. Rather, part (a) may be considered as the lexically-stated context in which NPIs are appropriate, and the conventional implicature associated with NPIs requires that the speaker be actively attempting to convey an appropriate NI. Under certain circumstances, a sentence whose LF satisfies the ISC may fail to license NPIs because the speaker's intentions render this NI insufficiently salient.

3.3. *Summary of Section 3*

The interaction between NPIs, quantifiers, and negation reveals a sensitivity to the proximity of negation which parallels the behavior of NPIs in sentences with negated 'because'-clauses. These phenomena provide further support for the ISC as a grammaticality-stated contextual requirement of NPIs. Whether the ISC is to be taken as a sufficient condition on NPI acceptability – or whether, instead, all licensing is part (b) licensing – depends upon our analysis of denial sentences such as (101)–(102).

4. LADUSAW'S ANALYSIS

In the preceding section I have sketched a syntactic-pragmatic account of negative polarity licensing. The grammar provides a contextual feature (the ISC), and NPIs bring to a sentence *S* in which they occur the

conventional implicature that the speaker is attempting to express a proposition in whose LF the ISC is satisfied. In the event that *S* itself does not satisfy the ISC, then the effect of this implicature is to bring about an *allusion* to some sentence *S'* in whose LF the ISC is satisfied. Thus parts (a) and (b) represent, respectively, the syntactic and pragmatic components of this account.

In contrast to the syntactic-pragmatic account that I have argued for is a semantic analysis of negative polarity proposed in a series of papers by William Ladusaw. Ladusaw (1979, 1980, 1983) argues that negation enjoys no special status as the primary trigger for NPIs. Rather, he proposes, expressions that license NPIs may be defined in terms of a logical property, the property of being 'downward entailing' (that is, monotone decreasing) with respect to expressions in their scope.

The starting point for Ladusaw's theory is the notion of 'scalar endpoint' developed by Fauconnier (1975a, b). Fauconnier observes that expressions like 'Adolph Hitler' and 'the most difficult problem' in (105) and (106) below function pragmatically as universal quantifiers because they may be regarded as lower endpoints on the pragmatic scales associated with the proposition schemata *John would be polite to X* and *Mary can solve X*.

(105) John would be polite to Adolph Hitler.

(106) Mary can solve the most difficult problem.

The lower endpoint of a pragmatic scale associated with a proposition schema is the value for *X* for which the proposition is least likely to be true: thus if it is true for this value of *X* it can be inferred (pragmatically, not logically) that it will be true for all other values of *X*. If John would be polite to Adolph Hitler, we can fairly safely conclude that he would also be polite to anyone else; if Mary can solve the most difficult problem, then we can infer that she can solve any problem, the most difficult problems being assumed to be the least likely to be solved.

In Fauconnier's account, a proposition schema *P* (e.g. *John would be polite to X*) and its negation, the schema NOT *P* (e.g. *John wouldn't be polite to X*), are associated with the same pragmatic scale *S*. The truth of *P* for any value *X* licenses inferences 'upward' on this scale; e.g. if it is true that John would be polite to Adolph Hitler, who is the pragmatic bottom point on the scale of people to whom John is likely to be polite, then we are licensed to infer the truth of *P* for values of *X* that are higher on the scale than Adolph Hitler. On the other hand, the truth of NOT *P* licenses inferences 'downward' on this same scale. Since Adolph Hitler is treated here as the lower endpoint of this scale, sentence (107)

will not allow us to infer anything about John's politeness to people other than Hitler, since we are allowed only to make downward inferences, and Hitler represents the bottom of this scale. In contrast, if we treat Mother Theresa as a plausible *upper* endpoint of the scale of people who John is likely to be polite to, then it is clear that (108) does permit us to infer that NOT *P* is true for all values of *X*, since all such values lie below Mother Theresa on this scale.¹⁶

(107) John wouldn't be polite to Adolph Hitler.

(108) John wouldn't be polite to Mother Theresa.

Fauconnier observes that there is a strong relationship between this notion of pragmatic 'downward' entailment and the licensing of NPIs. For one thing, as observed in Schmerling (1971), many (although not all) NPIs are expressions which represent the lower endpoint of such a pragmatic scale.¹⁷ If John 'didn't lift a finger', then he can be presumed not to have engaged in more strenuous activity. Furthermore, the same range of environments which license 'downward' inferences on pragmatic scales also tend to license NPIs.¹⁸

Ladusaw's theory represents an interesting and ambitious attempt to treat 'downward' inferencing as a logical rather than a pragmatic phenomenon; he argues that the class of expressions which license NPIs may be characterized in terms of the entailment properties of their truth-conditional meanings: 'the property of being a trigger is completely predictable from the truth-conditional meaning of an expression' (1979, p. 162).

According to Ladusaw, negation should not be singled out as the paradigmatic affective (i.e. NPI-licensing) expression. Rather, it is simply one of a number of expressions which license downward entailments in their scope:

(109) "A negative-polarity expression is acceptable only if it is interpreted in the scope of a downward-entailing expression An expression is affective [i.e. an NPI trigger] iff it licenses inferences in its scope from supersets to subsets." (1980, pp. 7, 13)

'Scope' may be defined configurationally over LF or over 'disambiguated representations' in Montague grammar as well as nonconfigurationally over function/argument relations in composition structure.¹⁹

Consider first the negation operator. Expressing the fact that kale is a subset of the class of green vegetables in terms of the entailment from (110a) to (110b) below, we see that (111a) entails (111b) by con-

trapolation. In considering entailments such as that in (111), note that it is the narrow scope reading of the indefinite that is relevant; clearly (111a) does not entail (111b) under the wide scope reading of ‘a green vegetable’. (The fact that John failed to eat asparagus certainly does not entail that he also failed to eat kale.) The negation operator thus qualifies as a downward entailing operator, since we are able to substitute expressions denoting subsets for expressions denoting supersets in (111) *salva veritate*.

- (100)(a) John ate kale. →
 (b) John ate a green vegetable.
 (111)(a) John didn’t eat a green vegetable. →
 (b) John didn’t eat kale.

More generally, DE operators permit ‘strengthening’ of expressions in their scope, as in (112):

- (112)(a) John didn’t walk. →
 (b) John didn’t walk slowly.

Since ‘walk slowly’ is a more specific, hence ‘stronger’, expression than ‘walk’, the latter may be substituted for the former within the scope of the DE operator *not*.

Note that the failure of ‘not’ to trigger NPIs in its metalinguistic ‘denial’ usage, demonstrated in (101)–(102), is equally problematic for the DE account. But, as observed in the discussion above, the logical properties of negation in such sentences remain unclear and we may therefore set aside these cases in the discussion here.

Considering triggers other than overt negation, it is clear that licensing expressions such as ‘too’ and ‘few’ (illustrated in (7) and (8) above) are similarly downward entailing,

- (113)(a) Few people walked. →
 (b) Few people walked slowly.
 (114)(a) Bill is too tired to walk. →
 (b) Bill is too tired to walk slowly.

Cases such as these, however, present little difficulty for the pragmatic account of part (b) that I have sketched (but left undeveloped until the following section), given the available NIs (115) and (116) respectively.

- (115) Most people didn’t walk.
 (116) Bill is so tired that he can’t walk.

Moreover, this theory (hereafter, the DE theory) accounts quite elegantly

for the appearance of NPIs in certain environments which seem to be further removed from negation: for example, in relative clauses headed by universal quantifiers, in the antecedent clause of conditional sentences, and in 'before'-clauses. Consider first the case of relative clauses headed by universal quantifiers, as in (117). Since (118a) entails (118b) – that is, since 'kale' can be substituted *salva veritate* for 'a green vegetable' – 'everyone' qualifies as a DE operator.

- (117) Everyone who drank **any** of that water got sick.
 (118)(a) Everyone who ate a green vegetable was cured. →
 (b) Everyone who ate kale was cured.

In contrast, replacement of 'everyone' by 'someone' in the above sentences demonstrates that existential quantifiers are not DE and do not license NPIs:

- (119) *Someone who drank **any** of that water got sick.
 (120)(a) Someone who ate a green vegetable was cured. —/→
 (b) Someone who ate kale was cured.

It is, of course, possible to construct a licensing NI expressed by the utterance of (117) – a matter taken up in the following section – but Ladusaw's analysis of negative polarity licensing in these structures is particularly satisfying.

Similarly, 'if' at least appears to be a DE operator, a matter to be considered further in Section 5.1; (121a) seems to entail to (121b):

- (121)(a) If you bring a green vegetable, you will get in free. →
 (b) If you bring kale, you will get in free.

As illustrated in (12) above, 'if' licenses NPIs. Again, discussion of the treatment of conditionals in the account that I have proposed is deferred to the following section, but it is clear that such cases may prove problematic to my account because they sometimes lack obvious negative implicatures.

Finally, observe that 'before', which often triggers NPIs (as in (122)) is DE, as we see in (123); in contrast, 'after', which usually doesn't (cf. (124)) is not DE, as we see in (125).

- (122) He left before Mary had eaten **any** vegetables.
 (123)(a) He left before Mary had eaten a green vegetable.
 (b) He left before Mary had eaten kale.
 (124) *He left after Mary had eaten **any** vegetables.²⁰
 (125)(a) He left after Mary had eaten a green vegetable. —/→
 (b) He left after Mary had eaten kale.

It might be objected that (123a) does not entail (123b) because the latter carries with it the implicature that Mary has in fact eaten kale. To evaluate these entailments, then, we must ignore all such non-truth-conditional implicatures, since DE-ness is to be defined strictly in terms of truth-conditional meaning; in particular, we must – for reasons to be discussed below – evaluate the entailment in (123) only against worlds in which it is in fact the case that Mary has eaten kale. Thus, with this stipulation, (123a) on the *de dicto* reading does seem to entail (123b). In contrast, (125a) could be true in a world in which Mary had just eaten spinach but was not to eat kale for another twenty years; in this case, (125b) would be false.

While cases such as (122) are accounted for naturally on my account as well, the DE theory's treatment of them is impressively algorithmic.

Two further points should be spelled out here. First, note that what is required to license NPIs is occurrence in the scope of some expression which is a DE operator, rather than occurrence in just any context which permits subset-for-superset substitution.

Second, note that Ladusaw proposes a *necessary* but not a *sufficient* condition on NPIs.²¹ Thus one must be careful not to misread his claim that 'the property of being a trigger is completely predictable from the truth-conditional meaning of an expression.' A trigger in this account is an expression in whose scope an NPI must occur, but occurrence in the scope of such a 'trigger' does not guarantee acceptability, as we will see below.

This is a most interesting proposal. It at least appears to provide an elegant and economical unification of the variety of part (b) licensing expressions, certain of which are problematic for the two-stage theory. Ladusaw, in fact, interprets the apparent success of the DE theory as an argument that sentence grammar must provide not only 'LFs' but also interpretations, in order to capture linguistic generalizations such as well-formedness constraints on NPIs. Hence he suggests that the phenomenon of negative polarity represents a test case for evaluating the respective merits of the Extended Standard Theory and Montague grammar:

I would like to point out one consequence of these results for our ideas about the role of semantics in a grammar. We have seen that the property of [unacceptable sentences with NPIs] which renders them unacceptable is to be defined in terms of the entailments licensed by certain lexical items, rather than by simply marking certain morphemes with a semantic feature. It seems to follow directly then that no grammar can in principle distinguish [between acceptable and unacceptable sentences with NPIs] unless its semantic component aims higher than at simply disambiguating sentences by deriving 'logical forms' for them to the goal of providing a theory of entailment for the language it generates. (1980, pp. 14–15)

5. PART (B): DOWNWARD ENTAILMENT OR
NEGATIVE IMPLICATURE?

In Sections 3 and 4, two competing analyses of negative polarity licensing have been sketched: the syntactic-pragmatic account that I have argued for, henceforth referred to as the 'NI (negative implicatum) theory', and Ladusaw's account of NPI licensing in terms of downward entailment, the 'DE theory'.

In this section, the two theories are considered a much wider range of data. My claim is that negative polarity licensing in English cannot begin to be predicted on the basis of truth-conditional meaning alone. Despite its elegance, the DE theory is faced with two sets of problematic data. First are the cases of NPIs which are acceptable despite the fact that they are not (I argue below) in the scope of a DE operator. These cases, examined in Section 5.1, include NPI licensing by adversative verbs (5.1.1), 'after' (5.1.2), 'only' (5.1.3), 'exactly' (5.1.4), and in certain other environments (5.1.5). A second problem for the DE theory is the critical role of negative implicature and other pragmatic factors in the licensing of NPIs even within the scope of downward-entailing operators. These cases, examined in Section 5.2, include NPI licensing in the non-immediate scope of negation (5.2.1), in comparatives (5.2.2), under 'before' (5.2.3), in the antecedent of conditionals (5.2.4), and in relative clauses (5.2.5).

5.1. *Licensing expressions which are not DE*

5.1.1. *Adversatives.* Recall that NPIs are generally acceptable in the scope of adversative predicates like 'surprised', 'regret', 'doubt', and so forth. The discussion here focusses upon 'surprised', although the discussion applies to certain other adversatives as well. The acceptability of NPIs embedded under 'surprised' is illustrated in (126)–(128) below.

- (126) She was amazed that there was **any** food left.
 (127) I was surprised that he **budgeted an inch**.
 (128) We were astounded that she **lifted a finger** to help, considering her reputation for laziness.

Under the NI theory, there must be some negative proposition which (126)–(128) are appropriately employed to express. Under the DE theory, 'surprised' must be a downward-entailing operator. These two analyses are considered in turn below.

The NI theory account. The account of NPIs licensed by 'surprised'

follows quite closely the account of NPIs in negated ‘because’-clauses developed in Section 2.2. We saw there that an implicature arises in such sentences which is normally cancellable, but which is obligatory if the negated ‘because’-clause contains an NPI. In the same way, I believe that the NPI in (126) is licensed by the implicature paraphrased in (129), and that (129) is an implicature normally available (but cancelable) in sentences without NPIs.

(129) She had expected that there wouldn’t be **any** food left.

Clearly surprise at some situation is impossible unless one has expected it to be otherwise in some way or another. However, these previous expectations need not have had as their specific content the negation of the embedded proposition; that is, surprise at *P* does not entail a previous expectation of NOT *P*. It may often be reasonable to infer such a specific previous expectation on the basis of someone’s surprise, but nothing compels this inference in sentences without NPIs, and it may easily be cancelled. Thus (130) below may, but need not, give rise to the implicature (131):

(130) I was surprised that John had (some) llamas in his apartment.

(131) I had expected that John would not have llamas in his apartment.

Such an implicature is possible (‘I had explicitly put it in the lease that he was not to keep his llamas in the apartment, so when I went to fix the sink I was surprised . . .’), but it is not obligatory, nor even (given the presence of ‘some’) particularly salient. Thus (130) may be followed by an explicit denial of any previous awareness of the existence of llamas. And (132) clearly does not give rise to the implicature (131).

(132) No, I wasn’t surprised that the apartment was *a mess* . . . I was surprised that there were five Peruvian llamas gravely eyeing me from the kitchen door.

Thus (131) may reasonably be implicated by (130) under certain circumstances, but is no way an entailment of (130). However, the presence of an NPI in the embedded proposition seems actually to *compel* this implicature, by virtue of the fact that the NPI would be unacceptable without it. Thus (133), containing the expression ‘**any** llamas’, has the implicature (134) obligatorily, and is rendered unacceptable by the continuation which explicitly cancels it.

(133) I was surprised that John had **any** llamas in his apartment
(*. . . I had no idea that such creatures existed).

- (134) I had expected that John would not have **any** llamas in his apartment.

Thus it appears that the acceptability of an NPI in a sentential complement of 'surprised' depends crucially upon the presence of this implicature rather than upon its truth-conditional properties alone.

Under the NI theory (as sketched in Section 2.3.2), this negative implicature must strengthen the assertion made by the host sentence. The truth of NI, in context, must 'virtually guarantee' the truth of the host sentence. In the case of 'surprise', the presence of specific expectations of an apartment *sans* llamas virtually assures, given the way the world is, that their presence will induce surprise. I leave unspecified at this point whether 'in context' may be given more precise specification in terms of, for example, 'background entailments' of the host sentence (133) such as, in this case, that John believes that there are llamas in the apartment. Such a belief in conjunction with a previous negative expectation would seem to make it quite likely (although *not* logically inevitable) that (130)–(133) would be true.

The DE theory. In the DE account, any expression which licenses an NPI must be downward-entailing, since DE-ness is a necessary condition on NPI triggers. Thus adversatives *must* be DE; and, in order for the DE account to be predictive, the non-adversative counterparts, which do not license NPIs, should **not** be DE.

But are adversatives in fact DE? And is it possible to distinguish between adversative triggers and non-adversative non-triggers on the basis of this property? As in the above discussion, I will consider only the case of 'surprised', although the arguments bear on several other adversatives as well.

Consider the entailments that we will be forced to argue for under the DE analysis. On this account, since 'surprised' licenses NPIs, as in (133) above, it must be a DE expression; and thus (135a) below must entail (135b).

- (135)(a) Mary was surprised that John bought a car.
 (b) Mary was surprised that John bought a Mercedes.

As noted above, it is the *de dicto* readings that are at issue in the discussion below, since only they are relevant to NPI licensing. This is demonstrated by (136) below. Only on the *de dicto* reading is 'any' licensed in (136a); that is, the NPI is unacceptable on the interpretation in which Mary is surprised that John knows Smith, who unbeknownst to Mary is a spy. However, this *de re* reading is available in (136b) along

with the *de dicto* reading. (See Linebarger, 1980b, for some discussion of this issue.)

- (136)(a) Mary was surprised that John knew **any** spies.
 (b) Mary was surprised that John knew some spies.

Under the most straightforward notion of entailment, (135a) plainly does not entail (135b), since it is possible for there to be a world in which (135a) is true and (135b) is not: one, for example, in which John surprises Mary by purchasing a Pinto, but does not purchase a Mercedes (and hence does not surprise Mary by doing so). In this case (135a) is true and (135b) is not. (Under some analyses it is false; in others it is neither-true-nor-false due to presupposition failure.) In any event, the truth of (135b) does not follow from the truth of (135a).

But there are, of course, other analyses of entailment in such sentences. Ladusaw (personal communication) argues that the relevant entailment of (135a) “would be ‘Mary was surprised that John bought a Mercedes’ minus the commitment to the truth of ‘John bought a Mercedes’”.

On this view, then, it will only be appropriate to evaluate these proposed entailments with respect to the worlds in which all the presuppositions and/or conventional implicatures of the *consequent* are satisfied. On this account, one must examine the proposed entailment from (135a) to (135b) only against worlds in which all presuppositions/conventional implicatures of (135b) are satisfied. Since ‘surprised’ is a factive predicate, which carries with it the presupposition or conventional implicature that the complement *S* is true, the situation in which (135b) fails to be true because John bought a Pinto rather than a Mercedes does not furnish a counterexample to the claim that (135a) entails (135b). Such cases are ruled out by the requirement that the presuppositions/conventional implicatures of the consequent must be satisfied.

However, there are other situations in which (135a) would be true and (135b) not true. Let us grant, for example, that John did buy a Mercedes, in order to avoid the presupposition failure/infelicity just mentioned above. Suppose, however, that Mary does not *believe* that John bought a Mercedes, despite the fact that he actually did. Do we still wish to say that Mary is surprised that he bought a Mercedes, despite the absence of any belief on her part that he did?

Once again, the only possible approach to the problem seems to be to treat the element of belief as a presupposition or conventional implicature associated with ‘surprised’, rather than as part of its truth-conditional meaning. If we say that (137a) *entails* (137b) below, then –

given the claim that (135a) entails (135b) – we are faced with entailments such as those in (138). Mary's surprise toward the notion of John buying some unspecified automobile will entail a whole set of beliefs about John's automotive purchases. (That is, if (137a) entails (137b), then we are faced with the following chain of entailments: Mary is surprised that John bought a car → Mary is surprised that John bought a Mercedes → Mary believes that John bought a Mercedes; hence Mary's surprise at John's purchase of a car *entails* a belief that he bought a Mercedes or any other car at all.)

- (137)(a) Mary is surprised that John bought a Mercedes. →
 (b) Mary believes that John bought a Mercedes.
- (138)(a) Mary is surprised that John bought a car. →
 (b) Mary believes that John bought { a Mercedes
 a rusted orange Corvette
 a 1968 beige Saab

Treating the element of belief in 'surprised' as presupposition or conventional implicature is not an unreasonable approach, and the negation test provides some motivation for this analysis. Sentence (139) below, the negation of (135b), does seem to retain, under the 'internal negation' reading, the presupposition/implicature that Mary believes John bought a Mercedes.

- (139) Mary wasn't surprised that John bought a Mercedes.

This theory of entailment, then, will allow us to set aside two potential counterexamples to the claim that (135a) entails (135b); that is, it prevents us from evaluating his claim in two contexts in which (135a), but not (135b), is true. And Ladusaw argues that when all the presuppositions/conventional implicatures of (135b) are granted, (135a) actually does entail (135b); and that, in contrast, non-adversative predicates such as 'glad' are not DE, and hence that (140a) below does not entail (140b). Thus consider (135) and (140) in a world in which the presuppositions of the (b) sentences are granted; i.e. in a world in which John bought a Mercedes and in which Mary believes that he did.

- (140)(a) Mary is glad that John bought a car.
 (b) Mary is glad that John bought a Mercedes.

The proposed argument to the effect that (140a) does not entail (140b) proceeds, I assume, along the following lines. Suppose that Mary discovered that John had purchased a sensible Toyota, and was glad to see him come into possession of a car. Then (140a) would be true. But

suppose John bought a Mercedes *as well*. This might displease Mary, because this purchase rendered him unable to repay certain debts to her. In this case, (140a) would be true and (140b) false. In contrast, it is argued, the truth of (135a) does commit us to the truth of (135b), even under analogous circumstances: if the thought of car-buying by John is surprising to Mary, then no matter how many cars John buys, each purchase should prove surprising. Thus, it is argued, the NPI licenser 'surprised' is DE, while the non-licenser 'glad' is not.

I wish to argue against this claim, and to suggest the following. First, neither 'surprised' nor 'glad' is *logically* downward-entailing. Second, if we reformulate the notion of DE so that it encompasses psychological consistency rather than logical necessity, (a move which would seem to be seriously at odds with Ladusaw's claim that NPI licensing is predictable on the basis of truth-conditional meaning alone), then *both* predicates appear to be DE. The apparent distinction observed above between 'surprised' and 'glad', I believe, is misleading, because it is the result of the differing availability of a 'conditionalizing' interpretation in sentences containing the two types of predicates. These two suggestions will be elaborated below.

A. Neither 'surprised' nor 'glad' is logically DE: That neither predicate is *logically* DE seems clear enough: both are examples of classical belief-contexts. A psychological disposition toward a proposition involving some superset (e.g. surprise toward John buying an unspecified car) may prove to be a psychologically accurate predictor of one's disposition toward the same proposition under subset-for-superset substitution (e.g. surprise toward John's buying a Toyota), but logical necessity does not compel this expectation. This difficulty posed by belief-contexts is widely discussed among Montague grammarians (see, e.g. Partee, 1982) and is acknowledged in Ladusaw (1980). The extent to which human beings are consistent in their beliefs is a matter of psychology, not of logic. And of course there is reason to doubt that human beings are relentlessly consistent in their beliefs.

Thus in discussing such entailments, we need to substitute this considerably weaker notion of 'psychological downward entailment' for logical downward entailment. A predicate is psychologically DE, let us say, if subset-for-superset substitution is always possible in its scope, on the assumption that human beings are unerringly consistent in their beliefs.

B. Both 'surprised' and 'glad' are 'psychologically DE': But with this

redefinition of downward entailment, we lose the contrast between the two predicates, and hence even this severely weakened variant of the DE theory will be unable to predict the distribution of NPIs in such contexts. This is, I claim that both 'glad' and 'surprised' qualify as DE, despite the fact that only the former licenses NPIs.

Let us re-examine the argument that 'surprised', but not 'glad', is DE; that is, that (135a) entails (135b) but that (140a) does not entail (140b). In particular, the non-DE-ness of 'glad' needs to be reexamined. The two-car scenario – in which Mary is glad about the first car, but not glad about the second one – led us to the conclusion that 'glad' is not DE. However, this scenario is somewhat misleading, since the lack of gladness toward the second car is conditional on gladness toward the first car. There is a covert conditionalizing; the scenario might be paraphrased as in (141).

- (141) Mary is glad that he bought a car, i.e. the Toyota, since John needed a means of transportation. However, *given that* John now has a car, i.e. the Toyota, she is *not* glad that he also bought the Mercedes, since he owes her money.

Thus in some sense Mary's gladness is 'used up' by the purchase of the Toyota; the lack of gladness toward the second purchase is conditional on the first purchase having fulfilled John's need for a car. In fact, two cars are not necessary for this interpretation: Mary might be glad at John's purchase of the Toyota *qua* car, but not glad that it was a Toyota, if she believes that small cars are dangerous. Such a sentiment is common enough: 'I'm glad he bought a car, but (given that he did) I wish it weren't a Toyota.'

There are two points to be made here. First, it is important to note that *in the absence of this conditionalizing*, the non-affective predicate 'glad' also is DE, using 'DE' here in the sense of 'psychological downward entailment' introduced above. If John bought only a Toyota, then if (140a) is true we are committed to the truth of (140b): if Mary is glad that John bought a car, and if John only bought a Toyota, then Mary must be glad that John bought the Toyota at least *qua* car, although *given that he did* she may have additional, and negative, opinions about the Toyota.

The second point to be made is that the situation is identical for affective predicates like 'surprised': in the absence of this conditionalizing ('given that he bought a car...'), 'surprised' is DE; with a conditionalized interpretation, however, it becomes as clearly non-DE as 'glad'. Let us reconsider the situation in (135). Suppose that John had

made many statements such as 'I will never set foot in a car', 'Cars are the instrument of the devil', etc. Then the initial purchase of a Toyota might indeed surprise Mary, rendering (135a) true. However, *given that* John had bought a car, his additional purchase of a Mercedes, perhaps to replace the Toyota following a theft, might not be surprising. To consider another scenario, if John never wore shoes, one might be surprised to see him pull a left shoe out of his shopping bag; however, *given this shoe*, one might not be surprised to see him also pull out the other, right shoe. And, analogously to case above with 'glad', the conditionalizing does not require two distinct subset-for-superset substitutions but can apply to different aspects of the same element. Thus one might be surprised that John bought a Toyota, *qua* car, if he were known to loathe cars, but *given his purchase of the Toyota* one might still be not at all surprised that the car he chose to buy was a Toyota, given his admiration for Japanese workmanship in general. To consider yet another such situation, one might be surprised that an unambitious student has applied for admission to college, but, *given that he has*, one might not find it surprising that the college of his choice is an undemanding institution in a tropical locale. Or, to consider another adversative predicate, we see that 'regret' is not necessarily DE, given the appropriate conditionalizing: John may regret that he assaulted a fellow patron in a restaurant, because he was arrested and fined, but it may also be true that *given that he did so*, he is glad that it was the obnoxious George Smith that he assaulted.

To summarize thus far, it appears that the liberalized notion of DE as 'psychological' does allow us to characterize adversative NPI triggers like 'surprised' as DE, although not in the logical sense that is required by the DE theory. But non-affectives like 'glad' also appear to be DE in this sense, although scenarios with a hidden conditionalizing may initially obscure this point. But the effect of conditionalizing is the same on adversatives as on non-adversatives: without it, these predicates are psychologically DE; with it, they may not be. And hence even this non-logical notion of DE appears to be inadequate to the task of simply distinguishing between triggers and non-triggers.

It may be, of course, that there is a link between the fact that this interpretation is somewhat less available for adversatives, in the absence of any explicit conditionalizing, and the fact that these expressions trigger NPIs. Perhaps their inherent 'negativity', to borrow a notion from the NI theory, plays some role in this: surprise or unhappiness or regret toward one aspect of a situation (John's buying a car *qua* car) may tend to taint all aspects of the situation and thus make one less likely to

express other reactions to the situation. That is, it may be easier to think of an additional feature which undoes one's gladness than to think of an additional feature that undoes one's surprise or regret. But this is surely a matter of pragmatics, not of logic; and, furthermore, it makes use of the very notion of covert negativity that the DE account so carefully eschews.

Thus it appears that the ability of adversative predicates like 'surprised' to license NPIs cannot be accounted for within the DE theory. If we interpret the notion of downward entailment strictly logically, then neither adversatives or non-adversatives are DE, contradicting Ladusaw's basic claim that all expressions which license negative polarity items are DE. If we extend the notion of entailment to characterize DE-ness 'psychologically', i.e. as following from the meanings of these expressions under the additional assumption of psychological consistency, then both 'surprised' and 'glad' are DE, and we have no account for the difference in their ability to license NPIs. And even if the notion of 'psychological DE-ness' had been successful in distinguishing 'surprised' from 'glad', it would have represented a severe weakening of the DE theory, because it would undermine Ladusaw's claim that the licensing of negative polarity items can be brought within sentence grammar if and only if the grammar itself computes truth-conditional meaning.

Finally, even if the DE account had proved itself able to account for the simple fact that 'surprised' licenses NPIs while 'glad' does not, it has nothing to say by way of explanation for the strong dependence upon negative implicature that we have observed in the licensing of NPIs under 'surprised'. The obligatoriness of the additional implicature (134) as a result of the NPI in (130) remains unexplained under the DE theory.

5.1.2. '*After*'. Another expression which licenses NPIs but which is not DE is 'after'.

The NI theory account. Under the NI theory, NPIs are acceptable in 'after'-clauses only when there is an appropriate NI available. Thus the NPIs in (142), (143a), and (144a) sound acceptable, because of the availability of the italicized NIs. The tendency to 'close down' the previous situation associated with the expressions 'long after' or 'years after' (but not 'seconds after') gives rise to the NI appropriate for NPI licensing.

- (142)(a) She persisted long after she had **any** hope **at all** of succeeding.

- (b) She persisted for years after she had **any** hope at all of succeeding.
She persisted (even) when she didn't have any hope of succeeding.
- (143)(a) The mad general kept issuing orders long after there was **anyone** to obey them.
The mad general kept issuing orders (even) when there wasn't anyone to obey them.
- (b) *The mad general kept issuing orders seconds after there was **anyone** to obey them.
- (c) He kept juggling the pinball machine seconds after there were **any** balls left to play.
He kept juggling the pinball machine (even) when there weren't any balls left to play.
- (144)(a) He kept writing novels long after he had **any** reason to believe they would sell.
He wrote novels even (when) he didn't have any reason to believe they would sell.
- (b) *He kept writing novels long after he retired to **any** Caribbean island.
- (145) *She felt sick after she drank **any** of that wine.

In contrast, the other sentences lack such implicature and are consequently unacceptable. Why they do lack this implicature is an interesting but separable issue. The NI theory claim is simply that NPI acceptability *requires* that such implicature be available; the reader may verify, by eliminating NPIs from the acceptable sentences above, that the relevant NIs are available (although no longer obligatory).

The availability of the appropriate NI is obviously a matter of pragmatics. The acceptability of (143c), pointed out by one of the referees, contrasts nicely with the unacceptable (143b): in the domain of pinball, 'seconds after' constitutes a significant interval. Thus it is the pragmatic equivalent, in this domain, of 'long after', with the resultant availability of the italicized NI.

The requirement that the NI strengthen the host sentence seems met in these cases: if, for simplicity, we consider only the claim about the relative ordering of *P* and *Q* in '*P* after *Q*', it would seem that an NI 'when *P* occurred, *Q* was not the case anymore' establishes this order more explicitly than the host sentence itself.

The DE theory. Under the DE theory, what is relevant to NPI licensing is the DE-ness of the trigger. Despite the acceptability of NPIs in

certain of the sentences above, it is clear that 'after' is not DE: (146a) below does not entail (146b).

- (146)(a) She became ill long after eating a contaminated vegetable.
 $\text{---} \not\rightarrow$
 (b) She became ill long after eating contaminated kale.

Consider the following scenario. The unfortunate woman eats a contaminated carrot in 1964, becomes ill in 1967, and eats contaminated kale in 1970. In this case, (146a) is true, assuming that three years qualifies as a long interval; but (146b) is not. Thus 'after' is not DE, despite its ability to trigger NPIs, and the sensitivity to negative implicature of NPIs in this context provides additional support for the NI theory.

5.1.3. *Only*. 'Only' licenses NPIs both outside and inside its focus, as in (147) and (148) respectively.

- (147) Only John has **ever** been there.
 (148) Only the students who had ever read **anything** about phrenology attended the lectures. (= (117) in Ladusaw, 1980)

The NI theory account. As discussed in Section 2.3.2 above, both (147) and (148) actually entail (under some analyses of 'only') the appropriate NIs: ' $Ax(\text{NOT}[x = \text{John}] \rightarrow \text{NOT}(P(x)))$ ', where the NPI is contained in *P*.

The DE theory. The DE theory accounts easily for the licensing of NPIs outside the focus of 'only', as in (147). Clearly, for example, (149a) below entails (149b) on this analysis of 'only' (which Ladusaw adopts); recall that the implicature that John actually did walk is to be ignored in evaluating the relevant entailments. If no one who was not John walked at all, then no one who was not John walked slowly.

- (149)(a) Only John walked. \rightarrow
 (b) Only John walked slowly.

However, the cases of NPIs in the focus of 'only', as in (148), seem problematic for the DE account. For example, consider the relationship between (150a) and (150b): surely the former does not entail the latter. Nevertheless, the NPI is acceptable in (151).

- (150)(a) Only people who have had a debilitating illness themselves can appreciate what an ordeal this was.
 (b) Only people who have had polio can appreciate what an ordeal this was.

- (151) Only people who have **ever** had a debilitating illness themselves can appreciate what an ordeal this was.

To say that no one who has never been seriously ill could appreciate some event is a much weaker claim than to say that no one who has never had *polio* could appreciate this event. But if ‘only’ is not DE with respect to a relative clause in its focus, why are NPIs acceptable in this position, as in (148) and (151)?

5.1.4. *Exactly*. NPIs are sometimes licensed in sentences such as (152):

- (152) Exactly four people in the whole world have **ever** read that dissertation: Bill, Mary, Tom, and Ed.

The NI theory and the DE theory provide different accounts of this phenomenon.

The NI theory account. The use of ‘exactly QP’ implicates ‘only QP’, and hence the NI for (152) might be said to be the same as for ‘only’:

- (153)(a) Everyone who is NOT Bill, Mary, Ed, or Tom has not **ever** read that dissertation.

NPI acceptability in such contexts decreases with the magnitude (context determining what counts as large) of the number expression modified by ‘exactly’. It is pragmatically strange to bank on an implicature of ‘only QP’ from a large QP, and hence contextually large numbers do not license NPIs.

The DE theory account. Under the DE theory, the acceptability of (152) requires that ‘exactly’ be DE. But, of course, it isn’t, as demonstrated by the failure of (154a) to entail (154b):

- (154)(a) Exactly four people in the whole world have heard a dolphin recite poetry: Bill, Mary, Tom, and Ed, —/→
 (b) Exactly four people in the world have heard a dolphin recite Greek poetry: Bill, Mary, Tom, and Ed.

5.1.5. *Other non-DE licensing environments.* NPIs are used quite productively in English; they are not tied to specific lexical items as triggers. In (155), for example, the acceptability of the NPI cannot be accounted for by the DE theory, since, as demonstrated by (156), no DE operator appears to be available. There is, however, an obvious NI: ‘It’s likely that there isn’t anything illegal about what he did.’ And the requirement that the NI strengthen the host sentence seems met: if it’s

likely that NOT *P*, then one will certainly need substantial evidence to support a claim of *P*.

- (155) If you're going to convict him, you'll need hard evidence that there's **anything** illegal in what he did.
- (156) If you're going to convict him, you'll need evidence that he stole a car —/→
If you're going to convict him, you'll need evidence that he stole a 1968 Saab.

5.1.6. *Non-DE triggers: summary.* Ladusaw proposes the DE requirement as a necessary condition on NPI acceptability: thus any cases of NPI licensing in which the trigger is not DE represent counterexamples to his claim. In this section I have argued that adversative predicates such as 'surprised' are not DE in any logical sense, and can be distinguished from predicates which do not trigger NPIs only by reference to clearly pragmatic factors such as the availability of a 'conditionalized' interpretation, which may itself derive from negative implicature of the sort invoked in the NI theory. Similarly, 'after', 'exactly', and other non-DE expressions have been shown to license NPIs; and the ability of 'only' to license NPIs in its focus is also unaccounted for on the DE theory. In all of these cases, NIs of the sort invoked by the NI theory appear to be available in the acceptable cases and unavailable in the others.

5.2. *NPI unacceptability in the scope of DE expressions*

Recall that the DE condition is stated as a necessary rather than a sufficient condition on NPIs: 'A negative polarity expression is acceptable *only if* it is interpreted in the scope of a downward-entailing expression'. The question of whether the DE condition is also a *sufficient* condition is not addressed explicitly in Ladusaw (1980, 1983). His claim that 'the property of being a trigger is completely predictable from the truth-conditional meaning of an expression' (1980, 162) tends to implicate the stronger claim that NPI acceptability is a function of truth-conditional meaning alone. And although he describes the DE condition only as a necessary one (1983, 385), it is clear that the considerable appeal to his analysis rests upon its ability to define the core cases of NPI licensing in truth-conditional terms.

In fact, Ladusaw himself appears to regard insensitivity to (negative) implicature as a feature of his core cases of NPI licensing. He observes

that our two theories agree in their characterization of negation as a core case of an NPI licenser, but differ on the issue of what other expressions are included in the set of core cases. I have argued above that negation is the core licensing expression, that all other licensing is derivative. In contrast, Ladusaw includes in his set of core cases not only 'not' but a wide variety of other expressions, and accords no special status to negation as the primary trigger. And in Ladusaw (1983), he appears to suggest that the core cases of NPI licensing ought not to be sensitive to implicature.²²

Thus although the most serious counterexamples to his analysis are cases of NPIs triggered by expressions that are not DE, such as those considered in the previous section, there is another set of cases that are problematic for the DE account: expressions which are DE but which nevertheless license NPIs only under certain conditions of use. In this section I argue that NPIs in the scope of DE operators demonstrate the very sensitivity to *negative implicata* that Ladusaw denies. The cases considered here include 'at most QP' the non-immediate scope of negation (5.2.2), comparatives (5.2.3), 'before' (5.2.4), conditionals (5.2.5), and relative clauses (5.2.6).

5.2.1. 'At most QP'. We may begin with Ladusaw's example of 'at most three' as an expression which licenses NPIs in its scope without sensitivity to implicature. Sentence (157) demonstrates that NPIs may be acceptable in the scope of this expression:

- (157) At most three people in this room have **anything** coherent to say about Cantonese reversible verbs.

Under the NI theory, 'at most QP' is acceptable perhaps because it implicates 'only QP'. (Recall the discussion in Section 5.1.4 of 'exactly NP' as a trigger.) That is, (157) may be used to indicate that a significant number of people do *not* have anything coherent to say on the matter of Cantonese reversible verbs. Under the DE theory, in contrast, the acceptability of NPIs in such sentences is a function of the downward-entailment properties of this expression, and does not require any such negative implicature. But, in fact, 'at most QP' does *not* license NPIs unless QP represents a small number within the domain under consideration. Thus the differing acceptability of (158b) and (158c) in contrast to (157) and (158a) remains unexplained on the DE theory.

- (158)(a) At most 1 out of 100 linguists has **anything** coherent to say about Cantonese reversible verbs.

- (b) *At most 3 out of 3 linguists has **anything** coherent to say about Cantonese reversible verbs.
- (c) *At most 99 out of 100 linguists has **anything** coherent to say about Cantonese reversible verbs.

5.2.2. *The non-immediate scope of negation.* Consider first the licensing of NPIs in the non-immediate scope of negation: in negated 'because'-clauses and in complements of negated verbs. Despite the fact that NPIs in these environments are in the scope of a DE operator, their acceptability depends crucially upon negative implicature.

Negated 'because' clauses: Recall from Section 2.1 the contrast between (70) and (71), repeated below as (159) and (160). This difference was attributed to the availability of an appropriate NI ('Dogs don't have any auditory sensory organ that we don't') for (159) but not for (160) (the corresponding NI, 'Dogs don't have any eyes', being unavailable on the basis of real world knowledge).

- (159) Dogs don't hear because they have **anything** that we don't. Like us, they have ears.
- (160) *Dogs don't hear because they have **any** eyes. They hear because they have ears.

The DE theory cannot handle these distinctions. Thus (161) below, under the reading in which the negation operator has wide scope with respect to the 'because'-clause, entails (162): if eyes are not the cause of dogs' hearing, then neither are lidded eyes.

- (161) Dogs don't hear because they have eyes. →
- (162) Dogs don't hear because they have lidded eyes.

(Recall that we must ignore any positive implicatures in evaluating these entailments.) Thus subset-for-superset substitution is possible in the (non-immediate) scope of the negation operator, but NPI acceptability in this environment is dependent upon the availability of negative implicature. Under the DE theory, (159) and (160) should be equally acceptable.

NPIs in complements of negated verbs. It is widely observed that NPIs embedded in the complements of negated verbs vary widely in acceptability, as in (163)–(165) below:

- (163) I didn't realize that there was **any** food in the refrigerator.
- (164) I didn't say that there was **any** food in the refrigerator.
- (165) *I didn't add that there was **any** food in the refrigerator.

Although judgments may vary on such sentences, (165) sounds significantly less acceptable than (163) or (164).²³

Since NPIs embedded under a matrix negation are not in the immediate scope of negation, they must be licensed by an appropriate NI. (163) seems to carry the implicature 'I thought that there was not any food in the refrigerator', and the NPI is acceptable despite the positive (factive) implicature that there was food in the refrigerator. Similarly, (164) carries an implicature such as 'I left open the possibility that there would not be any food in the refrigerator'. In contrast, (165) seems not to carry any such implicature, with or without the negative polarity item. I do not have a predictive account of why this should be so. Nevertheless, we see here again that NPI acceptability correlates with the availability of negative implicature.

The DE theory cannot account for these contrasts, since in (163)–(165) the NPI falls in the scope of a DE operator ('not'); and, furthermore, the three sentences seem not to differ in their entailment properties. All three would seem to allow substitution of 'Thai food' for 'food'. And even if we were to restrict NPIs to the *immediate* scope of a DE operator, we would not be able to distinguish between (163)–(164) and the unacceptable (165).

Note also that we cannot appeal to a two-stage analysis with downward entailing operators rather than negation as the paradigm triggers, given that the same sensitivity to negative implicature characterizes the licensing of NPIs in the immediate scope of DE operators such as comparatives and 'before', to be described below; and in the immediate scope of the allegedly DE operators examined in Section 5.1.

5.2.3. *Comparatives*. NPIs are frequently acceptable in comparative clauses, as in (166) below.

(166) Cows fly more often than John **lifts a finger** to help Louise.

The simplest NI account of NPI licensing in such sentences²⁴ would seem to invoke an NI such as 'John usually doesn't lift a finger to help Louise'. (The 'strengthening' requirement seems met here: if 'NOT *P*', then '*Q* more often than *P*' is likely to be true.) Given the infrequency of cow flight, (166) may be used to convey this implicature. But since the sun comes up too frequently to give rise to this implicature, real world facts render the structurally identical (167) unacceptable:

(167) *The sun rises more often than John **lifts a finger** to help Louise.

Similarly, NPIs sound acceptable in (168) below because of the available implicature ‘You usually don’t budge an inch from that chair’, given the rarity of state visits to Mongolia; in (169), by contrast, the comparative is used simply to state the relative frequency of two events of unknown frequency and therefore does not give rise to this required implicature.

- (168) U.S. presidents go to Mongolia and back more often than you **budge an inch** from that chair.
 (169) *In this study of family interaction, the baby cried more often than the mother **budged an inch** from her chair.

Thus once again, it appears that NPI acceptability depends crucially upon aspects of sentence meaning that seem to have no bearing on truth conditions.

And yet the comparative operator in all four sentences is *logically* DE, as demonstrated by Hoeksma (1983). Thus (170) below logically entails (171) and (172) logically entails (173), granting any positive implicatures that might tend to cloud intuitions. That is, in order to evaluate this entailment, we must consider only worlds in which the mother sometimes did get up slowly.

- (170) The sun rises more often than John eats bread. →
 (171) The sun rises more often than John eats raisin bread.
 (172) In this study of family interaction, the baby cried more often than the mother got up. →
 (173) In this study of family interaction, the baby cried more often than the mother got up slowly.

Thus again, NPI acceptability in the scope of a DE operator seems nevertheless to be a function of the availability of an NI; that is, of conditions of use as well as truth-conditional properties.

5.2.4. ‘*Before*’-clauses. Similarly, NPIs in ‘before’-clauses appear to require negative implicature. Thus (174) sounds acceptable because it may be used naturally to convey that ‘the mule didn’t budge an inch until we kicked it; it took our kicking to get it moving.’ That is, a possible account of NPI licensing in this context is that the NI of ‘*P* before *Q*’ is ‘(NOT *Q*) unless *P*’, given the overtones of causality. (Such an NI would also meet the strengthening requirement described in Section 2.2.) In contrast, the most natural use of (175) is simply to describe a sequence of events, one of which preceded the other, rather than to express the proposition that ‘The mule didn’t budge an inch until it had sighed’. This is simply an unlikely message. However, (176) may felicitously be used to

express a sequence of causally related sighing and moving, since it implies 'The owner didn't budge an inch until the mule had complained for hours'. The NPI sounds acceptable as a result.

- (174) We had to kick the mule hard before it **budged an inch**.
 (175) *The mule sighed before it **budged an inch**.
 (176) The mule sighed piteously for hours before the heartless owner **budged an inch**.

Thus again NPI acceptability seems tied to negative implicature.

Clearly, however, 'before' is a DE operator, given the entailments in (177) and (178) below. (Recall that it is necessary to neutralize the implicature that the sentence in the 'before'-clause is true; in order to evaluate the entailments, it is necessary to grant that in both cases the mule really did move rightward.)

- (177)(a) We had to kick the mule hard before it moved. →
 (b) We had to kick the mule hard before it moved rightward.
 (178)(a) The mule sighed before it moved. →
 (b) The mule sighed before it moved rightward.

Thus once again we see that occurrence in the scope of a DE operator is no guarantee of NPI acceptability.

5.2.5. *Conditionals*. Despite the elegance of the DE analysis of polarity licensing in the antecedent of conditionals, this too is an environment in which NPI licensing is sensitive to aspects of sentence use, not merely to truth-conditional properties of the host sentence.

R. Lakoff (1969) observed that NPIs sound considerably more appropriate in conditionals used as threats than in conditionals used as promises; thus contrast (179) with (180), and (181) with (182).

- (179) If you contribute **a red cent** to those crackpots, I'll never speak to you again.
 (180) *If you contribute **a red cent** to those crackpots, you'll get yourself nice tax deduction.
 (181) If you drink **any** water, you'll get dysentery.
 (182) *If you drink **any** water, you'll feel better.

The NI theory account. In the case of direct threats such as (179), the NI theory can account for NPI licensing on the basis of, perhaps, the relation between $P \rightarrow Q$ and $(\text{NOT } P) \vee Q$, which, with an exclusive interpretation of 'or', is reflected transparently in threats: 'either you

don't contribute a red cent to those crackpots or I never speak to you again'. A comparable paraphrase of the unacceptable (180) sounds infelicitous.

Indirect threats such as (181) seem less amenable to such a paraphrase; but the contrast between (181) and (182) might still be accounted for as a means of 'highlighting' the negativity of *P*, the implied choice between NOT *P* and *Q*.

But NPIs also occur in conditionals which do not express threats. The NPI in (183), for example, seems to highlight the contrapositive entailment: 'if he doesn't take his cat to the vet, then he doesn't give a damn about it.' On the NI account, this entailment must be conversationally relevant in order for the NPI to be acceptable.

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

In other cases, NPIs in conditionals of the form $P \rightarrow Q$ seem licensed merely by the possibility of NOT *P*; or, more precisely, by the speaker's allusion to a belief that NOT *P* is possible:

(184) If he has **ever** been there, he can tell us about it.

But if context suggests that the speaker does not believe NOT *P* to be true, if the conditional cannot be construed as a threat, or if the contrapositive entailment is not appropriately 'highlighted', then NPIs are unacceptable. In addition to the unacceptable (180) and (182), consider the contrast between (185) and (186) below. Since (185) tends to implicate *P* rather than NOT *P*, there is no available NI to license the NPIs.

(185) If you think John had fun, you should have seen Fred!

(186) *If you think John had **any** fun, you should have seen Fred!

Under the NI theory, then, NPIs may be licensed in conditionals by a variety of NIs. A conditional $P \rightarrow Q$ may be taken as a threat ('either NOT *P* or else *Q*'), or the contrapositive entailment may be salient ('if not *Q* then NOT *P*'), or the occurrence of NPIs may simply highlight the contingency, emphasize the speaker's belief that NOT *P* is possible.

Under the DE theory, NPIs in 'if'-clauses are licensed because 'if' is a DE operator. Heim (1983) observes that certain paradoxes arise from the treatment of 'if' as expressing material implication; however, even if we grant that 'if' is in fact a DE operator, the sensitivity to negative implicature remains unaccounted for under a strictly truth-conditional account.

5.2.6. *Relative clauses.* NPIs are acceptable in relative clauses embedded under universal quantifiers, as in (171) below.

(171) Anyone who **budged an inch** was shot.

Under the NI theory, the acceptability of NPIs in this position is treated as a subcase of licensing under conditionals, given the translation of (171) as $Ax(P(x) \rightarrow Q(x))$. That is, a licensing NI 'NOT *P*' may be available because of an implied threat ('Everyone was subject to the threat: "don't budge an inch or you will be shot".') Or the contrapositive may be highlighted, as in (172), which may be paraphrased 'if someone doesn't know that English is an SVO language, he doesn't know a damn thing about it'.)

(172) Anyone who knows a **damn thing** about English knows that its an SVO language.

But if no such NI is available, then NPIs are not acceptable in this environment.

(173) *Each man who **budged an inch** was a member of the 33rd Division.

The DE theory account. Under the DE theory, NPIs should be acceptable in this context regardless of the availability of an appropriate NI. The DE properties of 'each' are illustrated below: (174a) entails (174b).

(174)(a) Each man who moved was a member of the 33rd Division, →
(b) Each man who moved rightward was a member of the 33rd Division.

Thus again we see that NPIs may unacceptable in the scope of DE operators; that the availability of specifically negative implicata plays a role in NPI licensing.

Clearly, the NI theory as developed here remains frustratingly unalgorithmic. Under what circumstances is the relevant negative implicatum salient enough to license NPIs? But the very sensitivity of NPIs to the availability of an NI, however we account for this availability, provides counter-evidence to Ladusaw's claim that a grammar which computes interpretations as well as LFs will be able to account for the distribution of NPIs in English.

5.3. *Summary of Section 5*

The DE theory and the NI theory have been compared across a wide, although not exhaustive, range of data. I have argued that it is not possible to provide a purely semantic account of NPI licensing in terms of downward entailment. Some expressions which license NPIs are not downward-entailing operators at all; and even in the scope of DE operators, NPI acceptability appears to be dependent upon the presence of negative implicature, or upon the conversational relevance of highlighting a negative entailment.

6. CONCLUSION

The aim of this discussion has been to clarify the analysis of negative polarity items in English, and in particular to explore the implications of this phenomenon for the relationship between grammar and meaning.

Over the years, negative polarity expressions have provided something of a Trojan horse for the importation of semantic and pragmatic constraints into sentence grammar, given the apparent ungrammaticality of sentences containing unlicensed NPIs.

I have argued that NPIs do indeed provide evidence that grammatical processes are sensitive to certain aspects of meaning: namely, to those aspects of logical structure that are expressible in the vocabulary of a level of grammatical representation such as the 'LF' of the Extended Standard Theory or the 'disambiguated representations' of Montague grammar. For NPIs are lexically marked with a contextual feature (the Immediate Scope Constraint) of immediate adjacency to negation in LF. The fact that a class of lexical items is marked with a feature which can only be stated in the vocabulary of a level of representation at which scope is explicitly expressed supports the view that the scope of logical elements plays a role in grammatical processes.

Under the analysis that I have proposed, the sole grammatical expression of the constraint on NPIs is the Immediate Scope Constraint. By virtue of this constraint, I have argued, an NPI contributes to the sentence in which it occurs the conventional implicature that the sentence is being used to convey some proposition in whose lexical representation the NPI does occur in the immediate scope of negation. If this requirement is met outside the LF of the host sentence, then it may be said that the NPI has triggered an 'allusion' to the sentence in which the Immediate Scope Constraint is met.

The constraints on this process are plainly extragrammatical: we have

seen that the NI by virtue of which NPIs are licensed is in many cases a conversational implicature, one which may be rendered unavailable by explicit denial, by conflict with known facts about the world, or by constraints on sentence use. Thus negative polarity licensing reflects the interplay between syntax and pragmatics.

In contrast to this analysis, Ladusaw argues that the distribution of NPIs may be predicted on the basis of certain entailment properties of expressions which license NPIs. He argues further that the success of his downward-entailment analysis of negative polarity would argue against the view that the grammatical representation of meaning is limited to the 'syntactic' level of LF, since only a grammar which actually computes truth-conditional meaning will be able to filter polarity items on the basis of downward entailment.

I have argued above that this notion of 'downward entailment' does not, in fact, capture the phenomenon; and that the vocabulary provided by the REST notion of logical structure is indeed appropriate to the expression of grammatical constraints on the distribution of these expressions.

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NOTES

¹ The discussion below is restricted to negative polarity 'any', which is treated here as an existential quantifier. This analysis is proposed in Horn (1972), Fauconnier (1975b), Ladusaw (1979), Carlson (1980), and Linebarger (1980a, b). Others, notably Hintikka (1977, 1980) and Quine (1960), have held that 'any' represents a wide scope universal quantifier.

² 'Too' is an NPI in the usage which is not paraphraseable as 'excessively'. See Note 16 below.

³ 'Until' is a negative polarity expression when it occurs with punctative verbs; compare (ii) and (iii) below.

- (i) John slept **until** noon.
- (ii) *John woke up **until** noon.
- (iii) John didn't wake up **until** noon.

⁴ 'Only' does not generally license NPIs in its focus; thus (i) below is unacceptable. NPIs in the focus of 'only' are discussed further in Section 5.

- (i) *John only drank **any** water, not wine.

⁵ See also the treatment of negation in Jackendoff (1969, 1972).

⁶ Safir (1982) argues that the *minimal* scope of negation is its *S*-structure scope; this seems incorrect, given that the interpretations available for sentences such as (22) include readings such as (23b), in which ‘many’ has wide scope with respect to the (c-commanding) negation. And while this wide scope reading *may* be associated with an intonational break, it need not be.

⁷ For an example of scope ambiguities between ‘because’ and quantifiers, consider (i) below, which seems to have readings (ii) and (iii).

- (i) He stole two cars because he was bored.
 (ii) CAUSE [he was bored] TWO_x [he stole *x*]
 where x = a car
 ‘The reason for his going out and stealing two cars was that he was bored.’
 (iii) TWO_x CAUSE [he was bored, he stole *x*]
 where x = a car
 ‘There were two cars which he stole out of sheer boredom
 (. . . the others he stole out of greed).’

⁸ Note that sentences such as (53) rule out a possible *S*-structure explanation of the loss of the wide scope reading in (47) and the unacceptability of (48)–(50): one might claim that NPIs themselves block further rightward spread of negation, on a feature-based account, or that they block raising of the negation operator, on a QR account; in either case, the effect would be to prevent the ‘because’-clause from being negated. However, (53) shows that the mere presence of ‘any’ in the VP does not prevent the ‘because’-clause from being negated.

⁹ Note, incidentally, that sentences with the logical structure ‘not *S*₁ because *S*₂’ need not be interpreted in this way, with the implication that *S*₁, the matrix clause, is in fact true. Consider (i), for example.

- (i) I’m not a woman because I don’t want to shoot birds.

In this sentence, uttered by Oliver Mellors in *Lady Chatterly’s Lover*, it is the ‘because’-clause (‘I don’t want to shoot birds’) that is taken as given, and, in uttering (i), Mellors denies that *S*₂ (not wishing to shoot birds) has as a consequence *S*₁ (being a woman). Nevertheless, the negation still has wide scope over the ‘because’-clause if the acceptability of a positive tag (as in (ii)) can be regarded as evidence for wide scope; and there would seem to be no justification for providing distinct LFs to these different usages.

- (ii) I’m not a woman because I don’t want to shoot birds, am I?

¹⁰ A proposal somewhat similar to (57) is made in Kempson (1984).

¹¹ See, e.g. Horn (1969), Fraser (1971), Anderson (1972), Stalnaker (1974), and Fauconnier (1975a).

¹² Note, incidentally, that the decision to allow entailments to function as NIs blurs the distinction between cases of licensing by part (a) and licensing by part (b). An NPI in a sentence which satisfies the Immediate Scope Constraint might be said to satisfy part (b) by its entailment of itself, the LF in which the ISC is satisfied being in this case the same as the LF of the host sentence. The notion of allusion arises when this is not the case. The relation between parts (a) and (b) is discussed further in Section 3.2 below.

¹³ The discussion in this section is, of course, in conflict with analyses of polarity ‘any’ as a universal quantifier taking wide scope over negation (see references in Note 1) or as a flagged variable (Hornstein, 1984; Aoun, Hornstein, and Sportiche, 1980).

¹⁴ One also might ask whether modals and temporal operators similarly intervene. That is, are we to treat (i) below as a case of part (b) licensing?

- (i) I can’t budge an inch.
 NOT CAN (. . . budge . . .)

Since the licensing NI is so clearly available in such cases, I have no evidence to offer on the issue.

¹⁵ The data, unfortunately, are less clearcut than one might wish; for example, (i) below seems acceptable with AtF intonation, despite the presence of the NPI 'ever'.

- (i) No, you're wrong . . . JOHN hasn't ever been to Turkey, it was MARY who went on that trip.

¹⁶ Ignore the 'external negation' reading which preserves the inference properties of *P*.

¹⁷ Just as 'scalar endpoint' NPIs may represent the frozen forms that develop from this pragmatic process of downward implicature, so other types of NPIs appear to be frozen forms which have developed from other sorts of habitual association with negation: there are, for example, NPIs of 'understatement' ('I'm not **too** pleased'); NPI subcategorizations of verbs ('**need** go' vs. 'need to go'; '**dare** leave' vs 'dare to leave'), and so forth. See Linebarger (1980a).

¹⁸ It is argued in Linebarger (1980) that this pragmatic downward implicature also requires the immediate scope of negation at LF or an associated NI.

¹⁹ Ladusaw (1983), p. 385.

²⁰ Ignore the reading 'any green vegetables that there might have been' ('whatever green vegetables there were').

²¹ In Ladusaw (1979), a stronger claim is made: 'NPIs are appropriate in structures in the scope of a downward-entailing expression'.

²² Ladusaw's discussion of this matter centers around the licensing of NPIs in comparatives. Ladusaw takes note of an observation in Linebarger (1980) that NPIs are licensed by comparatives only when the appropriate NI is available, and remarks:

The question is simply this: Is the licensing of negative polarity items by such polarity reversing expressions as 'rarely', 'few', 'if', and 'at most three' more like cases of licensing by 'not', *as expected on my analysis*, or more like [these cases of implicature-based licensing under comparatives], as Linebarger claims? [1983, 389: emphasis added]

He asserts later in the discussion that polarity licensing expressions such as 'rarely', 'few', and 'at most three'

. . . show no sensitivity to the use to which sentences containing them may be put. They always license negative polarity items in their scopes. [1983, 390]

These remarks are made in the context of Ladusaw's observation that the failure of negation to trigger NPIs in denial sentences (discussed in Section 3.2 above) suggests that, under the NI account, part (a) licensing is no less sensitive to pragmatic influences than part (b). This would argue against the claim in Linebarger (1980) that the ISC is a sufficient condition on NPI acceptability. I agree with Ladusaw on this point, as discussed above.

²³ The possibility of a 'neg-raised' interpretation seems not to be at issue here, although 'strict' NPIs such as 'until' generally are restricted to the complements of neg-raising verbs in such cases (Horn, 1978; Horn and Bayer, 1984).

²⁴ These cases are considered in greater detail in Linebarger (1980a).

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