

Interpreting Accent

draft

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This paper grew out of a reaction to Elisabeth Selkirk's contribution to the Handbook of Phonology (Goldsmith 1996). Section 1.2 of that article is concerned with syntactic and semantic aspects of the placement of pitch accents in English. As will be seen in the data to be presented below, the constellation of pitch accents in an utterance is determined in part by properties of the preceding discourse, including the distinction between new and old information. This means for example, that a phrase containing accent is appropriate in a different set of contexts than that same phrase unaccented. Since accents are assigned within words but the pragmatics can make reference to phrases, the following question arises. Given a word that is accented, which phrases count as containing accent as far as the pragmatics is concerned and which not? This question is known as the **projection problem**, though I have characterized it in slightly different terms than is normally done, for reasons to be made clear below. As Selkirk shows, projection is sensitive to argument structure and other syntactic notions (see Gussenhoven(1984), Rochement(1986), Schmerling(1976) and Selkirk 1984)).

In Selkirk's system, a sentence can have one or more foci and these foci are marked with an F in the syntactic tree. Focussing a phrase leads to a certain kind of semantic or pragmatic interpretation. The position of accent within the focus is spelled out in terms of additional F-markings embedded under the F that marks focus. Embedded F-markers induce their own pragmatic interpretation and are subject to syntactic constraints which capture the sensitivity to argument structure mentioned earlier.

There are a two claims that underlie Selkirk's theory which I wish to challenge here. They are:

- (1) a. Focus and projection are governed by different pragmatic and syntactic constraints.

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- b. The accent-discourse relation, what one might call the phonology-semantics interface, is mediated through a syntactic structure in which there are F-markers. Constraints of a purely syntactic nature govern the placement of F-markers. The syntax of English therefore needs to make reference to F-marking.

In arguing against (1a), I will be claiming that the pragmatic factors that determine the position of accent within a focus (new/old information), also come into play in the interpretation of the focus itself. This means that I will not adopt the idea that:

- (2) "the basic function of Focus is to introduce a set of alternatives into the discourse" (p553)²

It also will mean that, for the data I will be looking at, the focus/non-focus distinction plays no role in the grammar. What matters is what represents new information and what doesn't. "new" is meant in it's relative sense. It doesn't simply mean information that hasn't been mentioned before.³ Spelling out this relative sense of novelty will be key to appreciating its role in accent placement.

Sections 1 and 2 of this paper are taken up with standard types of examples showing how intonation is controlled by prior discourse. In section 2, I try to show why researchers have tended to keep the projection problem and the semantics of focus separate. These two sections are meant primarily for readers who are less familiar with work in this area. In section 3, contrastive focus is analyzed. The theory presented there is very similar to what is found elsewhere, though it differs in ways that will allow for an explanation of projection phenomena as well (sections 4-7). The analysis is extended to question-answer discourse (section 8) via a process called insinuation. A speaker insinuates one meaning into the discourse by mentioning another closely related one. The process of insinuation is spelled out in terms of generalized entailment.

1. Discourse Phenomena Affecting Intonation

Halliday(1967) took intonational prominence to be an indication that the material

²Rooth(1985,1992) is cited for details on "how these alternatives are used in the semantics of various constructions." In the theory of Rooth(1992), focus constitutes part of a complex anaphor. This anaphor requires the presence of alternatives in the discourse, it doesn't introduce them. This is much closer to the picture that will emerge here.

³Roughly the sense used in "My bike has a new light" spoken by someone who buys a old light in a garage sale and attaches it to his bike.

was either (i) "replacing the WH-element in a presupposed question" (226), (ii) "contrary to some predicted or stated alternative" (206) or (iii) "textually and situationally non-derivable information". The following subsections illustrate these three factors.

I. Q&A

The position of prominence in the examples in (3-4) follows from the generalization in (5). Here and throughout capitals letters indicate the presence of an H* accent and material in curly brackets is meant to supply previous discourse.

(3) {Who did John call?}
He called BILL

(4) {Who called John?}
BILL called him.

(5) Q/A Generalization: In a question-answer pair, prominence appears on the part of the answer that corresponds to the Wh phrase in the question.

II. Contrast

The examples in (6-7) are instances of **contrastive focus** in which prominence marks the part of the utterance that is "contrary to some predicted or stated alternative". (7) indicates that contrastive focus is not restricted to corrections.

(6) {John's mother chose Bill.}
no, she chose JOHN

(7) {Bill chose John's mother and then}
JOHN chose her.

III. Information Status (Novelty, Givenness) and Deaccenting

Compare the continuations in (8a-b)

(8) {John's cat meowed and then}
a. It scratched HANNA.
b. It SCRATCHED him.

The apparent 'shift' in prominence from the object in (8a) to the verb in (8b) is described as "deaccenting" (for discussion see Ladd 1980). The term derives from the impression that the accent was expected to fall on the object as in (8a) but since the object in this case represents given information, it is left unaccented and the accent moves to the verb. Although there are more pedestrian examples illustrating

the principle in (9) below, deaccenting phenomena present rather striking evidence. (10) is another example of this phenomenon.

(9) New information is accented, given information is not.

- (10) {Why did Gloria go to Irvine last week?}
- a. She went to see the Mayor of New YORK.
 - b. She went to see the MAYOR of Irvine.

2. The reduction problem: Generalizing one of the phenomena to cover the others

A question that now arises is whether the three phenomena illustrated in the last section can be assimilated into one or not. For now, I will be assuming that the question/answer effect can be assimilated to either or both of others. In a later section I will present a more serious account of question/answer pairs within a general theory of accent interpretation. As for the other two phenomena, in this section, I review the empirical obstacles to unifying them along with some intuitive hints about what goes wrong.

If one takes contrastive focus to be the central principle used to interpret accent, it becomes difficult to explain the position of prominence in deaccenting examples, such as (8) repeated below (see Ladd 1980:81ff):

- (8) {John's cat meowed and then}
- a. It scratched HANNA.
 - b. It SCRATCHED him.

Were these accents to be interpreted contrastively, we would expect the first to require a context of the form "it scratched X", and the second to require a context of the form "it (=the cat) Xed John". One might argue that in (8), the verb phrases are contrastive and in both cases we require a context of the form "it (=the cat) Xed", which we in fact have. There is no problem with that claim, however it still doesn't explain why the accent falls on the verb in b. and on the object in a.

A different approach involves Rooth(1992)'s notion of scope of focus, illustrated in the following pair:

- (11) {Max attacked Sally's father}
no, he attacked BILL's father.
- (12) {If Sally's father resigns), he'll attack BILL's father.

In both examples, a contrastive interpretation of the accent on *Bill* is possible. In both cases, *Bill* is contrary to *Sally*, to use Halliday's terminology. There is a difference,

however. In (11), the scope of the accent is the entire clause. The antecedent context looks just like the utterance itself, save the accented part. In (12), the scope of the accent is just the containing NP. *BILL's father* contrasts with *Sally's father* but we don't have an antecedent of the form "he'll attack X's father". Returning now to the example in (8b), we might say that the scope of the accent on the verb is very small, just including the verb itself. With such narrow scope, there is no problem fitting it into the discourse. For all we've said it could contrast with anything. The only thing missing now is an explanation for why the scope is on the verb in the first place. We also need to know why there is no similar scope and contrast in (8a). Similar questions arise in connection with the scopes in (11-12). Judging from the analysis of (11), I might have expected sentence scope for the accent in (12), leading thereby to infelicity and thus to a different choice of accent placement.

If we take the other position now, according to which information status (novelty/givenness) is the central concept, we have a problem explaining why *John* is accented in (6) below, even though it represents given information:

- (6) {John's cat licked Bill.}
no, it licked JOHN

Those who take information status to be central often respond to examples like (6) by pointing out that novelty is a relative notion and that *John* represents information that is novel relative to the context in which it appears (Prince1981:228). A problem with this view is that while *John* is in fact novel relative to "it licked ___", *it* is similarly novel in the context "___ licked John". Worse yet, this relative notion of novelty will undermine the explanation given for deaccenting. In (8b), *him* is novel relative to the context "it scratched ___". In effect, we would like to say *JOHN* is relatively novel in (6), but again we need a principled way to work that out so that we can somehow retain an absolute notion of novelty for (8b).

3. Intonational Background Matching

In the previous section we found that information status and contrast come close to covering the same ground but a gap remains. A slightly different perspective on contrast will allow us to bridge the gap. To that end, I want to begin with a somewhat graphic description of how speakers arrive at the accenting in (6) repeated below:

- (6) {John's cat licked Bill.}
a. no, she licked JOHN.
b. *no, SHE licked John.

Imagine a game in which one attempts to match the utterances in (6a-b) to the background, word by word and phrase by phrase (cf. Carlson 1984). In this game,

when no accent is involved, if the content of an expression is already present in the background, we say it has a match. If a word is accented, it counts as a wildcard: it matches anything. We begin with (6a). Assuming a context in which *she* and *John's cat* are coreferent, they will count as having the same content and so *she* has a match. *licked* has a match because its content was mentioned earlier. The accent on *JOHN* allows us to match it with anything. Having accented the object NP, we also gain a match for the verb phrase. If *JOHN* can match *Bill*, then *licked JOHN* can match *licked Bill* so we're safe there and similarly for the sentence. Since *JOHN* can match *Bill*, *she licked JOHN* has a match in the background. (6b) on the other hand is a miserable failure. The subject is a wildcard so it has a match, but that is it. No other word or phrase has a match. The device defined below will be used in formalizing the matching game just described:

(13) An **Intonational Background Matching** (IBM) is a function G such that:

- A. Domain of G consists of expressions of the language.
- B. Range of G consists of meanings that are *salient in the local context* (eg things recently mentioned, the speaker, the hearer)
- C. G can make a **random** assignment. In that case, the only requirement is that the meaning be in the range of G.
- D. G can assign a meaning in the **ordinary** way. For example,
 - i. for a word this would just be its standard meaning.
 - ii. For a complex phrase $[A B]_C$, this would be a meaning of the type normally associated with C (e.g. a verb phrase meaning, if C is verb phrase), arrived at by applying the ordinary compositional methods to the meanings G assigns to A and to B.

EXAMPLE:⁴

If $G(\textit{JOHN}) = \textit{Bill}$, and $G(\textit{licked}) = \textit{licked}$, then $G(\textit{licked JOHN}) = \textit{licked Bill}$

In B., I've used the term "salient in the local context". Whether or not a linguistic context is local will depend in part on what rhetorical relations it bears to the utterance being matched. Salience will depend on factors such as recency, frequency and grammatical relations (Allerton1978). This is not to imply that all meanings have to

⁴Italics are used to indicate mention. If there are no italics, the words represent their meanings. $G(\textit{JOHN}) = \textit{Bill}$, should be read: "Bill (himself) is the meaning assigned by G to the expression 'JOHN'".

be introduced linguistically. The accenting properties of deictic pronouns, for example, is explained by assuming the speaker and the hearer are salient in the local context. Later on, we will look at ways in which meanings can 'sneak' into the local context. None of these details will be crucial for the simple dialogues we are about to discuss.

For our purposes, meanings are not characters (Kaplan 1990) but rather whatever is determined by the character in the context. This entails that anaphora and ambiguity resolution precedes matching. If the character of a particular term determines a referent in a context, then for our purposes its meaning is its referent. All pronouns in the examples we will study fit into this category.

In D., I've given simple examples of the assignment of meaning in the ordinary way. This will suffice for the examples we will discuss, however the definition is meant to cover more elaborate methods of assigning meaning, such as variable binding or type-shifting. All that D requires is that the meaning assignment be guided by the standard rules, applied to the meanings already assigned to the relevant parts. Bear in mind that a meaning assigned in the ordinary way is not the same as the standard meaning. In the example above, *licked JOHN* is assigned a meaning in the ordinary way (for instance, by function argument application of $G(\textit{licked})$ to $G(\textit{JOHN})$) but the resulting meaning is not the standard meaning of that phrase (*licked John* doesn't have the meaning of *licked Bill*).

For any utterance/context pair there are many possible IBMs. They differ in the number of random assignments made. For example, some G' might use only random assignments assigning the meaning of Bill to every constituent in (6a). This is an impolite matching. If the background had contained nothing but Bill, one would have no choice but to use a function like G' . So using G' in (6) implies that you are ignoring previous context. In general, among the possible background matchings, the fewer the random assignments used, the more the function accurately represents preceding discourse. This observation leads to the following maxim:

- (14) **Attentiveness Maxim:** Assume a Background Matching function with the fewest random assignments possible.

The game outlined above can now be recast as follows. An utterance is selected and then a Background Matching is chosen. Relative to this function, accenting is governed by the rule in (15) below. $\|X\|$ is to be read "the standard meaning of X".

- (15) **Accent Placement Rule** (to be revised)
Relative to a Background-Matching function G :
- a. if a word X is accented then: $G(X) \neq \|X\|$.
 - b. if a word X is unaccented then: $G(X) = \|X\|$.

To pull all of this together, we return to our examples in (6). In order to keep track of the intended Background Matching, I will use an F to indicate where a random assignment is made:

- (6) {John's cat licked Bill.}
a. no, she licked [JOHN]_F.
b. *no, [SHE]_F licked John.

In the case of (6a) we have the following background matching:

$G([JOHN]_F) = \text{Bill}$
 $G(\textit{licked} [JOHN]_F) = \textit{licked Bill}$
 $G(\textit{she licked} [JOHN]_F) = \textit{she licked Bill}$

In (6b), I pretended we had a background matching that would use a random assignment just for [*she*]_F, but in fact that is impossible. Such a function would have to assign *licked John* to the expression *licked John*, for example, but *licked John* is not in the range of any background matching since it is not salient in the local context. Similar remarks apply to the assignment to the sentence. So such a background matching is impossible. I would like to claim that in fact the matching used in (6a) is the only one possible in this context. To see this note first that any matching will result in at least one random assignment. A background matching that used no random assignments would, among other things, have to assign the sentence its standard meaning but that meaning couldn't be in the range of a background matching. So at least one random is needed. On the other hand, we will not countenance any matching that uses two or more random assignments, since that would violate the Attentiveness Maxim, given that we have just shown it is possible to use just one. Barring violation of Attentiveness then, the accenting in (6a) is predicted by our Accent Placement Rule in (15).

The analysis given so far resembles in large measure existing accounts of contrastive focus. The matching idea is reminiscent of the approach in Carlson(1984) though it is meaning based, more along the lines of Rochemont(1986) for example. The Attentiveness Maxim does roughly the same job as the minimality clause in the Contrast Constraint of Schwarzschild(1994). Matching functions are a kind of secondary interpretation and as such resemble Rooth(1985)'s focus interpretation. Two important differences between background-matching and focus-interpretation are worth noting, however. First, when a matching function assigns a meaning, it must be something already present in the discourse, whereas a focus-interpretation assigns a set of meanings most of which will not be present in prior discourse. Perhaps a more important difference is that focus interpretations are constrained to assign meanings of the same type as the standard meaning, for a given expression. A random assignment, on the other hand, can assign any kind of meaning, so long as it is present in the background. These differences will play a role in explaining

deaccenting, something other accounts of contrastive focus do not attempt.

4. Explaining Information Status Effects.

We now turn to our deaccenting example, to see how the theory presented in (13-15) fares.

- (8) {John's cat meowed and then}
It SCRATCHED him.

We begin by matching the utterance in question. Since the meaning of *scratched* is new, it must get a random assignment (see 13 B, Di). The pronouns don't suffer this problem, so it looks as though they can get ordinary assignments. Next, consider the verb phrase. Assigning it a meaning in the ordinary way entails combining $G(\text{SCRATCHED})$ with John to get a verb phrase meaning that is present in the discourse. Since we're making a random assignment to *scratched*, any meaning can be assigned to it. Nevertheless, no meaning is available to do the job just mentioned. It follows then that the VP must also receive a random assignment. Marking the location of random assignments with F's we get:

- (16) It $[[\text{SCRATCHED}]_F \text{him}]_F$

As the assignments in (17) show, no more random assignments are necessary:

- (17) Background Matching for (8):
 $G(it) = \text{John's cat}$
 $G(him) = \text{John}$
 $G(\text{SCRATCHED}) = ?$ (meowed, John, cat, the speaker!, etc)
 $G([\text{SCRATCHED}_F \text{him}]_F) = \text{meowed}$
 $G(It [\text{SCRATCHED}_F \text{him}]_F) = \text{it meowed.}$

The question mark in the assignment to *scratched* is only meant to indicate that it doesn't matter what the assignment is, anything in the parentheses will do (and nothing in the parentheses will help to avoid the random assignment to the VP). This contrasts with the assignment to the VP. If we had chosen anything but meowed, we would have run into problems on the next level and this would have entailed the use of a third random assignment, in violation of Attentiveness. A similar situation arose earlier with *JOHN* in (6a). Nothing in the definition in (13) requires that it specifically be assigned Bill. However, if it hadn't been assigned Bill, the containing VP couldn't have been assigned a meaning in the ordinary way and so another random assignment would have been needed.

The upshot of all this is that the APR and the Attentiveness Maxim, invented to account for so-called contrastive focus, proved sufficient to explain a case of

deaccenting

5. Projection

Our accent placement rule repeated below makes the wrong prediction for examples like (18) in which there is no deaccenting.

- (15) **Accent Placement Rule** (to be revised)
Relative to a Background Matching function G:
- if a word X is accented then: $G(X) \neq \llbracket X \rrbracket$.
 - if a word X is unaccented then: $G(X) = \llbracket X \rrbracket$.

- (18) {John's cat meowed and then}
it $[[\text{scratched}]_F [\text{HANNA}]_F]_F$

The background matching for (18) works as in our previous example, with an additional random assignment needed for the object NP because it is novel. As in the previous example, the verb could not be assigned its standard meaning. But this means that (15b) incorrectly predicts accenting on *scratched*. Suppose we eliminate (15b):

- (19) **Accent Placement Rule** (to be revised)
Relative to a Background Matching function G:
- if a word X is accented then: $G(X) \neq \llbracket X \rrbracket$.

This removes the incorrect prediction concerning the verb, but then we have no explanation for why, if there is only one accent, it has to fall on the object noun phrase rather than on the verb. Instead of eliminating (15b), it needs to be modified to capture this difference between phrases and non-phrases. (15b) should be replaced with:

- (20) if a phrase XP is unaccented then: $G(XP) = \llbracket XP \rrbracket$.

For expository reasons, we will use the logically equivalent contrapositive:

- (21) **Accent Placement Rule**
Relative to a Background Matching function G:
Lexical: If a word X is accented then: $G(X) \neq \llbracket X \rrbracket$.
Phrasal: If $G(XP) \neq \llbracket XP \rrbracket$, then XP contains accent

In (18), the VP and the NP are both assigned non-standard meanings, hence they both require accent (Phrasal APR). Both the verb and the object are potential bearers of accent (Lexical APR). Accenting just the object satisfies all the phrasal

requirements. (21) allows for optional accenting of the verb which appears to be empirically justified (Selkirk 1984).

The APR (21) along with the Attentiveness Maxim now explain the data discussed under the heading of deaccenting and contrastive focus. Aspects of the theory will be discussed in the next two sections, but the theory will not be modified. An independent process will be introduced below to explain the question-answer data (section 8).

6. On the Nature of Attentiveness

Attentiveness (14) is a conversational maxim. As such, it enjoins the speaker to make a certain kind of choice from among alternatives the grammar makes available for the utterance in question. The maxim is violated if the speaker uses a background matching G when the grammar allows a G' which is better than G in the sense that it uses fewer random assignments. In the examples seen so far, this led to a unique choice. However, it is possible that the grammar allows two or more matchings that use the same number of random assignments. In this case there is a tie and the speaker is free to choose either. Conversational maxims are only as strong as the ordering they are based on. A relevant example is (22) below similar to one in Büring(1996):

- (22) {John drove the convertible that Felix liked, but what did Bill drive?}
- a. He [drove the convertible that [DONNA]_F liked]_F.
 - b. HE_F drove the convertible that [DONNA]_F liked.

In order to avoid the issues surrounding question/answer pairs, we consider a similar type of example with declaratives:⁵

- (23) {John was fixing the bike that Felix had ridden and Bill was fixing his car.}
- a. not true, [Bill was fixing the bike that [CATHY]_F had ridden.]_F
 - b. not true, [BILL]_F was fixing the bike that [CATHY]_F had ridden.

Due to its novelty, *Cathy* will have to receive a random assignment and we will take the value to be Felix. Considering (23a) first, the verb phrase and all of its parts (other than *Cathy*) can receive ordinary assignments as can the subject. The sentence cannot receive an ordinary assignment. Now considering (23b), if a random assignment is used for *Bill* and it is assigned John, then an ordinary assignment is possible for the sentence. Attentiveness has nothing to say about the choice between a. or b. since the same number of random assignments is employed.

⁵I am ignoring possible accents on *Bill* marking it as a topic or link (see Vallduví and Engdahl 1996).

Among the grammatical factors that delimit the alternatives considered by Attentiveness is the Accent Placement Rule. If an otherwise optimal background match yields an utterance that violates the APR, then this match is not considered. It is in the very nature of conversational maxims that they are 'post-grammatical'. This effect is seen in the following:

- (24) {John's mother saw Bill and then}
*she saw [her mother]_F

A match is possible in which Bill is assigned to *her mother* and in which no other random assignments are made. The Accent Placement Rule now requires accent in the object noun phrase and in phrases that contain it. The lexical part of the rule prevents the accenting of any of the words, hence this example is ungrammatical. So this match is not really possible after all. On the other hand, a match which involved the assignment of a non-standard meaning to either of the words in the object NP is possible⁶:

- (25) {John's mother saw Bill and then}
a. she saw [HER_F mother]_F.
b. she saw [her MOTHER_F]_F.

There is a one final aspect of Attentiveness that should be mentioned. Attentiveness selects among background matchings which are themselves sensitive to salience. A meaning may have been mentioned but for some reason is not salient, perhaps because of interference from parallel meanings. The maxim doesn't do any work here. Something that hasn't been noticed couldn't be ignored.

7. The APR and Focus.

The theory presented here doesn't make reference to "focus". The purpose of this section is to ferret out substantive aspects of this omission.

The term "focus" has a syntactic sense in which it refers to a constituent which is subject to certain kinds of special treatment by the grammar. Focus also refers to the interpretations that focussed phrases get. The theory outlined here doesn't make use of special syntactic markings, so it has no syntactic focus; more on this in a moment. As for the semantics, the APR distinguishes among constituents based on their meaning and their assignments by G. Below I will suggest that these distinctions do not in fact correspond to the difference between focus and non-focus in the

⁶This example and the fact that it allows two different accent patterns was brought to my attention by Mats Rooth.

semantic sense.

In the examples cited so far, I use F-markers to show where random assignments are made. These look very much like the syntactic markers that have been posited by Jackendoff(1972) and in subsequent work. Nevertheless, the F-markers crucially do not appear in the theory itself. There is no reference to F-marking either in the definition of a background matching or in the Accent Placement Rule, repeated here:

(21) **Accent Placement Rule**

Relative to a Background Matching function G :

Lexical: If a word X is accented then: $G(X) \neq \|X\|$.

Phrasal: If $G(XP) \neq \|XP\|$, then XP contains accent

In fact, without altering the theory considerably, the F-markers couldn't be used to restate things in a more modular way (i.e. with semantics and phonology interfacing independently with syntax). To see this, consider the following possible restatement of the phrasal part of the APR:

(26) Phrasal: If $G(XP)$ is F-marked, then XP contains accent.

Such a restatement will produce incorrect results in the following case:

(27) {The yellow robot stirred the soup and then}
the GREEN_F robot SERVED_F it.

In this example there is no XP that receives a random assignment. If (26) replaced the phrasal part of (21), it would not require any accent, much less two of them. On the other hand, without the amendment in (26), (21) requires accent in the NP and in the VP since they both receive a non-standard interpretation from G .

All I have shown so far is that the F-markings used for illustrative purposes in this paper are perhaps not the ones that would play a role as syntactic focus markers. The problem is that these F-markers correspond to random assignments and the APR doesn't care about random assignments per se. But one could of course have F markers that are placed on all and only constituents that receive non-standard interpretations from G . Such markers could then be used to restate the APR in terms of a pure syntax-phonology map. Is there anything to be gained by such a move? To answer this we need to confront general questions about the architecture of the grammar, as well as empirical issues concerning the full range of effects of syntax on accent placement and the role of focus in determining other syntactic and phonological

effects.⁷

It should be noted that adoption of the APR does not amount to claiming that syntax is irrelevant to placement of accent: witness the reference to maximal projections (XP) and lexical categories (X) which is crucial in the assignment of accent. We have essentially followed Cinque(1991) in taking the relevant syntactic notion to be depth of embeddedness. Whenever an XP requires accent, the accent will appear on the most deeply embedded lexical item in that XP. This approach has empirical problems as Cinque noted. For example, it makes the wrong prediction for a novel utterance of *I found the man from Philadelphia's hat*. *hat* is not the most deeply embedded item, but it receives main stress and attracts the accent. Selkirk(1996), reporting on her own work and that of others, argues that accent placement involves more syntactic information, including the distinction between arguments and adjuncts and the traces of syntactic transformations. An adequate treatment of these cases will have to await further research.

Regardless of how one comes down on the syntax question, one can still ask whether the semantic notion of focus corresponds to being assigned a non-standard interpretation by G (ie. $G(X) \neq \llbracket X \rrbracket$, $G(XP) \neq \llbracket XP \rrbracket$). I believe the answer to this question is no, though it hard to show this directly given the diversity of opinion about what exactly the semantics of focus is. I think a more productive method, at least initially, is to think about particular examples in which there is consensus. Compare the verb phrases used in two of our previous examples:

(8) {John's cat meowed and then}
It SCRATCHED_F him.

(27) {The yellow robot stirred the soup and then}
the GREEN_F robot SERVED_F it.

Most researchers (Selkirk 1996 and references therein included) would say that in (27) the verb is focussed, while in (8) it is not. Many would say that (8) has a focussed VP while (27) does not. So these examples differ on whether or not the verb is focussed and possibly on whether or not the VP is focussed. In the analysis provided here, G assigns non-standard interpretations to both verbs and to both VPs. It follows that " $G(X) \neq \llbracket X \rrbracket$ " does not correspond to "X is focussed". Rather, according to the APR the accent placement is identical in these two VPs, because relevant aspects of their semantics/pragmatics are the same.

⁷On a related note, the APR cares about whether an XP "contains accent". Is there any independant motivation in the phonology for distinguishing XPs that do and do not contain accent or stress?

Discussion of the two examples above raises the issue of contrastive accent/stress about which there is some disagreement (see Schafer et. al(1996) for recent discussion and experimental evidence for systematic differences in the comprehension of "contrastive accents" versus "new accents"). Some would claim that *served* is pronounced with a contrastive accent (higher peaks, longer duration), while *scratched* is not. Assuming that there is such a phonological difference, it should correlate with a difference in the semantics. Recall, that in the case of (8), the assignment to *scratched* by G was of no consequence; all assignments led to the same results. In the case of *served* on the other hand, the assignment matters. If we have:

$$G(\textit{served}) = \textit{stirred}$$

then we avoid a random assignment to the VP and otherwise we do not. So Attentiveness requires exactly that assignment. One way to make this information available to a rule like the APR, would be to modify our definition of a matching function to allow G to make no assignment, if it isn't going to matter at a higher level. In such a case, a necessary condition for contrastive accent is that G make an assignment and that it be random.

The upshot of this last discussion is that while the APR may not care about whether an assignment by G is random or not, other rules of syntax or phonology might. The lesson then is that background matching allows for various ways of categorizing expressions. Some of these will be encoded by grammars syntactically and phonologically, others may not. Some of these will correspond to what has been called focus others will not. An interesting question is what the notion of "scope of focus" (Rooth 1992) corresponds to. While one could define it in terms of background matches, it doesn't seem to correspond to any natural class.

8. Salience in the Local Context

The domain of a background matching consists of meanings that are salient in the local context. This terms "salient" and "local" are the subject of this section.

I. Remarks on salience and question-answer pairs.

From what we have so far seen, other than some contextual parameters such as the discourse participants, meanings become salient in the local context by being mentioned. In reality, that assumption is both too narrow and too broad. It is too broad because there are factors that lead to different degrees of salience for 'mentioned meanings'. These include recency and frequency of mention (Allerton 1978:142-3) as well as grammatical role and position in the sentence (for recent discussion see Terken and Hirschberg(1994)). The assumption is too narrow because

a speaker can **insinuate** meanings into the discourse by mentioning related ones.⁸ In Ladd(1980)'s example,

(28) Harry wants a VW but his wife would prefer an AMERICAN car

mention of VW has the effect of making the meaning of *car* available, provided the conversants know that a VW is a car. Allerton(1978:141) similarly notes that *spirits* behaves like given information on the basis of a prior mention of *whiskey* (for me, this doesn't work as well as the sequence *whiskey, alcohol*). These effects involve kinds and subkinds. Allerton also provides examples where a speaker insinuates the meaning of a whole by mention of a part. The general impression then is that the presence of a meaning m_1 in the local context can lead to the presence of m_2 , if m_1 entails m_2 relative to some shared set of assumptions. Since these meanings are not always propositional, we are in need of a generalized sense of entailment. One method that works fairly well generalizes the notion of entailment by existentially binding unfilled arguments to yield something of propositional type. For example, *whiskey* entails *spirits* in this general sense, because, relative to some shared set of propositions c :

(29) $\exists x(\text{whiskey}'(x)) \text{ entails } \exists x(\text{spirits}'(x))$

where c includes the proposition that anything which is whiskey is spirits.⁹ Of course,

⁸A speaker insinuates a meaning into the discourse that isn't actually expressed. A related phenomenon is accommodation in which the hearer's model of the discourse is repaired by adding a meaning that wasn't actually expressed but which appears to be needed to understand the speaker's contribution.

According to Woody Allen, Needleman's last words were: "No thanks, I already own a penguin". We can only imagine what was going on inside Needleman's head. It would help to know if he said "no thanks, I already own a PENGUIN" or "No thanks, I already OWN a penguin".

⁹ I use the predicate logic symbol \exists here to indicate unrestricted quantification. This means that by uttering *walked* one does not insinuate the meaning of the English sentence *someone walked*. The English sentence requires that someone in the domain of discourse walked.

Insinuation can be formalized as follows. Taking type t to be the type of propositions, we define an operation ExClo :

- (1) a. If $\omega \in D_t$, then $\text{ExClo}(\omega) = \omega$
 b. For any conjoinable type $\langle a, b \rangle$:
 If $\omega \in D_{\langle a, b \rangle}$, then $\text{ExClo}(\omega) = \lambda w \exists u \in D_a [\text{ExClo}(\omega(u))(w)]$

this only recasts the problem in more manageable terms. The real issue of what propositions are considered to be in *c* for these purposes is not addressed here (cf. Prince (1981,1992) and references therein)¹⁰. The interest for us in analyzing insinuation in these terms lies in the grammar of accent in question/answer pairs, to which we now turn.

The locus of accent in the answer to a Wh-question is parallel to the position of the Wh expression in the question.

(3) {Who did John call?}
He called BILL.

(4) {Who called John?}
BILL called him.

Insinuation affords a way of understanding this phenomenon. In order to show this, I need to briefly side-track into Karttunen(1977)'s analysis of Wh questions. In that work, a Wh phrase is synonymous with the corresponding indefinite: *who* means someone, *what* means something and so on. These meanings combine with others to form the meaning of a question which is a predicate over propositions. The question *who left* is a predicate true of any proposition *p*, just in case *p* itself is true and *p* is a proposition expressed by a sentence of the form "X left", for some X. One of the motivations for this theory comes from the use of questions in embedded contexts. To know who left, is to know propositions of the form "X left" for some individual X and to know which of them is true. If Bill knows who left, and Sally left, then Bill knows that Sally left. When a speaker utters the question *who left*, at least two meanings are

-
- c. *t* is a conjoinable type.
 if *b* is a conjoinable type, then so is <*a*,*b*>, for any type *a*.

To see how the definition works, one can verify that if α is a meaning of type $\langle e, \langle e, t \rangle \rangle$, then $\text{ExClo}(\alpha) = \lambda w \exists u \in D_e \exists v \in D_e [(\alpha(u)(v))(w)]$.

A speaker who uses meaning A **insinuates** meaning B if:

$$\forall w \in c [\text{ExClo}(A)(w) \rightarrow \text{ExClo}(B)(w)]$$

¹⁰Characterizing exactly which propositions are in *c* is no easy matter. Plausibility is clearly not enough: if *c* included the proposition that a car exists then no use of *car* would be accented for reasons of novelty. On the other hand, we can't just limit *c* to generic propositions. In the dialogue *Why did John get the job? because We WANTED a New Yorker*, the relevant background assumption, that John is a New Yorker, is not generic.

added to the local context: the meaning of *who* (=someone) and the meaning of the question. The question, we have just said, is a predicate which holds true of propositions. If there is some proposition to which that predicate applies, then someone left. So the speaker insinuates, by using the question, that someone left.¹¹ This means that the range of a background matching now includes the proposition that someone left. In that case, it is felicitous to answer the question with:

[*JOHN*]_F left.

[*JOHN*]_F can be matched with the meaning of *who*. Because the proposition that someone left has been insinuated into the local context, it can serve as a match for the whole sentence. Note that the insinuation appealed to in the case of question-answer pairs does not depend on any particular propositions being shared among participants in the dialogue. Insinuation is more or less automatic here as opposed to in the cases discussed earlier.

This way of understanding accent in Q/A pairs, sheds some light on a puzzle that arises in connection with reflexives¹², illustrated in the following:

- (30) {Who fired John?}
 a. He fired HIMSELF.
 b. * HE fired himself.
 c. ?HE fired HIMSELF.

In order to explain the data in (30), we need to consider possible background matchings. Let us begin with (30c). This accenting is compatible with a match involving the two random assignments indicated below with F-marking:

(31) [*HE*]_F fired [*HIMSELF*]_F

HE is matched with *who* (=someone) and *HIMSELF* is matched with John. The entire sentence is matched with the proposition the questioner insinuated (someone fired John). Since (31) is felicitous, Attentiveness requires us to consider only matches with two or fewer random assignments. With this in mind, we consider some alternatives compatible with the accenting in (30a):

- (32) a. He fired [*HIMSELF*]_F.
 b. He [*fired* [*HIMSELF*]_F]_F

¹¹ If we existentially bind unfilled arguments of the question-predicate we get the proposition that someone left.

¹²I believe this puzzle was pointed out to me by Barbara Partee.

c. [He fired [HIMSELF]_F]_F

(32a) is out because no matter what *HIMSELF* is matched with, no proposition is available to match the entire answer. (32b) is also bad, because the only meaning available to match the VP is the meaning of *fired John* and again, using that meaning leaves us with no match at the sentence level. In (32c), the problem at the sentential level is solved by using a random assignment. No other match is possible with two or fewer random assignments that leads to accent other than on *himself*. This account of the accenting in (30a) doesn't make appeal to insinuation. Nevertheless, our account of (30a) relies indirectly on insinuation. Insinuation allows us to bring the question-answer effect within the purview of the general theory of accent interpretation. In so doing, we avoid having to simply stipulate that interrogative expressions control the accent in a reply. Besides being less elegant, if such a stipulation makes any prediction in the reflexive case, it is that accent falls on the subject *he*.

Questions insinuate answers, but assertions can also insinuate questions. *John left* entails that someone left, which means that it entails that there is some true proposition of the form "X left" which in turn means that the predicate *who left* is true of some proposition. In short, by asserting that John left, I insinuate the meaning of the question *who left*. This would help explain the fact that accenting of Wh questions appears to follow the pattern of accenting in declaratives. Compare the following pair of examples:

(33) {I bought a watch for my younger sister.}
and, I bought a watch for my OLDER sister.

(34) {I bought a watch for my younger sister.}
What did you buy for your OLDER sister?

The interrogative in (34) finds a match in the insinuated question 'what did you buy for your younger sister?'

II. Local context

Whether or not a linguistic context is local will depend in part on what rhetorical relations it bears to the utterance being matched. The hope would be that background matching figures in a larger theory of rhetorical networks. Such a theory would entail for example that if:

(35) U_A constitutes a reply to U_B

then U_A is background-matched with the meaning of U_B . Since the APR relates choice of matching to accent, in some cases, accent could be used to disambiguate between two possible rhetorical roles an utterance might be playing in a discourse. For example, consider the possibilities in (36) below:

- (36) What did the dog who attacked Sally do to Paula?
- he ATTACKED_F her
 - he attacked HER_F *(as well)
 - *he ATTACKED_F her as well

(36a) directly answers the question and it is matched with the meaning insinuated by the question (*attacked* is matched with the meaning of *what*). (36b), on the other hand, while it answers the question, is linked here to *the dog who attacked Sally* or just to the relative clause. This difference is reflected in the accenting and in the use of *as well*. *as well* must be used in (36b) where an assertion is made that parallels a previous assertion/presupposition it is linked to. Question/answer pairs don't bear this kind of rhetorical relation so it cannot be used in (36c).

9. Conclusion (of Part I)

The idea that accent marks new information is about as old as the study of accent itself. The problem has always been to define what is meant by "new". The following analogy should help to put a finger on the sense of "new" that comes out of the theory presented here. Suppose my friend Theseus decides to attach a silver chrome bumper on the front of my car. The result is a car that is different from the car I started with. However, to say that I have a new car would be grossly misleading. Instead, I say I have a car with a new bumper. I single out the source of the difference, the bumper, and I call that new. The bumper itself may be old, older than the rest of my car for that matter. So when I say the bumper is new, I don't mean it in an absolute sense. I also don't mean that the bumper is in a new context. The hood is also in a new context: it abuts a bumper it didn't abut yesterday. Still, I don't call the hood new because it is not the source of the difference in my car. How do I decide that the bumper is the source of the difference and not some larger piece? The front of the car is different from what it was yesterday, yet I don't say I have a car with a new front end. If I did that, I would be back on the road towards saying the car is new. These larger pieces are not specific enough. This doesn't mean we should go overboard in the other direction. The bumper forms a unit, and so even if Theseus used a piece from the old bumper to attach it to the car, I don't need to mention that. Rather, among the relevant units, I find an **atomic** source of difference. The bumper is an atomic source of difference because it cannot be further divided into a relevant unit that is a source of difference and one that isn't. While atomicity is a factor, it wouldn't rule out my saying that I have a bumper with a new car. But that would be overstating the case: it implies a major change where there was really just a minor one. Finally, we should allow for several sources of difference. If a tailpipe had also been added, I would say I have a car with a new bumper and a new tailpipe, picking two atomic sources for the difference in my car. In the case of accent our interest is in utterances that are different from previous ones, but the meaning of "new" is the same. The Attentiveness Maxim insures that we don't overstate the case, calling the larger part new and the smaller remainder old. The Accent Placement Rule then

works to single out the atomic sources of the difference, with the relevant units being syntactic phrases. The phrasal part of the rule says that any part of the utterance that is different from prior discourse, must contain a source for that difference, so it will have to contain accent. The lexical part then guarantees atomicity by making sure that the accent isn't applied too liberally.

10. Preview of Part II

Consider the following trio:

- (37) a. A SIMILAR excuse was given by the Mayor of IRVINE.
b. A SIMILAR excuse was given by the MAYOR of Irvine
c. A SIMILAR excuse was given by IRVINE's Mayor.

(37a) presupposes that an excuse was given by X, $X \neq$ the Mayor of Irvine. (37b) presupposes that an excuse was given by the X of Irvine, $X \neq$ Mayor. (37c) presupposes that an excuse was given by the Mayor of X, $X \neq$ Irvine. The explanation for these differences would surely have to take into consideration the fact that:

- i. *similar* is anaphoric.
- ii. the accenting differences in (37a-c) reflect differences in background.

But do the presuppositional differences in (37a-c) simply follow from a combination of i. and ii. or do they require a modification of our semantics of accent? This question arises not just in cases of association with focus. Ladd(1980:80) sees in (38) "the accent pattern meaning 'parallel'"

(38) {John hit Bill then} HE hit HIM

Roberts(1995:§2.2.2.2), treating a similar example, shows how such a meaning falls out of a general discourse based approach to focus. I am sympathetic with Roberts approach. I believe that the accenting in (38) follows from the APR and the feeling of parallelism is derived from the fact that such a pattern requires contexts like that in (38).

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