Specificity and Accent: The Case of English Wh-Questions[*]

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0. Introduction

The prosodic behavior of the wh-words in English is peculiar in that although they are interpreted as a focus, they generally do not receive an accent in out-of-the-blue contexts. Many accentologists have paid attention to this peculiar prosodic behavior of wh-words (e.g. Gunter 1966, Culicover and Rochemont 1983, Gussenhoven 1984, Bolinger 1985, 1986, and Rochemont 1986, among others). However, none of them have provided a proper solution to the question of why wh-words do not receive an accent in out-of-the-blue contexts, or more specifically, to the question of what sort of factor crucially enters into their peculiar prosodic behavior. We must therefore reconsider the accentuation of wh-questions from a radically different standpoint from those adopted in previous studies on sentence accent.

This paper is an attempt to capture the peculiar accentual behavior of wh-words in a perspective different from those which have thus far been adopted. Section 1 raises the problem of why wh-words cannot receive an accent, and shows that the accentual patterns of wh-questions must be treated from a semantic perspective. Section 2 demonstrates that the accentual behavior of wh-words is best accounted for in terms of the focus structure and of the nonspecific nature of wh-words, specifically, in terms of the focus structure and of a constraint proposed by Okazaki (1989a), called the Specificity Constraint on Sentence Accent Assignment. In section 3, the nonspecific nature of wh-words is also shown to be a crucial factor in the accentuation of wh-questions in German and Japanese. In section 4, it is shown that exceptions to my analysis are accounted for by an independently motivated pragmatic principle on sentence accent assignment.

1. The Problem

It is widely known that in out-of-the-blue contexts, wh-words

cannot receive a pitch accent and cannot be the nucleus of an intonational contour. This is illustrated by the simple cases in (1)-(3).

(1) in an out-of-the-blue context
    a. What's HAPPENED?
    b. *WHAT's happened?

(2) A: Bill took me downtown to all the big department stores today.
    B: Oh, yeah? What did you BUY?
                            (Culicover and Rochemont 1983: 140)

(3) (In a situation where two people who do not know each other meet, one asks about the other.)
    Hullo there! Where are you FROM?
                            (Summer Time, movie, 1955)

Each sentence in (1)-(3) is, as a whole, taken as new information in the discourse, and in each case all the elements but the pronoun you are construed as a focus. In fact, a wh-word is a focus of the question, and intuitively the most important word in a sentence. We expect, then, that each wh-word receives a pitch accent, for a focused element can in general receive it. Contrary to expectation, however, it falls on other elements which are closely related, both syntactically and semantically, to wh-words.

The observation that wh-words cannot receive an accent in out-of-the-blue contexts is confirmed by the following pairs of sentences.

(4) a. What are you WAITING for? Let's go!
                            (Highnoon, movie, 1952)
    b. What are you THINKING of?

(5) a. What IS it?
    b. What's THAT?

(6) a. Who ARE they?
    b. Who are those GENTLEMEN?

(7) a. What's it FOR?
    b. What's this ARRANGEMENT for?

(8) a. What's it all ABOUT?
    b. What's this FUSS all about? ((4b)-(8b) from Suiko 1985)

All of the sentences in (4)-(8) can be uttered discourse-initially, and the wh-words there can of course be interpreted as a focus of the question and seen as the most important word. Thus, they are expected to receive an accent. However, none of them receive an accent.

Naturally, then, the following problem arises, which I will tackle in this paper:

(9)   Why is it that wh-words cannot receive a nuclear accent in out-of-the-blue contexts?

I will show that this problem must be solved from a semantic viewpoint, specifically, I will demonstrate that the nonspecific nature of wh-words is the most crucial factor in their deaccenting.

Before turning to a semantic analysis I will propose, however, I will consider the nature of this problem; that is, I will examine some conceivable solutions to this problem in either a pragmatic or a syntactic perspective. I will show that in neither of the perspectives can the problem in (9) be solved and that it must be solved in a semantic perspective.

Let us first examine the validity of pragmatic solutions. Two possible analyses suggest themselves. The first is that wh-words have the status of old infomation in a discourse. That is because an element which has an antecedent, either explicitly or implicitly, in a discourse and are interpreted as old information does not receive a pitch accent. This is typically seen in the deaccenting of personal pronouns like I, you, he, and she. This analysis is, however, not valid for the deaccenting of wh-words. There is no strong evidence to argue that they have the status of old information. Unlike personal pronouns, they are used without an antecedent in a discourse, and are construed as having the status of new information in a discourse.

A second possibility is that the deaccenting of wh-words is due to some emotional factor. Bolinger's (1985, 1986, 1989) notion of "accents of power" would be the most reliable candidate. The speaker thereby puts an accent on either as right an element as possible or the 'least accentable' element in a sentence to 'emphasize', and increase the 'power' of, the whole utterance. This is observed in the

following four examples.

   (10) a. Are you practiCING?   (Imai 1987)

        b. If we were ambassaDORS,... (Ibid.)

        c. I am not accustomed to speaking in pubLIC.

                      (How Green was my Valley, movie, 1941)

        d. Like it? I've got TO.   (Summer Time, movie, 1955)

The examples in (10) exhibit the accentual pattern where a pitch accent falls on unexpected positions: recognize, ambassador, and public are in isolation pronouned as REcognize, amBAssador, and PUBlic, and the infinitival marker to cannot be the nucleus of an intonational contour even if it is in sentence-final position (cf. Zwicky and Levin 1980). The accents on -nized, -dors, and -lic, however, do not indicate their contrast with other syllables, nor does the accent on to indicate its contrast with other words. Rather, these accents 'emphasize', and increase the 'power' of, the whole utterance.[1]

   By applying Bolinger's "accents of power", we could account for the deaccenting of wh-words in out-of-the-blue contexts as follows: The speaker is excited for some extralinguistic reason at the time of uttering each sentence in (1)-(8), so that he does not place an accent on the wh-word, which is focused and most important, but on the rightmost or the 'least accentable' word in the sentence intentionally in order to increase the 'power' of the utterance. This account of the deaccenting of wh-words is factually incompatible, however. It should be noticed here that the sentences in (1)-(8) convey the nuance of so-called 'neutral emotion', as implied by the neutral versions of (10a-d), which are indicated bolow.

   (10) a'. Are you PRACticing?

        b'. If we were amBAssadors,...

        c'. I am not accustomed to speaking in PUBlic.

        d'. Like it? I've GOT to.

That is, none of the examples in (1)-(8) convey the nuance of amplified emotion as implied by examples (10a-d). Thus, their accentual pattern should not be accounted for in terms of emotional

factors.

I have now demonstrated that the deaccenting of wh-words in out-of-the-blue contexts should not be attributed to discourse or emotional factors. It naturally follows, then, that their deaccenting must be accounted for in terms of sentence grammar. Let us now examine this possibility. The first possibility is that the deaccenting is attributed to the functional nature of wh-words. Wh-words, or interrogative pronouns, belong to the class of so-called function words. The function words in English do not receive a pitch accent within a broad focus domain, and are typically pronounced in weak forms with the reduced vowel schwa. If the deaccenting of wh-words were attributed to their functional nature, the deaccenting of wh-words would result simply because they belong to the class of function words.

This analysis is not at all convincing for the following two reasons. First, as observed by Selkirk (1984: 359), interrogative pronouns are different from other function words in that they have no weak forms containing the reduced vowel schwa. In fact, as mentioned above, interrogative pronouns can be used without an antecedent in a previous discourse. Thus, there is no good reason to argue that wh-words cannot receive a pitch accent. Second, if the deaccenting of wh-words is attributed to their functional nature, we cannot account for their different prosodic behavior from that of the demonstrative pronouns this, that, these, and those. Like interrogative pronouns, they belong to the class of function words and can be used without an antecedent. In fact, none of them have weak forms containing the reduced vowel, either (cf. Selkirk 1984). Unlike interrogative pronouns, however, they can bear a pitch accent and become the nucleus of an intonational contour in out-of-the-blue contexts, as the examples in (11) explicitly show.

(11) a. Thomas Mitchel, in his speech
       ...I'll say THIS...   (Highnoon, movie, 1952)
   b. James Stewart suddenly points out a man knifed in the
       back.
       Hey, look at THAT!

(The Man who Knew too much, movie, 1956)

We can conclude, then, that the deaccenting of interrogative pronouns cannot be attributed to their functional nature.

The second possible solution is that the deaccenting of wh-words is attributed to the inherent prosodic nature of the position where they occur at surface structure, that is, to that of sentence-initial position. The nature would be that elements in sentence-initial position do not bear a pitch accent even if they are interpreted as a focus. If this were correct, we could account for the deaccenting of wh-words straightforwardly. This analysis is, however, not at all convincing, for the deaccenting is not an essential prosodic property of sentence-initial position. In fact, focused elements can receive a pitch accent in sentence-initial position, as the following famous examples amply show. Cf. Bolinger (1985), Faber (1987), and Okazaki (1989b, 1990a), among others.

(12) What happened?
    a. JOHN WEPT.
    b. One of my STUDENTS was SMOKING.
(13) What happened?
    a. JOHN appeared.
    b. JOHN died.
(14) a. Why are you so upset?---The FLOOR is dirty.
     b. Why was the ambulance in such a hurry?---
        An ACCIDENT had just been reported.

Aside from the reason for the accenting and deaccenting of the verbs in (12)-(14), we must admit that focused elements in sentence-initial position may or may not receive a pitch accent.[2] It follows, then, that the second possible solution in terms of the prosodic nature of sentence-initial position is untenable for its factual incompatibility.

The third possible solution is to derive the deaccenting by sentence accent assignment rules making reference to both surface and focus structure. Gussenhoven's (1984) Sentence Accent Assignment Rule (SAAR) and Rochemont's (1986) Nuclear Stress Rule (NSR) are reliable

candidates.

Both rules are formulated on the assumption widely but implicitly shared among accentologists, which I call here the One-Accent Requirement on a Focus Domain. It is formulated as follows:

(15) One-Accent Requirement on a Focus Domain

At least one accent must be assigned to a focus domain.

Gussenhoven's SAAR requires that an accent be assigned to an argument within a focus domain consisting of the argument and its head. This rule predicts that the wh-words in (1)-(8) receive an accent obligatorily because they are arguments of either the verbs or the prepositions. This prediction is, however, factually incompatible. Gussenhoven himself admits this inadequacy of his proposed rule, but he simply states that interrogative pronouns are exceptions to the rule. He does not make clear the reason for the deaccenting of wh-words.

Rochemont's NSR requires that an accent be assigned to the right-most element within a focus domain. This rule also produces unattested accentual patterns. Take the accent assignment to What did you buy? in an out-of-the-blue context. The subject you is construed as old information, and thus the sequences what did and buy are construed as new information and constitute two split focus domains. The rule predicts that an accent is obligatorily assigned to both focus domains, specifically, to did and buy as shown in (16).

(16) *What DID you BUY?

However, the accentual pattern in (16) is factually incompatible. An accent is assigned, as illustrated in (2), only to the verb buy in sentence-final position. We can say therefore that neither Gussenhoven's nor Rochemont's framework can provide a proper solution to the question in (9).

To summarize, I have raised the problem in (9), which I believe is significant for accentologists and must be solved in a principled manner, and shown that the problem cannot be solved in pragmatic or syntactic perspectives. I venture to say here that the question in (9) must be solved in a perspective radically different from those of

all the previous studies on sentence accent. In particular, I believe
that it is properly solved by taking into account the nonspecific
nature of wh-words. I will turn to this issue in the next section.

2. A semantic account of the deaccenting of wh-words
    I will argue in this section that the deaccenting of wh-words in
(1)-(8) is purely semantic in nature, or more specifically, that the
prosodic phenomenon can be accounted for in exactly the same manner as
that of Okazaki's (1989a) account of the deaccenting of several kinds
of nonspecific NPs. Before making main points I would like to make, I
will briefly review Okazaki's (1989a) proposal.

2.1. Okazaki's (1989a) proposal
    I have proposed in Okazaki (1989a) that a semantic constraint be
at work on sentence accent assignment in English. This constraint,
called the Specificity Constraint on Sentence Accent Assignment, is
formulated as follows.

    (17)   Specificity Constraint on Sentence Accent Assignment
           A nonspecific NP cannot bear an accent solely within a
           broad focus domain.

In formulating this constraint, the notion specificity and the broad
focus domain are defined as follows. An NP is specific if and only if
it can be modified by a nonrestrictive relative clause containing no
uncertainty modalities like modal, negation, habitual, future, and
nonfactivity (cf. Givón 1973); the broad focus domain is defined as a
focus domain which is larger than an X^{max} (X=N, A, V, P). In
addition to these two notions, the constraint in (17) presupposes two
devices. One is the One-Accent Requirement on a Focus Domain in (15),
and the other is Gussenhoven's (1984) SAAR, which requires as
mentioned in the previous section that an accent be assigned to an
argument within a focus domain consisting of the argument and its
head.
    An advantage of this constraint is that it provides a unified
account of the data which would otherwise be treated in a separate
way. To illustrate this, consider the accentuation in the following

examples. Cf. Bolinger (1985) and Okazaki (1989a, in preparation).

(18) What is Mr. Arnold doing?
    a. Caning a STUDENT, I guess.
    b. *CANING a student, I guess.

(19) What is Mr. Arnold doing?
    a. *Caning some STUDENT (or other), I guess.
    b. CANING some student (or other), I guess.

(20) What is Mr. Arnold doing?
    a. *Caning every STUDENT (that listens music), I guess.
    b. CANING every student (that listens music), I guess.

Each example consists only of a VP which contains a verb and an object
NP, and is, as a whole, new information in the discourse. Thus, all
of the cases in (18)-(20) constitute a broad focus domain. We expect,
then, that the object NPs receive an accent by rule. Example (18)
exhibits the expected accentual pattern. However, the other two
examples exhibit the unexpected accentual pattern where an accent does
not fall on an NP but on a verb. There arises the question why the
NPs in (19)-(20) cannot receive an accent.

Bolinger (1985) argues that the deaccenting of some student and
every student is attributed to their indefiniteness because some and
every are both so-called indefinites. Bolinger's indefinite hypothe-
sis, however, fails to account for the accentuation of the following
two examples.

(21) in an out-of-the-blue context
    a. *Bring me a HOTDOG.
    b. BRING me a hotdog.

(22) What is John doing?
    a. *He's painting a PICTURE.
    b. He's PAINTING a picture.

The object NPs in (21) and (22) are both headed by the indefinite
article, and, in fact, contained in a broad focus domain because in
both cases the VPs are new information and form a broad focus domains.
Unlike the object NP in (18), neither of the NPs in (21) and (22)
receives an accent; the NPs and indefinites constitute a class with

respect to accentuation. Bolinger's hypothesis cannot capture the prosodic contrast between the NP in (18) and those in (21) and (22) or the fact that the NPs in (19) and (20) and those in (21) and (22) constitute a class with respect to accentuation.

We can account for the deaccenting in NPs in (19)-(22) in a unified way if we take their nonspecific nature into account. Thus, none of the object NPs in (19)-(22) have a specific referent. That is because none of the NPs in (19)-(22) can be modified by a non-restrictive relative clause containing no uncertainty modalities, as shown in (23)-(26).

(23) *He's caning some student (or other), who hit Mary.

(24) *He's caning every student, who hit Mary.

(25) *Bring me a hotdog, which I ate yesterday.

(26) *He's painting a picture, which is hung in the living room.

We can account for the deaccenting of the NPs in (19)-(22) in a unified manner only if we posit the constraint in (17). That is, the object NPs in (19)-(22) are expected to receive an accent by rule. However, none of them have a specific referent. Thus, the verbs, which are their heads and within the same focus domain, receive an accent instead of the NPs in accordance with the requirement in (15).

We can also account for the accentuation in (18) by taking into account the specific nature of the object NP a student. It receives an accent because it has a specific referent. That is because it can be modified by a nonrestrictive relative clause containing no un-certainty modalities, as shown in (27).

(27) He's caning a student, who hit Mary.

Thus, my proposed account of English sentence accent also captures the accentual contrast between the NP in (18) and those in (21) and (22).

2.2. The deaccenting of wh-words

We have seen that the specificity of an NP crucially enters into sentence accent assignment in English. In this section, I will examine in some detail whether the specificty of an NP enters into the accentuation of wh-questions, or more specifically, whether the

constraint in (17) plays a crucial role in the accentuation of wh questions.

One of the essential semantic properties of wh words is:

(28) Wh-words have no specific referent.

Thus, it is highly likely that their deaccenting within a broad focus domain is due to their nonspecificity; specifically, that their deaccenting can be explicitly captured by the Specificity Constraint on Sentence Accent Assignment in (17). In fact, the constraint straightforwardly accounts for the accentuation of questions like (1), repeated below.

(1) What's HAPPENED?

Notice again that in (1) what's and happened constitute a single broad focus domain and that the latter rather than the former receives an accent and becomes the nucleus. The deaccenting of what's naturally follows from the constraint in (17) and the requirement in (15). The interrogative pronoun what has no specific referent, so that it cannot receive an accent within a broad focus domain. Thus, the verb happened receives an accent in accordance with (15).

The accetuation of wh-questions is, however, not so simple as cases like (1). Let us apply the constraint in (17) and the requirement in (15) to an account of the the accentuation of more complex cases. Take again the accentuation of (2) and (3), repeated below.

(2) What did you BUY?
(3) Where are you FROM?

Both examples are uttered out of the blue; only the subject pronouns are old information. Thus, the distribution of their foci at surface structure is indicated as in (29) and (30), respectively.

(29) What did you buy?
      focus   focus
(30) Where are you from?
      focus   focus

Both cases have two split focus domains. The elements in sentence-final position buy and from constitute a narrow focus domain, and

they receive an accent. The requirement in (15) accounts for this
phenomenon straightforwardly. The wh-words what and where are
both contained in a broad focus domain, and neither of them receives
an accent. The constraint in (17) accounts for this phenomenon.

It appears, however, that (15) and (17) produce factually
incompatible accentual patterns for (2) and (3). Specifically, (15)
and (17) incorrectly predict that the auxiliaries did and are
must receive an accent in the focus domains what did and where are,
respectively. This is shown in (31) and (32).

     (31) *What DID you BUY?

     (32) *Where ARE you FROM?

The accentual patterns in (31) and (32) are both unacceptable in
out-of-the-blue contexts. Thus, one might doubt the validity of the
constraint in (17) and the requirement in (15). My impression is,
however, that a problem does not lie in the constraint in (17) or the
requirement in (15). A real problem lies in the assumption that an
accent is assigned based only on surface syntactic structure and the
focus represented on surface structure. This assumption is widely
accepted without considering its validity, but if we are to maintain
(15) and (17), we must examine the validity of this widely accepted
assumption.

Recall here that I have argued in Okazaki (1989a) that an accent
is assigned with special reference to the specificity of an NP.
In fact, information about the specificity of an NP does not seem to
be represented at D-structure, S-structure, or LF. This implies that
an accent is assigned based not only on surface syntactic structure
but also on a semantic representation of some kind which is not
directly represented at D-structure, S-structure, or LF but in the
semantic component outside of LF. The idea that an accent is assigned
based on the semantic representation seems to be quite plausible
because it enables us to make a proper generalization about sentence
accent assignment in English. Thus, if the focus is represented in
the semantic component and is not isomorphic to surface syntactic
structure, we are able to maintain the two plausible devices:
the Specificity Constraint on Sentence Accent Assignment (17) and the

One-Accent Requirement on a Focus Domain (15).

Many linguists posit the representation of focus-presupposition, aside from the problem whether or not the focus is represented at S-structure and whether or not there is an operation called Focus Raising at LF. Cf. Jackendoff (1972), Culicover and Rochemont (1983), and Rochemont (1986), among others.

I assume in line with this tradition a level of semantic representation called focus structure, which is not represented at S- or surface structure but in the semantic component outside of LF. I also assume that focus structure is not necessarily isomorphic to surface syntactic structure.

In particular, I maintain here that wh-words are in situ at focus structure. As examples, take the focus structures of (2) and (3). They are represented as in (33) and (34), respectively.

(33) [did buy what]
(34) [are from where]

In (33), what is in object position of the verb buy, and in (34), where is in object position of the preposition from. If the focus is so represented in the semantic representation, then it is not unreasonable to argue that information at focus structure is directly accessible to sentence accent assignment. That is because, as mentioned above, the idea that semantic information is directly accessible to sentence accent assignment is valid and makes it possible to make a proper generalization about English sentence accents.

In fact, if we assume that accent assignment makes reference to the focus structure proposed just above, we can make a proper account of the accentuation of English wh-questions without modifying the Specificity Constraint on Sentence Accent Assignment (17) and the One Accent Requirement on a Focus Domain (15), both of which have a wide empirical coverage. Take again the deaccenting of the wh-words in (2) and (3). In (2), what is contained in a broad focus domain as shown in (32), so that an accent does not fall on the word in accordance with the constraint in (17) but on the verb buy in accordance with the requirement in (15). Exactly the same analysis is made for

(3). <u>Where</u> is contained in a broad focus domain, as represented in (33). Thus, the word does not receive an accent as the constraint in (17) requires. Instead of the word, <u>from</u>, which is its head, receives an accent, as (15) requires.[3]

If we assume that <u>wh</u>-words are in situ at focus structure, we can of course account for the deaccenting of <u>wh</u>-words in and (4)-(8) in exactly the same manner. In each case, the <u>wh</u>-word is contained within a broad focus domain, as explicitly shown in (35)-(39). Thus, in none of these cases can the <u>wh</u>-words receive an accent as required by the Specificity Constraint on Sentence Accent Assignment (17).

(35) a. [are waiting for what] (for (4a))
     b. [are thinking of what] (for (4b))
(36) a. [is what] (for (5a))
     b. [that is what] (for (5b))
(37) a. [are who] (for (6a))
     b. [those gentleman are who] (for (6b))
(38) a. [is for what] (for (7a))
     b. [this arrangement is for what] (for (7b))
(39) a. [is all about what] (for (8a))
     b. [this fuss is all about what] (for (8b))

We are now in a position to solve the problem in (9). The answer to the question is now obvious: The reason for the deaccenting of <u>wh</u>-words in out-of-the-blue contexts is that they have no specific referent. Their deaccenting has exactly the same nature as the deaccenting of other nonspecific NPs discussed in detail by Okazaki (1989a).

The proposed account of the deaccenting of <u>wh</u>-words predicts that if they constitute a narrow focus domain, they receive an accent. This prediction is borne out by the following two cases pointed out by Bolinger (1986: 96).

(40) A: I finally went out and bought something today.
     B: WHAT did you buy?
(41) A: John left early.
     B: WHY did he leave?

The wh-words what and why receive an accent because both of them constitute a narrow focus domain. There is no other place for an accent to fall.

The proposed account of the deaccenting of wh-words also provides a principled account of the accentual contrast which has not been accounted for in an explicit way. To illustrate this, consider the cases in (42) and (43), which are also pointed out by Bolinger (1986: 96) for a purpose different from mine.

(42) John did it.
    a. WHY did he do it?
    b. What did he do it FOR?

(43) John broke the vase.
    a. HOW did he break it?---With a hammer.
    b. What did he break it WITH?---With a hammer.

An accent falls on the wh-words in the (a)-examples, while in the (b)-examples, it falls on the prepositions in sentence-final position. This accentual contrast between the (a)- and (b)-examples must be accounted for by the Specificity Constraint on Sentence Accent Assignment and the One-Accent Requirement on a Focus Domain, with the help of the focus structure I have proposed just above.

In the (a)-examples, why and how themselves constitute a narrow focus domain because only the wh-word is new information in each discourse. Thus, an accent does not have any other place to fall, and, in fact, falls on them. In the (b)-examples, on the other hand, the focus domains are broad. The wh-word and the preposition are new information in each discourse. The focus structures of (42b) and (43b) are represented as in (44a) and (44b), respectively.

(44) a. [for what]
    b. [with what]

What is contained in a broad focus domain in both cases. Thus, this word cannot bear an accent in accordance with the constraint in (17), and, instead of it, the preposition bears an accent in accordance with the requirement in (15).

Neither Gussenhoven's (1984) nor Rochemont's (1986) accent

assignment rule can predict the accentual pattern of (42b) and (43b), although they correctly predict the pattern of (42a) and (43a). Both rules require that one and only one accent be assigned to a sigle focus domain at surface syntactic structure. In the (b)-examples, in fact, the wh-words and the prepositions form two split domains. The rules predict, then, the obligatory accenting of the wh-words, as shown in (45).

(45) a. WHAT did he do it FOR?
     b. WHAT did he break it WITH?

The accentual patterns in (44) are possiblities, but they are emphatic versions of accentuation or instances of "accents of power." The assignment of an accent to the wh-words is not obligatory, while that to the prepositions is. It follows, then, that neither Gussenhoven's nor Rochemont's framework can make clear the reason for the deaccenting of the wh-words in the (b)-examples above, nor can they account for accentual contrast between the (a)- and (b)-examples. The accentual contrast must be treated by the devices I am adopting here.

2.3. Summary

To summarize the argument in this section, I have solved the problem in (9) raised in section 1 on the basis of the following three devices: the Specificity Constraint on Sentence Accent Assignment (17), the One-Accent Requirement on a Focus Domain (15), and the focus structure proposed in this section. The former two devices, in particular, have a lot of motivations independent of the accentuation of wh-questions. The last device does not have independent motivation, but does not have an disadvantage in treating linguistic phenomena, either syntactic, semantic, or phonological. My account of the accentuation of wh-quetions, then, is not ad hoc. Rather, it is well-motivated, and shows explicitly that the accentual behavior of wh-words is not an exceptional prosodic phenomenon as treated in previous studies on sentence accent but can be seen as a kind of very general prosodic phenomenon in English.

3. Further cases

Having demonstrated that the nonspecific nature of wh-words is
the most crucial factor in their destressing in out-of-the-blue
contexts, I will show cross-linguistic evidence for my account of
the destressing of wh-words, which comes from the prosodic character
of wh-questions in German and Japanese. In what follows, I will see
that wh-questions in these two languages exhibit exactly the same
prosodic character as those in English.

3.1. The accentuation of wh-questions in German

The accentuation of German wh-questions is a topic which, as far
as I know, is of little interest to many accentologists. But a few
exceptional accentologists like Bierwisch (1966) and Lötscher (1983)
have investigated the prosody of German wh-questions. Bierwisch
(1966: 165-9) briefly touches upon the prosodic character of German
wh-questions with special reference to their discourse functions.
Lötscher (1983) also makes a descriptive study on the accentuation of
wh-questions, paying particular attention to their informational
structure.

Although he does not commit himself to an analysis of
the accentuation of wh-questions in out-of-the-blue contexts, Lötscher
(1983: 257) adduces the following data:

(46) a. Wer hat die MILCH ausgeleert?
         "Who has drunk up the milk?"

     b. Wer hat die Milch AUSGELEERT?

He argues that each version of the accentuation corresponds directly
to the difference in information structure. (46a) is an appropriate
accentual pattern in a context where that something has been drunk
is under discussion or presupposed, and in the same vein (46b) is an
appropriate accentual pattern in a context where something about milk
is under discussion or presupposed.

Lötscher (1983: 256f.) attributes the lack of accent on wh-words
to their emptiness. He states:

...Fragewörter als völlig unspezifizierte Markierungen von Lücken
erhalten im Normalfall keinen Akzent.

This statement is, I believe, basically correct, but it is merely intuitive and does not factor out a crucial factor involved in the deaccenting of wh-words. In fact, as Lötcher himself observes, wh-words receive an accent in cases which are not 'normal', for example, in echo questions. This is illustrated in (47).

> (47) Der Onkel von Kaiser Franz hat die Milch ausgeleert.---
> WER hat die Milch ausgeleert?
> ˉThe uncle of Kaiser Franz have drunk up the milk.---
> Who has drunk up the milk?ˉ

Lötscher simply points out the accentual difference between (46) and (47), and does not have any specific way to distinguish the two cases.

The accentual difference between (46) and (47) can be captured in a principled manner by the devices I have adopted for an account of the accentuation of English wh-questions. Notice first that German wh-words have no specific referent, either. Notice also that wer in (46) is contained in a broad focus domain because the sequences Wer hat die Milch in (46a) and Wer hat ausgeleert in (46b) are construed as new information in each discourse. Wer in (47), on the other hand, is contained in a narrow focus domain, for hat die Milch ausgeleert is explicitly mentioned in the immediately preceding sentence. This difference in focus structure crucially enters into the accentual difference between (46) and (47). Thus, the wh-words in (46) are prohibited from receiving an accent by the Specificity Constraint on Sentence Accent Assignment (17), and another element within the same focus domain receives an accent in accordance with the One-Accent Requirement on a Focus Domain (15). The wh-word in (47), on the other hand, receives an accent merely because there is no other place for an accent to fall.

I have demonstrated that the accentual behavior of German wh-words is captured in exactly the same way as that of English counterpart is.[4]

3.2. The accentuation of wh-questions in Japanese

It seems that none of the accentologists have attempted to capture the prosodic property of Japanese wh-questions with special

reference to discourse structure. I will claim here that the generalization about the accentuation in English wh-questions also holds for the accentuation of Japanese wh-questions. That is, Japanese wh-words cannot receive an accent within a broad focus domain. To illustrate this point, consider the following examples, all of which are uttered out of the blue.

(48) in an out-of-the-blue context: The speaker points out a building which has not been a topic of the conversation.
  a. ANO TATEMONO-wa nan-desu-ka?
    "What is that building?"
  b. *Ano tatemono-wa NAN-desu-ka?

(49) in an out-of-the-blue context: The speaker points out a a person who has not been a topic of the conversation.
  a. ANO HITO-wa dare-desu-ka?
    "Who is that gentleman?"
  b. *Ano hito-wa DARE-desu-ka?

(50) in an out-of-the-blue context: The speaker runs into a room.
  a. Watashi-no-MANNENHITSU-o TSUKATTA-no-wa dare-desu-ka?
    "Who used my fountain pen?"
  b. *Watashi-no-mannenhitsu-o tsukatta-no-wa DARE-desu-ka?

The (a)-versions, where the wh-words are deaccented, are appropriate in out-of-the-blue contexts.[5] The (b)-versions, where the wh-words are accented, are inappropriate in an out-of-the-blue context; they may be appropriate in cases where a wh-word itself constitutes a narrow focus domain, or in cases where the speaker intends to increase the power of the whole utterance by accenting the rightmost of the least accentable syllable. In fact, a wh-word receives an accent if it constitutes a narrow focus domain. Observe:

(51) Omoshiroimono-o tsukutta yo. Korenandakedo-ne.
  "I have made an interesting invention. Here it is."
  a. Kore-wa NAN-desu-ka?/NAN-desu-ka kore?
    "What is this?"
  b. *KORE-wa nan-desu-ka?/*Nan-desu-ka KORE?

(52) Mata Taro-ga ie-ni kitan-da-yo.

"Taro made another visit to my house."

a. Kare-wa NANIMONO?/NANIMONO kare-wa?

   "Who is he?"

b. *KARE-wa nanimono?/*Nanimono KARE-wa?

(53) Taro-nara uchi-ni kita-koto-ga ari-masu-yo.

"Taro once visited me."

a. Sore-wa ITSU-desu-ka?/ITSU-desu-ka sore-wa?⁶

   "When did he visit you?"

b. *SORE-wa itsu-desu-ka?/*Itsu-desu-ka SORE-wa?

On the basis of the data in (48)-(53), we can say that Japanese wh-words do not receive an accent within a broad focus domain, but receive it within a narrow one. It is interesting to note here that Japanese wh-words exhibit exactly the same prosodic behavior as that of English counterpart. It naturally follows, then, that we can account for the prosodic behavior of Japanese wh-questions by the Specificity Constraint on Sentence Accent Assignment (17), The One-Accent Requirement on a Focus Domain (15), and the focus structure I have proposed in the previous section. Thus, each wh-word in (48)-(50) is prohibited from receiving an accent by (17), and instead of the wh-word, another element within the same focus domain receives an accent in accordance with (15).⁷

The accentual behavior of Japanese wh-words has an important implication for the Specificity Constraint on Sentence Accent Assignment, which is formulated based on prosodic facts in English. Recall again that Japanese wh-words exhibit the same accentual behavior as that of English wh-words and that their behavior is accounted for by the devices I have adopted for an analysis of English sentence accents. Furthermore, Japanese belongs to a different language family from that of English. Thus, the accentual behavior of Japanese wh-words serves as strong cross-linguistic evidence for my proposed constraint in (17), and shows that the constraint is not at all an ad hoc device, but rather is highly likely to be one of the universals of sentence accents.

4. Exceptions and their explanation

I have shown in the previous sections that _wh_ words, or more generally, nonspecific NPs cannot bear an accent within a broad focus domain. This generalization has a wide empirical coverage, but has some exceptions. Consider the following two examples.

(54) in an out-of-the-blue context
    a. *What books have you READ lately?
    b. What BOOKS have you read lately? (Bresnan 1972: 340)

(55) in an out-of-the-blue context
    a. *Which turn should we TAKE?
    b. Which TURN should we take? (Ibid.)

The wh-phrases _what books_ and _which turn_ seem to be contained in a broad focus domain because both sentences are uttered out of the blue, and neither of the phrases has a specific referent. It is then predicted that neither of the _wh_-phrases receives an accent in accordance with the Specificity Constraint on Sentence Accent Assignment (17). In fact, however, both of the phrases receive an accent and become the nuclei of intonational contours. Thus, examples (54) and (55) seem to serve as counterexamples to my proposed constraint in (17), for none of the devices I have been adopting here provide an explanation for the prosodic phenomenon in (54) and (55). Notice, however, that if we prove that another factor enters into the stressing of _wh_-phrases in (54) and (55), we need not treat these cases as counterexamples. It is thus worth while to examine whether or not another factor enters into this prosodic phenomenon.

It is interesting to note here that in both of the examples, the wh-phrases are closely related to their respective verbs. Specifically, the proper function of books is to be read, and thus the verb _read_ is easily predictable from _what book_. The same relation holds between _take_ and _which turn_. That is, the turn is to be taken, and the former is easily predictable from the latter. We can say therefore that the speaker gives the status of old information to the verbs _read_ and _take_, although they do not have any explicit antecedent in the respective discourses. Thus, it is better to represent the focus structures of (54) and (55) as in (56a) and (56b), respectively.

(56) a. [what book]
     b. [which turn]

The wh-phrases in (54) and (55) are both contained in a narrow focus
domain. That is why they receive a pitch accent and become the nuclei
of the respective intonational contours.

This analysis is supported by the fact that if there is no essen-
tial relationship between a wh-phrase and a verb, the verb rather than
the wh-phrase receive an accent. This is illustrated by the following
examples.

(57) in an out-of-the-blue context
     a. What book have you BOUGHT today?
     b. *What BOOK have you bought today?
(58) in an out-of-the-blue context (John is old information.)
     a. What book did John CRITICIZE this week?
     b. *What BOOK did John criticize this week?

In these cases, there is no essential relationship between the wh-
phrases and the verbs; specifically between what book and bought and
between what book and criticize. Thus, both wh-phrase are
contained in a broad focus domain, roughly represented as in (59).

(59) a. [have bought what book]
     b. [did criticize what book]

We can thus account for the the accentual pattern of (57) and (58) by
the devices I am adopting here. The wh-words are both contained in a
broad focus domain, and probihited from receiving an accent by the
constraint in (17). Instead of them, the verbs receive an accent in
accordance with the requirement in (15).

5. Conclusion and a Remaining Problem

In this paper, I have argued that the semantic analysis I have
advocated in Okazaki (1889a) can naturally be extended to an account
of the accentuation of English wh-questions. In particular, I have
demonstrated that the nonspecific nature of wh-words is the most
crucial factor for their destressing in out-of-the-blue contexts and
that the deaccenting is accounted for by the Specificity Constraint on

Sentence Accent Assignment (17). I have also shown that the
accentuation of wh-questions in German and Japanese is analyzed in
exactly the same way and argued that the constraint in (17) is highly
likely to be one of the universals of sentence accents.

One might argue here that the Specificity Constraint serves only
as a descriptive device and that the following problem remains to be
solved:

(60) Why is it that a nonspecific NP cannot bear an accent
solely within a broad focus domain?

One might further argue that my arguments do not stand without an
answer to the above question.

It is indeed true that my proposed constraint is rather descrip-
tive and that the problem in (60) remains to be solved. Yet, it is
also true that my proposed constraint enables us to capture, in a
unified manner, a wide range of data which would otherwise be treated
separately, and to find significant data which have not been found
from any of the standpoints adopted in previous treatments of sentence
accents. In fact, only by my proposed constraint can we account in a
unified manner for the accentuation of the data in section 2.1 and
that of wh-questions. Furthermore, only from the standpoint adopted
here can we find data like (21) and (22), repeated below, which have
not been seen significant.

(21) in an out-of-blue context
    a. *Bring me a HOTDOG.
    b. BRING me a hotdog.
(22) What is John doing?
    a. *He's painting a PICTURE.
    b. He's PAINTING a picture.

My proposed constraint also makes a large contribution to under-
standing the nature of sentence accents in that it explicitly shows
the relation between specificity and accent that no one has ever found
important. Even if the problem in (60) remains to be solved, we
cannot deny the essential relation between specificity and accent
insofar as the data adduced in this paper are taken into account.

NOTES

* This paper is a revised and enlarged version of the former half
of Okazaki (1990b). I am very grateful to the following people for
their invaluable comments on an earlier version of this paper: Takeru
Honma, Shinsuke Homma, Shin-ichi Tanaka, and Yukiko Kazumi. I am also
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¹ "Accents of power" can also be observed in Japanese. In
Japanese, 'unaccentable' elements like particles and anaphoric
pronominal expressions often receive an accent, as the following
examples show.

(i)   a.   SoonandesukeredoMO...
           "That is indeed true, but..."
      b.   SoonandesuGA...
           "That is indeed true, but..."
(ii) SONNAKOTO wakattemasuyo.
      "I know it."

Particles receive an accent in (i), while in (ii) an anaphoric
pronominal expression receives an accent. These accents do not
indicate the contrast of the particles and the pronominal with other
particles and pronominals. Rather, they emphasize, and increase the
'power' of, the whole utterance.

² The accentual contrast between the predicates in (12) and those
in (13) and (14) is ascribed to a semantic difference between them.
In particular, the constrast must be ascribed to the semantic
difference between action-type and non-action-type predicates in the
sense of Nakau's (1985) tripartite theory of basic predicate types:
The verbs in (12) are action-type predicates, and those in (13) and
(14) are non-action-type predicates. Thus, the contrast is captured
by the following generalization made in Okazaki (1989b, 1990a).

(i) Action-type predicates receive an accent within a broad focus
    domain, while non-action-type predicates do not receive an
    accent within a broad focus domain.

For further details, see Okazaki (1989b, 1990a).

³ A question arises here of why so-called auxiliaries like <u>are</u>

and <u>did</u> do not receive an accent in cases like (2) and (3).

There are two reasons for the nonassignment of an accent to the auxiliaries in (2) and (3). In the first place, a rule seems to be operative in English sentence accent assignment, which requires that if an NP cannot receive an accent for a semantic or a pragmatic reason, an element which has the closest relationship, both syntactically and semantically, to the NP receive an accent (cf. section 1). In neither of the cases do the auxiliaries has such a relationship to the respective <u>wh</u>-words. In (2), the verb <u>buy</u> is most closely related to <u>what</u>, and in (3), the preposition <u>from</u> is most closely related to <u>where</u>.

Second, a semantic factor is also involved in this prosodic phenomenon. Notice that auxiliaries are state verbs or non-action-type predicates in Nakau's (1985) tripartite theory of basic predicate types. Thus, the prosodic behavior of auxiliaries within a broad focus domain can be captured in a principled manner by Okazaki's (1989b, 1990a) generalization (cf. note 2).

⁴ The accentuation of German declarative sentences is also subject to the Specificity Constraint on Sentence Accent Assignment (17). To illustrate this, consider the accentuation of the following two cases.

(i)   A: Warum kreischst du so?
         "Why are you crying?"
      B: Es ist eine SPINNE in die Suppe gefallen.
         "A spider has fallen in the soup."

                                        (Lötscher 1983:   50)

(ii) Es ist etwas auf den BODEN gefallen.
      "Something has fallen on the ground."

                                        (Ibid.:   51)

A whole part of each sentence is new information, and thus construed as a focus. However, there is a prosodic constrast between (i) and (ii). An accent falls on the NP <u>eine Spinne</u> in (i), while in (ii) it falls on the PP <u>auf den Boden</u>. The crucial difference between the two cases is that <u>eine Spinne</u> in (i) has a specific referent, while <u>etwas</u> in (ii) does not. It follows, then, that the accentual

difference between (i) and (ii) must be accounted for by the constraint in (17). Thus, in (i), the subject NP receives an accent by rule. In (ii), on the other hand, the subject NP is prohibited from receiving an accent by the constraint in (17), and the PP receives it in accordance with the requirement in (15).

We can say therefore that the account of the accentuation of German wh-questions proposed in this paper is not ad hoc, but has a wider empirical coverage than expected. For further details of sentence accent assignment in German, see Lötscher (1983), Altmann (1988), and Okazaki (1990c,d).

⁵ One might argue that Japanese wh-words receive an accent in out-of-the-blue contexts on the grounds that they must receive an accent in questions which seem to be uttered out of the blue like

(i) a. NANI-ga attandesu-ka?.
   "What happened?"
   b. DARE-ga kitandesu-ka?
   "Who came?"

This argument does not stand, however. The questions in (i) are inappropriate in out-of-the-blue contexts. In such contexts, questions like those in (ii) are appropriate.

(ii) a. Nanika ATTANDESU-ka?
   "Did anything happen?"
   b. Dareka KITANDESU-ka?
   "Did anyone come?"

The reason for the inappropriateness of (ia) and (ib) as out-of-the-blue utterances is that in both of the sentences the predicates are presupposed or old information, and cannot serve as a focus. In other words, the wh-words themselves constitute a narrow focus domain. That is why they receive an accent in questions like those in (i).

Shinsuke Homma has suggested to me that in an English wh-question, the predicate can also be presupposed. That is, a wh-word constitutes a narrow focus domain. In fact, Huang (1982: 251f.) observes that in questions like Who arrived?, that somebody arrived is presupposed. In other words, the wh-word who is focused and

constitutes a narrow focus domain. This implies that questions like
Who arrived? are inappropriate in out-of-the-blue contexts. Huang's
observation is basically correct but is not always the case. It is
also true that questions like What happend? can be uttered out of
the blue. Thus, wh-questions should be classified into two classes:
those can be uttered out of the blue, and those cannot.

[6] Takeru Honma has suggested to me that the wh-words why,
how, and when are different from other wh-words in that all of
the three words always constitute a narrow focus domain. That is,
wh-questions headed by these words cannot be uttered out of the blue.
Honma's generalization is correct. In Japanese, wh-questions headed
by naze 'why', dooyatte 'how', and itsu 'when' are inappropriate as
discourse-initial utterances. (53) is a typical example. The
generalization is also true of English wh-questions headed by why,
how, and when. They cannot be uttered out of the blue. (42a) and
(43a) are typical examples.

[7] The accentuation of Japanese declarative sentences is also
subject to the Specificity Constraint on Sentence Accent Assignment
(17). To illustrate this, consider the following two sentences
uttered out of the blue.

> (i) OTOOSAN-ga kita.
>   "My father came."
> (ii) Dareka-ga KITA.
>   "Someone came."

An accent falls on the subject in (i), while in (ii) it falls on the
verb. This difference in accentuation must be attributed to the
difference between a specific and a nonspecific NP. In fact, the
subject NP in (i) has a specific referent, while that in (ii) does
not. Thus, in (ii), the subject NP is deaccented in accordance with
the constraint in (17), and the verb receive an accent in accordance
with the requirement in (15). For further details of the relation
between accent and specificity in Japanese, see Okazaki (1990d).

REFERENCES

Altmann, H. 1988. (ed.) Intonationsforschungen. Tübingen: Max
    Niemeyer.

Bierwisch, M. 1966. "Regeln für die Intonation Deutscher Sätze,"
    Studia Grammatica 7. 99-201.

Bolinger, D. 1985. "Two views of accents," Journal of Linguistics 21.
    79-123.

_____. 1986. Intonation and its parts: Melody in spoken English.
    Stanford: Stanford University Press.

_____. 1989. Intonation and its uses: Melody in grammar and dis-
    course. Standford: Stanford University Press.

Bresnan, J. 1972. "Stress and syntax: A reply," Language 48. 326-42.

Culicover, P. and M. Rochemont. 1983. "Stress and focus in English,"
    Language 59. 123-65.

Faber, D. 1987. "The accentuation of intransitive sentences in
    English," Journal of Linguistics 23. 341-58.

Givón, T. 1973. "Opacity and reference in language: An inquiry into
    the modalities," in J. Kimball (ed.) Syntax and Semantics 2.
    95-122. Tokyo: Taishukan.

Gunter, R. 1966. "On the placement of accent in dialogue: A feature
    of context grammar," Journal of Linguitics 2. 159-79.

Gussenhoven, C. 1984. On the grammar and semantics of sentence
    accents. Dordrecht: Foris.

Huang, C.-T.J. 1982. Logical relations in Chinese and the theory of
    grammar. Ph.D. dissertation, MIT.

Imai, K. 1987. "Nurete de awa," Gengo 16:8. 4-6.

Jackendoff, R. 1972. Semantic interpretation in generative grammar.
    Cambridge, MA: MIT Press.

Lötscher, A. 1983. Satzakzent und funktionale Perspektive im
    Deutschen. Tübingen: Max Niemeyer.

Nakau, M. 1985. "Imiron no genri (21)," The Rising Generation 131.
    464-6.

Okazaki, M. 1989a. "Specificity and sentence accent assignment."
    Paper read at the 61st General Meeting of English Literary
    Society of Japan held at Aoyama Gakuin University on May 21,
    1989.

_____. 1989b. "On sentence accent assignment." Paper read at the Seventh National Conference of the English Linguistic Society of Japan held at Kobe University on November 19, 1989.

_____. 1990a. "A semantic analysis of sentence accent assignment in English." ms., University of Tsukuba.

_____. 1990b. "Pitch accent assignment and the organization of grammar." Paper read at the monthly meeting of the Tsukuba English Liguistics Colloquium held on January 28, 1990.

_____. 1990c. "Specificity, predicate types, and German sentence accents." ms., University of Tsukuba.

_____. 1990d. "Further notes on accent, specificity and predicate types." Paper read at the monthly meeting of the Tsukuba Circle of Phonologists held on June 28, 1990 and to be read at the monthly meeting of the Tsukuba English Linguistics Colloquium to be held in September, 1990.

_____. in preparation. "Specificity and sentence accent assignment."

Rochemont, M. 1986. Focus in generative grammar. Amsterdam: John Benjamins.

Selkirk, E.O. 1984. Phonology and syntax: The relation between sound and structure. Cambridge, MA: MIT Press.

Suiko, M. 1985. "Syntax and phonology: intonation." handout.

Zwicky, A. and N.S. Levin. 1980. "You don't have tó," Linguitic Inquiry 11. 631-6.

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