Tsukuba English Studies (1995) vol. 14, 41-74

On Backward Anaphora of Psych-Verbs*

Seizi Iwata

0. Introduction

This paper is concerned with backward anaphora of psych-verbs, which is usually not possible with non-psych-verbs.

(1) Pictures of himself$_i$ worry John$_i$.
(2) *Pictures of himself$_i$ hit John$_i$.

In the generative literature, reflexives are generally assumed to be subject to Condition A of the Binding Theory.

(3) Binding Theory
A. An anaphor is bound in a local domain.
B. A pronominal is free in a local domain.
C. An R-expression is free.
(Chomsky 1981)

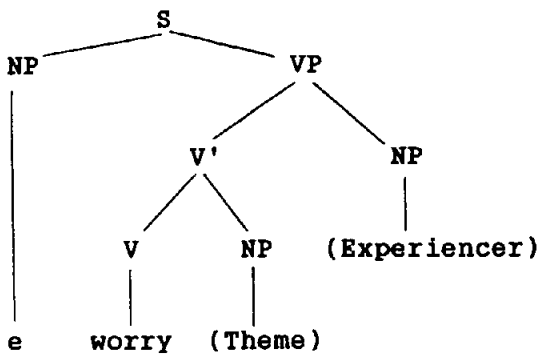
In order for an anaphor to be bound, it must be c-commanded by its antecedent. Apparently, however, himself is not in a position c-commanded by John in (1). Thus backward anaphora of psych-verbs constitutes a challenging problem for the Binding Theory.

1. Previous analyses

1.1. Belletti & Rizzi (1988)

In an attempt to salvage the Binding Theory, Belletti and Rizzi (1988) propose a purely structural account of backward anaphora, claiming that psych-verbs are unaccusatives, that is to say, psych-verbs like worry lexically take Theme and Experiencer arguments, both of which are projected onto VP-internal positions at D-structure, with the subject position being empty.

(4)



In this configuration, Experiencer c-commands Theme, thereby satisfying the c-command requirement. The Theme argument is subsequently moved to the subject position at S-structure, yielding the surface word order in (1).

There are two considerations which call into question the validity of such a purely structural account. The first is that backward anaphora is observable in a wide range of constructions that do not fit into the proposed D-structure configuration. There are periphrastic causatives.

(5) a. Stories about himself$_i$ always worry John$_i$.
b. Stories about himself$_i$ always make John$_i$ worry.
(Campbell & Martin 1989)

Backward anaphora exists in various constructions in which no psych-verbs appear such as the double object construction (6), make + adjectives (7) (8), and make + verbs that are not inherently psychological (9).

(6) a. Pictures of himself$_i$ give Bill$_i$ a headache.
b. Stories about herself$_i$ give Mary$_i$ the chills.
(Ibid.)

(7) a. Each other$_i$'s remarks made John and Mary$_i$ angry.
b. Pictures of each other$_i$ make us$_i$ happy.
c. These stories about herself$_i$ made Mary$_i$ nervous.

(Pesetsky 1990)

(8) a. Stories about herself$_i$ make Susan$_i$ proud of her achievements.

b. Pictures of himself$_i$ make John$_i$ angry at his plastic surgeon. (Campbell & Martin 1989)

(9) a. Stories about each other$_i$ made the men$_i$ laugh.

b. Pictures of each other$_i$ made them$_i$ cry.

c. Stories about each other$_i$'s life made the girls$_i$ cry over lost loves. (Ibid.)

Finally, since the antecedent is in the specifier position of the object NP in the following sentences, the c-command requirement cannot be met even with the putative D-structure.

(10) a. Pictures of himself$_i$ make John$_i$'s head hurt.

b. Stories about herself$_i$ cause Mary$_i$'s head to ache. (Ibid.)

(11) a. These rumors about himself$_i$ caught John$_i$'s attention.

b. The jokes about herself$_i$ got Mary$_i$'s goat.

c. Each other$_i$'s nasty remarks really ruffled John and Mary$_i$'s feathers. (Pesetsky 1990:109)

It is practically impossible to apply the unaccusative analysis to all these sentences without ad hoc assumptions and mechanisms. This indicates that the special D-structure configuration in (4) does not really account for backward anaphora.

Rather, all these data point to the relevance of meaning, for what is shared by (6)-(11) is not syntactic structure but a psychological meaning. This conjecture is further supported by the following contrast noted by Pesetsky (1990). He observes that the sentences with an agentive subject in (12) are unacceptable, whereas their counterparts with an abstract

subject in (13) are significantly better.

(12) a. *Each other$_i$'s stupid friends eventually killed John and Mary$_i$.
b. *Each other$_i$'s parents harmed John and Mary$_i$.
c. *Each other$_i$'s swimming coaches plunged John and Mary$_i$ into the pool.

(13) a. ?Each other$_i$'s stupid remarks eventually killed John and Mary$_i$.
b. ?Each other$_i$'s criticism harmed John and Mary$_i$.
c. ?Rumors about herself$_i$ always plunge Mary$_i$ into a deep depression. (Pesetsky 1990)

This contrast is not surprising once we realize that the verbs kill, harm, etc., change from physical meanings in (12) to psychological ones in (13). Abstract entities like remarks cannot kill people in the concrete, physical sense. What differentiates (12) from (13) is thus not syntactic structure but meaning.

The other consideration leading to rejection of the unaccusative analysis is the fact that psych-verbs behave just like ordinary verbs in several respects when the notions of external argument and direct internal argument are crucially involved. First, middle formation is generally taken to suppress the external argument and externalize the direct internal argument. Psych-verbs have middles.[1]

(14) Sue frightens easily.

Second, as Levin and Rappaport (1986) demonstrate, -ed adjectives (= adjectival passives) are generally predicated of the direct internal argument of the base verb. Psych-verbs behave like ordinary transitive verbs in this respect.

(15) a. The movie pleased/amused/annoyed the customers.

b. the pleased/amused/annoyed customers
c. *the pleased/amused/annoyed movie

The asymmetry of (15b) and (15c) is straightforwardly accounted for by reference to a direct internal argument. But in the D-structure configuration that Belletti and Rizzi propose, the direct/indirect distinction is reversed. Consequently, they would have to resort to a special mechanism, one which would have to contradict the well-established understanding of adjectival passive formation and which would be limited to psych-verbs.

The same holds for a third phenomenon. As Wasow (1977) and Itoh (1981) point out, -able adjectives are also predicated of the direct internal argument of the base verb. Psych-verbs exhibit the following paradigm.

(16) a. I can't help annoying John. He's so annoyable!
b. In general, Queen Victoria was not amuseable.
(Pesetsky 1990:54)
(17) *The movie is annoyable/amuseable.

Again, Belletti and Rizzi would have to explain why the sentences in (16) are well-formed but the one in (17) is ill-formed.

Fourth, -ing adjectives are allegedly not derivable from a transitive verb (*a killing man, *a destroying man, *a telling man). However, if the meaning is appropriately modified to express a characteristic, -ing adjectives are well-formed.

(18) a killing task, a destroying angel, a telling style,
a convincing argument, a revealing remark,
a calculating politician

Well-formed -ing adjectives then are predicated of the

external argument of the base verb. Psych-verbs conform to this pattern.

(19) a. the (very) pleasing/amusing/annoying movie
b. *the (very) pleasing/amusing/annoying man
(acceptable when "the man" not an Experiencer)

Finally, -er nominals correspond to an entity understood to be the external argument of the base verb, as Rappaport and Levin (1992) point out. -Er nominals can be formed from psych-verbs.

(20) a. John is an annoyer of little children.
b. Someone was finally able to amuse the prince. The amuser of the prince was none other than Bill. (Pesetsky 1990:54)

These phenomena suggest that psych-verbs have both external and direct internal arguments, just like ordinary transitive verbs. But Belletti and Rizzi's unaccusative hypothesis would necessitate quite complicated descriptions of the foregoing five lexical processes, which can in fact be simply described by reference to external and direct internal arguments.

To recapitulate, the unaccusative analysis is untenable for two reasons: It cannot handle periphrastic expressions like (5)-(11), and there is evidence against the unaccusativity of psych-verbs.

1.2. Grimshaw (1990)

Grimshaw proposes a lexical approach, based on the assumption that binding can be sensitive to something other than pure syntactic configuration. She argues that the anaphor must be bound by the most prominent argument, where prominence relations are defined over the structure of

argument structure. Non-agentive and agentive psych-verbs have argument structures (21a) and (21b), respectively.

(21) a. ((x (y)))
Exp Theme
b. (x (y))
Agent Exp

Grimshaw claims that for non-agentive psych-verbs, the Experiencer is always the thematically most prominent argument. Hence the Experiencer, even though it is realized in object position, is a proper antecedent for each other.

(22) a. Pictures of each other$_i$ depress the politicians$_i$.
b. Each other$_i$'s pictures depress the politicians$_i$.

Grimshaw's theory in fact makes a strong claim that the object is the only possible antecedent. The antecedent cannot appear in subject position, where the Theme, not the Experiencer, appears.

(23) a. *The students amazed each other's parents.
b. *The children depressed each other's friends.
c.??They worry each other's friends.

Grimshaw seems to be right in seeking a non-structural solution. Yet her analysis also has difficulty in handling the sentences that are problematic to Belletti and Rizzi's proposal, that is, (5)-(11). Take (5), repeated here as (24), as an illustration.

(24) a. Stories about himself always worry John.
b. Stories about himself always make John worry.

The composition of make-worry should go as follows, parallel

to Grimshaw's analysis of the Japanese -sase construction (1990:169).

(25) a. make (z)
b. worry ((x (y)))
c. make-worry (z (x (y))) or [z [x (y)]]

The argument structure of make, with one argument z (Agent or Cause?), combines with that of worry to yield the argument structure in (25c). In this resultant structure, then, the most prominent argument is no longer the Experiencer (x) but argument z introduced by make. Consequently, the theory incorrectly predicts that in (24b) the only possible antecedent for himself should be the subject stories, which is the most prominent argument.

In order to circumvent this unwelcome result, Grimshaw would be forced to say that make-worry is a fixed, idiomatic expression, having acquired the status of a lexical item with the argument structure ((x (y))). But it is quite dubious to claim that make-laugh and make-cry, along with make-worry and make-happy, should be lexical items on a par with worry. And there seems to be no non-circular reason to motivate such a claim (save, of course, for the need to explain anaphora).

Moreover, since Grimshaw's prominence account maintains that the object is the only possible antecedent, it cannot explain examples like (26) where the antecedent is embedded within the object and is not the object itself.[2]

(26) Pictures of each other$_i$ held the men$_i$'s attention.

Finally, Grimshaw attributes backward anaphora to the Experiencer argument, but this conjecture turns out to be incorrect. Bouchard (1991) observes that a picture NP can be given two interpretations: an individual one, where we are

referring to the object itself as in (27a), or a representational one as in (27b).

(27) a. That picture of Mary is funny because it has an odd shape/frame.
b. That picture of Mary is funny because of what she looks like in it. (Bouchard 1991:32)

Crucially, backward anaphora is possible only with the representational interpretation. Thus, a reflexive must refer to the element represented in the picture NP, and not to the author or owner of the picture, as in (28).

(28)??That book by herself$_i$ struck Mary$_i$ as embarrassing. (Ibid.)

No reference can be made to an individual interpretation.

(29) That picture of herself$_i$ struck Mary$_i$ as funny
OK= ... because of what she looked like in it.
??= ... because it had an odd frame.
(Ibid.)

The same contrast is observable with other psych-verbs.

(30) a. That biography about himself$_i$ frightened the president$_i$ because of its revealing details.
b. *That biography about himself$_i$ frightened the president$_i$ because of its bright cover.
(van Voorst 1992:84, fn.12, due to Bouchard)

It is thus the representational interpretation, not the Experiencer role, which actually licenses backward anaphora. Clearly the representational/individual distinction cannot be derived from the prominence relations of argument structure,

indicating a serious flaw in Grimshaw's analysis.

1.3. Fujita (1992)

Fujita proposes an LF movement analysis within the framework of the Minimalist Program of Chomsky (1992). The object NP moves to Spec of AgrO at LF and c-commands the trace of the subject inside VP (assuming the VP-internal subject hypothesis).

(31) [$_{AgrSP}$NPS [$_{AgrS}$·AgrS [$_{TP}$...[$_{AgrOP}$NPO [$_{AgrO}$· AgrO

[$_{VP}$t [$_{V}$·V t]]]]]]]

One advantage of this analysis is that it eliminates the need to posit a special D-structure a la Belletti and Rizzi (1988). However, the LF movement analysis is not tenable; the putative chain binding does not truly explain backward anaphora of psych-verbs. Fujita claims that backward anaphora is permitted with a Cause subject, but this is incorrect. As seen in 1.2., backward anaphora is sensitive to the representational/individual distinction. This distinction cannot be derived from LF movement, which is claimed to be triggered by the need for Case checking.

Some might argue that this only indicates that LF movement is not sufficient to account for backward anaphora; LF movement is necessary only to ensure that the sentences are syntactically well-formed. The outputs of LF movement will then undergo a semantic filter which rules out non-representational cases.

Yet even this means of reconciliation does not justify the LF movement approach, for it is quite dubious whether LF movement is really necessary. The proposed LF movement must rule in all the acceptable sentences. But consider the following sentences:

(32) a. These rumors about himself$_i$ caught John$_i$'s attention.
b. The jokes about herself$_i$ got Mary$_i$'s goat.
c. Each other$_i$'s teasing really got their$_i$ dander up. (Pesetsky 1990)

Even if LF movement applies, the antecedent NP will fail to c-command the trace of the subject. Consequently, the analysis incorrectly rules out all the sentences in (32).

All this suggests that LF movement is neither sufficient nor necessary to account for backward anaphora of psych-verbs. The LF movement analysis does not really answer the question when and why backward anaphora is possible.

2. Logophoricity

Previous analyses of backward anaphora, whether undertaken in terms of D-structure, lexicon, or LF, have been shown to be untenable.[3] Rather, the crucial factor is to be sought in the following contrast (33), which indicates that backward anaphora is sensitive to the distinction of individual/representational interpretations.

(33) a. That biography about himself$_i$ frightened the president$_i$ because of its revealing details.
b. *That biography about himself$_i$ frightened the president$_i$ because of its bright cover.

But why is only the representational interpretation acceptable? Bouchard argues that it is because the subject NP in the representational interpretation is logophoric, i.e., it represents what is in the thought of the entity standing as its antecedent. Therefore, the antecedent must be a "subject of consciousness", and since only individuals can be subjects of consciousness, backward anaphora is sensitive to the individual/non-individual distinction.[4,5] Bouchard then

goes on to propose the following condition.

(34) Long Distance Anaphor Binding:
A Long Distance Anaphor must be bound by the highest individual in a minimal syntactic domain.
(Bouchard 1991:33)

This condition operates as follows. In (33a) the object the president, but not the subject that biography about himself, is an individual. Hence the president, which is the highest individual, can be the antecedent. By contrast, in (33b) both the subject and the object are individuals. Because the object is lower than the subject, the president cannot be the antecedent.

Surely the subject NP in the representational interpretation is logophoric, but condition (34) is not without problems. For one thing, what is actually going on in (33b) is not that the individual interpretation forces the subject NP to be the only possible antecedent, but that the logophoric interpretation is precluded in the first place. For another, condition (34) is limited to anaphors and its relation to Binding Theory is not clear. But pronominals as well as anaphors may be governed by logophoricity. Kuno (1987) observes that when psych-verbs take a sentential subject, they allow both backward and forward pronominalizations.

(35) a. That he_i was blond worried $John_i$.
b. That $John_i$ was blond worried him_i.
(36) a. That he_i was unpopular didn't disturb $Oscar_i$ at all.
b. That $Oscar_i$ was unpopular didn't disturb him_i at all. (Kuno 1987:112)

Crucially, the two sentences differ in interpretation: The

sentential subject of (35a) represents John's internal feelings directly, whereas in (35b) it represents the speaker's knowledge of John's feelings. The contrast is made clearer in Kuno (1973), where he argues that (37a), whose sentential subject is the indirect discourse representation of what John thought, has the underlying structure (38a), whereas (37b), whose sentential subject does not represent John's internal feelings, is derived from (38b).

(37) a. That he was sick worried John.
b. That John was sick worried him.
(38) a. "I am sick" worried John.
b. The fact that John is sick worried John.
(Kuno 1973)

We thus have an instance where logophoricity licenses a backward pronominalization, which suggests the relevance of logophoricity to binding as a whole, not just to anaphor binding.

Kuno also argues that in addition to psych-verbs, verbs of communication and consciousness such as say, tell, ask, complain, etc., fall into the class of logophoric verbs. Thus the anaphor himself is licensed by logophoricity in both (39a) and (39b), regardless of whether anaphora is forward or backward.

(39) a. That there was a picture of himself$_i$ in the post office surprised John$_i$.
b. John$_i$ said to Mary that there was a picture of himself$_i$ in the post office. (Kuno 1987:126)

Consequently, the cases above involving logophoricity can be summarized as in (40), where the subject of consciousness is on the left and the represented thought on the right. (40a), (40b) and (40c) correspond to (33a), (35a) and (39b).

(40) a. the president$_i$: that biography about himself$_i$
b. John$_i$: he$_i$ was blond
c. John$_i$: there was a picture of himself$_i$ in the post office

The antecedents are on the left side and the proforms on the right uniformly. In this respect, (33a) is no different from (35a) or (39b). Whether anaphora is forward or backward is a separate issue, having to do with the relative positions of the antecedent and anaphor in syntactic structure.

The uniform pattern in (40) suggests that it might be possible to assimilate this pattern to binding and say that the subject of consciousness "binds" an anaphor or a pronominal occurring inside the represented thought. To give substance to this idea, I introduce the following functional representation:

(41) [LOG([X],[Y])]: X = subject of consciousness
Y = represented thought

This functional representation allows us to state the antecedent-anaphor relation straightforwardly without hypothesizing a special D-structure.[6]

Notice that the LOG function cannot be located in the lexicon, for the lexicon does not adequately handle binding phenomena, as noted in 1.2. Therefore I will appeal to semantic structure in the sense of Jackendoff (1987, 1990). In semantic representation the LOG function must be distinct from that part of semantic structure which corresponds with syntactic structure. Consequently, the semantic representations for (33a), (35a), (39a) and (39b) are the following:

(42) [CAUSE([THAT BIOGRAPHY ABOUT HIMSELF],
[INCH[BE([PRESIDENT],[AT FRIGHT([ ])])]])]

[LOG ([PRESIDENT],[THAT BIOGRAPHY ABOUT HIMSELF])]

(43) [CAUSE([HE WAS BLOND], [INCH[BE([JOHN],
[AT WORRY([ ])])]])]
[LOG ([JOHN],[HE WAS BLOND])]

(44) [CAUSE([THERE WAS A PICTURE OF HIMSELF],
[INCH[BE([JOHN], [AT SURPRISE([ ])])]])]
[LOG ([JOHN],[THERE WAS A PICTURE OF HIMSELF])]

(45) [CAUSE([JOHN],
[GO([THERE WAS A PICTURE OF HIMSELF], $\begin{bmatrix}\text{FROM JOHN}\\ \text{TO MARY}\end{bmatrix}$)])]
[LOG ([JOHN],[THERE WAS A PICTURE OF HIMSELF])]

3. Implications for the Binding Theory

In the last section, we have seen that backward anaphora of psych-verbs is conditioned by logophoricity, and the possibility of integrating logophoricity into Binding Theory was suggested. Let us now turn to the issue of how the integration can be achieved.

3.1. Integrating logophoricity into binding

3.1.1. A fourth condition

There seem to be several possibilities for integrating logophoricity into Binding Theory. One is to set up a logophoric rule and introduce it as a further condition. This is actually the proposal made in Kuno (1987), where he suggests the following reformulation of Binding Theory.

(46) Anaphor rules (Cyclical)
Condition A'
Condition B'

(47) Nonanaphor Rule (Postcyclical)

Condition C'

(48) Logophoric Rule (cyclical)
Condition D': Given a verb that takes [+logo-1/2] NPs and a logophoric complement clause, an R-expression in the complement clause must be marked for disjoint reference with the [+logo-1/2] NPs.
(Kuno 1987:147-148)

Here the logophoric rule is introduced as a fourth condition.[7]

However, this formulation does not seem to be coherent with Binding Theory as originally conceived, where the three conditions are associated with three classes of NPs: Anaphors, pronominals, and R-expressions. It would be reasonable to introduce a fourth condition in order to deal with a class of NPs that belong to none of these three classes. However, logophoricity conditions coreference possibilities of anaphors and pronominals, not those of a hitherto unknown fourth class of NPs.

What's more, logophoricity conditions coreference possibilities of all the three classes. Consider (49).

(49) a. Pictures of himself$_i$ worry John$_i$.
b. That he$_i$ was blond worried John$_i$.

The anaphor himself is coreferential with John in (49a), and the pronominal he is coreferential with John in (49b). The R-expression John cannot take the place of himself in (49a) or he in (49b). This indicates that logophoricity covers both coreference requirements of anaphors and pronominals on the one hand and the disjoint reference requirement of R-expressions on the other, although Condition D' in (48) specifies disjoint reference of R-expressions alone.

3.1.2. A logophoric version of Condition A

Now an alternative possibility emerges: Rather than add

Napoli (1992), taking up this issue, gives evidence showing not only that linearity is relevant, but also that c-command is irrelevant in some instances. She further shows that Larson's c-command-based analysis rests on a number of theory-dependent or data-specific assumptions which cannot be maintained.

Yet at the same time Napoli acknowledges the fact that in the literature there is evidence for the relevance of both c-command and of linearity.

She points out that the existence of evidence on both sides stems from the fact that the two factors come into play in different syntactic contexts: In all the examples used to demonstrate the relevance of linearity and the irrelevance of c-command to binding, both the binder and the bindee are inside a single VP in a simple sentence. In contrast, in the examples crucial for claiming that c-command is the only relevant factor, the binder and the bindee are often members of different clauses (Napoli 1992:847).[10]

Napoli has thus demonstrated not only that both linear order and c-command are relevant to binding, but also that the two factors establish binding relationships in different contexts. (Of course, nothing prevents the two factors from jointly coming into play. In many instances where the anaphor is well-formed, the antecedent both precedes and c-commands the anaphor.) So even apart from the issue of logophoricity, the content of syntactic binding is not homogeneous.

Consequently, we have three factors relevant to binding: linear precedence, c-command, and logophoricity. All three can be regarded as assigning the antecedent some kind of prominence over the pronoun, be it in terms of linear order, domination, or point of view: Linear precedence amounts to linear prominence; a node c-commanding another node has structural prominence over the latter; a subject of consciousness has prominence over what appears inside a projection of the subject's mental world.[11] To the extent

to the number of conditions, it seems better to modify Condition A by treating logophoricity as a factor relevant to binding, parallel to c-command. Binding may be syntactically licensed when the antecedent is in a position c-commanding the anaphor. But it can also be licensed when the antecedent is a subject of consciousness and the anaphor lies within the represented thought. Consequently, what we need is a logophoric version of Condition A rather than Condition D.[8]

This comes close to the position of Jackendoff (1992) and Suzuki (1993), who both argue that the licensing of anaphor involves both syntactic and semantic structures. Yet neither makes reference to logophoricity. They both attempt to establish a structural requirement defined over configuration in semantic structure.[9]

3.2. Binding as a complex phenomenon

3.2.1. Factors relevant to binding

Most of the current GB literature assumes that c-command is the only factor relevant to binding. Thus some linguists may be still reluctant to admit that binding can be licensed by a factor other than c-command, claiming that the content of binding would no longer be homogeneous.

However, empirical considerations suggest that c-command is not the only structural relationship establishing syntactic binding. There has been a debate between Larson (1988,1990) and Jackendoff (1990) over just this point. Larson (1988) offers an analysis of the double object construction in which the first object asymmetrically c-commands the second object, on the assumption that c-command alone is relevant. Jackendoff (1990) raises serious problems for Larson's analysis, and argues that linear order plays a role as well. Larson (1990) refutes some of Jackendoff's objections, yet he concedes that an analysis based on linear precedence and c-command together could handle most of the relevant data.

that this idea has some plausibility, then, Condition A can be restated as in (50), which generalizes over the three factors:

(50) An anaphor must be bound by means of some prominence relation within a minimal domain.

The overall picture of binding we have arrived at is summarized in Table 1.

Table 1: The Overall Picture of Binding

	domain	level	person
Syntactic binding			
linear order c-command	governing category	sentential	3rd person
Logophoric binding			
logophoricity	domain of point of view	discourse	1st and 2nd

Binding falls into two parts, syntactic and logophoric, with different characteristics. Syntactic binding employs either linear order or c-command (or both) in determining the minimal domain in which the anaphor must be bound. The relevant domain is the governing category as conceived in the GB literature. Syntactic binding operates at the sentence level, and typically involves 3rd person pronouns.

By contrast, logophoric binding is established by point of view. The relevant domain is the domain of point of view, which may be defined as a portion of discourse which involves one and only one narrative point of view (Zribi-Hertz 1989). Logophoric binding is insensitive to syntactic locality, but is not literally unbounded. The anaphor must be bound by the minimal subject of consciousness, which is either (a) the

nearest available NP that occurs in discourse and is read as logophoric, or (b) the speaker or the addressee, whether or not explicitly mentioned in discourse. The latter case is exemplified, for instance, by the following sentences.

(51) a. As for myself, I won't be invited.
b.??As for yourself, you won't be invited.
c. *As for herself, she won't be invited.
(Kuno 1987:129)

The speaker and the addressee can directly participate in binding only under logophoric binding. In this sense, logophoric binding can be said to be '1st and 2nd person' binding.[12]

Of course, this does not mean that logophoric binding is limited to 1st and 2nd person pronouns, or that it necessarily operates across sentences. 3rd person anaphors can have antecedents within the same sentence, as in the case of psych-verbs.[13]

3.2.2. The minimal subject of consciousness

As mentioned above, logophoric anaphors have different characteristics from syntactic anaphors, from which an important consequence follows. Consider (52), whose ill-formedness appears to be due to the failure of John to c-command himself.

(52) a. *John$_i$'s father hates himself$_i$.
b. *John$_i$'s father hates everybody except himself$_i$.
(Zribi-Hertz 1989:723)

This is only part of the matter, however. It is true that syntactic binding fails in (52). But we must ask why logophoric binding, which is not sensitive to the c-command restriction, cannot save (52). In fact, logophoric binding is

possible from the specifier position, as in (53).

(53) a. John$_i$'s face turned red despite himself$_i$.
b. John$_i$'s father received more books from the Baron than from himself$_i$. (Ibid.)

The difference between (52) and (53) is that the subject NP that includes the antecedent John is a potential subject of consciousness in (52), but not in (53). Consequently, John in (52), qualifying as a potential subject of consciousness but not the minimal one, cannot be the antecedent of himself. By contrast, the subject NP does not qualify as a subject of consciousness in (53). Thus (52) is rendered ill-formed not only by a violation of the c-command restriction, but also by John's inability to serve as the minimal subject of consciousness.

The same explanation applies to (54), where the antecedent is part of the object rather than the object itself.

(54) a. *Pictures of each other$_i$ annoy [the millionaire who funded the politicians$_i$].
b. *Stories about herself$_i$ generally please [Mary$_i$'s father].
c. *Each other$_i$'s health worried [the students$_i$' doctor].
d. *Each other$_i$'s books amazed [the men$_i$'s teacher].
(Pesetsky 1987:127-128)

Syntacticians might be tempted to attribute the ill-formedness of these sentences to failure of c-command in the D-structure, as hypothesized by Belletti and Rizzi (1988). But notice that in all the sentences of (54) the object NP qualifies as a subject of consciousness. Thus what blocks the intended binding is not the failure of c-command but the intervention of another subject of consciousness.

This leads us to the following prediction: Logophoric binding is possible even from the specifier position of the object NP, provided that the object NP does not count as a subject of consciousness. This prediction is borne out by the following sentences.[14]

(55) a. These rumors about himself$_i$ caught John$_i$'s attention.
b. The jokes about herself$_i$ got Mary$_i$'s goat.
c. Each other$_i$'s teasing really got their$_i$ dander up.

As noted in Section 1, these sentences pose a serious problem to both syntactic and lexical analyses. Yet they are quite naturally accommodated within my analysis. The contrast between (54) and (55), parallel to that between (52) and (53), follows from characteristics of logophoric binding.

3.2.3. Forward anaphora and backward anaphora

As seen in section 2, psych-verbs with a sentential subject allow forward (56b) as well as backward anaphora (56a).

(56) a. That he$_i$ was blond worried John$_i$.
b. That John$_i$ was blond worried him$_i$.

Forward anaphora is also observed with a non-sentential subject.

(57) A party without Lucie$_i$ annoys her$_i$.
(Grodzinsky and Reinhart 1993:72)

Those who hold that binding is established by c-command alone will have to assume two different structures to account for anaphora in the two directions. Claiming that these two

structures are derivationally related, as Belletti and Rizzi (1988) do, does not help much. In the D-structure configuration hypothesized by Belletti and Rizzi to account for backward anaphora, the pronoun (him, her) will c-command the R-expression (John, Lucie) in (56b) and (57), violating Condition C. In order to avoid this problem, one would be forced to say that in the case of psych-verbs Condition C applies at S-structure alone, whereas Condition A applies at D-structure. Yet this flatly contradicts Belletti and Rizzi's claim that Conditions B and C, in contrast to Condition A, must be satisfied at every level of derivation.[15]

By contrast, my theory accommodates anaphora in both directions without creating undesirable complications. Backward anaphora is licensed under logophoric binding, which does not require a special D-structure. In contrast, forward anaphora must be subject to syntactic binding, since logophoric reading is not possible either in (56b) or in (57). In (57) neither Lucie nor her c-commands the other, so it violates neither Condition C nor Condition B of syntactic binding.

Unlike backward anaphora, however, the anaphoric relation in (57) does not come directly from binding. Grodzinsky and Reinhart (1993) argue that (57) is a case of coreference, where pronouns are not bound but are coreferential with other NPs by being interpreted as referential expressions. The bound anaphora interpretation can be tested by sloppy identity reading, which, according to Reinhart (1983), is obtained only with bound anaphora.

(58) a. Los Angeles$_i$ is adored by its$_i$ residents and so is New York. SLOPPY

b. Each of the western cities$_i$ is adored by its$_i$ residents.

(59) a. People from LA$_i$ adore it$_i$ and so do people from NY. NON-SLOPPY

b. *People from each of the western cities$_i$ adore it$_i$. (Reinhart 1983:155)

Forward anaphora of psych-verbs behaves like coreference, parallel to (59).

(60) A party without Lucie$_i$ annoys her$_i$, and a party without Zelda, too.
ONLY: A party without Zelda annoys Lucie.
(Grodzinsky and Reinhart 1993:74)

Incidentally, if backward anaphora of psych-verbs truly falls under binding, as I claim, it should behave like bound anaphora. This prediction is borne out. Sloppy identity reading is available as in (61a) and (62a), and bound anaphora with quantified NPs is possible as in (61b) and (62b).

(61) a. Jokes about his$_i$ wife upset Max$_i$, but not Felix.
SLOPPY
b. The jokes about her$_i$ boss pleased each of the secretaries$_i$.

(62) a. That people hate him$_i$ disturbed Felix$_i$ but not Max.
SLOPPY
b. That people hate him$_i$ disturbed every student$_i$.
(Reinhart 1983:179-180)

To recapitulate, psych-verbs allow anaphora in two directions not because they have two different configurations in the course of derivation, but because different factors establish the anaphoric relationships in the two cases. Backward anaphora, being a case of logophoric binding, is licensed by logophoricity. In contrast, forward anaphora falls within the realm of syntactic binding. It does not violate Conditions B and C and hence is well-formed. Its

anaphoric relationship arises from referential interpretation of the pronoun.

3.2.4. Binding as a category

Finally, let us consider one more characteristic of my version of Condition A, which can be stated as in (63).

(63) An anaphor must be bound within a domain by an antecedent NP which either
(a) c-commands the anaphor,
or (b) precedes the anaphor,
or (c) refers to a subject of consciousness.

Crucially, my version of Condition A is defined in terms of a disjunction of three conditions. The three conditions need not be simultaneously met; anaphors are licensed so long as one of the three conditions is satisfied.[16]

This version of Condition A is more complex than Condition A characterized in terms of c-command alone. This complexity might appear to be undesirable, considering that most of the GB theory is guided by an implicit assumption that the less descriptive apparatus, the simpler it is and hence the better.

Simplicity tends to be evaluated in the mathematical sense of the smaller the number, the simpler. However, simplicity is not always what it seems. Recent findings in cognitive linguistics have shown that human conceptual systems are fundamentally different from purely formal systems defined mathematically. Thus Lakoff (1987:490) maintains that in experiential gestalts, a complex description may correspond to a cognitively simple concept, while a relatively simple description may be cognitively more complex. Therefore, one cannot dismiss a theory solely on the basis of the number of conditions called for.

The disjunctive character of (63) is not problematic,

either. Fillmore (1982) observes a number of cases in which word meanings cannot be characterized in terms of necessary and sufficient conditions. The English verb climb, with its two critical conditions of Clambering and Ascending, illustrates this.

(64) a. A monkey climbed up a flagpole.
b. A monkey climbed down a flagpole.
c. A snail climbed (up) the wall.
d. *A snail climbed down the wall.
(Fillmore 1982)

A monkey climbing up a flagpole satisfies both conditions and exemplifies prototypical climbing (a). A monkey climbing down a flagpole can also be said to be climbing, even though only the Clambering condition is met (b). A snail ascending a wall can be said to be climbing (up) the wall, even though only the Ascending condition is met (c), but the snail when returning to the bottom of the wall cannot be described as climbing (d), since neither condition is met.

The conditions governing the use of climb and Condition A proposed here are similar in being disjunctive. Disjunctive characterization is not inherently blameworthy. If we realize that binding constitutes a category, then it is not surprising that binding exhibits a disjunctive character. My analysis is thus quite natural in the context of human categorization.

4. Conclusion

Backward anaphora of psych-verbs is licensed by logophoricity. Without recognizing the relevance of logophoricity, a coherent account of such anaphora cannot be given, whether it is stated in terms of D-structure, lexicon, or LF.

Rather than treating anaphora licensed by logophoricity as exceptional, I have argued that logophoricity should be

regarded as a factor relevant to binding, on a par with c-command. The modified version of Condition A presented in this paper does not necessitate ad hoc assumptions or mechanisms, and explains sentences which are recalcitrant to previous analyses.

Notes

*I'd like to express my gratitude to Prof. Minoru Nakau, Yukio Hirose and reviewers for reading an earlier version of this paper. I am also indebted to Lynne Roecklein, who helped me as informant and suggested extensive stylistic improvements.

[1] Some might argue that (14) is derived from an agentive psych-verb, not from a non-agentive one. But Fellbaum (1986:14) observes that (14) allows for a reading in which Sue becomes frightened at the smallest provocation or for no good reason, as well as a reading in which anybody can frighten Sue without much difficulty. Evidently the two readings are derived from non-agentive and agentive psych-verbs, respectively. Also, Dixon (1991:327) argues that (i) is appropriate if John gets shocked at the mildest swear-word without anyone meaning to shock him.

(i) John shocks easily.

[2] Grimshaw herself admits (p.185) that her theory cannot handle sentences like (26).

[3] Zubizarreta (1992) proposes an account based on scope relations among arguments. Yet it is clear that the individual/representational contrast does not follow from scope considerations. Moreover, Johnson (1992: 266-267) demonstrates that the putative scope relations contradict other scope dependency phenomena (quantifier, weak cross-over, and negative polarity) and thereby concludes that backward anaphora of psych-verbs has nothing to do with scope. For details, see Johnson (1992).

[4] Zribi-Hertz (1989) points out several characteristics which are unique to anaphors licensed by logophoricity, one of which is split antecedent. As a matter of fact, backward anaphora of psych-verbs allows split antecedent.

(i) Pictures of themselves at the party amused Mary but enraged Bill. (Bouchard 1984:56)

Bouchard (1984) and Lebeaux (1984) also note several characteristics that are observable with non-local anaphors.

[5] The term "subject of consciousness" is borrowed from Banfield (1982).

[6] I am claiming only that logophoricity can be formalized as in (41), not that logophoricity is to be reduced to a structural notion.

[7] Actually, Kuno proposes Condition D' only as a possible reformulation of Binding Theory. He proposes the following condition to account for anaphora within his own theory, which is stated independent of Binding Theory.

> Awareness Condition for Picture Noun Reflexives: Use of a picture noun reflexive is obligatory if the referent of the reflexive perceived/perceives/will perceive the referent of the picture noun as one that involves him.

[8] The discussion in the text will be concerned only with a possible extension of Condition A. In order to propose an overall reformulation of the Binding Theory, it is necessary to be able to draw a line of demarcation between Conditions A, B, and C, but this is a challenging task. Chomsky's Binding Theory predicts complementarity between anaphors and pronominals, but the complementarity often fails.

(i) a. Only Felix_i voted for himself_i.
b. Only Felix_i voted for $\text{him}_i/\text{Felix}_i$.

(ii) a. The boys_i like each other_i's books.
b. The boys_i like their_i books.

(Levinson 1991:117)

See Levinson (1991), Grodzinsky and Reinhart (1992),

and Reinhart and Reuland (1991, 1993) for possible solutions.

[9] Jackendoff (1992) argues that the licensing of anaphors involves both syntactic and conceptual structure. But the proposed binding is intended to account for the following contrast, not backward anaphora.

(i) a.?*Bill and his wife worry themselves. (nonagentive stative)

b. Bill and his wife purposely frightened themselves. (agentive)

Suzuki (1993) advances a similar proposal to account for backward anaphora, claiming that Principle A applies to both syntactic and semantic structures.

(ii) Thematic Principle A

An s-anaphor is s-commanded by its s-antecedent in a local domain. (Suzuki 1993:52)

[10] Reinhart (1981, 1983) presents many examples that can only be accounted for in terms of c-command, not linear order. Yet she herself admits that there are cases pointing to the relevance of linear order rather than c-command. One potential counterexample to her thesis involves coordination.

(ia) Each of the employees and his wife will be invited to the party.

(ib) *His wife and each of the employees will be invited to the party. (Reinhart 1983:134, note 9)

[11] Reinhart (1975) divides parentheticals into two subclasses: parenthetical-subject oriented and speaker oriented. She argues that with parenthetical-subject oriented parentheticals as in (ia), the main clause represents the parenthetical-subject's point of view, whereas with speaker oriented parentheticals as in (ib), the main clause represents the speaker's point of view.

(i) a. He_i would be late, $John_i$ said.

b. John will be late, he said. (Reinhart 1975:136)

With parenthetical-subject oriented parentheticals, tense concord and backward anaphora are obligatory.

(ii) a. *He will be late, John said.

b. *John would be late, he said. (ibid.)

Evidently in (ia), logophoricity licenses backward anaphora. At the same time, (iia) indicates that logophoricity plays a part in establishing sequence of tenses phenomena as well as anaphoric relations between NPs.

[12] I am indebted to Yukio Hirose for bringing this point to my attention.

[13] The usual term "long-distance anaphor" seems to me highly misleading. Logophorically licensed anaphors can occur at any distance (cf. Reinhart and Reuland 1991, 1993). Therefore, this misleading term is avoided throughout the paper.

[14] Pollard and Sag (1992) make essentially the same observation, arguing that (ib) is unacceptable precisely because it presents the experiencer's (John's father's) viewpoint, not John's.

(i) a. The picture of himself$_i$ in Newsweek bothered John$_i$.

b. *The picture of himself$_i$ in Newsweek bothered John$_i$'s father.

By contrast, all the examples in (ii) are grammatical, although they are structurally the same as (ib), since it is John whose viewpoint is reflected in (ii).

(ii) a. The picture of himself$_i$ in Newsweek dominated John$_i$'s thoughts.

b. The picture of himself$_i$ in Newsweek made John$_i$'s day.

c. The picture of himself$_i$ in Newsweek shattered the peace of mind that John$_i$ had spent the last six months trying to restore.

(Pollard and Sag 1992:277-78)

[15] Kuno and Takami (1993) point out this problem.

[16] Actually, things are more complex than this exposition might have us believe. As noted in 3.2.1., the three

factors come into play in different syntactic contexts. Therefore, satisfaction of just one condition may license anaphors in some cases but may not in others. In order to arrive at a fully articulate theory of anaphora, therefore, exactly which factor wins out in what syntactic contexts needs to be worked out.

References

Banfield, A. 1982. Unspeakable Sentences, Routledge & Kegan Paul, London.

Belletti, A. and L. Rizzi. 1988. 'Psych-Verbs and Theta-Theory', Natural Language and Linguistic Theory 6, 291-352.

Bouchard, D. 1984. On the Content of Empty Categories, Foris, Dordrecht.

————. 1991. From Conceptual Structure to Syntactic Structure, Manuscript, Université du Québec à Montréal.

Campbell, R. and J. Martin. 1989. 'Sensation Predicates and the Syntax of Stativity', Proceedings of the Eighth West Coast Conference on Formal Linguistics, 44-55.

Chomsky, N. 1981. Lectures on Government and Binding, Foris, Dordrecht.

————. 1992. 'A Minimalist Program for Linguistic Theory', MIT Occasional Papers in Linguistics 1. Department of Linguistics and Philosophy, MIT, Cambridge.

Dixon, R. 1991. A New Approach to English Grammar, on Semantic Principles, Clarendon Press, Oxford.

Fellbaum, C. 1986. On the Middle Construction in English, Indiana University Linguistics Club, Bloomington.

Fillmore, C. 1982. 'Towards a Descriptive Framework for Spatial Deixis', in R. J. Jarvella and W. Klein (eds.), Speech, Place, and Action, 31-59. John Wiley, London.

Fujita, K. 1993. 'Object Movement and Binding at LF',

Linguistic Inquiry 24, 381-388.

Giorgi, A. 1984. 'Towards a Theory of Long Distance Anaphors: A GB Approach', The Linguistic Review 3, 307-359.

Grimshaw, J. 1990. Argument Structure, MIT Press, Cambridge, MA.

Grodzinsky, Y. and T. Reinhart. 1992. 'The Innateness of Binding and Coreference', Linguistic Inquiry 24, 69-101.

Higuchi, Y. 1993. Shinridoshi-no Gyakko-shoo-ni Tsuite (On Backward Anaphora of Psych-Verbs). BA thesis, Gifu Women's University.

Itoh, T. 1981. 'The Lexicalist Hypothesis Revisited', Linguistic Research 1, 33-63.

Iwata, S. 1993. 'Three Types of Passives for Psych-Verbs', English Linguistics 10, 160-184.

Jackendoff, R. 1983. Semantics and Cognition, MIT Press, Cambridge, MA.

————. 1990. 'On Larson's Treatment of the Double Object Construction', Linguistic Inquiry 21, 427-455.

————. 1992. 'Mme. Tussaud Meets the Binding Theory', Natural Language and Linguistic Theory 10, 1-31.

Johnson, K. 1992. 'Scope and the Binding Theory: Comments on Zubizarreta', in T. Stowell and E. Wehrli (eds.), Syntax and Semantics 26: Syntax and the Lexicon, 259-276. Academic Press, New York.

Kuno, S. 1973, Nihon-Bunpoo Kenkyuu, Taishukan, Tokyo.

————. 1987. Functional Syntax, University of Chicago Press, Chicago.

Kuno, S. and K. Takami: 1993, Grammar and Discourse Principles: Functional Syntax and GB Theory, University of Chicago Press, Chicago.

Lakoff, G. 1987. Women, Fire, and Dangerous Things: What Categories Reveal about the Mind, University of Chicago Press, Chicago.

Larson, R. 1988. 'On the Double Object Construction',

Linguistic Inquiry 19, 335-391.

————. 1990. 'Double Objects Revisited: Reply to Jackendoff', Linguistic Inquiry 21, 589-632.

Lebeaux, D. 1984. 'Locality and Anaphoric Binding', The Linguistic Review 4, 343-363.

Levin, B. and M. Rappaport: 1986, 'The Formation of Adjectival Passives', Linguistic Inquiry 17, 623-661.

Levinson, S. 1991. 'Pragmatic Reduction of the Binding Conditions Revisited', Journal of Linguistics 27, 107-161.

Napoli, D. 1992. 'The Double-Object Construction, Domain Asymmetries, and Linear Precedence', Linguistics 30, 837-871.

Pesetsky, D. 1987. 'Binding Problems with Experiencer Verbs', Linguistic Inquiry 18, 126-140.

————. 1990. Experiencer Predicates and Universal Alignment Principles, Manuscript, MIT.

Pollard, C. and I. Sag: 1992, 'Anaphors in English and the Scope of Binding Theory', Linguistic Inquiry 23, 261-303.

Rappaport, M. and B. Levin: 1992, '-er Nominals: Implications for the Theory of Argument Structure', in T. Stowell and E. Wehrli (eds.), Syntax and Semantics 26: Syntax and the Lexicon, 127-154. Academic Press, New York.

Reinhart, T. 1975. 'Whose Main Clause? (Point of View in Sentences with Parentheticals)' in S. Kuno (ed.), Harvard Studies in Syntax and Semantics Vol.1. 127-170. Department of Linguistics, Harvard University, Cambridge, Mass.

————. 1981. 'Definite NP Anaphora and C-Command', Linguistic Inquiry 12, 605-636.

————. 1983. Anaphora and Semantic Interpretation, Croom Helm, London.

Reinhart, T. and E. Reuland: 1991, Anaphora and Logophoricity: An Argument Structure Perspective', in J. Koster and E. Reuland (eds.), Long-Distance Anaphora, 283-321.

Cambridge University Press, Cambridge.

————. 1993. 'Reflexivity', Linguistic Inquiry 24, 657-720.

Sells, P. 1987. 'Aspects of Logophoricity', Linguistic Inquiry 18, 445-479.

Suzuki, T. 1993. 'A Lexical-Semantic Approach to Psychological Verbs and Anaphoric Binding', in H. Nakajima and Y. Otsu (eds.), Argument Structure: Its Syntax and Acquisition, 47-67. Kaitakusha, Tokyo.

van Voorst, J. 1992. 'The Aspectual Semantics of Psychological Verbs', Linguistics and Philosophy 15, 65-92.

Wasow, T. 1977. 'Transformations and the Lexicon', in P. Culicover et al. (eds.), Formal Syntax, 327-360. Academic Press, New York.

Zribi-Hertz, A. 1989. 'Anaphor Binding and Narrative Point of View: English Reflexive Pronouns in Sentence and Discourse', Language 65, 695-727.

Zubizarreta, M. L. 1992. 'The Lexical Encoding of Scope Relations among Arguments', in T. Stowell and E. Wehrli (eds.), Syntax and Semantics 26: Syntax and the Lexicon, 211-258. Academic Press, New York.

Faculty of General Education
Gifu University