Surface Anaphora / Deep anaphora and Conversational Inference in English

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1. INTRODUCTION

Anaphora has been generally classified into surface anaphora, which requires only linguistic elements as antecedents, and deep anaphora, which allows both linguistic and nonlinguistic elements to be antecedents. Hankamer and Sag (1976) first formalized the distinction between these two types of anaphora and pointed out some theoretical differences between them. Several studies have followed their proposal which confirm the classification (e.g., Sag 1979, Sag and Hankamer 1984), question the authenticity of the classification itself (e.g., Williams 1977, Schachter 1977, Tasmowskiské-De Ryck and Verluyten 1981), or critique the adequacy of the governing ground for the distinction (e.g., Murphy 1985). The prototypical examples of surface and deep anaphora which have been proposed in the literature are shown in (1).

(1) SURFACE ANAPHORA:

sluicing (John was going to the station, but he didn’t say when.)
stripping (Gwen snorts cocaine, but not in her own house.)
gapping (Leslie drove the car, and Kim the moped.)
verb phrase ellipsis (I can’t see the problem, but Lee can.)
so anaphora (You say she is guilty, but do you really think so?)

DEEP ANAPHORA:

null complement anaphora (Johnson told me to wash his car, but I wouldn’t comply.)
do it anaphora (Jones couldn’t flip the pancake, so Smith did it.)
sentential it anaphora (I mean business, but I can’t get anyone to believe it.)
one anaphora (Richard bought a blue shirt and returned the red one.)

(Murphy 1985)

Making an overall consideration of referring expressions, I suppose that they can be classified into one or the other group. However, the proposed grounds for distinguishing them have serious theoretical problems. Therefore, the focus of what follows will be exclusively on the third issue: what criterion is most adequate for distinguishing these two types of anaphora? My interest here is not in describing a great variety of these anaphora, but in presenting the decisive criterion.¹

¹ It can be considered that there are some other anaphors which can meet the classification here. This paper, however, limits the scope of the discussion into the examples in (1). See Sag (1979) for the other anaphors for each type of anaphora.
Furthermore, the explorations proposed thus far lack an implicational investigation. This paper aims to explain how two different conversational implicatures—Q-implicatures and I-implicatures—theoretically framed by Levinson (1987) are involved in the recovering of the antecedent of surface and deep anaphors. I will proceed as follows. Section 2 will explain the shortcomings of the previous attempts that have been made to distinguish surface and deep anaphora. Section 3 will introduce Levinson’s theory of conversational inference, and will be dedicated to my own implicational approach concerning the difference in recovering the antecedent. The conclusions will be: (i) it is inadequate to prescribe in advance that surface anaphora is not pragmatically controlled, and (ii) concerning surface anaphora, the antecedent is recovered in the process of inducing I-implicatures, while concerning deep anaphora, it is recovered in the process of inducing both Q-implicatures and I-implicatures. The grouping of each anaphora mentioned in (1) seems arbitrary at first sight, but the implicational explanation will correspond to our intuition in involving the distinction.

2. PREVIOUS STUDIES AND SOME PROBLEMS

In this chapter, I will critique two explanations why English should set two classes of anaphora. Hankamer and Sag (1976), the first formalization, is a syntactic one, whereas Murphy (1985) is a psychological one.

2.1. Hankamer and Sag (1976)

Sag and Hankamer (1984), which summarize Hankamer and Sag (1976), explicate what helps to distinguish surface anaphora from deep anaphora, as in (2):2

(2) a. Only deep anaphora can be used deictically, or in the terms of HS (viz. Hankamer and Sag 1976), can be ‘pragmatically controlled.’

b. Only surface anaphora requires parallelism in syntactic form between anaphors and antecedents.3

Following the dichotomy mentioned above, (3b) and (4b) cannot be accepted under the nonlinguistic context.

(3) a. H: Someone’s just been shot.
   S: Yeah, I wonder who.

b. [Hankamer produces a gun, points it offstage and fires, whereupon a scream is

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2 Sag and Hankamer (1984) defines their approach as psychological, in addition to Murphy (1985). As Murphy claims, however, that Sag and Hankamer merely try to reduce the linguistic explanation into a psychological one, where ‘psychological’ refers to the way of processing surface and deep anaphora. I agree with him on this point, because the linguistic explanation cannot work without the process of these sorts of anaphora considered. However, it is also a question whether or not Murphy’s explanation is psychological.

3 The syntactic identity between antecedents and anaphors has been supposed to be the requirement for surface anaphora. But, in fact, (1) and (2), which do not satisfy such a strict criterion, can be realized as acceptable or even grammatical.

(1) The newspaper was read by Pat, and Fran did too.
(2) The garbage needed to be taken out, so Chris did.
If Hankamer and Sag are correct, declarative sentences with an illocutionary force of statement would be syntactically controlled, whereas those with an illocutionary force of imperative or advice would be pragmatically controlled. Schachter (1977), on the other hand, restricts the possible anaphora to accept pragmatic control into verb phrase ellipsis. Concerning an illocutionary force, Schachter explains, nondeclaratives are more subject to pragmatic control than declaratives, because the number of the referent actions are more restricted in nondeclaratives. Both explanations affect the acceptability of the following sentences.

(5) a. [Hankamer brandishes a cleaver, advances on Sag]
   Don't! My God, please, don't!
   b. [If you see that an acquaintance has dyed his hair green, you can say:]
   You didn't! (a–b: Hankamer and Sag 1976)
   c. [John pours another martini for Mary. She says:]
   I really shouldn't.
   d. [John hands Mary an expensive present he has bought for her. She says:]
   Oh, John, you shouldn't have. (c–d: Schachter 1977)

However, (6a)–(6c) (i.e. stripping (6a), sluicing (6b)–(6c)) indicate that pragmatic control can be applied in the examples of surface anaphora apart from verb phrase ellipsis. Even verb phrase ellipsis in (6d), like (5c)–(5d), cannot be asserted to be nondeclarative, though it is not easy to define the illocutionary force.

(6) a. [John attempts to throw a soda can into Mary's garbage carelessly. She says:]
   Not in my wastebasket, you don't.
   b. [A is teaching B how to use a new copy machine]
   C: Show me how.
   c. [As soon as John produces a gun, it goes off before Bob's eyes]
   Bob: Oh, I wonder why.
   d. [A and B are competing in weight lifting. A lifts 300 pounds. B says:]
   If you can, so can I. (d: Kuno's suggestion in Schachter 1977)

To explain these examples inclusively, a generalization must be made in order to incorporate both explanations. That is, concerning surface anaphora, pragmatic control is allowed in case the speaker and the hearer are in the same speech situation, and the hearer can recognize how the speaker is acting and how the event is proceeding. An illocutionary force matters when the utterance is paid attention to by the hearer. For example, vocatives and exclamatory expressions like "Oh" or "Yeah", which focus on the presence of the hearer, are
often used, and the meaning of the quick response is also conveyed.4

Thus, Hankamer and Sag's explanation based on pragmatic control/syntactic control cannot appropriately distinguish between these two anaphoric relations. Moreover, if it is the measure of distinction, pragmatically-controlled examples of surface anaphora can be regarded as a mere exception. However, it is mysterious to prescribe first that some anaphoric relations are pragmatically controlled and others are not.

2.2. Murphy (1985)

Murphy (1985) explains the two classes of anaphora by analyzing the degree of difficulty a hearer has in recovering the antecedent of the anaphors. The scales required to determine the recoverability are:

(7) a. the number (range) of possible antecedents for an anaphoric form
   b. the quality of the anaphoric utterance as a clue to the correct antecedent (i. e. the
      clues provided by the sentence containing the anaphor) (Murphy 1985)

More specifically, the scale (a) is about how many antecedents an anaphor can potentially refer to: the more restricted it is, the more easily the hearer can recover the antecedent (i. e. interpret the referring expression). The scale (b), on the other hand, is about how many syntactic and morphological clues to search for the correct antecedent remain in the anaphoric sentence: the more linguistic elements that remain in the anaphoric sentence and the more perfect the form of the sentence, the more clues it should contain. The combination of these two scales, it is argued, would predict the differences in the tendency to recover the antecedent between surface and deep anaphora, as in (8).

(8) a. The form with the most restricted sets of antecedents (personal pronouns, do it
      anaphora) are deep; those with the least restricted sets (stripping, clausal so
      anaphora) are surface.
   b. The forms that preserve more information to help recover the antecedent tend to be
      deep. (ibid.)

However, there are at least two problems for this recoverability explanation. They both arise from the analysis that the scale of recoverability is relatively determined by comparing two similar expressions between surface anaphora and deep anaphora (i. e., sluicing and null complement anaphora). Compare (9a), null complement anaphora, with (9b), verb phrase ellipsis, for instance.

(9) a. I don't see why you even try.
   b. I don't see why you even try to.

Contrary to the actual classification, “try to” in (9a) can be incorrectly interpreted as being deep anaphora: Murphy himself confirms it is, because the anaphoric sentence contains more information to help recover the antecedent than “try” in (9b). That is, the information value of “try to” can be guaranteed, following Murphy, by the analysis that it has a more

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4 According to this explanation, for example, (3b) is low in acceptability, partly because the relationship between speaker and hearer is less certain than (6c).
definite property as deep anaphora than “try”, one of the forms of deep anaphora.5

Murphy explains the reason (9b) is classified into deep anaphora is that it does not require the morphologically identical antecedent in (10a), and that it is pragmatically controlled in (10b).

(10) a. The garbage needs to be taken out.
    Well, I refuse to.
    b. [Each person at the table swallows a goldfish whole.]
    Sandy: Come on, Lee, it’s your turn.
    Lee: Not me, I refuse to. (cf. Not me, I refuse.)

Of course, these may be good arguments for “try to” to be one of the forms of deep anaphora. However, this does not insure that it is deep anaphora. Even though it is surface anaphora, the similarity, not the identicality in linguistic form as shown in (10a), would virtually allow the anaphor to have an anaphoric relation with the antecedent (see note 3). According to my research, on the other hand, some informants tell me that the form without to sounds more natural, and others tell me that it does not affect the acceptability of (10b) whether it leaves to stranded or not. In either case, if the superiority of the form with to is not justified in (10), one could not classify it into deep anaphora.

The proposed argument I made against Sag afid Hankamer (1976) above can explain that (10b) belongs to deep anaphera like other forms of verb phrase ellipsis. That is, the reason surface anaphora “refuse to” is highly acceptable, even under the given nonlinguistic context, is that it is under the condition that enables it to be susceptive to pragmatic control: the speaker and the hearer recognize the stream of each action, and that play is at the center of attention for both. Therefore, there is no need to think that the “refuse to” in question is deep anaphora as Murphy suggests.

Another problem with Murphy’s recoverability explanation is that the scale (8a) is not consistent with the fact that sentential it anaphora is classified into deep anaphora. Even though the anaphoric sentence contains enough information to recover the antecedent, recoverability is low in scale, because it can refer to any state or event as an antecedent in discourse, linguistic or nonlinguistic. Thus, if combining these two factors, Murphy’s explanation would make a wrong prediction that sentential it anaphora does not belong to deep anaphora.6

To summarize: the surface/deep anaphora distinction cannot be properly made by Hankamer and Sag’s dichotomy between syntactic and pragmatic control. Nor can Murphy’s recoverability explanation based on the linguistic clue in the anaphoric sentence and the referentiability of the anaphors. Rather than prescribing surface anaphora as not prag-

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5 Murphy attempts to distinguish “try to” or “refuse to”, which leaves a stranded infinitive to, from other forms of verb phrase ellipsis, by terming “comp-verb phrase ellipsis.” However, I feel that the two are basically the same.

6 Murphy justifies his overall argument by explaining that though sentential it is more ambiguous than other pronouns for recovering the antecedent, one must rely on general pragmatic principles to understand it.
matically controlled as a grammatical rule, it seems natural to think that any anaphora can be interpreted with the use of context, linguistic or nonlinguistic. Therefore, it is now important to find an alternative explanation for making an essential distinction between these two types of anaphora.

3. ANAPHORA AND QUANTITY MAXIM

3.1. When several aspects of anaphora are considered (i.e. coreference, substitution, and ellipsis), it is evident that Grice's (1975) Quantity maxims are closely related to the phenomena. Even if anaphors function in any way, there is always an informative relationship between antecedent and anaphor. These seem to be totally independent issues, but in what follows, their interaction will be quite clear.

(11) Maxims of Quantity (Grice 1975):

Q 1. Make your contributions as informative as required (for the current purpose of the exchange).

Q 2. Do not make your contributions more informative than is required.

Levinson (1987) has proposed that Q-implicatures, based on Q1, and I-implicatures, based on Q2, operate on lines that look entirely inconsistent. There are additional questions about the antinomic interaction between these two implicatures, however, I trust that the idea is clear enough to proceed.

A first approximation of Q-implicatures and I-implicatures is (12a) and (12b), respectively.

(12)a. (1) "Some of the miners voted for Thatcher."

(2) Not of all the miners voted for Thatcher.

\[ \rightarrow [A(S) \vdash A(W)] \ [A(W) + > \sim A(S)] \]

b. (1) "I'll go to the meeting if you go."

(2) I'll go to the meeting if and only if you go.

\[ \rightarrow [A(S) \vdash A(W)] \ [A(W) + > A(S)] \]

First, the Q-implicature is a highly systematic Quantity implicature related with scaler items which consist of a contrasting set of expressions, where a stronger expression entails the weaker one, and the assertion of the weaker expression Q-implicates that the stronger one does not hold. Take some and all in (12a), which constitute a Horn scale, for instance. The proposition that all X have property P entails the one that some X have property P: in terms of informativeness all is stronger (or more informative) and some is weaker (or less informative). Under such a condition, the use of a weaker expression in (12a)(1) implicates the denial of the applicability of the stronger expression, as in (12a)(2). This principle instructs the speaker to make the strongest possible statement he can commit himself to, and the hearer to assume that the speaker has conformed to the principle. If the speaker chooses to use a weaker expression, though he can use the stronger expression, he would be in breach of the Maxim of Quantity Q1. A brief explanation of the discussion above is shown in the
notation in (12a), which indicates that the assertion of a weaker arbitrary sentence \( A(W) \) conversationally implicates the negation of the stronger arbitrary sentence \( A(S) \) on condition that the latter sentence entails the former.\(^7\)

Another implicature is generated from the statement (12b)(1): when there is a similar entailment between stronger and weaker expressions, the statement of a weaker expression implicates a stronger expression. In other words, it is the rule that enriches an expression from less informative to more informative through the inferential process. To illustrate, by making a statement of (12b)(1), the speaker expects the hearer to interpret (12b)(2) (i.e., the I-implicature that the speaker goes if and only if the hearer goes). However, if the information “if and only if” is expressed, it becomes more informative than is required; thus it would break Q2 in (11). This is clearly showed in the notation of (12b); what is different from the Q-implicature is that the statement of a weaker sentence conversationally implicates a stronger arbitrary sentence.

Levinson's framework of conversational inference resolves how contradictory Q-implicatures and I-implicatures can manage to coexist. In this section, the two kind of anaphora can be distinguished along these lines.

(13) a. genuine Q-implicature from tight Horn scales and similar contrast sets of equally brief, equally lexicalized linguistic expressions 'about' the same semantic relations, take precedence over I-implicatures.
   b. In all other cases, the I-principle induces stereotypical specific interpretations, unless:
   c. there are two (or more) available expressions coextensive in meaning, one of which is unmarked in form and the other marked in form. In that case, the unmarked form carries the I-implicatures as per usual, but the marked form Q/M-implicates the nonapplicability of the pertinent I-implicatures. (Levinson 1987)

Furthermore, Ariel (1994) suggests the application of these implicatures is ordered as follows:

(14) a. Q-implicatures (blocking a stronger interpretation when the relevant expression forms part of a Horn scale contrast set) take precedence over I-implicatures.
   b. M-implicatures (generating marked interpretations when long/marked forms are used) take precedence over I-implicatures.
   c. I-implicatures (producing stereotypical and specific interpretations) are generated, if a and b are not applicable.\(^8\) Ariel (1994)

The ordering of application between the two types of inferences is: (i) when there are scaler items like all and some, or items forming a contrast set, whose brevity are equal and which can designate the same semantic relation, Q-implicatures are generated first, and (ii) in

\(^7\) The use of the symbol follows Levinson's (1987), where \( \vdash \) stands for 'entails', and \( + \triangleright \) 'conversationally implicates'.

\(^8\) The explanation of Q/M-implicatures in (13) and M-implicatures in (14) is beyond the discussion of this paper, because they involve the maxims of Manner.
cases other than (i), the I-principle induces a stereotypical specific interpretation, which concerning anaphora, Levinson explains, is a coreferential interpretation. More specifically, pronouns or zero forms prefer a coreferential interpretation to a disjoint interpretation; the disjoint interpretation, which increases the number of referred entities, takes more processing cost for recovering the correct antecedent.9

Before applying the framework of conversational implicature to the issue of anaphora, some problems should first be considered. One of them is to transform the definition of the terms stronger and weaker. It is easily understood that scaler items like all and some would form a scale of quantity (i.e., more informative vs. less informative) both being lexically fixed. In the case of anaphora, on the other hand, the concept of informativeness must be reduced into the concept of schematicity/specificity. However, it can also be defined that specific expressions or statements are weaker (or less informative) than schematic expressions or statements, since specific items contain more information than schematic ones. Both expressions or statements are positioned on the same scale of quantity and have an entailment in that specific statements entail schematic statements.

Second, following Levinson, the Q-implicature and the I-implicature are induced “if that is compatible with what is taken for granted”; he assumes something like the knowledge of the world. However, it would be more natural to think that these implicatures arise from pragmatic induction based on default inference.

A third problem for the application of these implicatures is to define the meaning of “lexicalized”. In the course of this discussion, I try to define deep anaphor as lexicalized, and surface anaphora as nonlexicalized. Generally speaking, the main function of surface anaphora is to keep textual cohesion in the form of substitution or ellipsis. Most examples, in effect, of surface anaphora in (1) are zero forms, and it is conceivable that even the surface anaphors in verb phrase ellipsis and so anaphora have no lexical items. In verb phrase ellipsis, for instance, substitution verb do, auxiliaries, or copulas are left stranded in the anaphoric sentence, but they merely function as a marker to tell where information should be enriched: Halliday and Hasan (1976) call them “place holders”. For instance, do can be substituted for any lexical verb in (15a)-(15b) whatever content (i.e., state, action, or process) is replaced, even though the antecedent consists of more than two words. Furthermore, substitution verb do can be deleted, as a dialectal and individual property of American English. Also, “might have” in (15c) mainly marks where one should enrich information to recover the antecedent.10

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9 Levinson’s (1987) claims are contradictory regarding whether or not a contrasted item is supposed to be in linguistic discourse on defining Q-implicatures. In fact, even though he does not originally claim that it must be in the discourse, he mistakes the existence of a contrast set in a sentence for the requirement in its application. Ariel (1994), on the other hand, correctly claims that the items of the set are potentially contrasted. I agree with Ariel on this point.

10 I think so in do so anaphora functions almost in the same way as a substitute verb do. However more exploration is needed, including the issue of what the lexicon is.
In this section, I will explain how these implicatures that act in the opposite direction are related to interpreting the two kinds of anaphora. Regarding the conversational inference, I will use the same notation as used in (12).

Let us begin with sluicing (16), one of the forms of surface anaphora.

(16)a. Someone drank all my beer but I don't know who.  
   b. [As soon as John produces a gun, it goes off before Bob's eyes]  
      Bob: I wonder why.  
      a and b: \( \rightarrow \) I-implicature: \( \{A(S) \Leftarrow A(W)\} \quad \{A(W) + \rightarrow A(S)\} \)  
   c. [The lights go out for a moment and a shot rings out. When the lights return, the vicar is dead]  
      The detective: *I know who.  
   d. [A child is fond near a broken vase, and says:]  
      *I don't know who.

What is crucial here is that there are no scalar items nor contrast set of items involved, because the anaphor is the zero form; the anaphor itself is not lexicalized, and thus it is not conceivable that an lexical item contrasted with the anaphor is existent. There is no Q-inference from a scale or a contrast set to stop the I-inference from being used and the I-principle promotes a more specific interpretation; it helps recover the antecedent by informational enrichment from the zero form.$^{11}$

If both the speaker and the hearer are closely involved in the intended communication, the same implicational explanation can also be applied to (16b), where nonlinguistic information is relied upon to recover the antecedent. Presumably, this construction restricts the antecedent to refer to a property of action or event, and therefore, in the environment where the property can be specialized, I-inference operates to induce a stereotypical specific interpretation, by which one can recover the antecedent.

However, one cannot always recover the correct antecedent even though one relies on nonlinguistic information, as in (16c) and (16d). This is mainly because it is rather difficult to assume that the hearer is present in the position where he can recover the speaker's action.

$^{11}$ There are some theoretical problems with the nature of I-implicatures. It seems to contain a contradiction: even though there are no lexicalized contrast sets, enrichment of information can still occur. This paper does not have enough space to discuss it, but this comes from the diversified property of I-implicatures. In fact, most of the examples of I-implicatures used by Levinson (1987) do not have the contrasted lexical items. Above all, he does not decide whether the contrast set of expressions—stronger and weaker—should be lexicalized. If and if and only if the set that is often cited, are not lexical items, but concepts. I think the way of assuming a contrast set is basically different between Q-inferences and I-inferences.
“killing the vicar” or “breaking the vase”. It conflicts with the prerequisite that Q/I implicatures are induced if that is compatible with what is taken for granted: that is, the general pragmatic knowledge. Accordingly, there is no evidence to license informational enrichment to induce the I-implicature that if the speaker asserts a weaker statement he/she implicates the stronger statement. Cancellation of the implicature is allowed, because conversational implicature is based on default inference.

The same informational enrichment can be also licensed in (17), verb phrase ellipsis.

   b. Mary was a colonel. Sandy was too.
   c. [The band starts playing, and several couples head for the dance floor. Pulling back his chair and half-rising, John says to Mary:]
      Shall we?
   d. [John tries to kiss Mary. She says:]
      John, you mustn’t!
   e. [John comes to the table where Mary is sitting, makes as if to take one of the spare chairs there, and says:]
      May I?
      [Mary replies:]
      Please do. (c-e: Schachter 1977)
   a-e: → I-implicature: [A(S) ⊃ A(W)] [A(W) + >A(S)]

f. [Pat holds a running power saw over a handcuffed victim]
   *I hope she doesn’t. (cut that person in half) (Murphy 1985)

A stereotypical specific interpretation to recover the antecedent is induced as a consequence of inducing an I-implicature with the help of linguistic information in (17a) and (17b), and nonlinguistic information in (17c)-(17e). However, mere nonlinguistic information like (17f) would not license the I-inference, because the hearer cannot understand the purpose of Pat’s cutting the victim in half.

(18) is another form of surface anaphora, gapping.

(18)a. H: Ivan is now going to peel an apple.
   S: And Jorge, an orange.
   → I-implicature: [A(S) ⊃ A(W)] [A(W) + >A(S)]
   b. [Hankamer produces an orange, proceeds to peel it, and just as Sag produces an apple, says:]
      *And Ivan, an apple.

In (18a), since the zero anaphor has no information that forms a quantity entailment, the antecedent is recovered directly through the process of the I-inference. The reason (18b) cannot be interpreted as “and Ivan is going to peel an apple” is that the recovered content sounds bizarre when standing alone. Presumably, this comes from the very nature of gapping, that a gapped expression makes sense only when it is interpreted as the one conjunct used in a semantic unit of conjunctive construction: that is, it should be also a linguistic
constituent. For example, informants who judge (18b) to be acceptable will interpret that it means, for instance, “Could you peel an apple, Ivan?”, which focuses on an illocutionary aspect of utterance. Thus, that explains why gapping cannot be easily accepted under any nonlinguistic context. But, of course, it does not mean it prescribes surface anaphora, in general, is not pragmatically controlled.\textsuperscript{12}

To summarize thus far: surface anaphora, where the anaphor is informationally zero and cannot have an entailment with the contrasted expression, there is no Q-inference which excludes the application of the I-inference. Thus, it is easily predicted that the I-inference induces a stereotypical interpretation to recover the antecedent through the information enrichment from zero.

Next turn to the interaction between deep anaphora and conversational inference, taking do it anaphora and null complement anaphora as an example.

Do it is an anaphoric verb phrase like do so, except that it refers to the definite action. For example, the action did it refers to is discrete in (19); “did” refers to “ate” and “it” refers to the action of eating his/her cookie in (19a), and “did” refers to “bought”, and “it” refers to the action of buying three watch-dogs in (19b).

(19)a. Hiram just ate my cookie!—No, Ed did it.
   b. I bought three watch-dogs yesterday.—I can guess why you did it.

As I mentioned, substitution verb do and do so substitute the antecedent or copy the lexical meaning of the verb. This is why do or do so works as a substitute, while do it coreferentially refers to the antecedent. In that sense, do it definitely has a lexical meaning.

Therefore, it is conceivable that do it potentially has a contrast item. In that case, it can be assumed that do it is a schematic expression which can theoretically refer to any action or state, on the one hand. On the other hand, there is a specific expression that is yet known at the moment, on the same quantitative (i.e. informative) scale.\textsuperscript{13} These expressions form an entailment relation between a specific expression and a schematic expression. In (20a), for instance, the use of do it, a weaker (schematic) expression, implicates the denial of a strong (specific) expression, i.e. Q-implications that the anaphoric verb does not refer to a specific action.

(20)a. If the oats need to be taken down to the bin, then I’ll do it.
   b. [Sag produces a cleaver and prepares to hack off his left hand]
   Hankamer: Don’t be alarmed, ladies and gentlemen, we’ve rehearsed this act several times, and he never actually does it.
   a and b: \[ A(S) \vdash A(W) \]

\textsuperscript{12} The subjectability to pragmatic control is rather different in each case of surface anaphora. From my research, sluicing and verb phrase ellipsis are much more subject to control than stripping, gapping, and so anaphora, which strongly require that the antecedent is a linguistic constituent in the preceding discourse.

\textsuperscript{13} It does not matter what the contrasted item with do it is. Although the I-principle, as well as the Q-principle, requires the entailment relation between the contrasted set of expressions, as often mentioned, the contrasted item does not need to be lexicalized.
Q-implicature: \([A(W) + > \neg A(S)]\)

I-implicature: \([A(W) + > A(S)]\)

However, the implicature turns out to be wrong in the face of the linguistic information—the knowledge that tells it is inconsistent with what is taken for granted. As a result, the I-implicature defeats the Q-implicature, in which such informational enrichment induces a stereotypical specific interpretation. The use of do it I-implicates the applicability of a specific action. Also in (20b), the process of recovering the antecedent is the same, even though the available information is nonlinguistic.

Another typical form of deep anaphora is null complement anaphora, as in (21); (21a) and (21b) shows implicatures are worked out by the linguistic information, and (21c) and (21d) by nonlinguistic information. In either case, the inferential process is shown in the notation below.

(21) a. The garbage needs to be taken out.
   Well, I refuse.

b. Sag: Why don’t you stuff that ball through that hoop?
   Hankamer: I’m trying.

c. [Each student is juggling balls on the front lawn. Sandy notices Lee is the only one not juggling]
   Sandy: I can’t believe that you refused.

d. [Observing Hankamer attempting to stuff 12’ ball through 6’ hoop]
   Sag: I don’t see why you even try.

a-d: \([A(S) \models A(W)]\)

Q-implicature: \([A(W) + > \neg A(S)]\)

I-implicature: \([A(W) + > A(S)]\)

To illustrate, “I refuse” in (21a) and “I’m trying” in (21b) (i.e., weaker expressions) are contrasted in a potential semantic domain with “refusing something specific” and “trying something specific” (i.e., stronger expressions). The latter entails the former on the single informative scale. The Q-implicature, which is generated first from the above, licenses the hearer to think that the speaker’s assertion of “I refuse” or “I’m trying” Q-implicates that he/she has not intended to convey the action of refusing something specific or trying something specific. However, linguistic or nonlinguistic information available to recover the antecedent indicates that the Q-implicature is, in effect, inconsistent with the taken-for-granted fact. Thus, the I-principle wins over the Q-principle, and induces the informational enrichment from those schematic interpretations to the specific interpretations that the speaker has intended to say “I refused to take out the garbage” or “I’m trying to stuff that ball through that hoop”.

In the remainder of this section, I will demonstrate why the I-inference operates followed by the Q-inference. I assume it is connected to the simplicity with which Q-implicatures are generated. This is because, given a lexically-fixed or conceptually fixed relation, a more
informative expression entails a less informative expression; the assertion of a less informative expression would easily implicate the negation of the applicability of a more informative expression. It is only common-sensical to assume that a less costly process of inference in communicative behaviors is drawn if there is no decisive reason to block it. The I-inference, in contrast, overwhelmingly depends on the hearer's costly corollary, because it urges the hearer to amplify the informationally minimized content of the speaker's utterance up to what the hearer assumes to be the speaker's intended meaning. Furthermore, the direction of the informational enrichment seems more diversified than that of the Q-inference. Therefore, given lexically contrasted scalar items with entailment, I assume, it is natural to think that the Q-principle operates first. If the available information, linguistic or nonlinguistic, indicates that it is incompatible with what is taken for granted, all the next step is to apply a more costly I-inference.

4. CONCLUDING REMARKS AND REMAINING PROBLEMS

I have argued in this paper that the surface/deep anaphora distinction can be made properly from the inferential approach that investigates the difference in the informational enrichment between them. This is not found in Hankamer and Sag's dichotomy between syntactic/pragmatic control, nor in Murphy's recoverability explanation. If one is concerned about the roles of referring expressions in discourse, these inferential approaches can make a correct and common-sensical prediction about the essential differences in interpreting the two types of anaphora. As space is limited, I have concentrated on the inferential explanations of a few forms of surface and deep anaphora, and paid little attention to other individual examples. However, the same observation can be applied to them.

Of particular concern to me is the difference in the processing costs involved in interpreting these two types of anaphora. The explanations proposed here suggest that the interpretation of deep anaphora involves two-staged inferences: Q-inference and I-inference, in this order. If this issue is reviewed from the processing cost side, one possible assumption would be that the correct interpretation of deep anaphora requires more processing cost than that of surface anaphora. To further understanding of the interaction between the Q/I principles and surface/deep anaphora, the empirical support from psychological experiments should be consulted.

REFERENCES


14 Sentential *it* anaphora, which has been left unsolved by Murphy, can be properly classified into deep anaphora if one assumes that *it* has a lexically contrasted item like the other forms of deep anaphora.


英語における表層照応・深層照応と会話の推論

大 津 隆 広

従来なされてきた表層照応・深層照応の区別には問題点がある。まず，Hankamer and Sag (1976) の syntactic control/pragmatic control という 2 分法では，表層照応でも非言語的なコンテクストにもとづいた解釈を受ける例は例外としてしか扱うことができない。また，Murphy (1985) の復元可能性の説明では，照応形を含む文がもつ復元の統語的な手がかりをひとつの要因とするために正しい分類ができない。

拙論では，表層照応・深層照応における先行詞の復元に関して，会話の含意とそれを導く推論の過程がどのように異なるかを，Levinson (1987) の会話の含意の枠組を用いることにより説明する。表層照応・深層照応の両方の場合において，I-implicature により特定的な解釈がえられるが，その過程が両者では異なると考えられる。表層照応の照応形には，コントラスト・セットがないために Q-implicature が導き出されず，I-implicature により情報内容の解釈の拡張が行われることで先行詞の復元が行われる。これに対し，深層照応では，照応形が特定的な表現とコントラスト・セットをなすために，Q-implicature が生じ，それを抑えるように I-implicature が生じることで，先行詞の復元が行われる。