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Semantics of Preposition Stranding*

Masaki Sano

0. Introduction

In this paper we will examine under what conditions constructions involving stranded prepositions are allowed in English. The P head of a PP will be stranded when the NP object of this P is extracted out of the PP by such movement operations as NP-movement and wh-movement, as in the following:

(1) a. John was laughed at.
   b. Who did John laugh at?

Our main concern in this paper, however, is with wh-movement out of a PP. The so-called "pseudo-passive", as in (1a), will not be dealt with here, although there seems to be a relationship between pseudo-passives and wh-movement out of a PP—the NP object of a PP can be NP-moved (to create a pseudo-passive construction) only if it can be wh-moved, leaving a preposition stranded (cf. Riemsdijk (1978), Hornstein and Weinberg (1981)).

1. Overview

It is well-known that given an underlying sequence of the form P+wh-phrase, either the wh-phrase alone or the entire sequence may, in general, be fronted by wh-movement (cf. Ross' (1967) Pied-piping convention). The sentence created by the first option results in the construction with a stranded preposition, which we will henceforth call SC (S and C standing for stranded and construction, respectively). The sentence created by the second option will be referred to as PC (P standing for
(2) a. Who did John talk to? (SC)
    b. To who(m) did John talk? (PC)

It is often noted that there is a stylistic difference between SC and PC; PC is usually formal and SC colloquial (see, for example, Quirk et al. (1972)). There also seems to be a general belief that wherever SC is allowed, corresponding PC is also possible. However, there are cases where SC is far more natural than corresponding PC. Thus the following sentence sounds less natural than (1b):

(3) At who(m) did John laugh?

It seems that, intuitively, where the P head of a PP is more tightly linked to the V head of a VP than to the NP object of this PP, the P tends to remain within the VP, resulting in SC. We might regard the so-called verb-particle combination as an extreme case in this regard; "preposition" stranding of particles in this combination is the only option available:

(4) a. What did John put on?
    b. *On what did John put?

The copula be followed by a PP complement also requires preposition stranding in general (cf. Quirk et al. (ibid., 736)), as in the following:

(5) a. Who is this present for?
    b. *For who(m) is this present?

(6) a. What is it like?
    b. *Like what is it?
This is apparently related to the incomplete intransitivity of be, which always requires a complement and which would be virtually meaningless without it. Idioms involving a verb and a preposition may be regarded as another instance showing a tight link between the V (+complement) and the P. Thus consider the following:

(7) a. Who did you take advantage of?
   b. *Of whom(m) did you take advantage?

(8) a. Who did you keep tabs on?
   b. *On whom(m) did you keep tabs?

In other cases, the P head of a PP which is subcategorized for by a verb is less loosely linked to this verb, although there is indeed an "indirect" link in that the PP and the V are in a subcategorization relationship. Thus we have a SC-PC pair like (2), or (9) and (10) below, although there is a stylistic difference, as noted:

(9) a. Who did you give the book to?
   b. To whom(m) did you give the book?

(10) a. Which desk did you put the pen on?
   b. On which desk did you put the pen?

Thus, in general, the more the preposition is tightly linked to the verb, the more SC is preferable to PC. In case this linkage is not directly established but a PP is subcategorized by V, we have both options--SC and PC--with equal acceptability, as in (2), (9) and (10). When a PP is not in a subcategorization relationship with a V, however, we seem to have two cases—one is that both PC and SC are equally possible, as in the following: ¹
(11) a. John killed Mary [\textit{\textsubscript{pp}} with a knife]
    b. [\textit{\textsubscript{pp}} with which knife] did John kill Mary t
    c. which knife did John kill Mary [\textit{\textsubscript{pp}} with t]
(12)\textsuperscript{2} a. John went to the movies [\textit{\textsubscript{pp}} with Mary]
    b. [\textit{\textsubscript{pp}} with who(m)] did John go to the movies t
    c. who did John go to the movies [\textit{\textsubscript{pp}} with t]
(13)\textsuperscript{3} a. John went to the movies [\textit{\textsubscript{pp}} in this car]
    b. [\textit{\textsubscript{pp}} in which car] did John go to the movies t
    c. which car did John go to the movies [\textit{\textsubscript{pp}} in t]

The other case is that PC is the only option available, or highly preferred to corresponding SC:

(14) a. John has been reading a book since last night
    b. [\textit{\textsubscript{pp}} since when] has John been reading a book t
    c. *when has John been reading a book [\textit{\textsubscript{pp}} since t]
(15) a. John looked at a flying plane [\textit{\textsubscript{pp}} on the bridge]
    b. [\textit{\textsubscript{pp}} on which bridge] did John look at a flying plane t
    c. *which bridge did John look at a flying plane [\textit{\textsubscript{pp}} on t]
(16) a. John ate spaghetti in a bad manner
    b. [\textit{\textsubscript{pp}} in what manner] did John eat spaghetti t
    c. *what manner did John eat spaghetti [\textit{\textsubscript{pp}} in t]

In the remainder of this paper, we will try to account for why, of the PPs which are not in a subcategorization relationship with verbs, some allow their head Ps to be stranded while others do not.
2. **Syntactic vs. Semantic Approach**

It seems that the class of PPs allowing preposition stranding cannot be distinguished from that of PPs whose heads are impossible to strand in purely syntactic terms. Thus all of the PPs involved in (11)-(16) are internal to VP, and their positions within VP seem to be the same. The VP-internality of these PPs are confirmed by such well-established syntactic tests as VP-preposing and VP-deletion.

VP-preposing is an operation which preposes materials within VP to the left of the sentence, as in the following:

(17) a. Bill was afraid that John might kill Mary with a knife, and kill Mary with a knife John did.

b. Bill said that John had gone to the movies with Mary, and go to the movies with Mary John did.

c. Mary expected that John would go to the movies in her car, and go to the movies in her car John did.

(18) a. Bill says that John has been reading a book since last night, and reading a book since last night he has been.

b. Bill thought that John had looked at a flying plane on the bridge, and look at a flying plane on the bridge he did.

c. Bill said that John had eaten spaghetti in a bad manner, and eat spaghetti in a bad manner he did.

The grammaticality of the examples of both (17) and (18) shows that the PPs in question all behave alike with respect to VP-preposing.
VP-deletion is an operation which "deletes" materials in VP of the second conjunct under the virtual identity with those of the first: 4

(19) a. John killed many people with a knife, and Bill did, too. (=Bill killed many people with a knife)
   b. John went to the movies with his friends, and Bill did, too. (=Bill went to the movies with his friends)
   c. John went to the movies in a car, and Bill did, too. (=Bill went to the movies in a car)

(20) a. John has been reading a book since last night, and Bill has (been), too. (=Bill has been reading a book since last night)
   b. John looked at a flying plane on the bridge, and Bill did, too. (=Bill looked at a flying plane on the bridge)
   c. John ate spaghetti in a bad manner, and Bill did, too. (=Bill ate spaghetti in a bad manner)

Again, all of the PPs in question behave alike and cannot be distinguished from the viewpoint of VP-deletion.

Furthermore, each of these PPs can form part of the focus position of the pseudo-cleft sentence. Thus consider the following sentences:

(21) a. What John did was (to) kill Mary with a knife.
   b. What John did was (to) go to the movies with Mary.
   c. What John did was (to) go to the movies in a car.
(22) a. What John has been doing is (to) read a book since last night.
    b. What John did was (to) look at a flying plane on the bridge.
    c. What John did was (to) eat spaghetti in a bad manner.

Thus, these syntactic tests conspire to indicate that the PPs in question are all located within VP. Furthermore, these PPs seem to be located in the same position within VP; they all function as restrictive modifiers of the rest of the VP, and restrictive modifiers, in accordance with Jackendoff's (1977) X-theory, occupies the position β in (23) (cf. Jackendoff (ibid., 61)):

$$
\text{V (VP)} \quad \beta \quad \alpha: \text{strictly subcategorized phrases}
\quad \beta: \text{restrictive modifiers}
$$

In cases like this, therefore, syntactic approach to preposition stranding is definitely impossible.

How, then, should we account for the different behavior of PPs with respect to preposition stranding? In particular, why does the class of PPs in sentences like (11)-(13) allow their head Ps to be stranded while those PPs in sentences like (14)-(16) do not? It is most unlikely that each native speaker of English has learned, or has been taught, which PPs allow preposition stranding and which do not. In fact, this cannot be the case, since the same locative PP, for instance, allows preposition stranding in one case and does not in another:
(24) a. Which boat did John put his baggage on?
   b. *Which boat did John see a flying plane on?

We are left, then, with the possibility that preposition stranding is to be accounted for from the semantic point of view, and/or the pragmatic one, if a linguistically significant distinction between the two can be drawn with any accuracy.

As noted in the previous section, the PPs which are the targets of wh-movement in (11)-(16) are all restrictive modifiers of the rest of the VP. However, their semantic functions differ from one another. Thus with a knife in (11a) is interpreted as specifying the "instrument" with which John killed Mary, with Mary in (12a) as "accompaniment", and in this car in (13a) as "means". Needless to say, since last night in (14a), on the bridge in (15a) and in a bad manner in (16a) are PPs of time, location, and manner, respectively. Since PPs of the former type, namely those of instrument, accompaniment and means, as distinct from the latter PPs of time, location, and manner, allow their head Ps to be stranded, there must be some semantic property in the former PPs not shared by the latter. Putting PPs of manner aside for the moment, there indeed seems to be a significant difference between notions "instrument", "accompaniment", and "means", on the one hand, and notions "time" and "location", on the other. That is, the former notions are tied up with particular actions while the latter notions are, in principle, independent of particular actions or state. A given PP is interpreted as specifying instrument, accompaniment, or means only if the rest of the VP (the head V, in particular) is interpreted as describing what
may (though need not) involve some object or persons as instrument, accompaniment, or means. Thus whether notions like instrument, accompaniment and means make sense or not depends upon the interpretation of the rest of the VP. In contrast, there is in general no such dependency in the case of notion time and location; time flies independently of our particular action or state; place exists regardless of what action we do, what state we are in.

Assuming this difference to be relevant to the difference of strandability of a given preposition, it seems that whether a PP allows its head P to be stranded depends upon whether what is described in the PP is interpreted as having some relevance to what is described in the rest of the VP. Thus since PPs of instrument, accompaniment, and means, on the one hand, and the rest of the VP on the other are always semantically related, the head Ps of these PPs are strandable. However, since time and place are in general not perceived to have some inherent relationship with a particular action or state, the head Ps of the temporal or locative PPs are in general difficult to strand. I say "in general", since, as we shall see below, some PPs allow their head Ps to strand even if they are interpreted as specifying time or place in so far as what is described in the PP is perceived as having some relevance to what is described in the rest of the VP. Before considering these cases, let us turn to PPs of manner which we have put aside.

3. PPs of Manner

Notion manner, like instrument, accompaniment and means,
is, by definition, related to action; manner adverbials (including adverbs as well as PPs) describes the manner of what is described in the VP. However, unlike PPs of instrument, accompaniment and means, "manner" is consistent with virtually all kinds of action; where there is an action, there is a manner. We can add in a certain manner to virtually any sentence describing an event or process (but not state). For instance, in X manner is not required by particular verbs, such as eat, die, etc. (An exception to this will be noted shortly.) In this sense, the PP in X manner and the rest of the VP in general have no particular relationship with each other required to strand the preposition in in this PP. This seems to be the reason why "it is impossible to strand the preposition in when it occurs in conjunction with the noun manner." (Bresnan and Grimshaw (1977; 342)) Bresnan and Grimshaw (ibid.) give the following examples:

(25) a. John described the manner in which Dickens died.
    b. *John described the manner which Dickens died in.

(26) a. I'd like to know in what manner Dickens died.
    b. *I'd like to know what manner Dickens died in.

However, there seems to be some verbs which intrinsically require manner adverbials. One of such verbs is treat. The verb treat, when used in one of its senses, requires manner adverbials as well as its object NP:

(27) John treats his servants in a bad manner.

Sentence (27) would virtually lose its semantic content if in a bad manner were omitted. Thus in X manner is more tightly linked to treat NP than, say, to eat NP or die. This seems to
be the reason why (28) below sounds more natural than sentences
like (16c), (25) and (26):

(28) ??What manner does John treat his servants in?

Of course, manner adverbials need not include the word
manner. A PP of manner may be of the form with NP, where NP
is occupied by a word which is richer in its semantic content
than manner. In such a case, stranding of with seems to be
more acceptable than that of in in in x manner:

   b. With how much respect does John treat older men?
   c. ??How much respect does John treat older men with?

This is also the case with verbs other than treat. Thus con-
sider the following examples:

(30) a. *What manner did John give the lecture in?
   b. ??How much enthusiasm did John give the lecture
      with?

The reason seems to be that, because of its richer semantic
content, the PP with respect or enthusiasm is perceived to
have more relevance to the rest of the VP than the PP with
manner is.

4. Temporal PPs

It seems that PPs which are inherently temporal generally
disallow proposition stranding. (Cf. Bresnan and Grimshaw
(ibid.).) PPs referring to "calendar-time" and "clock-time",
such as in July, on Monday, at six (o'clock), are typical ex-
amples of inherently temporal PPs. Thus consider the following
examples:

(31) a. In which month did John get the flu?
    b. *Which month did John get the flu in?

(32) a. On what day did John quarrel with her wife?
    b. *What day did John quarrel with her wife on?

(33) a. At what time did John meet Mary?
    b. *What time did John meet Mary at?

The general impossibility for the prepositions of PPs of calendar or clock-time to strand is accounted for in a way briefly expressed in section 2; calendar and clock-times are not usually considered to have any direct relevance to a particular event or process described in the VP.

However, if the temporal PP is, in one way or another, perceived to have some relevance to what is described in the rest of the VP, stranding of the preposition results in a relatively acceptable sentence even if the PP refers to calendar or clock-time. For instance, verbs of "travelling" collocate naturally with temporal PPs, the reason being that, perhaps, it is not unnatural for us to be concerned with the time of "travelling". Thus the following sentences are acceptable, or at least, highly preferable to sentences like the b-examples in (31)-(33):

(34) a. What day will he fly to Paris on?
    b. What time does John go to class at?
    c. Which vacation did John visit his aunt in?

Consider in this regard the following example:

(35) (?)What day did John take the ship on?

Take may not be a verb of "travelling" in itself, nevertheless
we can easily interpret a sentence like the one above as describing a "travelling" event since take is followed by an NP designating locomotion.

A verb like begin, which represents "ingressive aspect" as a lexical property, also collocate easily with a PP designating a temporal reference point. This seems to be a reason for the (relative) acceptability of sentences like the following:

(36) a. What time does the meeting begin at?
    b. What day will he begin school on?

Another class of predicates which co-occur naturally with temporal PPs are those related to "birth". For instance, we tend to take interest in the time of the birth of an individual, and therefore the temporal wh-phrase alone can easily be fronted leaving a preposition behind, as in (37c) below:

(37) a. John was born in 1960.
    b. In what year was John born?
    c. What year was John born in?

Contrasted with (37) are examples like the following:

(38) a. John was still a small boy in 1960.
    b. In what year was John still a small boy?
    c. *What year was John still a small boy in?

    b. In what year did John die?
    c. ??What year did John die in?

The unacceptability of (38c) is related to the fact that the (physical) quality of an individual is not usually considered
to have any connection with a particular time. As for the
difference in acceptability between (39c) and (37c), this re-
fects the difference in the degree of cohesion between the
temporal PP and the rest of the VP; although it is not un-
natural for us to be concerned with the time of the death of
an individual, our interest may be otherwise: we can ask
naturally, not only when he died, but also why he died, how
he died, where he died, etc. In contrast, questions like
"Why/How was John born?" would be unlikely to be posed. Al-
though we could ask where John was born, it is nonetheless more
natural for us to be concerned with the time of the birth of
an individual than with its place.

Similar remarks apply to examples like the following:

(40) a. Which season did the bird breed in?
   b. *Which season was the bird still small in?
   c. ??Which season did the bird die in?

The breeding of a bird can easily be connected to a particular
season while its shape or death is not. Note that the birds' breeding is usually considered to have relevance to natural conditions brought about by a particular season, such as tem-
perature and weather.

The examples given so far confirm our view that the acceptability of preposition stranding depends upon the perceived relation between the PP and the rest of the VP; some predicates but not others contribute to the establishment of this relation. However, the PP itself is also relevant to this establishment. PPs of calendar/clock-time, for the reason noted above, is relatively independent of the rest of the VP.
Object nouns of these PPs, such as year, month, day, time, designate units of time or temporal reference points as lexical properties. But other nouns or noun phrases which are not inherently temporal may also be interpreted as designating temporal reference contextually, particularly when used with certain prepositions. Examples of this sort include before dinner, after the party, at work (as in he got hurt at work), during the operation, etc. PPs of this sort seem to have greater potentiality of establishing their relation with the preceding predicate part of sentences than PPs of calendar/clock-time do, since PPs of the former type are richer in their semantic content than those of the latter type in that object NPs of the former PPs refer to more than just (unit of) time. Thus consider the following examples:

(41) a. After which time did John leave the theater?
    b. *Which time did John leave the theater after?
(42) a. After which act did John leave the theater?
    b. Which act did John leave the theater after?  

As the (41b) shows, the predicate leave the theater does not allow after to be stranded when the NP object of after refers to clock-time. However, the same predicate does allow its stranding when its object NP contains act, rather than time, as in (42b), although which act, like which time, is interpreted as designating temporal reference in this context. The acceptability of (42b) is due to the fact that the semantic content of the PP containing act is taken to be in a particular relation with that of the rest of the VP containing theater. Thus, this sentence is interpreted as asking after which act
of the play performed at a certain theater John left that same theater. Consider in this regard the following example:

(43) Which act of Othello did John leave after?

This sentence is acceptable only if construed as asking after which act of Othello performed at a certain place John left that place; if John left a place which has nothing to do with the performance of Othello, (43) is unacceptable.\textsuperscript{13} It should be noted in passing that in the following pair of examples,

(44) a. John left the theater after three o'clock.
   b. John left the theater after the third act of Othello.

even if the third act of Othello happened to end at three o'clock, the semantic interpretations of (44a) and (44b) are quite different. It goes without saying, therefore, that (42b) and (43) (and (42a), for that matter) cannot be taken as questions asking the clock-time, which is independent of the performance of the play, when John left.

Now consider the following pair of examples, taken from Bresnan and Grimshaw (1978):

(45) a. *the patient died during the hour that the doctor had fallen asleep \[_{pp}^{during \ t}\]
   b. ??the patient died during the operation that the doctor had fallen asleep \[_{pp}^{during \ t}\]

The antecedent of \( t \) in (45a) is the \textit{hour}, which is inherently temporal. As expected, (45a) is unacceptable, since we can perceive no connection between the predicate \textit{fall asleep} and the hour during which the patient died. Now the antecedent of
t in (45b) is the operation, which is not inherently temporal. Although the predicate fall asleep is not usually connected to any operation, which seems to be a reason that (45b) is not fully acceptable, nevertheless there is some relation perceivable in this context between fall asleep and the operation during which the patient died. That is, we can take (45b) to be implying that the doctor's having fallen asleep during his performance of the operation on the patient is the cause of the patient's death during that operation. Note that the doctor in (45b) must be the patient's doctor who performed the operation on him, not a person who has nothing to do with the patient. Thus the following sentence is worse than (45b), in particular if John is not the patient's doctor who performed the operation on him:14

(46) ?*The patient died during the operation that John had fallen asleep during.

Similarly, the following sentences is worse than (45b):

(47) ?*The patient died during the operation that the doctor had felt hungry during.

The reason, obviously, is that the doctor's feeling hungry during the operation cannot be the cause of the patient's death, nor the patient's death during the operation cannot be the cause of the doctor's feeling hungry; the relation between the two is purely accidental.

It is interesting to note that the behavior of temporal PPs concerning preposition stranding is similar to that of PPs of manner discussed in the last section. Thus just as PPs whose object NPs are inherently temporal are in general
resistant to preposition stranding, the PP of manner whose object NP contains the head N manner, namely in X manner, is generally resistant to preposition stranding. However, it is more or less easy to strand prepositions of these PPs when combined with certain predicates which naturally collocate with these PPs. Thus just as sentences like (34)-(36) and (37b), for example, are better than the b-examples of (31)-(33), a sentence like (28) is better than a sentence like (30a). Furthermore, semantic "richness" of both temporal PPs and PPs of manner is relevant to preposition stranding. Thus the acceptability difference between (41b) and (42b), or between (45a) and (45b), is parallel to that between (28) and (29c) or (30a) and (30b). These parallelisms between temporal PPs and PPs of manner are by no means surprising, given our hypothesis that preposition stranding is contingent upon the relation, or "cohesion", between the PP and the rest of the predicate, which is characterized in semantic (and/or pragmatic) rather than syntactic terms. In the next section, we will examine cases of locative PPs and further confirm our hypothesis.

5. Locative PPs

It seems that locative PPs which specify the location of the NP subject of a clause rather than that of other NPs, such as object, are in general resistant to preposition stranding. For example, a sentence like (15a) (repeated below as (48a)) can be paraphrased into something like (48b):

(48) a. John looked at a flying plane on the bridge.
    b. John looked at a flying plane while he was on the bridge.
As we have seen, it is impossible to strand the preposition on in (48a):

(49) *Which bridge did John look at a flying plane on?
     (= (15c))

Similarly, consider the following example:

(50) John saw a snake on the bench.

This sentence is ambiguous. On the bench may either specify
the location of a snake or that of John when he saw a snake.
(Of course, this does not preclude the possibility that both
John and a snake happened to be on the same bench.) This
ambiguity is preserved in (51a) but not in (51b):

(51) a. On which bench did John see a snake?
     b. Which bench did John see a snake on?

(51b) is construed only as asking the location of a snake and
not that of John. 16

This property of locative PPs is accounted for in the
same manner as we have accounted for properties of PPs of
manner and time with regard to preposition stranding. Location
of the NP subject has in principle no intrinsic connection with
what is described in the predicate part of a sentence.
Whatever place one is in when he does something, it is gen-
erally accidental.

However, there are cases in which the relation between the
location of the NP subject described in PP and what is de-
scribed in the rest of VP is not perceived to be accidental.
For example, consider the following pair of sentences:

(52) a. John was reading a book in his room.
(52) b. John was laughing at Mary in his room.

In both examples, in his room specifies where John was when he was doing what is described in the VP. But in his room seems to be more tightly linked to read a book than to laugh at Mary, in that a room may be for reading but is unlikely to be for laughing. Thus, although to "read" may imply a place suitable for reading, to "laugh" does not imply one suitable for laughing. (Note that we have a reading room but not a laughing room.) This difference is indeed reflected in the possibility of preposition stranding, as shown by the following:

(53) a. In which room was John \{reading a book, laughing at Mary\}?

b. Which room was John \{reading a book, ?*laughing at Mary\}?

Similarly, consider the following examples:

(54) a. In which theater did you \{watch a movie, kiss Mary\}?

b. Which theater did you \{watch a movie, ?*kiss Mary\} in?

Since a theater may be for watching movies but not for kissing someone (although you could kiss someone in a theater), kissing someone in a theater is accidental while watching movies there is not. Thus preposition stranding is possible with watch a movie but gives a less acceptable result with kiss Mary. The following examples are accounted for in a similar way:

(55) a. In which restaurant did John \{eat, cry\}?
(55) b. Which restaurant did John \( \{ \text{eat} \}\) \( ?^* \{ \text{cry} \} \) in?

We can eat out in a restaurant, but we are not expected to "cry out" there.

The preceding examples confirm our claim that the relation between what is described in PP and that in the rest of VP is a crucial factor determining the possibility of preposition stranding. Only when there is some relationship perceivable between them is preposition stranding possible. 

Although what is described in a locative PP may be a natural place for doing what is described in the predicate, this predicate have in general no intrinsic connection with a particular location of the NP subject if it describes some "emotion" or psychological state on the part of the subject. (This would account for the contrast in (53b) or in (55b), if laugh or cry is regarded as implying some emotion on the part of the subject.) However, it is conceivable that being in a certain place gives rise to some emotion or psychological state on the part of the subject. For example, if one is at the place near a restaurant, he may feel hungry seeing the restaurant. This seems to be the reason for the acceptability difference between (56a) and (56b):

(56) a. ??Which restaurant did you feel hungry near?
   b. *Whose house did you feel hungry near?

In (56a) but not in (56b) a "causal" relation is establishable between the locative PP and the rest of the VP: for you to be near a restaurant would cause you to feel hungry. Now con-
sider the following examples:

(57) a. Mary felt lonely in Japan.
    b. Mary felt angry in Japan.

It is possible to infer from (57a) that Mary felt lonely because she was in Japan. However, a similar inference is harder to make in the case of (57b) and the question "Why did she feel that way?" is more likely to be posed to (57b) than to (57a). This is because to be in a strange country may well cause one to feel lonely, but would not cause him to be feel angry. In this sense, in Japan is more tightly linked to feel lonely than to feel angry. This difference brings about the following contrast in acceptability:

(58) a. Which country did Mary feel lonely in?
    b. ?Which country did Mary feel angry in?

6. Conclusion

In this paper, we have seen that to account for the preposition stranding phenomena, we must take into consideration the semantic (and/or pragmatic) relation between the PP and the rest of the VP. Where the PP is subcategorized for by a V, the more the V and the P head of the PP is tightly linked, the more preferable is preposition stranding. Where the PP is not in a subcategorization relationship with a V, preposition stranding depends upon how the PP is semantically related to the rest of the VP. PPs of instrument, accompaniment, and means are necessarily in a particular relationship with the rest of the VP while PPs of manner are less tightly related to
what is described in the VP. Temporal/Locative PPs are in principle independent of what is described in the VP, but are in some cases perceived to be in a certain relationship with it. These differences in the degree of "cohesion" are reflected in the strandability of prepositions.

Note that in all cases of PPs which are not subcategorized for by a V, "pied-piping" (namely movement of the entire PP to the clause-initial position) is always an option. This is because no particular relationship between the PP and the rest of the VP is required. Thus it is reasonable to suppose that there is a certain difference in meaning between a "pied-pied" sentence (PC) and the corresponding sentence with a preposition stranded (SC), since the latter but not the former type of sentence "forces" a certain relationship to be established between the PP and the rest of the VP. But we did not deal with this issue in detail. Cf. note 13.

Although this paper has dealt only with preposition stranding, it seems that some consideration similar to the one given in this paper is necessary as well in the case of wh-movement which does not involve preposition stranding. Thus consider the following examples:

(59) a. Whose paintings did you go to the museum to see?
    b. *Who did you go to the museum to see?

(60) a. What did you go to the store to buy?
    b. *Who did you go to the store to meet?

The b-examples above are worse than the corresponding a-examples. Note that one may well go to the museum or to the
store for the purpose of seeing paintings or buying something, 
but not usually for the purpose of seeing or meeting someone. 
This seems to be the reason for the difference in acceptability 
between the a and b-examples. To see how far this line of 
approach can go, however, we must await further study.

NOTES

* This is a revised version of my paper, "Remarks on 
Preposition Stranding," presented in 1982 to Prof. M. Nakau, 
to whom I am grateful for invaluable comments and suggestions. 
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I have to express my regret, however, for not having 
been able to incorporate into the present paper every bit of 
their suggestive comments that cannot be ignored.

Any errors, needless to add, are entirely my own.

1 Throughout, \( t \) indicates the trace left by movement.

2 As to the examples in (12) and (13), I received a hint 
from Kuno (1977), who gives the following examples:

(i) a. It was with Paul that Mary went to the movies.
    b. It was Paul that Mary went to the movies with.
       (p.106)

(ii) a. It was in a car that Mary went to the movies.
    b. It was a car that Mary went to the movies in.
       (p.107)
Kuno cites these examples in a context quite independent of the issue we are concerned with.

3 On the bridge should be construed with the embedded clause rather than the matrix clause.

4 In fact, VP-deletion may apply to sentences not involving coordination, which we may disregard. Incidentally, whether VP-deletion really involves deletion or is an interpretive rule as proposed by Williams (1977) does not affect our argument, since only the material in VP is affected by the rule in any case.

5 With respect of pseudo-clefting, if the focus part of the sentence (i.e., the predicate part after the copula be) in (21) and (22) is analyzed as $\overline{S}$ rather than VP, as in the following,

$$(i) \quad \text{what John} \begin{cases} \text{did was} \\ \text{has been doing is} \end{cases} [\overline{S} \ \text{PRO to VP}]$$

where PRO is controlled by John, then examples like (21) and (22) are neutral with respect to the syntactic position of PPs (i.e., whether they are internal or external to VP); what (21) and (22) show would be solely that the focus part of the each pseudo-cleft sentence forms a constituent.

6 This is not to claim that the syntactic position of PP does not have any relevance to preposition stranding at all. Thus PPs which are definitely outside the VP are always islands for extraction:

$$(i) \quad \text{In Prof. A's class, John is the most intelligent.}$$

$$(ii) \quad *\text{Whose class } [\text{PP in } t] \text{ is John the most intelligent?}$$
However, this island nature is not particular to PP; virtually all major categories—NP, AP, S as well as PP—are islands for extraction if they are outside the VP. As Koster (1981) notes, the VP in English has a curious "escape zone" property which is not attested in all languages with movement rules. He seems to be claiming that, in the unmarked case, all major categories other than VP are islands for extraction.

7 As for since (last night) in (14a), this preposition selects the perfect tense. However, the following NP with temporal reference (=last night) and to "read a book" has no intrinsic connection with each other.

8 Examples (34b,c) are taken from Hendrick (1976). His treatment of "exceptional" cases like this is purely syntactic and he pays no attention to the semantics of the verbs involved.

9 Hornstein and Weinberg (1981) give the following example, which they judge as unacceptable:

(i) *What time did John arrive at?

Note that arrive, as a lexical property, represents "effective aspect". Thus we are naturally concerned with the place of arrival rather than its time, which seems to be a reason for the unacceptability of (i). Because of the effective aspect of arrive, the preposition referring to the place of arrival is at, rather than to. (E.g., arrive at/*to the station vs. go *at/to the station) It may be that the collocation arrive at (+PLACE) is so strong that there is a kind of "clash" in (i), where at is used to point to the time of arrival rather
than its place.

It should be noted in passing that some prepositions tend to be omitted when used in conjunction with certain NPs. In particular, what time is quite often used without the help of at, at being recoverable. Therefore, sentences like (36a) and (34b) (and (33a) for that matter) are awkward or stilted in any event. For a recent study on the omission of prepositions in general, see Kishino (1981).

10 Examples (37a) and (38a) are taken from Kuno (1978). He claims that, in the unmarked case, in 1960 in (37a) represents new information, while in 1960 in (38a), old information. However, this difference does not seem to have much relevance to preposition stranding, since, although in 1960 in (39a), like in 1969 in (37a), seems to be qualified for carrying new information, (38c) is worse than (39c).

11 I am not quite sure whether vacation used in (34c) is "inherently temporal" in a relevant sense. But vacation has semantic properties distinct from those of the nouns which are definitely temporal. Thus a vacation may be long or short, it may be in summer or in winter. But year, for instance, refers to the unit of time of a certain length and time is used to designate a certain point of temporal reference.

12 (42b) is taken from Hornstein and Weinberg (1981). This sentence is a counterexample to their purely syntactic account of preposition stranding. They seem to be claiming that a sentence like this, although "often judged quite acceptable", should be regarded as ungrammatical in theory,
given the general impossibility of stranding of preposition of temporal PPs. Indeed, it is often the case that theoretically ungrammatical sentences are practically judged acceptable, and sentences of this sort are often subject to lexical and/or syntactic factors. Thus structural complexity contributes to acceptability, as shown by the following, also taken from Hornstein and Weinberg:

(i) *The third act of Othello is tough to leave the theater after.

However, it is important to explain why, and under what conditions, a given sentence deviating the general pattern (e.g., the one regarding preposition stranding) is judged acceptable.

13 With regard to the following PC sentence corresponding to (43),

(i) After which act of Othello did John leave?

if our reasoning is correct, (i) should be ambiguous at least in principle. Since PC, unlike SC, does not force a certain relationship between the PP and the rest of the VP to be established, the place John left in (i), unlike (43), may, theoretically, have nothing to do with the place where Othello was being performed. But this interpretation seems to be hard to put on (i), since it would be difficult to fine any reason for the use of which act of Othello rather than what time under this interpretation. The similar remark applies to (42a).

14 This suggests that preposition stranding is dependent upon the establishment of a relation between the PP and the
rest of the entire clause, rather than the rest of the VP alone. I will not pursue this possibility, however.

Recall that we are concerned with PPs which are not in a subcategorization relationship with verbs. Thus in the following sentence, for example,

(i) John sat in a chair.

although the PP in a chair designates the place where John sat and thus his location, this PP is subcategorized for by sit. Therefore the following sentence is grammatical.

(ii) Which chair did John sit in?

Cf. Hornstein and Weinberg (1981), who note examples with a similar property.

Throughout the cases where there is an NP object, the PP in question should not be taken to be a modifier of this NP; the PP specifies the location of the NP subject of a clause.

As for locative PPs, independent support for our claim is given by Bolinger's (1971) observation. He notes that certain sentences with progressive form without any locative PP can be answers to the where-question:

(i) Speaker A: Where's Susie?

Speaker B: She's {reading/sleeping/watching a movie, etc}.

However, this is possible only when the location asked by the where-question is inferred, on common-sense grounds, from what is described in the VP. Cf. Yasui (1982). When this inference
is hard to make, the sentence without a locative PP is odd. Thus the following sentences cannot be suitable answers to the where-question:

(ii) She's \{laughing/kissing John/crying/getting angry\}.

Interestingly enough, predicates employed without locative PPs in answers to the where-question seem to be a subset of those which allow stranding of prepositions of locative PPs. Thus just as "she's sleeping" but not "she's getting angry" is a possible answer to the where-question, "which room is she sleeping in" but not "which room is she getting angry in" is acceptable. I say "subset", since a certain location must be inferred from the predicate in a sentence in order for the sentence to be an answer to the where-question while this is not required in the case of preposition stranding. Thus you can eat not only in a restaurant but anywhere else. Therefore, although a sentence like (55b) with eat is acceptable, a sentence like she's eating can be an answer to the where-question only when the utterer of this sentence assumes that the one who asked where she was can infer from her eating that she is in a certain place, but this assumption is likely to be made under special contexts; pragmatic factors seem to be crucial.

19 Compare, for example, (58a) with the following:

(i) In which country did she feel lonely?

It may be that (58a) have a stronger implication than (i) that Mary's stay in a country have some relevance to her feeling lonely there.
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