Differences between Rational Clauses and Purpose Clauses in English

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1. Introduction

As is well known, English has two types of infinitival clauses expressing intentions or purposes, as in:

(1) a. John bought it_1 (in order) to read it_1 to the children.
b. John bought it_1 (*in order) to read e_1 to the children.

(1a) and (1b) are called rational clauses (RC) and purpose clauses (PC), respectively.[1] The latter type cannot be accompanied by *in order* and must have a phonetically null object, signified as *e*, referring to the noun phrase in the matrix clause. The syntactic and semantic differences between the two types have been discussed in the literature. However, this paper focuses on, and attempts to explain, their subtle difference in meaning. It is argued that the purposive meanings expressed by RCs and PCs are different in that the former and the latter are ascribed to the agent in the matrix clause and the speaker of the sentence, respectively.

Section 2 provides the data indicating the differences between RCs and PCs observed in previous studies. Section 3 introduces a few key ideas provided in the literature to explain these differences and identifies the problems with these ideas. Section 4, on the basis of the notion of resultant states developed in Bach (1982), explains the semantic differences between RCs and PCs. Section 5 summarizes the discussion.

2. Data

Though both RCs and PCs express purposes, it has been pointed out in the literature that these adverbials show different behaviors and have different characteristics. First, as in (1), repeated here, RCs cannot have a phonetically null object:

(1) a. John bought it_1 (in order) to read it_1 to the children.
b. John bought it_1 (*in order) to read e_1 to the children.

The phonetically null objects are usually considered to be an A'-trace left by a null operator, signified as *OP*, moving to the Spec of the embedded CP:

(1) b'. John bought it_1 [OP_1 [PRO to read e_1 to the children]].

Null operator movement is never involved in the derivation of RCs. Note that when the phonetically null subjects occur in RCs and PCs, they are both taken as PRO, controlled by DPs in the matrix clauses. In the case of (1), for example, PRO can be controlled by *John*.

Second, unlike RCs, PCs resist preposing:

(2) a. (In order) to please my wife, I bought a diamond ring.
b. *To read to e_1 the children, I bought a $book_1$. (Bach (1982))

This contrast is often analyzed in such a way that RCs are attached to a higher position in the matrix clause than PCs are and PCs resist preposing for the reason that they are deeply embedded.

Their difference in attachment position is confirmed again if we consider how PRO is controlled, what their linear order is, and whether they must be preposed with a VP in VP preposing:[2]

(3) a.*I bought Mary *Pride and Prejudice*$_1$ in order PRO to read it_1.
b. I bought Mary *Pride and Prejudice* $_1$ PRO to read e_1.

(4) a. George put that gun$_1$ on the table [for me to shoot him with e$_1$] [in order to prove I'm a coward].

b.*George put that gun$_1$ on the table [in order to prove I'm a coward] [for me to shoot him with e$_1$]. (Nissenbaum (2005))

(5) a. I said I'd invite Max over ··· and [invite Max over] I did [for you to talk to him.]

b. I said I'd invite Max over ··· and [invite Max$_1$ over] I did [for you to talk to e$_1$.] (Nissenbaum (2005))

The data in (3) are concerned with the selection of controllers. We have already observed in (1) that the matrix subjects can control the unpronounced subjects in RCs and PCs: that is, PRO. However, a direct object cannot be a controller of PRO in RCs, as is indicated in (3a), though the most natural interpretation conforming to common knowledge would be the object control interpretation, as in the following:

(6) I bought Mary *Pride and Prejudice*$_1$ so that she could read it$_1$.

Instead, as a matter of fact, we are forced to interpret (3a) as having the following reading:

(7) I bought Mary *Pride and Prejudice*$_1$ because I wanted to read it$_1$.

Subject control is thus always required in the case of RCs. In contrast, object control is possible in PCs, as shown in the grammatical judgment in (3b). Given that the controller of PRO must be the closest DP c-commanding it, it can be concluded that RCs, unlike PCs, are always adjoined to a position higher than the object position.

Turning to (4), it is shown that PCs always precede RCs when they co-occur. In (5), it is observed that PCs cannot be left in VP preposing, whereas RCs can. (4) and (5) also strongly suggest that the attachment position of RCs is outside VP and is higher than that of PCs.

Third, there are differences in the choice of matrix verbs between RCs

and PCs. For example, pure action verbs cannot take PCs, as in the examples that follow:

(8) a.*I read it$_1$ to review e$_1$.
b. I read it$_1$ (in order) to review it$_1$. (Bach (1982))

Read denotes only action, and PCs cannot follow it. The following contrast shows the same thing:

(9) a.*I wiped the table$_1$ to impress the guest with e$_1$.
b. I wiped the table$_1$ clean to impress the guest with e$_1$.
(Higginbotham (2000))

The ungrammaticality of (9a) suggests that the mere action of wiping the table cannot be a licenser of PCs. If the matrix VP is an accomplishment predicate as in (9b), where the resultative predicate *clean* is added, PCs can follow it. I will return to this characteristic later, but it should be noted here that PCs cannot follow the matrix clause only denoting activities.

A restriction of the matrix predicates turns out not to be so simple, however, looking at other kinds of data in which the meaning of matrix verbs seems to be responsible for the grammaticality of the sentence involving RCs and PCs. Dowty (1982) gives the following example, claiming that PCs cannot occur in a sentence whose matrix verb is intransitive:

(10) a.*It$_1$ arrived (for Bill) to deliver groceries in e$_1$.
b.*The dean$_1$ came in for us to talk to e$_1$.

Bresnan (1982), however, puts forth counterexamples like (11):

(11) a. My car$_1$ is always available (for us) to drive e$_1$.
b. I$_1$ am always on hand for students to talk to e$_1$.
c. It$_1$ (=a table) will serve nicely to fix drinks on e$_1$.

Given that the predicates in the matrix clauses leading PCs need to be accomplishment predicates, as shown in (8) and (9), the unacceptability of (10) may not be a mystery because *arrive* and *come in* are not accomplishment predicates. However, it is predicted that (11) is also unacceptable, contrary to fact. The matrix predicates in (11)—that is, *be available, be on hand* and *serve*—are all stative predicates. It thus seems that PCs are allowed to occur when the matrix predicates are accomplishments or statives.

Turning to RCs, we can also find some restrictions on the choice of matrix predicates. Jackendoff (1972) observes that RCs need an agentive subject in the matrix clause:

(12) a.*John received the book$_1$ from Bill in order to read it$_1$.
b. John took the book$_1$ from Bill in order to read it$_1$.

In both sentences in (12), John's possession of the book is implied. Both *receive* and *take* thus take subjects bearing Goal as a theta-role. However, the subject in (12b) is given an Agent role simultaneously. In sum, the matrix predicates followed by RCs are required to take agentive subjects.

The contrasts observed in (13) and (14) support this view:

(13) a. I am going to go to the U.S.A. in order to see my friend.
b.*I am available in order to talk to the students.
(14) a.*John had a headache in order to get her attention.
b. John had pretended to have a headache to get her attention.

Go to the U.S.A. requires an agentive subject and can take RCs. However, *be available* can only take PCs as purposive adjuncts, having a Theme DP as a subject. Furthermore, whereas the stative predicate *have a headache* is not compatible with the meaning expressed by RCs, embedding it within an active verb like *pretend* makes RCs acceptable. These phenomena strongly suggest that the matrix subject of the sentence involving RCs must have volition. Interestingly, *receive* and *be available* allow PCs to follow them as adverbials:

(15) John received *War and Peace* (from my publisher) to proofread e.
(Bach (1982))

As noted earlier, the subject of *receive* bears a Goal role. Namely, the book moves from the publisher to John and John owns it. John's owning the book is a resultant state, and this is just the context in which PCs can appear.

Nissenbaum (2005) clearly points out that RCs and PCs differ "in entailments about the intentions of the agent." He provides the following pairs:

(16) a. Max built that house$_1$ for his kids to inherit it$_1$.
b. Max built that house$_1$ for his kids to inherit e$_1$.
(17) a. Mary put these papers$_1$ on the desk for you to sign them$_1$.
b. Mary put these papers$_1$ on the desk for you to sign e$_1$.
(18) a. Someone left these leaves$_1$ here for me to rake them$_1$.
b. Someone left these leaves$_1$ here for me to rake e$_1$.

The (a)-sentences in (16)-(18) contain RCs and the (b)-sentences in ((16)-(18) PCs. According to him, RCs express the intentions of agent DPs, whereas PCs express a more abstract intention, without necessarily denoting the agent's intended purposes. It seems to me that his intuition captures the third difference between RCs and PCs. The type of intention expressed by purposive infinitivals and the type of predicates in the matrix clause have some correlation. The intention or volition of the subject in the matrix clause is crucial in licensing RCs, whereas accomplishment or stative predicates must occur in the matrix clause taking PCs as adjuncts.[3] Active verbs force agents to occur as subject on the one hand, while accomplishment verbs and stative verbs do not on the other hand.

3. Problems

In this section, I point out the problems with previous studies. In particular, I am concerned with Bach (1982) and Nissenbaun (2005).

3.1. Resultant States

Bach (1982) investigates the environment in which PCs can occur. His finding is that the state resulting from some action must be expressed in the matrix clause for PCs to occur. He calls this a resultant state and explains PCs as having recourse to this notion.

He begins with considering the following example, which contains no PC:

(19) Mary got up for an hour.

He suggests that "get up" expresses a change from not being up to being up. He further defines a resultant state as a state after a change. In his analysis, *getting up* consists of an event causing a change and a resultant state. He takes a resultant state as an indispensable element of a PC's occurrence.

Consider (3b), repeated here, for instance:

(3b) I bought Mary *Pride and Prejudice* $_{1}$ PRO to read e_{1}.

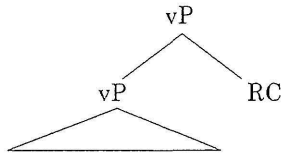
(3b) contains a PC. In (3b), there is a change of state with respect to ownership; if someone buys someone something, then the agent DP has it at first and the goal DP eventually receives it. The matrix clause denotes an event and a state caused by it. Bach suggests that the most natural controller of PRO in PCs is the person who ends up owning or having in his control the object in question.

I agree with Bach that the notion of resultant states is crucially involved in the occurrence of PCs. He can easily explain why the accomplishment predicates can be used in sentences containing PCs. However, as shown in the previous section, stative predicates and accomplishment predicates occur in the matrix clause taking PCs. In addition, it is unclear how the notion of resultant states and the purposive interpretation obtained in PCs (but not in RCs) are related to each other.

3.2. The Subtle Difference in Meaning

Nissenbaum's intuition is interesting in that RCs and PCs are clearly distinguished from a semantic point of view. He points out that RCs express the purposes intended by an agent in the matrix clause and that PCs express a more abstract intention. This difference is subtle but real. Following Huettner's (1989) intuition that purposive infinitivals all have a common basic meaning and that their differences result from their external syntactic environment, he connects this subtle difference to their difference in attachment site as mentioned in Section 2—for example, illustrated as follows:

(20)



(Nissenbaum (2005))

As for RCs, he seems to successfully explain their distribution and semantic properties. As in (20), the position of RCs is higher than that of PCs. Referring to the difference in attachment site, he attributes the semantic properties of RCs to the category v, which offers an attachment site to RCs and is responsible for the agentive meaning of the subject. Because RCs are adjoined to it, their expressed purposes are from agentive subjects. As for PCs, they do not have to denote the purposive meaning from agentive subjects, adjoining to the position within vP.

His attempts to uniformly deal with the differences in meaning and attachment site between RCs and PCs are attractive. However, the problem remains of what a more abstract intention denoted by PCs really means. PCs are adjoined to the lower position. However, it does not immediately follow that PCs denote a more abstract intention. Furthermore, the source of the will or the intention is not clear in the case of PCs. It is necessary to clarify what more abstract intentions mean and what mechanism introduces this interpretation of the sentences.

3.3. Summary

In this section, I have pointed out the following problems with the analyses in Bach (1982) and Nissenbaum (2005);

(21) a. States denoted by stative predicates seem to license PCs, too.
b. It is unclear how the notion of resultant states and the purposive interpretation obtained in PCs, but not in RCs, are related to each other.
c. It is unclear what a more abstract purpose expressed by PCs is.

The next section is devoted to providing a possible way around these problems.

4. Resultant States and Their Extension

4.1. Resultant States

I agree with Bach (1982) that the notion of resultant states is a crucial factor in deriving sentences with PCs. However, it is necessary to consider this condition in detail to get arrive at a full solution to the problems in (21). Let us begin by going back to the example given by Bach:

(22) Mary got up for an hour.

As noted earlier, *get up* denotes a change of states. It expresses the event of waking up and the state after it—that is, the resultant state of not sleeping. If a change of states is required to license PCs, the question naturally arises of how it is concerned with licensing PCs. To tackle this, it seems to be helpful to consider the relationship between *Mary got up* and *for an hour*. This is because *for an hour* is an adverbial like PCs, and it is expected that they will behave in a parallel fashion.

Bach finds that the following sentence is not strange:

(23) Mary got up for an hour but had to lie down again after fifteen min-

utes.

He suggested that (23) could be true if *Mary* did not stay up for an hour. According to him, Mary's being up for an hour involves someone's intention, and the *for*-phrase in (22) cannot be preposed with this reading:

(24) For an hour, Mary got up.

After all, the meaning of the adjunct *for an hour* can be outside the intention or consciousness of the subject of the matrix clause. In such a case, the person other than the subject is responsible for the function of the adjunct. I tentatively assume that the adverbials following the matrix clause expressing resultant states can be outside the consciousness of the subjects in the matrix clause.

Needless to say, it is possible to interpret (22) as indicating that Mary stayed up for an hour. With this reading, the adjunct can be preposed as in (24). It can thus be said that the meaning of adverbials can be included in the mental calculation by the subject on the one hand and that it can be outside the intention of the subjects on the other hand. Resultant states are required when purposive meanings are not ascribed to the matrix subject.

4.2. Restrictive and Non-restrictive Subordination

The discussion regarding the interpretation of *for an hour* in the previous subsection reminds us of the idea that there are restrictive and non-restrictive usages in subordination. Consider the following sentences:

(25) a. He's not coming to class because he's sick.
b. He's not coming to class, because he just called from San Diego.
(Rutherford (1970))

In (25a), his being sick is the reason for his not coming to class. In (25b), his just calling from San Diego is the reason for my being able to say that he's not coming. The *because*-clause in (25a) expresses the direct reason for the event

stated by the matrix clause, while that in (25b) expresses the reason for the speaker's utterance or judgment. Rutherford suggests that the *because*-clause in (25a) is restrictive and that the one in (25b) non-restrictive. The latter is independent from the matrix clause in some sense. The content denoted by the matrix clause is in one dimension, and that denoted by the adjunct clause is in another dimension. The *because*-clause in (25b) expresses the reason for the utterance of the matrix clause. They are each an independent sentence. The two independent sentences in sequence must be uttered without logical deviance. Therefore, the non-restrictive *because*-clause in (25b) cannot be preposed. Note that the *because*-clause in a restrictive usage is a part of a semantic unit with the matrix clause and cannot be independent.

Returning to *for an hour* in (22), we can say that it functions as a restrictive modifier or a non-restrictive modifier. If it functions as a non-restrictive modifier, it must be semantically independent from the clause *Mary got up*, which denotes resultant states. It seems to be a natural assumption that a change of states can be regarded as an independent minimal semantic unit. Some action causes some event, and some state results from the event. This sequence constitutes a typical independent semantic unit. If this assumption is correct, the meaning of *Mary got up* and that of *for an hour* can be independent from each other. The content denoted by the latter does not participate in forming a minimal semantic unit with the matrix clause, being outside the intention of Mary. Receiving the complete set of coherent information conveyed by *Mary got up*, someone else asserts a certain judgment about it. My claim is that this is just the interpretation that Bach reports. Again paradoxically, the interpretation of *for an hour* is logically based on the meaning of *Mary got up*. The phrases *Mary got up* and *for an hour* are independent in the sense that each constitutes a separate set of semantic units, but they are dependent in the sense that the event described by the former is presupposed in interpreting the latter in other dimensions. (24) is thus excluded in the interpretation compatible with (23)—that is, in a non-restrictive usage.

4.3. RCs as Restrictive Modifiers and PCs as Non-restrictive Modifiers

Bearing in mind the discussion above, let us consider the purposive infinitivals in this subsection. Remember that PCs must follow the matrix clause denoting resultant states. This means that PCs are non-restrictive modifiers and are semantically independent from the matrix clause. It thus follows that the content denoted by PCs is outside the intention of the subject of the matrix clause. The impossibility of preposing PCs also naturally follows. In contrast, RCs turn out to be restrictive modifiers because their matrix clauses do not have to express resultant states. RCs and the matrix clauses are not independent and build up the complete meaning in cooperation. There is an inseparable relationship in event construction between RCs and their matrix clauses. This is why the purposes denoted by RCs are derived from the will of the matrix subjects. Note also that RCs can be preposed.

Let us confirm the contrast between PCs and RCs from this perspective, using the following example:

(26) a. John bought *Bambi*$_i$ to read e$_i$ to the children.
b. John bought *Bambi*$_i$ in order to read it$_i$ to the children.

The agent in the matrix clause of the sentence containing PCs is not essential to their purposive meaning, and *to read e to the children*, which is a PC, do not have to be involved in the will of John. The content denoted by *John bought* Bambi is one thing, and the content denoted by the PC is another. In the case of RCs, the agent in the matrix clause plays a central role in its occurrence, and the will of the matrix subject is responsible for the event denoted by RCs. *In order to read it to the children* is John's own intention. RCs, restrictive modifiers, are related to the matrix subject in the sense that their purposive meaning is derived from the intention of the subject.

Unlike with RCs, it is not the case that PCs directly express the intention of the matrix subjects. Nissenbaum claims that PCs express a more abstract purpose. However, as stated in (21), it is unclear what the more abstract purpose expressed by PCs is. It is thus necessary to consider this issue

here. What is responsible for the purposive meaning of PCs? To solve this problem, I want to pay attention to the existence of the speaker. As in the case of non-restrictive *because*-clauses illustrated in (25b), the speaker plays a certain role in interpretation of PCs. What is denoted by PCs is not the idea of the agent in the matrix clause. Rather, the content denoted by PCs is the judgment made by the speaker. The speaker first observes the event described by the matrix clause and then understands how the situation is as a result. On the basis of this situation, the speaker infers the reason why it is brought about or judges what will follow. While the volition of the agent of the matrix clause is the direct source of the purposive meanings in RCs, the speaker's thought or judgment is the source of the purposive meanings of PCs.

Let me explain (27) along the lines mentioned above:

(27) a. John bought it$_1$ from Bill to read e$_1$ to the children.
b. John bought a diamond ring in order to please his wife.

In (27a), which has a PC, the state expressed by the matrix clause is grasped by the speaker of this sentence first. This state is John's possessing it, which is the result of John's buying it from Bill. The speaker judges from this state that John might read it to the children. The will of John is irrelevant. In (27b), which contains a RC, the content denoted by the RC is not the judgment made by the speaker but rather the intention of John. He himself wants to please his wife. John's intention itself is a trigger that makes him buy a diamond ring. In other words, the content denoted by the matrix clause must precede the judgment of the speaker expressed by the PC—and, on the other hand, the content denoted by the RC must precede the content denoted by the matrix clause followed by the RC.

Next, consider the following examples from Back (1982):

(28) a. She brought it$_1$ over for my brother to review e$_1$.
b. She hired a nurse in order for her daughter to learn Swedish.

In (28), the subjects of the infinitival clauses are not PRO. In (28a), the speaker of this sentence observed the event denoted by the matrix clause first. This event was her buying it. Then the speaker judged from this event that his own brother might review it. The event denoted by the PC is attributed to the judgment made by the speaker. (28b) contains an RC. The reason for her hiring a nurse is that she wants to her daughter to learn Swedish. Her intention makes her hire a nurse. Even if the subject of the RC is not controlled by the matrix subject, the event denoted by the RC is dependent on the will of the matrix subject.

The analysis presented here puts forth a possible solution to the problem stated in (21b). The relationship between resultant states and PCs can be clarified. PCs convey the purposive meaning attributed to the speaker. Namely, the speaker makes some prediction about what could occur in a future based on a certain situation that is described in the matrix clause. The situation is thus to be taken as a starting point for the future event. For this reason, the situation must be one of resultant states. They are brought about through changes in states and can thus be regarded as triggers of further events.

Remember, as stated in (21a), that stative predicates can appear as matrix clauses of PCs. It seems to me, however, that this does not raise a serious problem. Consider (11) again, repeated here:

(11) a. My car_1 is always available (for us) to drive e_1.
b. I_1 am always on hand for students to talk to e_1.
c. It_1 (=a table) will serve nicely to fix drinks on e_1.

What is important is that the situation expressed in the matrix clause can be taken as a starting point for the future event. The states described in the matrix clauses in (11) can be qualified as inducing further events. Besides, the matrix predicates are so-called stage-level predicates, which denote temporal and changeable states. We can easily infer that there would be a change of state. I thus assume here that this type of stative predicate can be qualified as a matrix predicate followed by a PC

5. Concluding Remarks

In this paper, I have claimed that RCs and PCs are restrictive and non-restrictive modifiers, respectively, reducing their subtle semantic difference to this distinction. In an RC, the intention of the agentive subject is the direct source of the purposive meaning, while in a PC, the speaker's thought or judgment is the source of the purposive meaning. The requirement of (resultant) states in the matrix clause is also accounted for in the way that it is necessary for the speaker to make some judgment about future events based on them.

This analysis poses an interesting question as to the relationship between syntax and semantics. The conclusion here is that RCs and PCs are restrictive and non-restrictive modifiers, respectively. However, from the hierarchical point of view, the opposite should be true: PCs and RCs are restrictive and non-restrictive, respectively. The consequence of the analysis presented is that there is no correlation between hierarchical structures and their semantic properties. In particular, some of their semantic aspects cannot be reduced to hierarchical structures.

An analysis in the spirit of Chomsky (1982)—but not resorting to a hierarchical structure—would be promising. Chomsky (1982) suggests that there is a level of LF', distinct from LF. He tries to explain a suspension of so-called weak crossover effects in some kind of relative clause. After the mapping of LF representations to LF' representations, re-indexing occurs between operators and variables to prevent illicit indexing. It is also suggested that reindexing is applicable to left dislocation and clefts, which are related to discourse. If the speaker's involvement can also be treated at LF', PCs are interpreted at this level, and PCs' characteristic of non-restrictiveness can be naturally explained. Remember that Safir (1986) applies an LF' approach to non-restrictive relative clauses. Non-restrictive modifiers are interpreted at LF'.

Notes

[1]Replacing the pronoun *it* with *a book* in (1b), it can also be interpreted as an infini-

tival relative clause modifying the noun phrase *a book*:

(i) John bought a book$_1$ to read e$_1$ to a children.

(i) is thus ambiguous.

PCs, which are adverbial modifiers, should be differentiated from infinitival relative clauses (IRCs). Kirkpatrick (1982) and Jones (1984) provide several ways of disambiguation, stated as follows:

1. The antecedent of the gap in IRCs cannot be a pronoun, as illustrated in the following examples:

   (ii) [{The man$_1$/*He$_1$} to talk to e$_1$] is here. (Kirkpatrick (1982))

   PCs, on the other hand, can follow pronominals, as in (1b) and (iii):

   (iii) George bought it$_1$ to make omelets in e$_1$. (Kirkpatrick (1982))

   (iii) as well as (1b) does not have the IRC reading.
2. IRCs cannot follow a tensed relative clause, while PCs can. Consider (iv) and (v) from Kirkpatrick (1982):

   (iv) a. [A philanthropist$_1$ to talk to e$_1$ who is wealthy] called this afternoon.

   b.*[A philanthropist$_1$ who is wealthy to talk to e$_1$] called this afternoon.

   (v) George bought [a skillet which was on sale at Sears]$_1$ to make omelets in e$_1$.

   To talk to, which is an IRC, cannot follow the tensed relative. However, this is not the case for *to make omelets in*, functioning as a PC.
3. IRCs cannot move from the original position to other positions. To put it differently, IRCs cannot float, as in (vi):

   (vi) a. [One philanthropist$_1$ to talk to e$_1$] called today.

   b. *One philanthropist$_1$ called today to talk to e$_1$. (Kirkpatrick (1982))

   PC, on the other hand, can float:

   (vii) He bought, to make omelets with e$_1$, every bloody skillet$_1$ in the store. (Kirkpatrick (1982))
4. IRCs must precede PCs when they co-occur in the same sentence:

   (viii) Marta brought in [an item$_1$ to play with e$_1$]$_2$ to show e$_2$ to George. (Kirkpatrick (1982))
5. IRCs must cling to the heads in passive sentences:

   (ix) a.*An item$_1$ was brought in to play with e$_1$ to show e$_1$ to George.

   b. [An item$_1$ to play with e$_1$]$_2$ was brought in to show e$_2$ to George. (Kirkpatrick (1982))
6. PCs must not contain an aspectual *have*, while IRCs can:

   (x) a. *Bambi*$_1$ is a book to have read e$_1$.

   b.*I bought it$_1$ to have read e$_1$. (Jones (1984))

[2] Consider the following examples, which have object control interpretation and are not involved in null operator movement.

(i) a. John bought a dog$_1$ PRO$_1$ to play with Mary. (Chomsky (1980))

b. I bought it$_1$ PRO$_1$ to hold books. (Williams (1980))
c. John hired him$_1$ PRO$_1$ to go over reports. (Bach (1982))

Nissenbaum's (2005) diagnostics lead us to conclude that this type of adverbial clause falls under the category of PCs. It must precede RCs and be left in VP preposing, as illustrated in (ii) and (iii), respectively, cited from Nissenbaum (2005):

(ii) a. They$_1$ brought Max$_2$ along [PRO$_2$ to talk to himself] [(in order) PRO$_1$ to amuse themselves].
b.*They$_1$ brought Max$_2$ along [(in order) PRO$_1$ to amuse themselves] [PRO$_2$ to talk to himself].
(iii) a.*I said I' d invite Max over ··· and [invite Max$_1$ over] I did [PRO$_1$ to talk to himself].
b. I said I'd invite Max over ··· and [invite Max over] I$_1$ did [PRO$_1$ to amuse myself].

I follow Nissenbaum with regard to this classification.

[3] Consider the following sentence:

(i) The exhibition is here in order to satisfy the people.

In (i), the subject of the matrix clause is not an agentive. If RCs need the agentive subject in the matrix clause, (i) should be ruled out. Nevertheless, it is acceptable. In fact, the exhibition is what an agent holds, and the content denoted by the matrix clause in (i) implies the existence of someone who has held the exhibition. He would have a will to satisfy people. It seems that even if there is no agent in the matrix clause of the sentence containing RCs, the sentence is accepted as long as the existence of the agent is implied.

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