

RAISING AND ARBITRARY CONTROL*

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1. Introduction

There has been a long-standing problem among one-place predicates that take an infinitive as an argument. Namely, some of them induce raising, while others arbitrary control. For instance, while *seem* is a raising predicate and not a control predicate as indicated in (1), the opposite is true of *possible* as can be seen in (2).

- (1) a. John_i seems [t_i to underestimate costs].
b. *When the numbers are so big, it seems [PRO_{arb} to underestimate costs].
- (2) a. *John_i is possible [t_i to underestimate costs].
b. When the numbers are so big, it is possible [PRO_{arb} to underestimate costs].

In the present paper I will elucidate why these two types of predicates display different behavior, arguing that it is at least in part syntactically determined.

The rest of the paper is organized as follows. In Section 2, a cursory sketch of my approach will be provided. Section 3 will discuss psych predicates, which potentially can be taken as evidence against my analysis, and show that they merely constitute an apparent counterexample. Section 4 will take up another problematic case *likely* and attempt to give a reasonable solution. The concluding remarks will be contained in section 5.

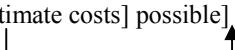
2. The Basic Approach

My approach to the phenomenon introduced in the preceding section consists of two parts. The next two subsections will be devoted to the illustration of those elements. In section 2.1 I will argue that the two predicates at issue, in fact, have different underlying structures. In section 2.2 I will discuss the chain condition, which will ultimately explain the divergent behavior of the two predicates. Finally, in section 2.3 I will consider a possible counterargument against my version of the chain condition.

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2.1 The Underlying Structures

My proposal in this subsection is that the two types of predicates in question differ in underlying structure. More specifically, whereas in *seem*-type predicates, the infinitive is underlyingly an internal argument as shown in (3a), in the *possible*-type, the infinitival argument is base-generated externally and subsequently extraposed sentence-finally as depicted in (3b).

- (3) a. [_{IP} e seems [_{IP} John to underestimate costs]]
 b. [_{IP} e is [_{SC} [_{IP} PRO_{arb} to underestimate costs] possible]]
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There are some pieces of evidence to suggest this line of analysis. First, as illustrated in (4b), *possible* allows another construction with the infinitive in the subject position, which is called an intraposition. But as can be seen in (4a), *seem* does not have such a counterpart.

- (4) a. *When the numbers are so big, [PRO_{arb} to underestimate costs] seems.
 b. When the numbers are so big, [PRO_{arb} to underestimate costs] is possible.

As demonstrated in (5) and (6), the fact remains the same even if the infinitival clause is replaced by a *that*-clause.

- (5) a. It seems that John underestimates costs.
 b. *That John underestimates costs seems.
 (6) a. It is possible that John underestimates costs.
 b. That John underestimates costs is possible.

This makes sense along the lines of the structures given in (3) in the following manner. With *possible*, the infinitive or the *that*-clause is inherently an external argument as in (3b). Hence, it is (4b) and (6b) that more or less reflect their underlying positions. In addition, there is an alternative derivation (2b) and (6a), which involves extraposition and the use of an expletive. On the other hand, for *seem*, the clausal argument is a complement as in (3a). Hence, although (1a) and (5a) are permitted, in which the infinitive/*that*-clause is in situ, the intraposition variants (4a) and (5b) are disallowed.¹

Second, as generalized under the Condition on Extraction Domains (CED) of Huang (1982), a *wh*-phrase cannot be extracted from extraposed clauses. For example, compare the two double complement constructions in (7) and (8).

¹ In order for this argument to hold, we must assume that unaccusative verbs (or adjectives) cannot raise clausal arguments to the subject position for an independent reason.

- (7) a. They told Bill that John underestimated costs.
 b. What did they tell Bill that John underestimated?
- (8) a. They mentioned to Bill that John underestimated costs.
 b. *What did they mention to Bill that John underestimated?

As indicated in (7b), *wh*-extraction is generally possible from argument clauses of double complement constructions. But when the clause is extraposed, extraction is blocked as can be seen in (8b).²

Also, as illustrated in (9a), the adjective *wrong* projects a clausal argument externally, and the extraction out of it is prohibited as in (9b).

- (9) a. That the ancients built this edifice is wrong.
 b. *What is that the ancients built wrong?

As evidenced in (10), extraposition does not enable extraction in this construction.

- (10) a. It is wrong that the ancients built this edifice.
 b. *What is it wrong that the ancients built?

We can take this fact and use it as a diagnostic for the two predicates at issue. Consider the following sentences.

- (11) a. What does John seem to underestimate?
 b. What is it possible to underestimate?

As can be observed in (11), extraction appears to be sanctioned with both *seem* and *possible*.

However, as is well known, nonfinite clauses such as infinitives and gerunds constitute only weak islands. Refer to the examples in (12).

- (12) a. It is wrong to blame John for this accident.
 b. Who is it wrong to blame for this accident?

If so, the data in (11) is not very informative.

One way of getting out of this dilemma is to replace the infinitive by a finite clause as in (13), assuming that we do not alter the basic structure.

- (13) a. What does it seem that John underestimates?
 b. *What is it possible that John underestimates?

² I suspect that there exists a PF constraint that requires clausal material to be a peripheral element in a clause or a nominal. To see that the (8a) and (8b) really involve extraposition, consider the *mention*-sentences below, whose Theme argument is nominal.

- (i) a. They mentioned John's mistake to Bill
 b. (??)They mentioned to Bill John's mistake.

Thus, in this construction, when Theme is not clausal, the order where it precedes the *to*-PP is less marked than the other way around as shown in (i).

As can be seen above, there is a contrast between *seem* and *possible* in this context. Another thing that we can do is to extract an adjunct, keeping the argument clause nonfinite. Consider the sentences below. The matrix reading of *how*, if at all available, should be ignored.

- (14) a. John seems to have fixed the car with a wrench.
 b. How does John seem to have fixed the car? (Answer: With a wrench)
- (15) a. It is possible to fix the car with a wrench.
 b. *How is it possible to fix the car? (Answer: With a wrench)

Here again, we find a contrast between the two types of predicates in (14b) and (15b).

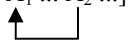
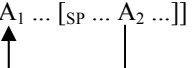
Therefore, the infinitive is an internal argument in *seem*-type predicates, whereas it is underlyingly an external argument in the *possible*-type.

2.2 The Chain Condition

Let us now turn to the other piece of my analysis, the chain condition, which will eventually explain the different behavior of the two types of predicates. As is standard in the Principles and Parameters approach, I adopt the hypothesis that every instance of A-movement results in the creation of an A-chain between the moved element and its trace. Thus, raising occurs only where a licit A-chain can be formed.

Furthermore, in accordance with Uchiumi (2003), I take obligatory control as also an A-chain relation between PRO and its controller that does not involve movement. Under this approach, non-obligatory control is viewed as a case in which PRO is in a configuration such that no potential antecedent can find it in their A-chain domain. As is standard, arbitrary control is subsumed under non-obligatory control.

According to Uchiumi (ibid.), an A-chain is licensed in either of the two configurations depicted in (16).


- (16) a. [SP ... A₁ ... A₂ ...]

 b. [SP A₁ ... [SP ... A₂ ...]]


That is, as in (16a), two elements in A-positions are arguments of the same syntactic predicate³. Or as in (16b), one is in the outermost A-position of a syntactic predicate, and another is an argument of the next syntactic predicate

³ Following Reinhart & Reuland (1993), I assume that a head forms a syntactic predicate just in case it has a subject.



up.

Therefore, in (1a), schematized here as in (17a), A-chain formation is possible, because the trace is in the outermost A-position of a syntactic predicate, namely the embedded IP, and its antecedent *John* is an argument of the matrix IP, which is the next syntactic predicate up. Thus, raising is licensed.

- (17) a. $[_{IP} \text{John}_i \text{ seems } [_{IP} t_i \text{ to underestimate costs}]]$

 b. $[_{IP} \text{it is } [_{SC} [_{IP} \text{PRO}_{arb} \text{ to underestimate costs}]] \text{ possible}]]$

On the other hand, as shown in (17b), an A-chain cannot be formed in (2b), since, although PRO is at the A-edge of the embedded IP⁴, no potential antecedent can be found in the next syntactic predicate up, the small clause. Hence, non-obligatory control obtains.

Meanwhile, the reason why (1b) is ungrammatical is that, PRO is in the A-chain domain of expletive *it* as illustrated in (18a). As a consequence, erroneous obligatory control is established, where the former is controlled by the latter.

- (18) a. $*[_{IP} \text{it seems } [_{IP} \text{PRO} \text{ to underestimate costs}]]$

 b. $*[_{IP} \text{John}_i \text{ is } [_{SC} [_{IP} t_i \text{ to underestimate costs}]] \text{ possible}]]$


Moreover, (2a) is ill-formed, because raising creates an illicit chain: *John* and its trace being separated by two syntactic predicate boundaries as shown in (18b).

2.3 A Possible Counterargument against the Chain Condition in Section 2.2

One might be opposed to my version of the chain condition on the grounds of the following examples.⁵ As illustrated in (19), *try* and *wonder* take an infinitival clause as an argument. Moreover, it must be an internal argument, because the external argument slot is occupied by the matrix subject *we*.

- (19) a. We tried to be clever.
 b. We wonder how to be clever.

If this is so, the infinitive in (20) should also be an internal argument.

⁴ I believe that a CP is further layered over the infinitival clause in (17b). However, in Uchiumi's (2003) system, CPs do not interfere with the formation of A-chains.

⁵ I thank Luigi Burzio (pc) for drawing my attention to this issue.

- (20) a. *John_i was tried [t_i to be clever].
 b. *John_i is wondered [how t_i to be clever].

Then the trace is in the A-chain domain of its antecedent according to (16). Nevertheless, as the ungrammaticality of the above sentences indicates, the embedded subject cannot be raised to obtain Case, even though the matrix verb is passivized.

With respect to (20a), I believe that verbs such as *try* have an entailment that the subject of the complement clause and the subject of the matrix clause are identical, which Chierchia (1983, 1984a & 1984b) treats as a meaning postulate. To put it more simply, with verbs like *try*, it does not make sense or no longer means what the verb should mean if the subject of the complement clause differs from that of the matrix clause. Therefore, (20a) is ruled out on the semantic grounds.⁶

In order to exclude sentences such as (20b), it must be stipulated that the verb in question cannot select an infinitival clause with a lexical subject as its complement. However, this stipulation does not weaken the present analysis. As can be observed below, it is independent of the operation of raising.

- (21) *We wonder how (for) John to be clever.

In (21) no movement of the infinitival subject is involved, and yet the sentence is bad nonetheless. Therefore, we inevitably need the selectional stipulation regardless of the approach taken to raising.

One might further challenge the proposed analysis, citing examples like the ones below.

- (22) a. We would prefer John to be clever.
 b. *John would be preferred to be clever.

As shown in (22a), *prefer* can select an infinitival clause with a lexical subject. Yet as can be seen in (22b), subject raising is still impossible.

As a clue to solve this problem, let us digress and consider another verb *believe*, which permits raising in the passive environment.

- (23) a. We believe John to be clever.
 b. John is believed to be clever.

⁶ Sentence (i) is ill-formed, even though the subject of *try* and the subject of its embedded clause are identical.

(i) *We tried ourselves to be clever.

I assume that here, a more general version of the Avoid Pronoun Principle (Chomsky 1981) is at work. In its original formulation, this principle forces the choice of a null element over a(n overt) pronoun. But I suspect that it may be more general to the effect that, where the null alternative is available, the use of an overt element should be avoided (unless there is a special reason to do so). In the context of (i), of course, PRO can be used instead of a reflexive for the same meaning as in (19a).

In (23a), as argued by Postal (1974), Johnson (1991), Koizumi (1993 & 1995) among others, the embedded subject raises to the matrix clause, where objects of simple transitive sentences typically receive accusative Case (raising-to-object or RTO) (see also Lasnik & Saito (1991) for a similar proposal). Consequently, if the accusative position is suppressed, the infinitival subject further moves to Spec of IP for Case reasons as in (23b). One basis for believing that *John* in (23a) is really in the matrix clause is an example like (24).

(24) */?We believe John sincerely to be clever.

Thus, in the sentence immediately above, the matrix adverb *sincerely* is permitted to the right of the embedded subject (at least marginally for some speakers),⁷ which makes us posit that the latter moves to the matrix domain.

Returning to *prefer*, I do not think that the infinitival subject of this verb raises to the matrix clause in the same way. More specifically, I suspect that (22a) has the structure as depicted in (25), where the embedded subject is Case-marked by the null version of the complementizer *for*.⁸

(25) We would prefer [_{CP} ϕ_{for} John to be clever].

As an argument to support this structure, in American English the complementizer *for* can be overtly realized as in (26a), which contrasts with the ungrammatical *believe* in (26b).

(26) a. We would prefer for John to be clever.
b. *We believe for John to be clever.

Second, as indicated in (27), unlike *believe*, *prefer* does not allow the matrix

⁷ In Postal (1974), examples like (24) are marked with either a full check or one question mark. But my informants judged them as worse than that. In fact, not a few of them claimed that they are simply ungrammatical. Johnson (1991) reports similar degraded judgments (see also Koizumi (1995)).

⁸ If *John* is Case-marked by the null *for* in (25), some might wonder why an impersonal passive like (i) is impossible.

(i) *It would be preferred John to be clever.

I believe that in impersonal passives, a complementizer is required to be phonologically realized. Thus, (ii) is acceptable, in which *for* is overtly manifested.

(ii) It would be preferred for John to be clever.

This constraint reveals itself in a somewhat weaker form when the complement clause is finite. Refer to the examples below.

(iii) a. We believe that everyone is smart.
b. We believe everyone is smart.

(iv) a. It is believed that everyone is smart.
b. (*)It is believed everyone is smart.

As can be seen in (iii), *believe* can normally select either a finite clause with an overt complementizer or one without it. But at least in some dialects, *that* must be phonologically present in the impersonal passive counterpart, which is shown in (iv).

adverb to appear to the right of the infinitival subject (even marginally), which suggests that the embedded subject stays inside the subordinate clause.

(27) *We would prefer John very much to be clever.

Finally, as shown in (28a), *prefer* has a pseudo-cleft counterpart. Compare the two sentences below.

(28) a. What we would prefer is for John to be clever.⁹
b. *What we believe is for John to be clever.

Believe, when taking a nonfinite complement, selects for an IP rather than a CP, and in order to get Case, the infinitival subject raises to the matrix domain as mentioned above. Hence, (28b) is out, where the relevant clause is a CP whose subject is Case-marked by *for* in situ. If *prefer* were also an RTO verb, then it should not license pseudo-clefting by the same token.

Therefore, for *prefer*, the embedded subject receives Case from the null complementizer, and it does not raise even if the matrix verb is passivized as in (22b).

3. Psych Predicates

Psych predicates do not allow raising as in (29a) but induce arbitrary control (marginally for some speakers)¹⁰ as in (29b).

(29) a. *John_i bothers Bill [_{t_i} to underestimate costs].
b. (??)It bothers Bill [PRO_{arb} to underestimate costs].

Thus, we expect that in these predicates the infinitive is projected externally, and in the case of (29b), it is later extraposed to the sentence-final position.

However, Landau (1999/2000 & 2001) argues that the infinitival clause of a psych predicate is an internal argument. For instance, he postulates the structure schematized in (31) for such a sentence as in (30).

(30) It bothers Bill_i [PRO_i to underestimate costs].

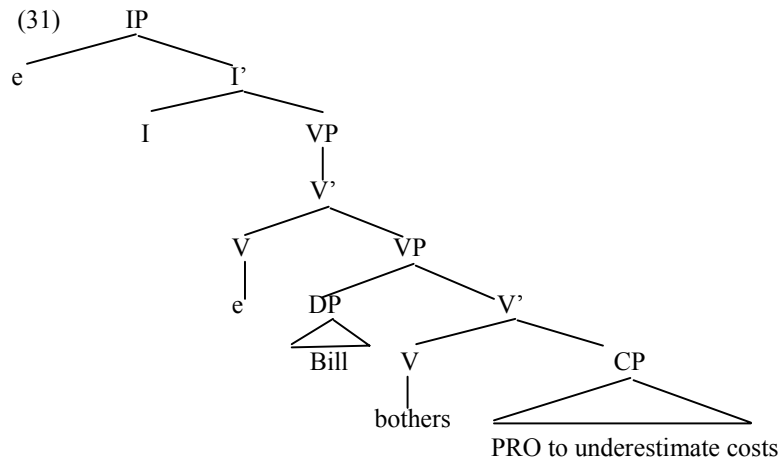
⁹ Again in pseudo-cleft contexts, a complementizer is supposed to be overtly realized, which is why (i) is ungrammatical.

(i) *What we would prefer is John to be clever.

This constraint can also be observed when the focused element is a finite clause as in (i).

(i) a. What we believe is that John is clever.
b. *What we believe is John is clever.

¹⁰ The reason why it is difficult for some speakers to obtain the arbitrary reading of PRO in (29b) is that in this construction, the Experiencer DP causes what I call pseudo-obligatory control (Uchiumi 2003 & 2004). See Uchiumi (2003) for details.



Namely, the infinitive is base-generated sentence-finally as the complement of the lower verb in the Larsonian shell (Larson 1988). If the above structure is the correct one, then it is rather mysterious under my analysis, why psych predicates do not allow raising just like *seem*-type predicates.

Some might suspect that it is the Experiencer argument on the movement path that blocks raising in (31). Yet this kind of approach does not work, since as shown in (32), *strike* also has an intervening Experiencer, but raising is perfectly possible.

(32) John_i struck Bill [t_i as practical].

In actuality, I disagree with the structure in (31), and some supporting evidence will be given in the remainder of this subsection.¹¹

First, psych predicates have an intraposition counterpart as indicated in (33) and (34b).

(33) [PRO_{arb} To underestimate costs] bothers Bill.

(34) a. It bothers Bill that John underestimates costs.
b. That John underestimates costs bothers Bill.

Second, psych predicates do not permit *wh*-extraction from their embedded clause as in (35) and (36b).

(35) *What does it bother Bill that John underestimates?

(36) a. It bothers Bill to fix the car with a wrench.

b. *How_i does it bother Bill [to fix the car t_i]? (Answer: With a wrench)

¹¹ See also Pesetsky (1995) for arguments against Belletti & Rizzi's (1988) analysis of psych predicates, which is a precursor of Landau's structure.

That is, the two diagnostics discussed in the preceding section show that the infinitival clause of the predicates in question is an external argument.

Therefore, the fact that psych predicates induce arbitrary control rather than raising as in (29) does not pose any problem.

4. *Likely*

As illustrated in (37) *likely* induces raising.

(37) John_i is likely [_{t_i} to underestimate costs].

However, for some speakers, this predicate also allows arbitrary control as indicated in (38), contrary to the typical characterization.¹²

(38) (*)When the numbers are so big, it is likely [PRO_{arb} to underestimate costs].

Moreover, *likely* allows an intraposition counterpart (at least marginally) as in (39) and (40b).

(39) ?When the numbers are so big, [PRO_{arb} to underestimate costs] is likely.

(40) a. It is likely that John underestimates costs.
b. (?)That John underestimates costs is likely.¹³

This is problematic for my analysis, because it ultimately claims that, if the embedded clause is an internal argument, it induces raising, while if it is an external argument, it induces arbitrary control. But it appears that *likely* allows both, which is a contradiction.

As the first step toward solving the problem, let us apply the *wh*-extraction test to this predicate. As can be observed in (41) and (42b), *likely* permits *wh*-extraction from its subordinate clause.

(41) What is it likely that John underestimates?

(42) a. John is likely to fix the car with a wrench.
b. How_i is John likely [to fix the car t_i] ? (Answer: With a wrench)

The above data suggests that the embedded clause is a complement. So the

¹² The arbitrary control use of *likely* seems to be very pervasive among young people in the United States and Canada according to my grammaticality judgment survey. But I am not sure if this is true of other English-speaking areas as well.

¹³ If a native speaker of English feels that this example is awkward, he/she should consider sentence (i), which perhaps sounds better to many people.

(i) That John will underestimate the cost of having a huge wedding is extremely likely. (Lisa Travis pc)

question to be answered is how this predicate induces arbitrary control and intraposition.

One possible explanation is that, for some speakers, *likely* is simply ambiguous between the familiar raising predicate as in (37) and the control predicate as in (38), which works in the same way as *easy*. But the problem with this approach is that it essentially argues that the two uses of *likely* are totally unrelated and that the fact that they share the identical phonological form is merely an accident.

Thus, I will give the following solution instead. For *likely*, the infinitive/*that*-clause is inherently an internal argument. However, it can optionally be externalized in the lexicon just as in Levin & Rappaport's (1986) analysis of adjectival passives. In support of this proposal, even for speakers who allow arbitrary control with *likely*, adjunct extraction is impossible with this construction as shown in (43).

- (43) a. (*)When the numbers are so big, it is likely to underestimate costs out of confusion.
 b. *When the numbers are so big, how_i is it likely [to underestimate costs t_i]? (Answer: Out of confusion)

Another piece of evidence to corroborate the suggested approach is that, if it is made clear that the infinitive has been extraposed, even among those who reject *likely* as a control verb, there are some who do permit such a construction. For instance, even if a speaker does not like (44a), he/she may still accept (44b), where the infinitive appears to the right of the locative adjunct.

- (44) a. (*)When driven by anger, it is likely [PRO_{arb} to commit a murder for an absurd reason].
 b. (*)When driven by anger, it is likely in this crazy world [PRO_{arb} to commit a murder for an absurd reason].

To sum up, *likely* is inherently a *possible*-type predicate, but it can optionally be turned into a *seem*-type one by a certain lexical operation. Consequently, this predicate allows both raising and arbitrary control (at least for some speakers).

5. Conclusion

Seem-type predicates allow only raising, whereas *possible* type ones induce only arbitrary control. The distinction between the two kinds of predicates is that in the former, the infinitive is an internal argument, whereas in the latter, it is an external argument. Raising obtains where the movement creates a licit A-chain, while arbitrary control obtains when no potential antecedent finds PRO in their A-chain domain. In psych predicates, the infinitive is an external argument, and therefore not raising but arbitrary control. For *likely*, the infinitive is inherently a complement, but there exists a lexical operation that optionally remaps it as an external argument, which is why this verb is ambiguous (at least for some speakers).

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