# On the Correlation between
## Scope Reconstruction and the Proper Binding Condition:
## Parametric Syntax on Scrambling in Japanese and German

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*Abstract*
*This paper investigates why A-movement and German scrambling resist scope reconstruction and their extraction sites can be unbound without violating the Proper Binding Condition while A'-movement and Japanese scrambling allow scope reconstruction and their extraction sites must obey the Proper Binding Condition. In order to account for this paradigm, I claim that the former do not leave a trace whereas the latter do so, extending Lasnik's (1999) hypothesis that A-movement does not leave a trace while A'-movement does so. I argue that the "extended Lasnik's hypothesis" can be explained by highlighting the difference between Japanese and German in the feature strength of v that induces V-to-v movement.*

*Keywords: scope reconstruction, the Proper Binding Condition, feature strength of v, V-to-v movement, Case-checking*

## 1. Introduction

In generative grammar, it has been widely held that syntactic movement always leaves a trace. However, Lasnik (1999) claims that A-movement does not leave a trace. The major evidence he relies on is the fact that A-movement cannot reconstruct scopally when it moves over a clause boundary. Look at the examples in (1). In the first sentence, the universal quantifier and the negation are within the same clausal domain. In such a case, we have scope ambiguity. However, once the universal quantifer moves into the matrix clause as seen in the second sentence, we no longer obtain a lowered reading for universal. For the sake of comparison, let us see how A'-movement behaves in the corresponding case. As shown in the second sentences in (2), A'-movement shows scope reconstruction even if it moves across a clause boundary. In order to account for the A/A'-distinction, Lasnik proposes that A-movement does not leave a trace, where "trace" is used in a sense of "copy." I will refer to this as Lasnik's hypothesis.

(1)  a.  (it seems that) everyone isn't there yet.      $(\forall > Neg, Neg > \forall)$
     b.  everyone seems [$_{TP}$ t not to be there yet]      $(\forall > Neg, *Neg > \forall)$

(2) a. [how many pictures] Mary will give everyone t    (how many> $\forall$, how many< $\forall$)
    b. [how many pictures] do you think [$_{CP}$ t that Mary will give everyone t]
                                                            (how many> $\forall$, how many< $\forall$)

(3) Lasnik's hypothesis:
    A-movement does not leave a trace.                         (Lasnik 1999: 206)

In this paper, I would like to examine the empirical and conceptual validity of Lasnik's Hypothesis. Firstly, I will present another piece of evidence that supports Lasnik's hypothesis in section 2: the extraction sites of A-movement can ignore the Proper Binding Condition (PBC) while those of A'-movement must obey it. In section 3, I will point out that scrambling (SCR) in German and Japanese parallels the contrast between A-movement and A'-movement: the extraction sites of German SCR resist scope reconstruction and do not have to observe the PBC whereas those of Japanese SCR readily allow scope reconstruction and must respect the PBC. At first glance, this observation may seem to indicate that Lasnik's hypothesis is on the right track in that movement rules that do not reconstruct scopally do not leave a trace and vice versa. However, given that Lasnik's hypothesis is merely a stipulation on UG, it cannot subsume German SCR unless it proves to be an instance of A-movement. In section 4, I will point out using anaphor-binding as a diagnostics that German SCR cannot be classified into A-movement. This suggests that Lasnik's hypothesis needs explaining. Otherwise, there will be no natural place in a theory of grammar for German SCR to fall into. In section 5, I attempt to explain why A-movement and German SCR do not leave a trace while Japanese SCR must do so. I propose that the source of the parametric variation lies in the different feature strength of $v$ that induces V-to-$v$ movement. In section 6, some consequences will be discussed.

## 2. Another Support for Lasnik's Hypothesis

In this section, I present another piece of evidence that A-movement does not leave a trace whereas A'-movement does so. For illustration of the point, I will employ the condition called Proper Binding Condition as a diagnostics to detect whether a certain movement operation leaves a trace or not. I assume that the PBC is an autonomous condition of UG that rules out a representation that contains an unbound trace in the phonological component.[1]

(4) Proper Binding Condition:
    Traces must be bound in the phonological component.
                    (Kuno 2000; cf. Fiengo 1977; Saito 1989; Lasnik & Saito 1992)

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1 This point is discussed in detail in Kuno (2000).

Look at the examples in (5) where each sentence contains an unbound trace of the subject within the fronted constituent.

(5)  a.  [$_{VP}$ $t_i$ hit Mary] John$_i$ did $t_j$
     b.  [$_{VP}$ criticized $t_i$ by his boss]$_j$ Mary$_i$ has never been $t_j$          (Müller 1996: (53))
     c.  [$_{AP}$ how likely [$_{TP}$ to [$_{VP}$ $t_i$ win the game]]$_j$ is John$_i$      (Lasnik & Saito 1992: 141)

The movement of the subject from the base-position to the surface position (Spec-TP) is an instance of A-movement. If A-movement leaves a trace, then we expect these sentences to violate the Proper Binding Condition. But they all are perfectly acceptable. So we can interpret the grammaticality of them as evidence that A-movement does not leave a trace.
     Next let us look into the sentences in (6).

(6)  a.  $^{??}$who$_i$ do you wonder whether John likes $t_i$
     b.  *[which picture of $t_i$]$_j$ do you wonder who$_i$ John likes $t_j$          (Saito 1989: 187)

The first sentence is marginal because the WH-phrase *who* is moved across an intervening WH-phrase; this is so called WH-island violation. As compared to this sentence, the second sentence is hopeless. Indeed, the WH-phrase *which picture of* is moved across another WH-phrase in this sentence too. But given the marginality of the first sentence, the severe ungrammaticality of the second requires an account. We expect that there should be another factor that renders it completely ungrammatical. Notice that the WH-phrase *which picture of* contains an extraction site of *who* via A'-movement. Since A'-movement unlike A-movement leaves a trace, this sentence violates not only a WH-island condition but also the PBC. Therefore, it is reasonable to conclude that the PBC is responsible for the severe deviance of the second instance.

## 3. Scrambling in German and Japanese

In this section, we will see that scrambling in German and Japanese parallels the two contrasts between A-movement and A'-movement, namely the availability of scope reconstruction and the immunity of "traces" to the PBC. Let us begin with the first point. German SCR is alike A-movement in that it cannot reconstruct scopally while Japanese SCR is similar to A'-movement in that it can do so. Look at the examples in (7) and (8).

(7) a.  dass eine  Frau    jeden      liebt        ($\exists > \forall$, *$\forall > \exists$)
         *that some  woman  everybody  loves*
         "Some woman loves everybody."

| | b. | dass | jeden | eine | Frau | t | liebt | | ($*\exists > \forall, \forall > \exists$) |
|---|---|---|---|---|---|---|---|---|---|
| | | *that* | *everybody* | *some* | *woman* | | *loves* | | (Fanselow 1990: 123) |

(8) a. dareka-ga daremo-o butta          ($\exists > \forall, *\forall > \exists$)
*someone-nom* *everyone-acc* *hit*
"Someone hit everyone."

    b. daremo-o dareka-ga t butta         ($\exists > \forall, \forall > \exists$)
*everyone-acc* *someone-nom* *hit*

(7a) and (8a) represent the canonical word order of German and Japanese, respectively: S-O-V. In such cases, only surface scope is available in either languages. But a difference emerges in a scrambled order in which the object precedes the subject as in (7b) and (8b): we obtain inverse scope only in the latter. The lack of inverse scope in the former indicates the impossibility of scope reconstruction in German SCR.

Furthermore, German SCR contrasts with Japanese SCR in that only the former does not violate the PBC when its extraction site gets unbound. Examine (9) and (10).

(9) a. [$_{VP}$ $t_i$ gelesen]$_j$ hat das Buch$_i$ keiner $t_j$
       *read*     *has the book*     *nobody*
"Nobody has read the book."

    b. [$_{VP}$ $t_i$ gelesen]$_j$ hat keiner das Buch$_i$ $t_j$
       *read*       *has*      *nobody the book*           (Müller 1996: 355)

(10)a. *[$_{VP}$ $t_i$ yomi]-sae$_j$ [huransu bungaku-o]$_i$ Taro-ga $t_j$ sita
       *read- even*    *French literature-acc*    *Taro-nom*      *did*
"Taro even read French literature."

    b. *[$_{CP}$ Mary-ga $t_i$ yonda to]$_j$ [sono hon -o]$_i$ [$_{IP}$John-ga $t_j$ itta]
       *Mary-nom*     *read*   *C*    *the*     *book-acc*     *John-nom*     *said*
"John said that Mary read the book."

In case of (9), the fronted VP contains an extraction site of the direct object *das Buch*; nevertheless the grammaticality is unaffected. In contrast, both sentences are seriously degraded in (10) where the fronted constituent contains an unbound trace of the scrambled object. Since multiple application of scrambling is permitted in Japanese, I attribute the ungrammaticality of the instances in (10) to the PBC.[2]

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2 It is noteworthy that A-movement in Japanese unlike SCR does not leave a trace. First examine the sentences in (i).

The discussion so far developed is summarized in the table below. We have seen the following: A-movement and German SCR are movement operations that cannot reconstruct scopally and whose extraction sites seem to ignore the PBC; whereas A'-movement and Japanese SCR are movement operations that can reconstruct scopally and whose extraction sites must obey the PBC. This paradigm can be best captured if we assume extending Lasnik's hypothesis that A-movement and German SCR do not leave a trace while A'-movement and Japanese SCR do so.

| | Scope Reconstruction | PBC | Trace |
|---|---|---|---|
| A-movement | Impossible | Ignores | Doesn't leave |
| A'-movement | Possible | Obeys | Leaves |
| German SCR | Impossible | Ignores | Doesn't leave |
| Japanese SCR | Possible | Obeys | Leaves |

(i)  a.  watasi-wa [sc John-o    kasikoito]    omoimasu
         *I-top*         *John-accintelligent*    *consider*
         "I consider John intelligent."
    b.  [sc John-o    kasikoito]    watasi-wa    t    omoimasu
         *John-acc  intelligent*    *I-top*            *consider*
    c.  *watasi-wa    kasikoito    [sc John-o    t    ]    omoimasu
         *I-top*          *intelligent*    *John-acc*              *consider*
    d.  *kasikoito    watasi-wa    [sc John-o    t    ]    omoimasu
         *intelligent*  *I-top*          *John-acc*              *consider*

(i-a) represents a canonical instance of ECM constructions in Japanese. In this instance, the matrix verb takes a small clause in which *John-o* is the subject of the predicate *kashikoi*. Here an attention should be paid to the fact that the small clause as a whole can be scrambled as in (i-b) whereas the predicate thereof cannot as in (i-c-d). Bearing this in mind, let us look into (ii).

(ii)  a.  John-ga$_i$ [sc t$_i$    kasikoito]    omow-areteimasu
          *John-nom*            *intelligent*    *consider-passive*
          "John is considered intelligent."
     b.  [sc t$_i$    kasikoito]    John-ga$_i$    omow-areteimasu
          *intelligent*    *John-nom*    *consider-passive*

(ii-a) is derived from (i-a) via the passivization of the matrix verb, which triggers the subject of the small clause to undergo A-movement into Spec-TP to check Case. As a result, the small clause becomes a remnant. Now notice that this remnant can be scrambled without violating the PBC as is proved by (ii-b). Given the ungrammaticality of (i-c-d), the fronted constituent cannot be just the predicate of the small clause. Accordingly, the acceptability of the (ii-b) can be viewed as an indication that A-movement in Japanese does not leave a trace.

## 4. Problems with Lasnik's Hypothesis

Given the correlation that the movement rules that resist scope reconstruction do not violate the PBC whereas those that allow it run afoul of the PBC, when their "traces" get unbound, we may say Lasnik is correct in associating the impossibility of A-movement reconstruction with the absence of A-traces. But it should be noticed that Lasnik's hypothesis is merely a stipulation on UG, apparently not reducible to some independent factor. This means that it cannot subsume German SCR unless it proves to be an instance of A-movement. To put it the other way round, given that A-movement is defined as a movement rule that does not leave a trace, we expect German SCR to fall under a subset of A-movement because it exhibits the striking similarity to A-movement. Unfortunately, this expectation fails to be met. Consider (11).

(11) a.  *weil [die Leherin von sich₁] in gutterErinnerung [den Studenten₁] behalten haben
     *since the teacher of himself  in good memory     the student      kept    have*
     "Since the teacher of himself has kept the student in good memory."

  b.  *weil [den Studenten₁]ᵢ [die Leherin von sich₁] in gutter Erinnerung tᵢ behalten haben
     *since  the student     the teacher of himself in good  memory       kept   have*
                                                              (Grewendorf and Sabel 1999: (18))

According to Grewendorf and Sable, *sich* is a local anaphor in German. In case of (11a), the anaphor is not locally c-commanded by a potential antecedent, hence a violation of Condition A. In case of (11b), however, the anaphor is locally bound by the potential antecedent; nevertheless the sentence is still uninterpretable as ever under the interpretation indicated by the indexing. This proves that German SCR is not an instance of A-movement.

Note in passing that Japanese SCR shows an A-property in the corresponding case. Examine the contrast in (12).

(12) a.  *[TP otagai₁-no    sensei-ga   [Masao to  Hanako₁-o]ᵢ hometa]
       *each other's  teacher-nom  Masao and Hanako-acc praised*
       "Each other's teacher praised Masao and Hanako."

  b.  [Masao to   Hanako₁-o]ᵢ [TP otagai₁-no    sensei-ga   tᵢ   hometa]
     *Masao and  Hanako-acc  each other's   teacher-nom      praised*  (Saito 1992)

Here I assume with Saito (1992) that *otagai* is a local anaphor in Japanese. In the first sentence, the anaphor fails to be locally bound by a potential antecedent, hence a violation of Condition A. In the second sentence, on the other hand, it is successfully bound by the scrambled antecedent. On the basis of this observation, it is often said that Japanese SCR bears a property of A-movement.

Returning now to the main stream, we have seen that German SCR cannot be an instance of A-movement and hence it cannot be subsumed under Lasnik's hypothesis, despite its remarkable similarity to A-movement. This is a fundamental problem of Lasnik's hypothesis because if we are to capture the correlation between the impossibility of scope reconstruction and the immunity to the PBC in case of A-movement and German SCR, all we can do is to stipulate that A-movement and German SCR do not leave a trace. This process, if repeated, will potentially complicate a theory of grammar to the limit. Every time we find a movement rule that behaves in the same as A-movement and German SCR, we would have to list it on the inventory of movement rules. In order to circumvent the worst scenario, we have to explain why A-movement and German SCR do not leave a trace. In the next section, I will demonstrate that considering why Japanese SCR must leave a trace sheds some light on this question.

## 5. A proposal

To begin with, let us consider why A'-movement leaves a trace. Lasnik offers a fairly uncontroversial account for this question. He claims that A'-movement must leave a trace so as to establish an operator-variable relation, where a trace is interpreted as a variable to be bound by a WH-operator. One might think that Japanese SCR leaves a trace because it is a kind of operator movement. However, recall that Japanese SCR is rather like A-movement in that it produces changes in the possibility of A-binding relations as seen in (12). This prevents us from treating Japanese SCR as an operator-movement.

It also deserves to note that theta-role assignment cannot be a factor that forces Japanese SCR to leave a trace. Otherwise, we would expect that A-movement and German SCR should leave a trace too. Such a speculation just brings the whole enterprise back to the square one.

Abandoning the idea that Japanese SCR leaves a trace for semantic reasons such as the formation of an operator-variable relation or the assignment of theta-roles, it seems promising to turn to think that the reason is rather syntactic. I propose within the framework of Chomsky (1995: Ch.4) that the parameter that distinguishes Japanese SCR from German SCR lies in the different feature strength of $v$ that triggers V-to-$v$ movement. Following the essence of Fukui and Takano (1998) and Watanabe (1998), I assume that the parameter value is set as in (13):
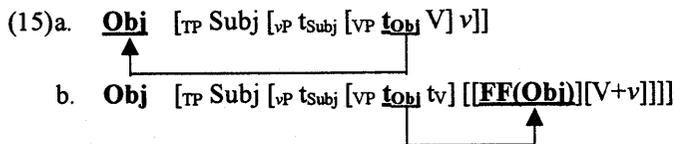
(13) a. $v$ is weak in Japanese.
    b. $v$ is strong in German.

These parameter settings entail that Japanese lacks overt V-to-$v$ movement while German has it. Furthermore, I assume (14), a condition on the feature checking between $v$ and an object.

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(14) $v$ can enter into checking relation with an object only when it is activated through V-to-$v$ movement into a complex [V+$v$].

This condition, coupled with the parameter values in (13), brings about a difference between these languages with respect to the timing of Case checking between $v$ and a scrambled phrase.

Given the parameter value in (13a) and the condition in (14), it follows that Japanese SCR cannot go through outer Spec-$v$P. This is so because no checking will take place at outer Spec-$v$P in overt syntax in Japanese and the Last Resort condition on movement (either Greed in the sense of Chomsky (1995) or Enlightened Self-Interest in the sense of Lasnik (1995)) prohibits a scrambled object to go though it. Therefore, I conclude that Japanese SCR must leave a trace for covert Case checking that takes place between the trace of a scrambled object and the complex [V+$v$] at LF. The process is schematically shown in (15).

(15) a. **Obj** [$_{TP}$ Subj [$_{vP}$ t$_{Subj}$ [VP **t$_{obj}$** V] $v$]]

b. **Obj** [$_{TP}$ Subj [$_{vP}$ t$_{Subj}$ [VP **t$_{obj}$** tv] [[**FF(Obj)**][V+$v$]]]]

(15a) depicts an object scrambling to the left of the subject. In this case, the scrambled object cannot move through the outer Spec-$v$P due to the lack of overt V-to-$v$ movement. Since the object cannot have its Case checked in overt syntax, covert Case checking is the only option, which process is illustrated in (15b).

Truing now to German SCR, given the strong setting of $v$ and the condition in (14), it follows that German has overt V-to-$v$ movement and that German SCR can go through outer Spec-$v$P in conformity to the Last Resort condition on movement (either Greed or Enlightened Self-Interest). This process is schematized in (16).

(16) **Obj** [$_{TP}$ Subj [$_{vP}$ **t$_{obj}$** [$_{vP}$ t$_{Subj}$ [VP **t$_{obj}$** tv] [V+$v$]]]]
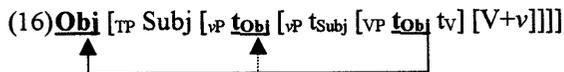
Since Case checking of a scrambled object can be executed in overt syntax, German SCR does not have to leave a trace.

The different feature setting of $v$ between German and Japanese can be evidenced by the fact that the former allows overt object shift while the latter does not.

(17) a. weil    ich$_i$ [$_{vP}$ nicht [$_{vP}$ t$_i$ [VP eine einzige Katze    gestreichelt]]    habe
        *since    I     not         a single cat     petted        have*
        "Since I have not petted a single cat."

b. weil ich$_i$ [$_{vP}$ eine einzige Katze$_j$ [$_{vP}$ nicht [$_{vP}$ t$_i$ [$_{VP}$ t$_j$ gestreichelt]]]] habe

    *since   I      a   single   cat     not             petted       have*

(Diesing 1996:(16))

First let us look into overt object shift in German. Here I assume with Diesing that the negation is left-adjoined to $v$P in German, hence signaling the left edge of $v$P in the canonical word order. This is exemplified by (17a). On this assumption, the position the shifted object occupies in (17b) is the outer Spec-$v$P. The availability of overt object shift in German supports the underlying assumptions that $v$ is strong and that outer Spec-$v$P is activated in overt syntax in German.

    Next let us make it clear that Japanese does not have overt object shift by examining the sentences in (18).

(18)a. [$_{TP}$ [$_{DP}$ gakusei-ga$_k$ 3-nin]$_i$   kinoo   [$_{vP}$ t$_i$ $v$ [$_{VP}$ hon-o$_j$    katta]]]

        *students-nom -CL     yesterday     book-acc    bought*

        "Three students bought books (yesterday)."

  b. [$_{TP}$ gakusei-ga$_k$  kinoo   [$_{vP}$ [$_{DP}$ t$_k$ 3-nin]$_i$  $v$ [$_{VP}$ hon-o$_j$    katta]]]

        *students-nom yesterday     -CL        book-acc   bought*

  c. *[$_{TP}$  gakusei-ga$_k$    kinoo   [$_{vP}$ hon-o$_j$ [$_{vP}$ [$_{DP}$ t$_k$ 3-nin]$_i$  $v$ [$_{VP}$ t$_j$ katta]]]]

        *students-nom    yesterday book-acc      -CL         bought*

According to Miyagawa (1989) and Koizumi (1995) among many others, in Japanese floating quantifiers are licensed when adjacent to (a trace of) their associates. Thus, the floating quantifiers in (18a-b) are licensed because the former is adjacent to its associate and the latter to the trace of its associate. However, (18c), where the object appears between the subject and the subject-modifying floating quantifer, is ungrammatical even though the quantifier is adjacent to the trace of its associate. Following Watanabe (1993), I interpret this fact as evidence that Japanese lacks overt object shift. This conclusion supports the underlying assumptions that $v$ is weak and that outer Spec-$v$P is not activated in overt syntax in Japanese.

    There is another piece of evidence that indicates the weakness of $v$ in Japanese. Let us examine the two sentences in (19).

(19)a. hon-o$_k$ [$_{TP}$ gakusei-ga$_j$    kinoo   [$_{vP}$ [$_{DP}$ t$_j$ 5-nin] [$_{VP}$ [$_{DP}$ t$_k$ 5-satu]    katta]]]

        *book-acc students-nom   yesterday        -CL           -CL     bought*

        "Five students bought five books yesterday."

  b. $^{??}$hon-o$_k$ [$_{TP}$ gakusei-ga$_j$   kinoo   [$_{vP}$ [$_{DP}$ t$_k$ 5-satu]$_i$ [$_{vP}$ [$_{DP}$ t$_j$ 5-nin] [$_{VP}$ t$_i$   katta]]]]

        *book-acc  students-nom   yesterday        -CL            -CL     bought*

I feel a clear contrast between the two. In (19a), both the subject-modifying quantifier and the

object-modifying quantifier are licensed because they both are adjacent to a trace of their own associates. In (19b) the surface order of these two floating quantifiers are reversed. In this case, the phrase [DP *hon-o 5-satu*] is forced to go through outer Spec-*v*P in order that the quantifer can be stranded there. However, since that position is not activated in overt syntax in Japanese, the scrambled DP cannot go though it. That's why (19b) is less acceptable than (19a).

Let us turn to A-movement. Given that covert Case checking is the factor that forces Japanese SCR to leave a trace, it follows that A-movement need not leave a trace since it moves an element into a Case checking position. This said, Lasnik's hypothesis can be viewed as a generalization derived from the property of A-movement (i.e., moving an element into a Case checking position) rather than a stipulation on UG.

## 6. Conclusion

In this paper, we have seen that the movement rules that resist scope reconstruction can ignore the PBC whereas those that allow it must observe the PBC, when their "traces" get unbound. The former include A-movement and German SCR while the latter A'-movement and Japanese SCR. In order to capture this paradigm, I have argued that the former do not leave a trace while the latter do so, extending Lasnik's hypothesis that A-movement does not leave a trace while A'-movement does. However, once it is made out that German SCR is not an instance of A-movement, this extension undermines the conceptual validity of Lasnik's hypothesis. Given that A'-movement leaves a trace for the purpose of forming an operator-variable relation, we are left with the necessity of explaining why Japanese SCR must leave a trace while A-movement and German SCR need not. I have proposed that the parameter lies in the different feature strength of *v* that induces V-to-*v* movement. Assuming that *v* is weak and that outer Spec-*v*P is not activated in overt syntax in Japanese, I have concluded that Japanese SCR must leave a trace for covert Case checking whereas in German, in which *v* is strong and thus outer Spec-*v*P is activated in overt syntax, scrambled objects can go through it for Case checking, hence no need for a trace. As for A-movement, since it moves an element into Case checking position, it does not have to leave a trace. Now that it is clear that A-movement and German SCR need not leave a trace while A'-movement and Japanese SCR must do so, the correlation between the availability of scope reconstruction and the immunity to the PBC naturally follows.

We have reached the conclusion that A-movement and German SCR need not leave a trace, rather than they must not. This paves the way for the pursuit of another possibility that A-movement and German SCR may leave a trace when it is needed for some independent reasons. Kuno (2000; To appear) discusses this possibility in detail, drawing the conclusion that whether a given movement rule leaves a trace or not should be determined depending on the type of a moved item rather than the type of movement operations such as A-movement, A'-movement,

head-movement or scrambling.[3] This implies that we can dispense with the widely held axiomatic statement as to when syntactic movement leaves a trace, even the strongest one that it always does so.

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3 For example, in order to account for the ungrammaticality of the (a)-sentences that involve remnant movement in contrast to the (b)-sentences that do not, it is claimed that A-movement in fact leaves a trace when a moved item is an "expletive" *there*, or a fragment of an idiom chunk.

(i) a. *[how likely $t_i$ to be a riot]$_j$ is there$_i$ $t_j$
b. [how likely] is there [t to be a riot]
(ii) a. *[how likely $t_i$ to be taken of John]$_j$ is advantage$_i$ $t_j$
b. [how likely] is advantage [t to be taken of John]          (Lasnik & Saito 1992: 141)

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