On Multiple *Wh*-Interrogatives in English

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0. Introduction

This paper investigates what conditions are required in the Minimalist Program in order to explain the behavior of *wh*-phrases in a multiple *wh*-interrogative construction. In section 1, I discuss two such conditions used in the GB framework, i.e. the Superiority Condition and the ECP (Empty Category Principle). In the Minimalist Program, however, the ECP is no longer available, since the essential notions for the definition of the ECP, such as 'government' and 'barrier', do not exist in this program. The question arises: can the Minimalist Program go along only with the already-available tactics, or does it need a new condition to compensate for the lack of the ECP?

In sections 2-4, I consider previous attempts to account for various kinds of multiple *wh*-interrogative data with no reliance on the ECP. In section 2, I discuss how much the MLC (Minimal Link Condition) account for the relevant data. Although the MLC covers a wide range of the data, the range at the same time shows the limitation of MLC's explanatory power. In section 3, I consider Kitahara's (1997) analysis: he stipulates that the acceptability of multiple *wh*-interrogative sentences is determined by the CFC (Chain Formation Condition) together with the MLC. This analysis is shown to be insufficient, however, to take over the task that the ECP used to do. In section 4, I briefly consider Kuno and Takami (1993): they insist that the superiority relation between *wh*-phrases should be determined by a pragmatic knowledge of a speaker/hearer, not by a syntactic condition. By pointing out the existence of counterexamples, I claim that syntax does play a role in regulating the behavior of *wh*-phrases.

In section 5, I conclude with a discussion that shows a direction for future research: a new condition is required to fully account for the behavior of *wh*-phrases in multiple *wh*-interrogatives. To formulate this condition, Kitahara's analysis gives us a clue: a 'wrong' movement or a 'wrong' distribution of a *wh*-phrase leads to a less acceptable/ ungrammatical LF representation. It does not satisfy the FI (Full Interpretation) principle, thus causing the representation to crash. In other words, the ECP is reformulated as a subcondition of the FI principle.

1. The Superiority Condition and the ECP

Firstly let us consider the following examples:

(1) a. *who t* bought *what?*

　b. * *what* did *who* buy *t?* 　　　　　　　　　　　　　(Ando et al. (1993:289))

(2) a. *who* did you tell *t* to read *what?*

　b. ?* *what* did you tell *who* to read *t?* 　　　　　　　　　(Op. cit. (1993:297))

When a sentence contains two (or more) *wh*-phrases, it is fixed which *wh*-phrase is chosen to raise.[1]　The wrong *wh*-movement results in an ungrammatical sentence, as (1b) and (2b) show.　This behavior is explained by Chomsky (1973) in terms of the Superiority Condition: when there is more than one candidate for some transformation, the one in the structurally-higher position is chosen.　Pesetsky (1987) rephrases it as the S-structure condition in order to fit it in the GB theory:

(3) In a multiple interrogation, where a *wh*-phrase is in Comp and another is in situ, the S-structure trace of the phrase in Comp must c-command the S-structure position of the *wh*-in-situ. 　　　　　　　　　　　　　　　　　　　　(Pesetsky (1987:104))

With this condition, we can account for the (un-) grammaticality of (1) and (2).　In (1a), the trace of *who* c-commands *what*, whereas in (1b), the trace of *what* does not c-command *who*. Therefore (1a) is grammatical while (1b) is excluded as a violation of the Superiority Condition.　The contrast in grammaticality between (2a, b) is explained in the same way.[2]

　However, Superiority cannot deal with such data exemplified by (4a):

(4) a. * *who t* came to the party *why/how?*

　b. * *why/how* did *who* come to the party *t?*

　c. * *who* thinks Mary left *why/how?*

　　　　　　　((4a) from Ando et al. (1993:294), (4c) from Lasnik and Saito (1992:19))

As for (4a, b), since the subject *who* is apparently superior to *why/how,* the prediction will be

that the transformation must be applied to *who* but not to *why/how*.   This accounts for the deviant status of (4b), but not for the deviance of (4a), which observes Superiority.   In fact, as (4c) shows, *why/how* cannot remain in situ in any circumstances.   A constraint other than Superiority is required to capture this fact.

In the GB framework, that constraint is identified with the ECP, which says that nonpronominal empty categories require licensing in some way.   The ungrammatical status of (4a, c) is now explained as follows: since all *wh*-phrases must raise to the operator position, *why/how* in (4a, c) raises and adjoins to *who* at LF, leaving the trace in its surface position.   But the trace is not licensed, i.e. properly governed in any way; not lexically governed because the phrase is not selected by the verb, nor antecedent-governed because c-command relation cannot be established between the adjoined position and the trace. Although the precise definition of the ECP differs from author to author, the requirement to satisfy the ECP thus constrains the behavior of *wh*-phrases and the distribution of *wh*-traces.

There have been attempts to eliminate the Superiority Condition and explain all the relevant data only with the reliance on the ECP.   (cf. Aoun, Hornstein and Sportiche (1980)) In fact, the contrast between (1a, b) is also accountable by the ECP: in (1a), the trace that will be created by LF-movement of *what* is lexically-governed, hence satisfies the ECP. On the other hand, in (1b), the trace that will be created by LF-movement of *who* is not lexically-governed nor antecedent-governed, hence the sentence is excluded as the ECP violation.   However, the ECP does not explain why (2b) should be ungrammatical, since the trace of *who* that will be created at LF is lexically governed by the verb *tell*, hence observes the ECP.   For the need to account for such data as (2a, b), it has been assumed that the Superiority Condition should be maintained independently of the ECP.   (cf. Pesetsky (1982), Lasnik and Saito (1992)) Thus, both the Superiority Condition and the ECP have been the means to account for multiple *wh*-interrogatives in the GB framework.

2. The MLC Analysis and Its Limitation

In the Minimalist Program, the Superiority Condition is rewritten as the MLC. Chomsky (1995:311) finally integrates the MLC into the definition of movement:

(5) The Minimal Link Condition (MLC)

K attracts α only if there is no β, β closer to K than α, such that K attracts β.

With this definition we can correctly predict the grammaticality of various kinds of multiple *wh*-interrogatives. Let us consider how the examples in (1) and (2), repeated here as (6) and (7) respectively, are explained by means of the MLC.

(6) a. *who t* bought *what*?

　　b. * *what* did *who* buy *t*?

(7) a. *who* did you tell *t* to read *what*?

　　b. ?* *what* did you tell *who* to read *t*?

C^0 bears a strong Q feature and attracts the 'closest' matching feature in the overt syntax. The closest category that contains such a feature is *who* but not *what* in (6a, b), and *who* but not *what* in (7a, b). Therefore, overt movements of *who* in (6a) and (7a) observe the MLC, resulting in grammatical sentences, whereas overt movements of *what* in (6b) and (7b) violate the MLC, causing the derivation to crash.

　　However, the MLC does not take over the task which the ECP previously did. In other words, the condition on movement is not sufficient to fully regulate the behavior of *wh*-phrases. Consider the examples in (4), repeated here as (8):

(8) a. * *who t* came to the party *why/how*?

　　b. * *why/how* did *who* come to the party *t*?

　　c. * *who* thinks Mary left *why/how*?

In each example in (8), the subject *who* is obviously closer to C than *why/how*. (8b), where *why/how* moves over the 'closer' phrase *who,* is therefore correctly excluded as an MLC violation. Still, the deviant status of (8a, c) is not attributed to the MLC.

　　Moreover, the MLC cannot deal with the fact as to long-distance movement of *wh*-phrases. It is known that there are subject-object and adjunct-argument asymmetries as to non-subjacent movement out of the *wh*-island. Consider the following contrast:

(9) a.　* *who* do you wonder *whether t* can help us?

　　b.　??*who* do you wonder *whether* we can help *t*?

　　c.　* *how* do you wonder *whether* we can help Bill *t*?　　　　　(Rizzi (1990:81))

When the object *wh*-phrase undergoes non-subjacent movement, as shown in (9b), it just degrades the acceptability of the sentence.　When the subject or the adjunct *wh*-phrase undergoes non-subjacent movement, on the other hand, the sentence results in total ungrammaticality, as shown in (9a) and (9c), respectively.

It depends on the stipulation of *whether* whether this kind of long-distance movement violates the MLC or not.　If we stipulate that *whether* is closer to the matrix C than other *wh*-phrases, then the *wh*-movements over *whether* in (9a-c) uniformly violate the MLC. On the other hand, if we stipulate that *whether* is not a candidate for the attraction from the matrix C, then the *wh*-movements in (9a-c) should uniformly observe the MLC.　Regardless of which stipulation to take, the contrast in grammaticality in (9a-c) cannot be accounted for by means of the constraint of movement: it must be due to the status of a subject or an adjunct that forbids the long-distance movement.

In sum, such examples as (8) and (9) show that a condition on the representation that regulates the distribution of (certain kinds of) *wh*-phrases is required, independently of the MLC.

3. Kitahara's (1997) CFC Analysis

3.1 An Analysis

In this section let us consider Kitahara's (1997) analysis on chain-formation of *wh*-phrases.　Kitahara's claim is unique in that the violation of the MLC does not necessarily cause the derivation to crash, but just degrades its grammaticality.　In other words, a less economical step is admissible as a less grammatical step.　According to him, the following sentences all violate the MLC, because Kitahara assumes that *whether* is a candidate for the attraction by the matrix C:

(10) a.　* *what* do you wonder [$_{CP}$ *whether t'* was fixed *t*] ?

　　b.　??*what* do you wonder [$_{CP}$ *whether* John fixed *t*] ?　　　　(Kitahara (1997:84))

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(11) a. * *how* do you wonder [CP *whether* John fixed the car *t*] ?

    b. ??*what* do you wonder [CP *whether* John fixed *t*] ?   (Op. cit. (1997:83))

(12) a. **how many pounds* do you wonder [CP *whether* John weighed *t*] ?

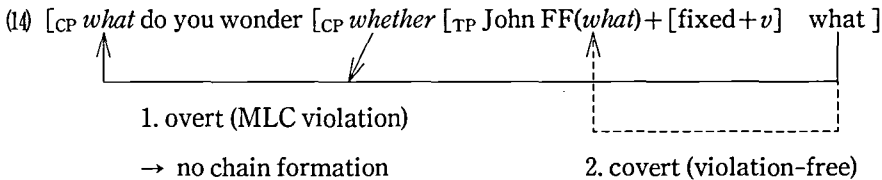   b. ??*what do you* wonder [CP *whether* John weighed *t*] ?   (Op. cit. (1997:85))

He claims that the subject-object asymmetry in (10), the adjunct-argument asymmetry in (11), and the quasi-object-genuine-object asymmetry in (12) is not due to the MLC, but to the success/failure of a legitimate chain-formation at LF. His analysis is composed of two stipulations: (i) a step that violates the MLC creates no chain, and (ii) a failed chain-formation can be compensated for by means of the *Chain Formation Condition* (CFC) defined as follows:

(13) Chain Formation Condition

    A application of Move forms ≧ 1 chain(s) only if it is legitimate (=violation-free).
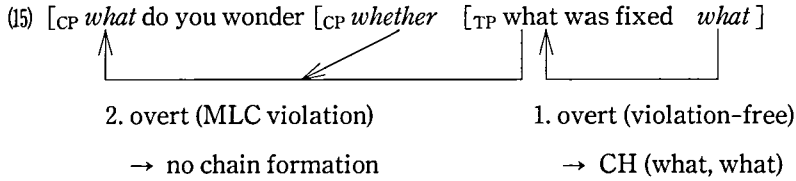
                                      (Op. cit. (1997:90))

Now let us see how this definition accounts for the contrast in grammaticality of (10)-(12). In (10), overt movement of *what* over *whether* violates the MLC, hence forms no chain at this point of derivation. Still, *what* in (10b) needs the additional movement in the covert syntax, to check its accusative Case feature against [vb fixed+v]:

(14) [CP *what* do you wonder [CP *whether* [TP John FF(*what*)+ [fixed+*v*]   what]

          1. overt (MLC violation)

          → no chain formation   2. covert (violation-free)

Since this covert raising is legitimate, the CFC defined in (13) enables *what* to form more than one chain. Thus, it forms two chains: one is (*what, what*), which has failed to be formed in the overt syntax, and the other is the chain of itself; (FF(*what*), *what*). After all, at LF this derivation consists only of legitimate chains, and therefore converges. Although it is true that this derivation violates the MLC and suffers a slight degradation for it, the MLC violation is not severe enough to cause the derivation to crash.

On the other hand, the subject *what* in (10a) has no chance to compensate for the failure of chain-formation. (15) indicates the movement paths of *what* in the overt syntax:

(15) [$_{CP}$ *what* do you wonder [$_{CP}$ *whether* [$_{TP}$ what was fixed *what*]

           2. overt (MLC violation)   1. overt (violation-free)

           → no chain formation   → CH (what, what)

What in (15) is a subject and needs an overt Case-checking in Spec of TP. The MLC-violating step comes about *only after* this raising. After this step there is no other overt or covert movement of *what,* and this *wh*-phrase remains chain-less until LF represtenta-tion. As a matter of course, this does not satisfy FI at LF, then the representation of (10a) crashes. The deviant status of (10a) thus obtains.

The same explanation holds for the ungrammatical status in (11a) and (12a): since there is no overt or covert movement of the *wh*-phrase that can compensate for the illegitimate *wh*-raising, their LF representation will crash.

To sum up, Kitahara accounts for those asymmetries by means of the CFC and FI, which the ECP previously dealt with. In other words, the ECP is replaced by a chain-licensing condition the violation of which fails to satisfy FI and crashes the sentence.

3.2 Problems with Kitahara (1997)

Here we consider problems that will arise from adopting Kitahara's CFC account. In fact, although the CFC works well for the explanation of complex sentences like (10)-(12), it predicts just the opposite when we deal with simple sentences. Let us consider the following simple sentences:

(16) a. * *what* did *who* buy *t* ?   (= (1b))

    b. * *what* did you buy *t why* ?

    c. * *when* did *who* come to the party *t* ?

    d. ?**who* did you give *what* to *t* ?

               ((16b) from Ando et al. (1993:293), (16d) from Lasnik and Saito (1992:120))

(17) *who t came to the party *how/why*?   (=(4a))

In (16), all of the moved *wh*-phrases violate the MLC: they raise over other *wh*-phrases that are 'closer' to C.   Following Kitahara's claim, however, we must detect another violation to exclude the sentences in (16), because he states that the MLC violation does not cause the derivation to crash.   Note that we cannot attribute the deviant status of each example in (16) to the failure of a legitimate chain formation: the failure to form a legitimate chain in the overt syntax can be compensated for later in the derivation in each case.   In the covert syntax, *what* in (16a, b) raises to Vb, *when* in (16c) to its sister (null P), and *who* in (16d) to *to*, in order to check its Case feature against the (sublabel of) head it adjoins to.[3]   I take (16a) and (16c) as illustrative examples and show their movement paths in (18a) and (18b), respectively:

(18) a. [$_{CP}$ *what*   did   [$_{TP}$ *who*   FF(*what*)+[buy+v] *what*]]

    1. overt (MLC violation)

        2. covert (violation-free)

  b. [$_{CP}$ *when*   did [$_{TP}$ *who* come to the party [$_{PP}$ FF(*when*)+P   *when*]]]
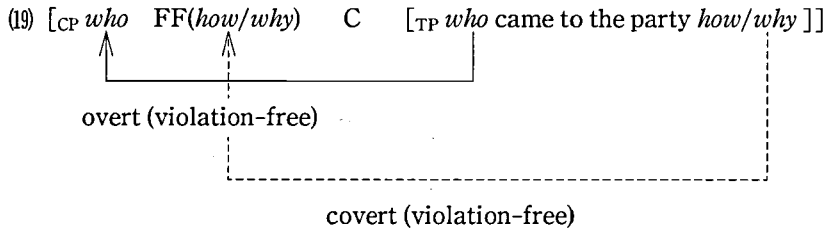
    1. overt (MLC violation)

        2. covert (violation-free)

Then the CFC should enable those *wh*-phrases to form legitimate chains of themselves, satisfying FI at LF.   Therefore, the excluded status in (16) cannot be attributed to the failure of a legitimate chain formation.   If so, why are these sentences excluded?

   The other problem concerns a special status of *how/why*.   Under Kitahara's claim, we cannot provide any explanation for the fact that *how/why* cannot remain in situ in any circumstances.   Let us turn to example (17).   Obviously *who* is closer to C than *how/why*: since overt movement of *who* observes the MLC, it forms a legitimate chain. Later in the covert syntax, FF(*how/why*) raises to C to check off its Q feature (F_Q).   This time the economy consideration is irrelevant since the strong Q feature on C has already been checked off and the raising of FF(*how/why*) is not driven by the attraction from C.   In other

words, the raising of FF(*how/why*) is done in order to satisfy the checking requirement of FF(*how/why*) itself.[4] Since the 'closer' relation is no longer relevant for the raising of FF(*how/why*), this covert movement causes no violation, either. The overt/covert movement paths in (17) are shown as follows:

(19) [$_{CP}$ *who* FF(*how/why*) C [$_{TP}$ *who* came to the party *how/why*]]

overt (violation-free)

covert (violation-free)

Therefore, each *wh*-phrase forms a legitimate chain and the representation satisfies FI at LF. Kitahara's CFC analysis thus predicts sentence (17) to be grammatical, contrary to fact. To exclude this kind of sentence, again, we must postulate a constraint other than the CFC.

Kitahara's CFC account, in short, only accounts for complex sentences that contain more than one *wh*-phrase, but not for simple sentences of similar kinds. To account for these examples, we would have to postulate a constraint other than the MLC or the CFC: an unwelcome result in the minimalist spirit.

4. A Functional Approach to Multiple *Wh*-Interrogatives: Kuno and Takami (1993)

Before concluding this paper, I make a brief reference to Kuno and Takami's (1993) functional analysis. They insist that it is no use to handle multiple *wh*-interrogative data in the syntactic field: according to them, it is a requirement from pragmatics that determines the superiority relation between *wh*-phrases.[5] Let us take the following contrast as an illustrative example:

(20) a. ?/??*why* did you buy *what*?

　　b. *when* did you buy *what*? (Kuno and Takami (1993:111))

They state that when a sentence contains more than one *wh*-phrase, the leftmost *wh*-phrase serves as a sorting key of information in the answer. In (20a), where *why* precedes *what,* for

example, the organization of the answer is expected to be a list of the reasons why the answerer bought something, each reason of which contains an item that the answerer bought for that reason. Then the expected answer will be like (21):

(21) ?? Because of hunger, I bought bread and butter, because of necessity, I bought furniture and clothes, because of vanity, I bought jewelry, ...   (Op. cit. (1993:116))

From our pragmatic knowledge of the world, we know that it is odd to categorize purchased items according to the reason why the speaker bought the item. The answer (21) sounds odd for this reason, and therefore the question that elicitates such an answer should be odd, too.

On the other hand, the expected answer in (20b) will be unproblematic:

(22) On Monday, I bought perfume and a watch, on Tuesday, I bought a watch, on Wednesday, I bought a camera, ...   (Op. cit. (1993:115))

Our pragmatic knowledge accepts such a sorting as natural: sorting purchased items according to the date when the speaker bought the item. Then the question (20b) which elicitates this kind of sorting, is acceptable, too.

However, under their hypothesis, how will we expect the acceptability of the following sentences?

(23) a. *who t* bought *what*?   (=(1a))
   b. * *what* did *who* buy *t*?   (=(1b))

(24) a. *what* did you give *t* to *who*?
   b. ?* *who* did you give *what* to *t*?   (=(16d))

(23b) and (24b) are expected to be acceptable, contrary to fact. In case of (23b), the expected answer will be like (25), where the buyers are sorted according to the purchased item:

(25) As for a watch, John bought it, as for a camera, Mary bought it, and as for a tie, Bill

bought it, ...

I consider this kind of sorting as unproblematic. In fact, Japanese allows a scrambled order like (23):

(26) *nani*-o   *dare*-ga   *katta-no* ?

    what-acc   who-nom   bought-Q

    'Who bought what ?'

As long as there is no pragmatic problem in (23b), its deviant status should be detected in the syntactic field.

    The same problem arises in (24b), where the expected answer will be a list of recipients and the gifts are subcategorized under the recipient:

(27) To John, I gave a watch, to Mary, I gave a camera, and to Bill, I gave a tie, ...

Our pragmatic knowledge would predict that this kind of sorting is unproblematic. Therefore, to exclude (24b), again, we need other tactics than pragmatics.

    In short, the superiority relation between *wh*-phrases exists as a syntactic fact. Although it may be true, at least to some extent, that our pragmatic knowledge should force the precedence of a phrase over another phrase, we should not leave out the role of syntax that automatically constrains the surface order of *wh*-phrases.

5. Concluding Remarks: The Direction for the Reformulation of the ECP

    Thus far I have considered previous analyses that deal with various phenomena of multiple *wh*-interrogatives. Although a complete analysis is beyond the scope of the present paper, we can see, through the discussion so far, what direction looks promising:

1. There must be a syntactic constraint on the behavior of *wh*-phrases in multiple *wh*-interrogatives. This is confirmed from the criticisms of Kuno and Takami's (1993) functional analysis.

2. Although it is true that the MLC, the constraint on movement operation, plays an

important role in determining which *wh*-phrase is to be attracted, it is insufficient to try to explain all the relevant data only by means of the MLC. This is shown in section 2: another constraint is required in order to account for the special status of *why/who,* and the subject-object/adjunct-argument asymmetries in long-distance movement out of the *wh*-island.

3. Kitahara (1997) regards *wh*-movement over another *wh*-phrase in the operator position as the violation of the MLC. However, the stipulation is problematic when dealing with simple sentences. Although he assumes that the violation of the MLC does not cause the derivation to crash, the MLC is in fact not violable, since the MLC is integrated into the definition of movement operaion, as shown in (5). The degradation of grammaticality in such movement cases should be attributed to another condition, the violation of which is not significant enough to crash the derivation.

4. As long as some cases of multiple *wh*-interrogatives cannot be dealt with by the MLC, i.e. a constraint on derivation, their grammaticality should be decided at LF representation. In other words, even if the derivation reaches its LF without crashing, the LF will crash unless it satisfies the FI principle. In this way the ECP can be integrated into the subcondition of the FI principle. The precise definition of the subcondition is yet to be formulated, a condition of a legitimate-chain formation at LF is a candidate for it, like one that is defined by Kitahara (1997).

The ECP plays a significant role in regulating various kinds of constructions as well as multiple *wh*-interrogatives: eg. *that*-trace effect, various island-constraint effects, and the language variation as to those effects. An alternative to the ECP to be formulated in the minimalist framework is expected, too, to handle the relevant range of phenomena.

NOTES

1. Contrary to (1) or (2), no superiority relation holds between the object *wh*-phrase and *where (or when)* which is assumed to be a VP-adjunct. Consider the following examples:

(i) *what* did he buy *t where*?

(ii) *where* did he buy *what t*? (Bošković (1997:229))

Huang (1982) assumes that *where* or *when* is base-generated as a complement of a null P: [_PP (null) P *where/when*]. If his claim is correct, then there is no c-commanding relation between the two *wh*-phrases in (i) and (ii). Since the Superiority Condition is relevant only for those *wh*-phrases in a c-commanding relation, either *what* or *where/when* can raise with no violation. Although this line of explanation is not compatible with Pesetsky's (1987) Superiority defined as (3), it goes along with the MLC, the alternative to Superiority in the Minimalist Program, which is defined below in (5).

See Bošković (1997) for an alternative analysis based on the global economy consideration.

2. As (2b) shows, the violation of Superiority (or the MLC) does not always result in a totally ungrammatical sentence, but sometimes in a seriously degraded, yet not excluded sentence. It is not clear when and how this can happen, and this paper will treat (2b) as equally ungrammatical as (1b).

3. Note that I have adopted Huang's (1982) claim as to the structure of *where/when*. See note 1.

4. Bošković (1997:239) provides the same account as to the linear order of *wh*-phrases in Bulgarian multiple *wh*-interrogatives.

5. In Kuno and Takami, *why/how* is given a special syntactic status, and therefore treated differently from other *wh*-phrases. Specifically, *why/how* is base-generated as a daughter of S". Since that position necessarily precedes any other position in a sentence, *why/how* must be in the first position.

(i) ?/??*why* did you buy *what*?

(ii) **what* did you buy *why*? (Kuno and Takami (1993:110-111))

According to them, whereas *why* in (i) is base-generated in a correct position, *why* in (ii) is not: the contrast in grammaticality thus obtains. A somewhat degraded status of (i) is due to the oddness of the order of the two *wh*-phrases, which is to be explained below.

The special syntactic status of *why/how* is hard to rationalize in a theoretically-convincing way. I do not commit myself in this discussion here and just mention the possibility of an alternative analysis of *why/how*.

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