A DERIVATIONAL APPROACH
TO INTERPRETATION OF WH-CONSTRUCTIONS

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1. Introduction

Suppose that there is a syntactic property P that manifests itself overtly in language A but apparently not in language B, but that there is some underlying similarity perceived between A and B with respect to P. One would attempt to resolve the apparent conflict between the surface variation and the underlying similarity, by postulating covert operations and hence the component of covert computation (LF). The basic tenet behind this type of attempt is that whatever process applies to P in A should apply to P in B. This could be recast as in (1) in the terms familiar in the Minimalist framework.

(1) The Checking Uniformity Hypothesis (p. 71)
Feature-checking relations are licensed within a uniform configurational locality.

This Checking Uniformity Hypothesis is challenged by Simpson in Wh-Movement and the Theory of Feature-Checking. He argues that

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configurational locality required for the checking of a given feature may be parameterized. His theory dispenses with the discrete component of LF, allowing for a model in which every feature-checking is accomplished by Spell-Out. I will review his analysis of regular *wh*- and *wh*-expletive constructions in section 2, and point out problems and consider how these problems can be resolved within the recent Minimalist framework in section 3. Section 3 will also examine the contribution of Simpson’s work to the understanding of the nature of the computational system of human language. Section 4 will attempt to solve the problems with his analysis, within the derivational approach to semantic interpretation of *wh*-constructions.

2. The Regular *Wh*- and *Wh*-Expletive Constructions

Simpson argues that the cross-linguistic variations observed with the (un)availability of overt *wh*-movement in the regular *wh*- and *wh*-expletive constructions follow from the interaction of the *wh*-checking domain parameter (2) and the triggering hypothesis (3). The *wh*-checking domain parameter defines the configuration required for a *wh* to enter a *wh*-feature-checking relation with C[wh], while the triggering hypothesis requires that every instance of C that enters a *wh*-feature checking relation be unambiguously C[wh] and that an ambiguous C get disambiguated as C[wh] through an overt movement of a *wh* to its specifier position.

(2) The *wh*-checking domain parameter
   a. the specifier position of C[wh]
   b. the immediate tense domain of C[wh]
   c. the whole domain of C[wh]

1 α is said to be in the “immediate tense domain” of C[wh], when (ia, b) hold.

( i ) a. α is in the domain of C[wh].
   b. There is no β, β an independent tensed/+finite clause, such that β
     is embedded in the domain of C[wh] and contains α.
Thus, not only α1 in (iia) but also α2 in (iib) is in the immediate tense domain of C[wh] if the embedded CP2 is not tensed/+finite.

(ii) a. [CP C[wh] ... α1 ...]
   b. [CP C[wh] ... [CP2 C ... α2 ...] ...]
The triggering hypothesis (p. 104)

Wh-movement to an ambiguous C is necessary to trigger the C as a licensors for specifically wh-elements. English has the value (2c) and its C is ambiguous (because one cannot tell from the inherent nature of C alone whether it gives rise to a yes/no question or wh-question interpretation), so that one wh is raised to [Spec, C[wh]] to trigger the C as +wh, and all of the rest, if any, remain where they are. The same is true of the regular wh-construction in German. In the regular wh-constructions in Bulgarian and Hungarian, on the other hand, the value for the wh-checking domain is specified as (2a), giving rise to the multiple-wh-fronting property. In Chinese, the wh-checking domain is valued as (2c), and its C is unambiguously identified as +wh with the presence of a wh-question particle ne. Hence, every instance of wh remains in situ. The value in (2c) is shared by Japanese, but unlike the Chinese ne, its counterparts (ka and no) are ambiguous as being either a yes/no question particle or a wh-question particle, so that some wh-element is required to overtly move into their specifier positions for triggering purposes.

The value in (2b) is exemplified by the regular wh-constructions in

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2 Whether these languages have an ambiguous C or not is not explicitly stated. This is probably because whichever the case may be it is obscured by the multiple-wh-fronting nature of the languages and hence cannot be determined.

3 Following Watanabe (1991), Simpson proposes that a phonetically null wh-specifier occurs with wh-phrases and that this null wh-specifier undergoes overt wh-movement for triggering purposes (p. 128).

4 As evidence for his analysis of ne and ka/no, Simpson gives the contrast in interpretation of wh-phrases embedded within wh-islands, as in (i) and (ii).

(i) ?John-wa [Mary-ga nani-o katta kadooka] Tom-ni tazuneta no?
John-Top Mary-Nom what-Acc bought whether Tom-Dat asked Q
Intended: ‘What did John ask Tom whether Mary bought?’

(ii) ni xiang-zhidao [shei mai-le shenme] ne?
you wonder who buy-Asp what Q
‘Who is the person x such that you wonder what x bought?’
‘What is the y such that you wonder who bought y?’

(i) is degraded with the interpretation in which nani-o ‘what’ takes scope over the matrix clause, because such an interpretation requires extraction of a null wh-determiner from within the embedded wh-island for triggering purposes. Such a constraint is, however, not observed in the Chinese counterpart in (ii), because ne is an unambiguous C[wh], inducing no triggering process and hence no extraction from within the wh-island.
Hindi and Iraqi Arabic, where every instance of *wh* occurring in the immediate tense domain of \(C_{[wh]}\) stays in situ but those occurring outside the domain are required to move into [Spec, \(C_{[wh]}\)].

Turning to the wh-expletive constructions, Simpson claims that expletive *whs* extend the *wh*-feature checking domain. In Hindi and Iraqi Arabic, then, every instance of substantive *wh* occurs in the tense domain adjacent to the immediate tense domain of \(C_{[wh]}\). The Hindi paradigm is summarized in (4), where *kyaa* ‘what’ is a wh-expletive and D1/D2/D3 are independent tense domains.

(4) Hindi wh-expletive construction

a. \([D_1 C_{[wh]} ... kyaa ... *wh1 ... (*wh2) ...]\)

b. \([D_1 C_{[wh]} ... kyaa ... [D_2 C ... wh1 ... (wh2) ...]\]

c. \([D_1 C_{[wh]} ... kyaa ... [D_2 C ... wh1 ... (wh2) ... [D_3 C ... t1 ... (t2) ...]]\]

(4a) is bad because *wh1/*wh2 occur in the immediate tense domain of \(C_{[wh]}\). The phenomenon is referred to as the “antilocality effect.”

What Simpson finds in need of explanation, in addition to the issue of the domain extension property of expletive *whs*, is that whatever process occurs in D2 in (4) also occurs in D1 in the corresponding regular *wh*-constructions in (5) below, in spite of the fact that the head \(C\) of D1 in (5) is +*wh* and the corresponding \(C\) of D2 in (4) is −*wh*.

(5) Hindi regular *wh*-construction

a. \([D_1 C_{[wh]} ... wh1 ... (wh) ...]\)

b. \([D_1 C_{[wh]} ... wh1 ... (wh2) ... [D_2 C ... t1 ... (t2) ...]]\]

This parallelism is not an accident, since a similar paradigm is observed

5 In these languages, \(C_{[wh]}\) is assumed to be fully specified as +*wh* (see p. 105), so that no *wh* is overtly raised for triggering purposes.

6 An antilocality effect is shown in the following sentence.

(i) *Tum-ne kis-ko vah kitaab kyaa dii?*

\begin{align*}
&\text{you-Erg who-Dat that book WHAT gave} \\
&\text{Intended: ‘Who did you give that book to?’}
\end{align*}

(Fanselow and Mahajan (2000))

One EL reviewer asks what kind of principle is behind this antilocality effect in Hindi. Simpson gives a detailed analysis of the effect in German *wh*-expletive constructions, to which we will turn shortly, but does not discuss the effect in the Hindi regular *wh*-construction like (i). It seems that if the Hindi expletive *kyaa* is a nominal, the analysis in German is applicable to Hindi as well.
in German as well. In the _wh_-expletive construction, \( C_{\text{wh}} \) is occupied by an expletive _wh_, and the substantive _wh_ occurs in [Spec, \( C \)] of the independent tense domain subordinate to the immediate tense domain of \( C_{\text{wh}} \). (Notice that we now witness the domain extension property of expletive _whs_ in German.) If there is more than one substantive _wh_, each instance other than the primary one is required to remain where it is. The paradigms are summarized in (6) and (7), where _was_ 'what' is the German expletive _wh_.

(6) German _wh_-expletive construction
   a. \([D_1 \text{ was } C_{\text{wh}} \ldots *\text{wh1} \ldots (*\text{wh2}) \ldots]\)
   b. \([D_1 \text{ was } C_{\text{wh}} \ldots [D_2 \text{ wh1 } C \ldots t_1 \ldots (\text{wh2}) \ldots]]\)
   c. \([D_1 \text{ was } C_{\text{wh}} \ldots [D_2 \text{ wh1 } C \ldots [D_3 C \ldots t_1 \ldots (\text{wh2}) \ldots]]\)

(7) German regular _wh_-construction
   a. \([D_1 \text{ wh1 } C_{\text{wh}} \ldots t_1 \ldots (\text{wh2}) \ldots]\)
   b. \([D_1 \text{ wh1 } C_{\text{wh}} \ldots [D_2 C \ldots t_1 \ldots (\text{wh2}) \ldots]\)

Here again, the behavior of _whs_ in D2 in (6) parallels that of _whs_ in D1 in (7). From the point of view of the feature-driven movement theory, one (apparently) surprising aspect of the German paradigms, which is not shared by Hindi, is that _wh1_ in (6b) undergoes overt partial _wh_-movement (PM) to the specifier position of the intermediate, declarative _C_ and stays there.

Simpson argues that the PM phenomenon is ultimately induced by _wh_-features, by proposing that the German expletive _wh_ (_was_) is a defective _wh_-element lacking a _wh_-operator feature (p. 198). Occurrence of such a defective _wh_ in [Spec, \( C_{\text{wh}} \)] cannot trigger the ambiguous \( C_{\text{wh}} \) as +_wh_, so that some other _wh_ with a _wh_-operator feature has to occupy a position local enough to the \( C_{\text{wh}} \). Thus, overt partial _wh_-movement of a substantive _wh_ (such as _wh1_ in (6b)) to [Spec, \( C \)] is forced. He then concludes that the parallel syntactic behavior of _whs_ in the regular _wh_- and _wh_-expletive constructions in German is ascribed to the requirements of _wh_-feature-checking.

Another source of differences between Hindi and German expletive _wh_-constructions is the nature of expletive _whs_: Hindi _kyaa_ is a proclitic on V, and German _was_, he claims, is a clitic to be cliticized to \( C \) (p. 213). Hence, in (multiple) _wh_-expletive constructions, as in (8) and (9), every instance of _kyaa_ must be adjacent to V, while _was_ must always occur within the C-projection.

(8) a. \([_{CP} \text{ Siita-ne kyaa abhii abhii socaa} \quad [{CP} \text{ ki } \text{ ravii-ne}]\]
   Sita-Erg WH now now thought that Ravi-Erg
who saw

Intended: ‘Who did Sita think just now that Ravi saw?’

b. [CP Siitaa-ne kya socaa [CP ki ravi-ne kis-ko Sita-Erg WH thought that Ravi-Erg who dekhaa]]?

‘Who did Sita think that Ravi saw?’ (Mahajan (2000))

(9) a. *[CP Wer glaubt was [CP wo er t hingegangen ist]]?

Who believe WH where he gone has

Intended: ‘Who believes he went where?’

b. [CP Was glaubst du [CP was er meint [CP wo Hans t WH believe you WH he thinks where Hans hingegangen ist]]?]

gone has

‘Where do you believe he thinks Hans went?’

The ungrammaticality of (10) and (11) is argued to be accounted for by the shared nature of clitic: clitics cannot undergo successive-cyclic movement.

(10) *[CP Raam-ne kya socaa [CP ki ravi-ne t kahaa [CP ki kon sa aadmii aayaa thaa? which man come has (Mahajan (2000))

Intended: ‘Which man did Ram think Ravi said came?’

(11) *[CP Was glaubst du [CP t (dass) er meint [CP wo Hans WH believe you that he thinks where Hans hingegangen ist]]?]

gone has

Intended: ‘Where do you believe he thinks Hans went?’

Simpson further argues that German expletive was is not directly generated within the C-projection, but base-generated in the complement position of V as a nominal clitic (p. 207), and that this nominal status is the origin of the antilocality effect. Being a nominal, was requires Case-feature checking, so that in (12), the expletive was and the substantive was “compete” for a single Accusative Case-feature on the verb, giving rise to a violation of the feature-checking requirement.

(12) *Was glaubst du was?

WH believe you what

Intended: ‘What do you believe?’
As evidence for this analysis, he presents the following example.

(13) \[CP \text{Was glaubt wer [CP wen sie liebt]}?\]

\(\text{WH believes who whom she loves}\)

‘Who believes she loves who?’

Unlike (12), (13) does not show an antilocality effect, in spite of the fact that the expletive \(wh\) and a substantive \(wh\) (wer) occur in the same tense domain. The source of the well-formedness of (13), Simpson argues, lies in the fact that wer checks a Nominative Case-feature against T and was checks an Accusative Case against V.

Notice here that this analysis of the antilocality effect disfavors the indirect dependency approach to \(wh\)-expletive constructions put forth by Mahajan (1990), Horvath (1997) and others, where an expletive \(wh\) is (i) a nominal element and (ii) a \(wh\)-equivalent of expletive \(it\), taking as its associate a CP containing a (substantive) \(wh\)-phrase.\(^7\) This indirect dependency approach accounts for the ungrammatical status of (12) as a violation of the property given in (ii): absence of a CP associate. However, if (12) is ruled out by the nominal property (i), as Simpson argues, then the postulation of the property (ii) is unnecessary. Thus, apparently, the reduction of the antilocality effect to Case-checking requirements constitutes an argument against the indirect dependency approach.

To summarize, the following features of Simpson’s analyses are highlighted.

(14) a. The \(wh\)-checking domain parameter
b. The triggering hypothesis
c. Cross-linguistic variations of \(wh\)-movement and \(wh\)-in-situ options
d. Domain extension as a fundamental property of expletive \(wh\)s
e. PM is a process induced by \(wh\)-feature-checking requirements.
f. Parallelism between the regular \(wh\)- and \(wh\)-expletive

\(^7\) Simpson sometimes refers to German expletive \(wh\) as a \(wh\)-equivalent of English expletive \(it\) (e.g. p. 211); but not in the sense that it takes a clausal associate, but just in the sense that it is a nominal element requiring Case-feature checking.
constructions

h. German expletive *was* (i) lacks a *wh*-operator-feature, (ii) is an Accusative-Case-marked nominal, and (iii) is a clitic to be criticized to C.

3. Arguments against Simpson’s Analysis

3.1. The Triggering Hypothesis (14b)

This hypothesis seems to be appealing in accounting for the contrast between the (un)availability of overt raising of a single (primary) *wh* in Chinese and English/German: the Chinese C[wh] is fully specified as +wh with the presence of a *wh*-question particle *ne*, so that overt raising is unnecessary, while the English/German C is ambiguously specified to be used both in a *yes/no* question and a *wh*-question, so that overt raising of a *wh* is required to trigger the ambiguous C as +wh. The hypothesis, however, has a serious drawback in its treatment of Hindi/Iraqi Arabic C: it is phonetically null in both *wh*-questions and *yes/no*-questions. We expect, therefore, that a triggering process is called for, resulting in the obligatory raising of a single (primary) *wh*, contrary to fact. (Simpson thus stipulates that C is unambiguously C[wh] due to the presence of a null *wh*-question particle (p. 105).)

Rejection of the triggering hypothesis would require one to present an alternative treatment of the cross-linguistic variations of *wh*-movement and *wh*-in-situ options (14c), and, specifically, a new analysis of the English/German single-*wh*-fronting phenomenon.

3.2. The Domain Extension Property of Expletive *Whs* (14d)

The extended domains in the presence of expletive *whs* in Hindi, Iraqi Arabic, and German are uniformly the “independent tense domain immediately adjacent to the tense domain of C[wh].” This is essentially the case in Bulgarian (15) and Hungarian (16), as well.

(15) [CP Miert vagy duhos [CP mert kivel talalkoztal]]

*WH* be-2SG angry because who-with met-2SG

‘Who is the person such that you are angry because you met that person?’

(16) [CP Mit áruit el János [CP hogy melyik lány kivel]

*WH* reveal away Janos that which girl who-with
találkozott]?
met (Horvath (2000))

‘Which girl did Janos reveal had met with whom?’

Why is the new domain uniformly the adjacent domain of the tense domain of $C_{[\text{wh}]}$ and not, say, the whole sentence? Simpson’s analysis cannot answer the question, because the $wh$-checking domain values include as a possible candidate the unwanted “whole sentence” value.

3.3. PM as a Wh-Feature-Driven Movement (14e)

Given the extension condition, the hypothesis that PM is a $wh$-feature-driven movement does not hold up. Consider (17), where $mit\ wen$ ‘with whom’ has undergone successive-cyclic movement.

(17) $[CP\ Was\ C_{[\text{wh}]}\ glaubst\ du\ [CP\ mit\ wen\ Hans\ meint\ [CP\ t2\ WH\ believe\ you\ with\ whom\ Hans\ says\ das\ Jakob\ t1\ gesprochen\ hat]]]\ (p.\ 174)$

‘With whom do you believe Hans says that Jakob spoke?’

The movement of $mit\ wen$ from the base-generated position ($t1$) to the specifier position of the most deeply embedded, declarative $C$ ($t2$) is clearly not induced by the matrix $C_{[\text{wh}]}$ because (i) at the moment of the application of $wh$-movement $C_{[\text{wh}]}$ has not yet been introduced into the relevant syntactic structure and (ii) the extension condition prohibits the $wh$-movement under consideration from applying after the $C_{[\text{wh}]}$ is introduced into the structure.

3.4. Parallelism between the Regular Wh- and Wh-Expletive Constructions (14f)

If PM cannot be characterized by $wh$-feature-checking, the parallel behavior of $wh$-elements in the regular $wh$- and $wh$-expletive constructions calls for a new explanation.

In the Minimalist framework explored by Chomsky (2000, 2001), each step of successive-cyclic $wh$-movement is viewed not as a feature-driven movement process but as a process to place the relevant element at the domain-peripheral position for it to be accessible to the domain-external operations (see the phase-impenetrability condition). PM is a licit operation to place a $wh$ at [Spec, $C$] for it to be accessible to operations outside. If the derivation that follows raises the $wh$ to [Spec, $C_{[\text{wh}]}$], a regular $wh$-construction is yielded; if expletive $was$ is introduced at a later stage of the derivation, a $wh$-expletive construction is
generated. Hence, the PM structure is a fragment of the structure shared by both the regular wh- and wh-expletive constructions.

3.5. The Antilocality Effect (14g)

Simpson’s account of the antilocality effect, which constitutes an argument against the indirect dependency approach according to which expletive whs are viewed as wh-equivalents of expletive it, is not valid. The reason why (13), repeated here as (18), is well formed is not that was and wer can check Accusative and Nominative Case-features, respectively, without giving rise to a conflict, but that expletive was can take as its associate a CP containing a wh (=wen).

(18) \[CP \text{Was glaubt } \text{wer } [CP \text{wen } \text{sie liebt}]\]

‘Who believes she loves who?’

That the existence of the wh-containing CP is crucial is highlighted by the ungrammaticality of the following example.

(19) *[CP \text{Was glaubt } \text{wer } [CP \text{dass Maria Karl liebt}]\]

Intended: ‘Who believes that Maria likes Karl?’

(Dayal (2000))

Here, was cannot find a wh-containing CP. Thus, the contrast in grammaticality between (18) and (19) is accounted for by the postulates of the indirect dependency approach. On the other hand, according to Simpson’s, not only (18) but also (19) is expected to be grammatical because there is no Case-checking conflict. The contrast between (18) and (19), therefore, indicates that antilocality cannot be ascribed to Case-checking requirements, and that the effect is explainable under the indirect dependency approach in which expletive whs have to take wh-containing CPs as their associates.

3.6. Expletive Whs as Clitics (14g)

Simpson’s proposal that German expletive was is a clitic is not well founded. The hosts of clitics are generally lexical. In the case of was, however, its host C is always null.

He proposes that this clitic status of was gives a straightforward account of the absence of successive-cyclic movement of the expletive was in German. This analysis allows for the presence of such languages that do not prohibit successive-cyclic movement of expletive whs just because they are not clitics. However, such a possibility does not
seem to be borne out. For example, Hungarian is an overt wh-movement language, "permitting (successive cyclic) wh-extraction" (Horvath (2000)). It has a wh-expression mit ‘what,’ which is ambiguously an expletive wh or a substantive wh. Expletive mit cannot be successive-cyclically extracted:

\[(20) * [CP Mit \ hitt \ Mari [CP hogy t akartad [CP hogy kivel \\
WH believed Mari that want-2SG that who-with \\
talk beszéljen]]] \]

(20) *[CP Mit hitt Mari [CP hogy t akartad [CP hogy kivel \\
WH believed Mari that want-2SG that who-with \\
talk beszéljen]]] (Horvath (2000))

Intended: ‘With whom did Mary think that you wanted that she talk?’

3.7. Summary and Discussion
Thus far, we have found the following.

(21) a. The triggering hypothesis does not naturally account for the Hindi/Iraqi Arabic facts.

b. The domains extended in the presence of expletive whs are uniformly the tense domain subordinate to the tense domain of C[\text{wh}].

c. PM is not explainable by wh-feature-checking requirements.

d. Once the wh-feature-motivated PM analysis is rejected, the parallelism between the regular wh- and the wh-expletive constructions is apparently lost.

e. Antilocality effect favors the indirect dependency approach, according to which expletive whs are viewed as being “associated” with CPs containing whs.

f. The lack of successive-cyclic wh-movement of expletive whs demands an explanation.

In what follows, I would like to first examine these problems from the point of view of the recent Minimalist program, and then consider what kind of contribution the work under review has to the understanding of the computational system of human language.

Simpson’s research is carried out under the earlier Minimalist framework explored by Chomsky (1995), where movement is viewed as a feature-induced operation. Simpson’s analysis of wh-feature-induced PM has a serious drawback in that the extension condition is not respected (21c), and hence the parallelism he claims to exist between expletive wh-sentences and regular wh-sentences is only apparent (21d).
These problems, however, can be resolved in the recent version of the Minimalist framework (Chomsky (2000, 2001)), where intermediate steps of wh-movement are to place a wh at a position accessible to operations outside of the domain.

Properties of the wh-checking domain extension (21b) and antilocality effect (21e) suggest reconsideration along the lines of the analysis proposed in the indirect dependency approach in which expletive whs are viewed as expletives that have to be “associated” with wh-containing CPs. The distributional property (21f) could be best accounted for by some interface conditions.

Let us turn to the problem in (21a): being phonetically null, C in Hindi/Iraqi Arabic seems to be ambiguously interpreted as a yes/no question or a wh-question, but it nevertheless does not induce a triggering process to disambiguate it as +wh. This may suggest that the default value for wh-feature checking is in fact “long-distance” agreement, requiring no overt wh-movement. Accordingly, what has to be explained is not the non-movement property of Hindi/Iraqi Arabic wh-constructions, but the obligatory wh-movement properties in languages such as English/German and Bulgarian/Hungarian and the availability of in situ whs embedded deeply in Chinese/Japanese.

These kinds of revisions, however, do not undermine the central claim of Simpson’s analysis: the rejection of the Checking Uniformity Hypothesis and the existence of the discrete, covert component in favor of a single, overt component with long-distance feature-checking operations. This shift in the conception of the computational system of human language accords with Chomsky (2000, 2001). In this light, Simpson’s claim gives independent support to the recent conception of the computational system. One salient problem brought to our attention by Simpson and still resisting interpretation by the recent Minimalist hypotheses is the explanation of the notion of immediate tense domains he postulated for wh-feature checking in Hindi/Iraqi Arabic and German/Hungarian wh-constructions:

(22) a. Raam-ne [Mohan-ko kise dekhne-ke liye] kahaa?
    Ram-Erg Mohan-Erg whom to-see for told
    ‘Who did Ram tell Mohan to look at?’

b. *Raam-ne kahaa [ki kOn aayaa-hE]?
    Ram-Erg said that who has-come
    Intended: ‘Who did Ram say has come?’
(23) a. Was glaubt Hans [wen Jakob anruft]?
   WH thinks Hans whom Jakob is-calling
   ‘Who does Hans think Jakob is calling?’

b. ?*Was will Hans [wen Jakob besticht]?
   WH wants Hans whom Jakob bribes
   Intended: ‘Who does Hans want Jakob to bribe?’

(McDaniel (1989))

In Hindi (22a), the immediate tense domain for kise ‘whom’ is the matrix clause, while the one for kOn ‘who’ in (22b) is the embedded, because the latter constitutes an independent tense domain. In German, when wen ‘whom’ occurs within an independent tense domain as in (23a), it can allow an expletive wh to occur in the external domain. On the other hand, if the embedded clause is dependent on the matrix tense as in (23b), the structure becomes ill formed. From a semantic point of view, an independent tense domain corresponds to an independent proposition: it may form a matrix clause by itself, for example. A possibility that deserves further investigation is that such an independent tense domain also defines a computational domain in which a probe can find a goal. The independent tense domain construed in this way is functionally redundant with the phases proposed by Chomsky, though at present it seems to be difficult to reduce to one or the other. Simpson’s analysis will facilitate the examination of the nature of computational domains.

In sum, Simpson’s claim that the computational system of human language consists of a single component with overt movement and long-distance feature-checking options is valid and gives independent support to the recent Minimalist analysis, as in Chomsky (2000, 2001). The possibility that independent tense domains function as domains in which a probe finds a goal sheds new light onto the exploration of the nature of computational domains. In the next section I present an alternative analysis of the problems in (21), along the lines suggested so far.

4. A Derivational Approach to Wh-Constructions

The claim at the heart of our analysis is that, intuitively, expletive whs are “pointers” between two syntactic objects, one that is an open sentence and one that is a vacuously quantified sentence. Before preceding to the details, we first have to set the framework: in section 4.1,
we propose an alternative analysis of the cross-linguistic variations observed with respect to the availability of overt wh-movement and wh-in-situ strategies. Section 4.2 outlines our derivational approach to interpretation of wh-constructions. We apply the assumptions and proposals given in 4.1 and 4.2 to the German paradigms of regular wh- and wh-expletive constructions in 4.3 and to their Hindi counterparts in 4.4.

4.1. Whs and Their Parametric Variations

A wh-expression consists of a wh-operator and a range over which it quantifies, and the quantificational force of the wh-operator is determined as +wh when it is “associated” with C[wh] (see Nishigauchi (1990) and Watanabe (1991) for discussions of these ideas). Once associated with C[wh], the wh-expression takes scope over the domain of the C[wh].

The configurational locality imposed on the establishment of wh-operator/C[wh] association (=determination of the quantificational force as +wh and hence assignment of scope) varies from language to language. Following the spirit behind Simpson’s proposal of the wh-checking domain parameter, let us assume that Universal Grammar allows for the following variations.

(24) A wh-operator must occur in:
   a. The specifier position of C[wh]
   b. The immediate tense domain of C[wh]
   c. The domain of C[wh]

Not only the multiple-wh-fronting languages such as Bulgarian but also English and German are specified as (22a). Hence, each wh makes an overt movement into [Spec, C[wh]] and determines its quantificational force as +wh. (We will turn to the “single-wh-movement” property of English/German below.) The value in (24b) is shared by Hindi and Iraqi Arabic, so that these languages require overt wh-movement to [Spec, C[wh]] only when whs are not situated in the immediate tense domain of the C[wh]. The value in (24c) is found in Chinese, where every instance of wh remains in situ. The parametric variations in (24) deal with the availability of overt wh-movement in a given language.8

8 One EL reviewer raises the issue of how children can single out a specific value among the choices in (24). One possibility is that the choice is determined by the nature of C in the relevant language. Suppose that the default value is the “im-
Let us now turn to the semantics of the multiple-\textit{wh} construction in English, such as (25), and consider the issue of single/multiple-\textit{wh}-movement variations.

(25) Who bought what?
A well-known property of the construction is that it generally gives rise to a “pair-list” reading: the answer to (25) should be a “list” of the “pairs” of the purchasers and the purchased. The origin of this “multiplicity” reading is arguably in the semantics of the primary \textit{wh}, which is in \textit{Spec, C[\textit{wh}]}, and has nothing to do with the semantics of the \textit{wh}(s) in situ. Hornstein (1995: 129), for example, states that “what seems required in multiple interrogatives is the domains that the WH-element in Spec CP singles out be discourse familiar.” In order to ask the question (25), a set of purchasers must be defined.\footnote{The pair-list reading tends to be absent in Japanese multiple \textit{wh}-questions. This would be because the language does not require the multiplicity reading on the primary \textit{wh}.} The multiplicity of the purchased items, on the other hand, is not presupposed knowledge, but a result obtained by substituting \(x\) with each member of the set of purchasers in the function \(y=f(x)\), where \(y\) is a purchased item and \(f\) is the activity of buying. Chierchia (1991), for example, captures this functional interpretation of the non-primary \textit{wh}(s), or their semantic dependence on the primary \textit{wh}, by mapping the non-primary \textit{wh}(s) to functional expressions. The issue of which \textit{wh} is dependent on which \textit{wh} is determined in structural terms, by the notion of c-com-

mediate tense domain of \textit{C[\textit{wh}]}” in (24b). Languages that have an unambiguous \textit{C[\textit{wh}]], as in Chinese, have the value (24c) (i.e. the domain of \textit{C[\textit{wh}]}, because they can achieve \textit{wh}-operator/\textit{C[\textit{wh}]} association within the lexical array by simply “pairing” the \textit{wh}-operator and the unambiguous \textit{C[\textit{wh}]}. This “pre-syntactic” association of a \textit{wh}-operator and \textit{C[\textit{wh}]} is impossible in languages whose \textit{C} is ambiguously a yes/no question or a \textit{wh} question.

The value (24a) (i.e. \textit{Spec-C[\textit{wh}]})) is found in languages whose \textit{C} is defective in the sense that it cannot “stand alone,” always requiring identification by some other lexical item. Children know whether the relevant language has this value, from the availability of Subject-Aux-Inversion and/or \textit{wh}-movement.

Japanese selects the default value (24b), because (i) \textit{C} is not fully disambiguated as \textit{C[\textit{wh}]} and (ii) processes equivalent to SAI and \textit{wh}-movement would be undetectable for learners. Then, a \textit{wh}-operator has its force determined as +\textit{wh}, if it is generated in the immediate tense domain of a licensing \textit{C[\textit{wh}]}; otherwise, the phonetically empty \textit{wh}-operator undergoes overt movement into such an independent tense domain, just as in Watanabe’s (1991) analysis.\footnote{The pair-list reading tends to be absent in Japanese multiple \textit{wh}-questions. This would be because the language does not require the multiplicity reading on the primary \textit{wh}.}
Suppose that there is a *wh* which is interpreted as being dependent on another *wh*. We will refer to such a *wh*, as an “anchored *wh*.” Being in an IP-internal position, an anchored *wh* in English apparently has not yet had its quantificational force determined as +*wh*. I propose that the anchoring process not only renders the relevant *wh* semantically dependent, but also renders the quantificational force of the relevant *wh* [+dependent on the value of the primary *wh*], and that the availability of the latter process is parameterized.

(26) The anchoring process makes the value of the quantificational force of the dependent *wh* [+dependent on the value of the anchoring *wh*].

The value of parameter (26) is [yes] in English and German. Accordingly, in multiple *wh*-constructions in these languages, all non-primary *whs* remain in situ, waiting for the value of the primary *wh* to be determined +*wh*. Not only multiple-*wh*-fronting languages but also Hindi and Iraqi Arabic have the value [no], so that every *wh* not occupying the relevant domain of *C*[*wh*] must undergo overt *wh*-movement. Japanese has the value [yes]. Consider the contrast in acceptability between (27a) and (27b).

(27) a. *John-wa [[sono hon-o naze katta] hito]-o
John-Top that book-Acc why bought person-Acc
sagasiteru no?
looking-for Q
Intended: ‘Why is John looking for the person that bought that book?’

b. ??John-wa [[nani-o naze katta] hito]-o
John-Top what-Acc why bought person-Acc
sagasiteru no?
looking-for Q
Intended: ‘What is John looking for the person that bought why?’

(27a) is ungrammatical because a phonetically null *wh*-operator contained in the *wh*-expression *naze* ‘why’ cannot be extracted from within the complex NP structure. In (27b), where a *wh*-phrase *nani* ‘what’ is introduced instead of *sono hon* ‘that book,’ we expect that movement of a phonetically null *wh*-operator on *naze* to the matrix *C*[*wh*] should equally lead to ungrammaticality. Since (27b) is more acceptable than (27a), it can be concluded that Japanese employs an anchoring process.
A DERIVATIONAL APPROACH

(See Saito (1994) for details.)

To summarize, the parameters in (24) and (26) yield the following language types.

(28)  [Spec, C_{[wh]}]  tense domain  whole sentence  
[yes]  English/German  Japanese  ?Chinese\(^{10}\)  
[no]  Bulgarian  Hindi/IA  ?Chinese

4.2. A Derivational Approach to Interpretation of Wh-Constructions

Under the derivational approach to semantic interpretation, interpretation of syntactic objects proceeds parallel to structure-building processes. The “timing” of semantic interpretation is, however, controversial. See, for example, Epstein et al. (1998), who argue that semantic interpretation is effected every time Merge applies; Uriagereka (1999), who proposes that formal feature checking is the switch to initiate interpretation; and Chomsky (2000, 2001), who introduces the notion of phase.

Let us assume that semantic interpretation is effected when an independent tensed clause is constructed. Suppose that in the derivation of sentence (29a), we arrive at a stage given in (29b).

(29)  a. What do you think she bought?
    b. [CP C [IP she bought what]]
    c. [CP what C [IP she bought t]]
    d. [CP what C_{[wh]} [IP you think [CP t C [IP she bought t]]]]

The wh-phrase what must ultimately move into the specifier position of C_{[wh]} and have its quantificational force determined as +wh. With the absence of C_{[wh]} in structure (29b), what can still raise into [Spec, C], because by doing so it can situate itself at a place accessible to operations outside the CP-domain. Since this CP is an independently tense-marked domain, semantic interpretation is effected. However, no interpretation is obtained because of the presence of a wh-element with an unspecified quantificational force, i.e. what. When (29d) is constructed at a later stage of the derivation, movement of what into [Spec, C_{[wh]}] enables it to determine the quantificational force as +wh. The sentence is interpreted as in (30).

(30)  for which x, x=entity: you think she bought x

\(^{10}\) We are not sure whether Chinese is [yes] or [no]. That is why “?” is added.
Consider again the stage (29b), repeated here as (31).

(31) \[[CP \ C \ [IP \ she \ bought \ what]] \quad (=\text{(29b)})\]

Suppose that *what* stays in situ. The interpretation of CP fails here again, because the quantificational force of *what* has not been specified. At a later stage of the derivation, *what* is no longer extractable out of the CP-domain, because it does not occupy an appropriate peripheral position. However, if a structure like (32a) is constructed during the course of derivation, *what* can be anchored by *who*.

(32) a. \[[IP \ who \ thinks \ [CP \ C \ [IP \ she \ bought \ what]]]\]
   b. \[[CP \ who \ [IP \ t \ thinks \ [CP \ C \ [IP \ she \ bought \ what]]]]\]

English makes the value of the quantificational force of the anchored *wh* [+dependent on the value of the anchoring *wh*]. The raising of the anchoring *wh* (*who*) to [Spec, C_{[wh]}] as in (32b) determines its quantificational force as +*wh*, which in turn automatically determines the quantificational force of the in situ *what* as +*wh* as well. The matrix CP is then interpreted roughly as in (33).

(33) for which \(x, x=\text{human} \): \(x \text{ think she bought } f(x)\)

4.3. Expletive Whs as "Pointers"

We have seen that syntactic objects sometimes fail to generate any interpretation and are embedded in a larger structure, where they can then be interpreted with the support of the elements introduced at a later stage of the derivation. Generally, interpreted parts of the structure do not interfere with the computational operations that would apply at later stages of the derivation, so computational efficiency favors interpretation over non-interpretation.

With this in mind, reconsider the declarative CP-domain in (29c) above, repeated here as (34), which contains an unspecified *wh*-operator.

(34) \[[CP \ what \ C \ [IP \ she \ bought \ t]]\]

If this structure can be interpreted, the computational processes that follow become very efficient in that they do not need to take the structure in (34) into consideration. Since the quantificational force of *what* in (34) has not been specified, the structure will be roughly interpreted as in (35).

(35) \(x=\text{entity}: \text{she bought } x\)

Although sentences of this type, i.e. open sentences, are not allowed in natural language, let us suppose that they are tolerable in the computational system and are interpreted as open sentences lacking an opera-
tor. In the derivation that follows, the computational system does not
close the structure (34) or the semantic representation (35); rather,
it considers how to determine the unspecified operator as +wh. If
there is a lexical item (WH) which is a pure realization of a wh-oper-
ator, the computational system attempts to associate it with \( C_{[wh]} \) and
license it as a wh-operator, as in (36a), where the quantificational force
of \( WH \) is determined as +wh by \( C_{[wh]} \).

(36) a. \[ CP \; WH \; C_{[wh]} \; do \; you \; think \]
b. for which \( x \): do you think

(36a) is interpreted as a vacuous wh-quantificational sentence as shown
in (36b), since there is no variable bound to the wh-operator.
(Vacuous quantification sentences are ill formed in natural language,
but we assume that they are tolerable in the computational system.)
(36b) is not intelligible by itself, but when it is coupled with the open
sentence in (35) above, the following semantic representation is
obtained.

(37) for which \( x \): do you think \[ x=\text{entity: Mary bought} \; x \]
Although deformed in that the wh-operator and its range are
scattered,\(^{11} \) it is intelligible. In our analysis, expletive whs are pure
realizations of wh-operators.

The analysis has the following properties.

(38) When a syntactic object is interpreted as an open sentence
lacking a wh-operator, a lexical wh-operator (WH) is called
for just to determine the quantificational force as +wh.
Thus,

a. The occurrence of \( WH \) is directly “associated” with a
syntactic object interpretable as an open sentence, i.e. CP.

b. \( WH \) cannot occur in simple sentences. (Antilocality)

(39) Since \( WH \) is nothing but a wh-operator, it cannot form an
operator-variable construction by itself. Thus,

a. \( WH \) cannot undergo successive-cyclic wh-movement, be-
cause a movement that crosses a CP-boundary requires
the formation of an operator-variable construction.

\(^{11} \) See Ouhalla (1996: 697) for a possible solution.
b. Clause-internal movement, on the other hand, is permissible.

(40) Since WH is a wh-operator, it cannot be transformed into a functional expression. Thus,
   a. WH cannot be anchored in multiple wh-constructions.
   b. In a WH-construction with multiple WHs, the apparent anchoring relation between the WHs is generated by recursive applications of open sentence interpretation and WH-introduction.

(38a, b) explain the ungrammatical status of (41a, b), respectively.

(41) a. *[CP3 Was glaubst du [CP2 dass Hans meint [CP1 mit wem Jakob t gesprochen hat]]?]
   Jakob spoken has
   Intended: ‘With whom do you believe that Hans says Jakob spoke?’
   b. *[Was glaubst du was]?
   WH believe you what
   Intended: ‘What do you believe?’

In (41a), with the interpretation of CP1 as an open sentence, a wh-operator was should have been introduced to construct the CP2 domain. But was was introduced in the CP3 domain. This is too late, and the sentence becomes ungrammatical. In (41b), on the other hand, there is no motivation to introduce was, because of the absence of an open sentence. This is why it is ungrammatical.

Suppose that soon after the CP1-domain in (41b) is interpreted as an open sentence, expletive wh (was) is introduced to merge with the verb meint ‘say’ as in (42a) below.

(42) a. [CP2 C [IP Hans [VP was meint]]]
   b. [CP2 was C [IP Hans [VP meint]]]

In German, one wh-operator must move into [Spec, C[wh]]. If the candidate is was in (42a), it first moves into the peripheral position of the CP2 domain, as in (42b). At a later stage of derivation, was moves out of the CP2 domain to raise to [Spec, C[wh]], as in (43).

(43) *[CP1 Was glaubst du [CP2 t C [IP Hans [VP meint]]]

This sentence, however, is ungrammatical, because (i) movement across a CP-boundary must form an operator-variable construction (see (39a)) but (ii) the wh-operator was cannot leave a trace.

If the computational system interprets (42b), we obtain an open sen-
tence lacking a \textit{wh}-operator. Subsequent operations may introduce another instance of \textit{was} and merge it with the verb \textit{glaubst} ‘believe,’ as in (44a).

\begin{align*}
\text{(44) a.} & \quad [\text{CP}_3 \ C_{[\text{wh}]} [\text{IP} \ du [\text{VP} \ was \ glaubst]]] \\
\text{b.} & \quad [\text{CP}_3 \ was \ C_{[\text{wh}]} [\text{IP} \ du [\text{VP} \ glaubst]]]
\end{align*}

At a later stage, \textit{was} raises to [Spec, \textit{C}_{[\text{wh}]}], as in (44b), and its \textit{wh}-quantificational force is determined. In this way, a multiple \textit{was}-sentence is generated (see (40b)).

\begin{align*}
\text{(45) [CP}_3 \ \text{Was glaubst du [CP}_2 \ was \ Hans \ meint [CP}_1 \ mit \ wem} \\
\text{WH believe you that} \text{Hans says with whom} \\
\text{Jakob t gesprochen hat]?}
\end{align*}

Property (40a), on the other hand, is instantiated by the ungrammaticality of (46).

\begin{align*}
\text{(46) * [CP}_2 \ \text{Wer glaubst was [CP}_1 \ wo er hingegangen ist]?}
\end{align*}

Intended: ‘Who believes he went where?’

The derivation of the sentence would proceed in this way. When \textit{CP}1 is constructed, it is interpreted as an open sentence. The next operation is to select \textit{was} and merge it with the matrix verb \textit{glaubst}. This complex merges with the subject \textit{wer} ‘who’ as in (47a).

\begin{align*}
\text{(47) a.} & \quad [\text{IP} \ wer [\text{VP} \ was \ glaubst]] \\
\text{b.} & \quad [\text{CP} \ wer \ C_{[\text{wh}]} [\text{IP} \ t [\text{VP} \ was \ glaubst]]] \quad \text{(order irrelevant)}
\end{align*}

If \textit{wer} moves into [Spec, \textit{C}_{[\text{wh}]}] as in (47b), then the expletive \textit{was} must be anchored by \textit{wer}. This is impossible, because \textit{was} is a \textit{wh}-operator and cannot be mapped to a functional expression like \textit{f(x)} (see (40a)).

\section{4.4. Hindi \textit{Wh}-Constructions}

Hindi \textit{whs} have to determine their quantificational force as \textit{+wh} in the immediate tense domain of \textit{C}_{[\text{wh}]}$. Thus, in a simple sentence every instance of \textit{wh} determines its \textit{wh}-quantificational force at the place where they are, without moving into [Spec, \textit{C}_{[\text{wh}]}]. As the contrast in grammaticality between (48a) and (48b) shows, in complex structures, every instance of \textit{wh} is required to move into the appropriate tense domain.

\begin{align*}
\text{(48) a.} & \quad *[\text{CP}_2 \ kOn \ raam-ne \ kahaa [CP}_1 \ ki \ t \ kis-ko \ maaregaal]? \\
\text{who \ Ram-Erg say that whom will-hit}
\end{align*}

Intended: ‘Who did Ram say will hit who?’
b. \([\text{CP2 kOn kis-ko raam-ne kahaa [CP1 ki } t t \text{ maaregaa]}]?\) 
   \[\text{who whom Ram-Erg say that will-hit}\]
   ‘Who did Ram say will hit who?’

This is because Hindi does not have the option of making the value for the wh-quantificational force [+dependent to the anchoring wh].

The same paradigm is observed in the wh-expletive construction:

(49) a. *[CP3 Raam-ne kyaa socaa [CP2 ki kOn raviipne kahaa 
   Ram-Erg WH thought that who Ravi-Erg said 
   [CP1 ki } t kis-ko maaregaa]]]? 
   [that whom will-hit]\
   Intended: ‘Who did Ram think that Ravi said will hit who?’

b. [CP3 Raam-ne kyaa socaa [CP2 ki kOn kis-ko raviipne 
   Ram-Erg WH thought that who whom Ravi-Erg 
   kahaa [CP1 ki } t t maaregaa]]]? 
   [that will-hit]\
   ‘Who did Ram think that Ravi said will hit who?’

In (49a), kis-ko ‘whom,’ which occurs in the most deeply embedded clause, fails to determine its quantificational force as +wh, because (i) it is not in the immediate tense domain of C[wh], (ii) Hindi does not have the option of wh-quantification determination in terms of anchoring relations, and (iii) the interpretation of CP1 as an open sentence is not followed by merger of the expletive wh (kyaa). In (49b), on the other hand, after the raising of both of the whs, the CP2-domain is interpreted as an open sentence, and a subsequent operation introduces the wh-operator kyaa.

Like German, Hindi shows an antilocality effect (50a), unavailability of successive-cyclic movement of the expletive wh (50b), and availability of multiple expletive whs (50c).

(50) a. *[Tum-ne kis-ko wah kitaab kyaa dii]? 
   [you-Erg who-Dat that book kyaa gave] 
   Intended: ‘Who did you give that book to?’

   (Fanselow and Mahajan (2000))

b. *[CP3 Raam-ne kyaa socaa [CP2 ki ravii-ne } t kahaa [CP3 
   Ram-Erg WH thought that Ravi-Erg said 
   ki } kOnsaa aadmii aayaathaa] 
   [that which man came] 
   Intended: ‘Which man did Ram think that Ravi said came?’
c. $[_{CP3} \text{Raam-ne kyaa socaa} \quad [_{CP2} \text{ki ravi-ne kyaa kahaa} ]$

Ram-Erg WH thought that Ravi-Erg WH said

$[_{CP3} \text{ki kOnsaa aadmii aayaathaa} ]$

that which man came

‘Which man did Ram think that Ravi said came?’

Let us finally turn to an apparent difference between German and Hindi \textit{wh}-constructions: the clause-internal PM phenomenon of German \textit{was} is not observed with Hindi \textit{kyaa}. It might be that the domains accessible to operations outside are defined in accordance with the values for the determination of the \textit{wh}-quantificational force. German has $[\text{Spec, } C[_{wh}]]$ as the domain in which it determines the \textit{wh}-quantificational force, and hence its peripheral position is determined as $[\text{Spec, } C]$. In Hindi, determination of the \textit{wh}-quantificational force is carried out in the immediate tense-domain of $C[_{wh}]$. Thus, the immediate tense domain of $C$ is accessible to operations outside, and \textit{kyaa} need not be raised.

5. Conclusion

I have examined Simpson’s analysis of \textit{wh}-constructions. His analysis has turned out to have a number of problems, but they do not undermine the central claim of his analysis: the rejection of the Uniformity Checking Hypothesis and the existence of a covert computational component in favor of a single, overt component with long-distance feature-checking operations. This shift in the conception of the computational component of human language accords with Chomsky (2000, 2001), and constitutes independent evidence supporting the recent Minimalist framework.

One of the salient ingredients of his analysis brought to our attention by Simpson and still resisting interpretation by the recent Minimalist hypotheses is the notion of immediate tense domains. His claim that immediate tense domains function as domains in which a probe finds a goal sheds new light onto the investigation of the nature of computational domains.
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