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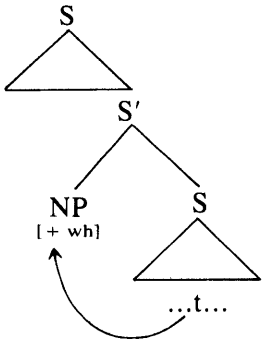
String-Vacuous Rule Application

In this article, we will argue on the basis of data in three languages, Icelandic, Kikuyu, and Irish, that string-vacuous rule application must be allowed by the theory of grammar.

In languages like English, constructions such as *wh*-questions and relative clauses involve a dependency between an element in sentence-initial position and an empty position or gap within the sentence. The conditions on this dependency can be expressed in different ways, e.g. through a movement or deletion rule as in transformational grammar, or through syntactic binding as in various nontransformational frameworks (see e.g. Gazdar (1981) or Kaplan and Bresnan (1982)). In a *Wh* Movement analysis, a sentence like (1) has the representation diagrammed in (2), with a trace[1] in the position from which the *wh*-constituent has been moved.

(1) I don't know what Harry saw.

(2)



On the other hand, in subject questions, it is not immediately clear whether a *wh*-word

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[1] What we call *trace* here is usually assumed to be a gap, but in some languages, under certain circumstances, it can also be realized as a (resumptive) pronoun. For Kikuyu, see Clements (1979); for the Scandinavian languages, see Maling and Zaenen (1982) and Zaenen, Engdahl, and Maling (1981). The important thing is that the position be syntactically bound by some element outside the S-domain, not that it necessarily be phonologically null.

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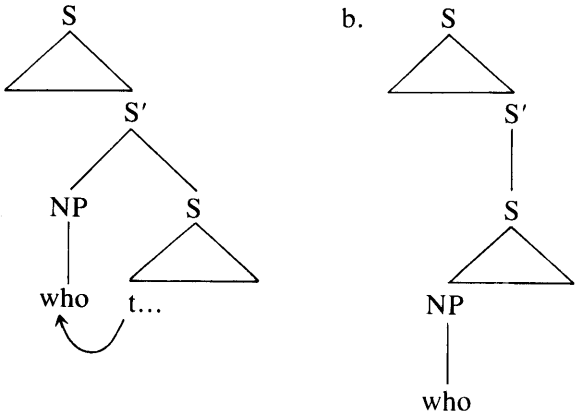
such as *who* in (3) is followed by a trace or whether it occupies subject position in surface structure.

(3) I know who saw Harry.

Both structures are given in (4a,b):

(4) a. b.



One might plausibly adopt (4a) as the null hypothesis, on the grounds that the simplest formulation of the rule accounting for the extraction in nonsubject questions like (1) would also account for the extraction in (3) in the way indicated in (4a).

Under certain theoretical assumptions, however, such an analysis would be impossible. One such assumption is that there is no string-vacuous movement. Constraints having this effect have been proposed in two different forms. Ross (1967, 99) suggested that "when one term is sister-adjoined to a variable and that variable is null for some particular structure, nothing happens to that structure". He argued that such a convention is necessary to account for the interaction between *Extraposition* and *It Deletion*. Under Ross's assumptions, these two rules are formulated as follows:

(5) *Extraposition* (optional)

	X –	[it –	S]$_{NP}$ –	Y
SD:	1	2	3	4
SC:	1	2	ϕ	4 + 3

(6) *It Deletion*

	X –	[it –	S]$_{NP}$ –	Y
SD:	1	2	3	4
SC:	1	ϕ	3	4

If Extraposition (5) could apply string-vacuously, though, a sentence like (7) should be possible.

(7) *I claimed it that Bobby was a genius.
  a. I claimed [it [that . . .]$_S$]$_{NP}$
  b. I claimed [it]$_{NP}$ [that . . .]$_S$

Under the analysis in which Extraposition has applied, albeit string-vacuously (7b), *It* Deletion will not be able to apply, and the sentence should be grammatical. Since the sentence is in fact ungrammatical, Ross proposed the constraint against string-vacuous movement to block such unwanted derivations.

Ross's constraint is one prohibiting the application of rules that operate vacuously on some terminal strings. A different prohibition against string-vacuous movement is formulated in Chomsky (1973) in connection with the desirability of a rule like Subject-to-Object Raising. Chomsky (p. 254) tentatively raises the question

> whether cyclic transformations should not be constrained so as to forbid operations that never change the terminal string of a phrase marker but only its structure, as in the original formulations of subject raising to object position.

Here the proposed constraint prohibits not rule applications, but a class of rules. This latter formulation of string-vacuous movement has become moot within more recent elaborations of the theory that recognize only one rule of core grammar, "Move α", since this rule obviously does not apply string-vacuously all of the time. Hence, if any prohibition against string-vacuous movement is to be maintained within this framework, it must once again be a constraint against string-vacuous rule *application*. As a condition on rule application, the constraint has recently been adopted by Taraldsen (1980) as a crucial assumption in an argument designed to derive the Fixed Subject Constraint (postulated in Bresnan (1972)), which has been proposed to account for the ungrammaticality of examples like (8), from other principles of grammar.

(8) *Who do you think that ____ came?

Taraldsen does not offer independent evidence for the constraint, but assumes that it is part of Universal Grammar.

We will show here that the prohibition cannot be part of Universal Grammar. Given the normal constraints on possible rules, though, it cannot be a principle in the grammar of individual languages either. If it is assumed that "Move α" is the only transformational rule in the grammar, the constraint must be formulated as a metacondition on the functioning of a grammatical rule system, involving a comparison of the structure in the immediate input of a rule with the structure in its immediate output. A constraint against string-vacuous rule application cannot be equivalently reformulated as a constraint governing a rule's output, since such a constraint would be unable to distinguish that rule's unique contribution to the output, as opposed to the contribution of previous rule applications or of the deep structure itself. In short, the prohibition against string-vacuous rule application amounts to a "global" constraint of the sort which is otherwise disallowed in linguistic theory as a (language-specific) condition on rules.

We will present empirical arguments from three languages in support of our position by showing that movement rules can and do apply string-vacuously. The first arguments, based on Icelandic and Kikuyu, show that in these languages subject questions have the structure given in (4a). The third argument, based on Irish, shows that extraposition of direct objects can also be string-vacuous.

The arguments from Icelandic and Kikuyu also bear on a proposal made by Gazdar (1981), which is similar in effect, within nontransformational theories of syntax, to a constraint prohibiting the string-vacuous application of *Wh* Movement. Gazdar proposes a Generalized Left Branch Condition (GLBC) to rule out sentences like (8). This condition takes the form of a node inadmissibility condition prohibiting null NPs or PPs as left branches:

(9) $*[_{\alpha/\beta}\ \sigma/\beta\ \ldots]$, where α and σ are any node labels, and β = NP or PP

The structure given in (4a)—which we will argue to be the correct one for subject questions in Icelandic and Kikuyu—would be prohibited if the GLBC were a universal constraint.[2]

1. Icelandic

Icelandic is a Germanic language with SVO word order. *Wh*-questions are formed very much as in English, with the question word or phrase occurring at the beginning of the clause. This is illustrated by sentences (10) and (11), the Icelandic counterparts of (1) and (3).

(10) Ég veit ekki, hvað Ólafur sá.
'I know not, what Olaf(N) saw.' (N = nominative)

(11) Ég veit ekki, hver sá Ólaf.
'I know not, who saw Olaf(A).' (A = accusative)

For Icelandic it is possible to show that a subject question like (11) must have the structure diagrammed in (4a). To do this, we will first describe the rule of *Stylistic Fronting* and then contrast it with the superficially similar rule of *Topicalization*. Finally, we will show with the aid of Stylistic Fronting that *Wh* Movement applies string-vacuously in Icelandic.

Icelandic has a syntactic rule, *Stylistic Fronting* (SF), which optionally preposes nonfinite verb forms, verbal particles, and predicate adjectives from their normal position after the finite verb to "first position" in the clause. This rule, which is especially common in embedded clauses, is illustrated in (12); the fronted lexical items are italicized.

(12) a. Ég færi heim í dag, $\left\{\begin{array}{l}\text{ef það yrði } \textit{flogið}\\ \text{ef } \textit{flogið} \text{ yrði}\end{array}\right\}$.

I would-go home today $\left\{\begin{array}{l}\text{if there was flown}\\ \text{if flown was}\end{array}\right\}$
(i.e. if there was a flight)

[2] Gazdar (1981) considers the GLBC to be language-specific. Our discussion here can be construed as an argument that it must indeed be considered a language-specific constraint, since it does not hold in Icelandic or Kikuyu.

b. Verðbólgan varð verri, $\left\{\begin{array}{l}\text{en hafði verið } \textit{búist við}\\ \text{en } \textit{búist} \text{ hafði verið við}\end{array}\right\}$.

inflation was worse $\left\{\begin{array}{l}\text{than had been expected}\\ \text{than expected had been}\end{array}\right\}$

c. Hann fór að muna eftir öllu, $\left\{\begin{array}{l}\text{sem hafði farið } \textit{fram}\\ \text{sem } \textit{fram} \text{ hafði farið}\end{array}\right\}$.

he began to remember all $\left\{\begin{array}{l}\text{that had gone on}\\ \text{that on had gone}\end{array}\right\}$

d. Hann kom nokkuð seinna $\left\{\begin{array}{l}\text{en var } \textit{venjulegt}\\ \text{en } \textit{venjulegt} \text{ var}\end{array}\right\}$.

he came somewhat later $\left\{\begin{array}{l}\text{than was usual}\\ \text{than usual was}\end{array}\right\}$

Observe that the embedded clauses in (12) are all subjectless, (12a,b) as the result of the application of impersonal passive, (12c) as the result of an extraction rule, and (12d) because it contains a lexically impersonal predicate which would otherwise take a dummy subject.[3]

Let us consider the conditions under which SF applies. First, as noted above, it applies only in clauses which lack subjects, as the ungrammaticality of sentences like (13b) illustrates.

(13) a. Verðbólgan varð verri en ríkistjórnin hafði *búist* við.
b. *Verðbólgan varð verri en *búist* hafði ríkistjórnin við.
'Inflation was worse than the government had expected/than expected had the government.'

Furthermore, SF is clause-bounded, as (14) illustrates.

(14) **Flogið* er talið að (það) verði í dag.
flown is believed that (there) will-be today

The fronting of this class of lexical categories cannot be attributed to the rule of Topicalization, since the two rules are distinct in a number of ways. For example, unlike SF, Topicalization can apply to clauses with overt surface subjects; compare (15) with (13b).[4]

(15) Sigga Ólina mundi vel eftir því, að *Brynjólf* hafði hún oft
Sigga Ólina remembered well [it] that Brynjólf(A) had she(N) often
og mörgum sinnum getað fengið.
and many times been-able-to get

[3] The exact conditions on dummy insertion in Icelandic are more complicated than indicated in Maling and Zaenen (1981), where it is observed that dummies occur only in clause-initial position and never undergo Subject–Verb Inversion. However, there are environments in which dummy insertion is blocked, namely, in "binding domains". Thus, *það* cannot be inserted in the embedded comparative clause of (12d). See Zaenen (1980; 1981) for further discussion.

[4] This example is from Gestur Pálsson's "Tilhugalíf", chapter 5.

Unlike SF, Topicalization is not clause-bounded; compare (16) with (14).

(16) *Ólaf einan* er talið að hún hafi getað fengið.
Olaf alone(A) is believed that she has been-able-to get

Furthermore, SF and Topicalization apply to different classes of constituents; whereas Topicalization can apply to any *phrasal* category, SF, as mentioned above, applies only to *lexical* categories. Another difference is that Topicalization cannot apply in clauses from which an element has been extracted, while SF is not limited in this way. In particular, Topicalization cannot apply inside indirect questions or comparative clauses, but SF can, as (12d) shows. (See Maling (1980) for further discussion.)

With this background, let us now return to the question of string-vacuous rule application. As noted above, SF can apply only in subjectless clauses. The relevant question is whether it can apply to clauses in which the subject has been questioned. If *Wh* Movement applies string-vacuously to subject NPs, removing them from their clause, then we predict that SF can apply; if string-vacuous rule application is prohibited, we predict that SF will not apply. The first prediction is correct, as (17a) demonstrates.

(17) a. Lögreglan veit ekki, {hver hafi *framið* glæpinn / hver *framið* hafi glæpinn}.
the-police know not {who(N) has committed the-crime(A) / who(N) committed has the-crime(A)}

b. Lögreglan veit ekki, {hvað glæpamaðurinn hafi *framið* / *hvað *framið* hafi glæpamaðurinn}.
the-police know not {what(A) the-criminal(N) has committed / *what(A) committed has the-criminal(N)}

In (17a), *Wh* Movement removes the subject, creating the environment for SF. In (17b), *Wh* Movement does not remove the subject, and SF therefore cannot apply. These examples are explained if we assume that *Wh* Movement applies string-vacuously.[5] In other words, the fact that SF can apply in subject questions falls under the generalization

[5] Maling and Zaenen (1981) give independent arguments that *Wh* Fronting extracts constituents from the clause, including the fact that *Wh* Fronting, unlike Topicalization, does not trigger Subject–Verb Inversion (SVI) in embedded clauses; compare (15) with (10). For direct (matrix clause) questions, on the other hand, SVI is obligatory. Maling and Zaenen hypothesize that word order constraints in Germanic languages are output filters defined at the level of S rather than S′ and that in direct questions the finite verb is in first position in the S-domain rather than in second position in the S′-domain as is usually assumed.

SF provides independent support for this hypothesis. Assuming that *Wh* Movement effects the same structural change in direct questions as in embedded questions, the direct question corresponding to (17a) must have the structure shown in (i).

(i) [$_{S'}$ hver [$_S$ hefur framið glæpinn]]
who has committed the-crime
'Who has committed the crime?'

SF cannot apply in direct questions, even if the subject NP has been questioned:

(ii) *hver [framið hefur glæpinn]

The sentence in (ii) is rejected by the output filter requiring that the verb must occur in first position at the S-level in direct questions.

that the rule applies only in subjectless clauses, if we assume that subject questions have structure (4a).[6]

2. Kikuyu

Kikuyu is a Bantu language spoken in Kenya; its normal word order is SVO. We will show that Kikuyu has a phonological rule triggered by the presence of trace and that this rule applies in subject questions in which there is no apparent movement of the questioned constituent.

In the Kikuyu declarative sentence, the verb in most tenses is suffixed with a downstep element [ˡ] that influences the tone pattern of following words. The downstep element normally appears at the end of the first major constituent following the verb. However, if this constituent ends with a high tone, the downstep is displaced to the right of any following sequence of (underlyingly) low-toned syllables, which themselves acquire high tone. This behavior of downstep, which is extensively discussed in Clements and Ford (1979; 1981), is illustrated in (18). In our transcriptions [ˊ] represents high tone, [ˋ] represents extra-low tone, [ˇ] represents rising tone, and [ˆ] represents falling tone; low tone is unmarked. Vowel sequences are tautosyllabic and constitute single tone-bearing units.[7]

(18) mondo ˡ ahɛírɛ́ moanákɛ́ káɣóˡkó ro:cí:nɛ̌ ˡ
person gave boy chicken this-morning
'Someone gave the boy a chicken this morning.'

The underlying tones of 'boy' and 'chicken' are as follows:

(19) /moanákɛ́/ 'boy'
/kaɣokó/ 'chicken'

The downstep internal to *kaɣoko* in (18) is a suffix to the verb *ahɛirɛ* in underlying representation, as shown in the following derivation. (20a) gives the underlying representation. The downstep elements which follow *mondo* and *ro:ci:ne* are part of their lexical representation and will not concern us further here; it is the downstep following

[6] Note that we cannot assume the reverse order of application (SF before *Wh* Movement), because the condition for SF is not met until *Wh* Movement has removed the subject from the clause. If we allow SF to apply freely, and subsequently filter out the surface forms in which SF has applied in clauses containing surface subjects, then both SF and the filter would have to redundantly specify the same class of elements (participle, particle, A, etc.). Moreover, as far as we can see, no *simple* filter would make the right distinctions. Finally, such a filter would have no other motivation than to permit the application of SF before *Wh* Movement. For further discussion, see the appendix.

Nor does the order of application assumed here violate strict cyclicity, if the notion of the strict cycle is defined on S′, and *Wh* Movement is assumed to apply successive-cyclically (as, for example, Kayne and Pollock (1978) do in their discussion of Stylistic Inversion in French). If *Wh* Movement is not assumed to be successive-cyclic, then the order of application is consonant with the assumption of Bach and Horn (1976) that rules apply whenever their structural descriptions are met.

[7] The correct gloss for *moanakɛ* is 'young unmarried man, initiated youth'; for *kaɣoko* 'small chicken' or 'small piece of chicken'. Shorter glosses are used in the examples for convenience. The pitch drop in *kaɣoko* occurs midway through the penultimate syllable, due to a late rule of tone anticipation. This will not be indicated in our transcriptions.

the verb *ahɛirɛ* that is central to our argument. (20b) shows the effect of the rule that shifts this downstep to the right of the first major constituent following the verb (here, the noun complement *moanakɛ*). (20c) shows the effect of the subsequent rule which moves this downstep to the right of a following sequence of low tones (causing them to become high in turn).

(20) a. mondo ꜜ ahɛírɛ́ ꜜ moanákɛ́ kaɣokó ro:cí:nĕ ꜜ
b. mondo ꜜ ahɛírɛ́ moanákɛ́ꜜ kaɣokó ro:cí:nĕ ꜜ
c. mondo ꜜ ahɛírɛ́ moanákɛ́ káɣóꜜkó ro:cí:nĕ ꜜ

Downsteps (which are unpronounced low tones) reveal their presence in tonal strings in two ways. First, downsteps which are nonfinal in the sentence cause all following tones (both high and low) to be produced in a distinctively lower pitch register. Second, downsteps which are final in the sentence have no direct phonetic consequences, but have the effect of blocking the operation of an otherwise exceptionless rule of Kikuyu phonology according to which one or more high tones occurring in absolute final position in the sentence are changed to low. For example, this rule (more fully described in Clements and Ford (1981)) applies to lower the underlying final high tones of *moanakɛ* and *kaɣoko* to low in citation form and other contexts:

(21) moanakɛ 'boy' (citation)
kaɣoko 'chicken' (citation)

This rule is blocked by the sentence-final downstep in sentences like (22a,b):

(22) a. mondo ꜜ ɔ:nírɛ́ moanákɛ́ ꜜ
'Someone saw the boy.'
b. mondo ꜜ ɔ:nírɛ́ kaɣokó ꜜ
'Someone saw the chicken.'

We now turn to the syntax. One way of forming *wh*-questions in Kikuyu is to place the question word at the beginning of the sentence,[8] preceded by the focus particle (FP) *ne*. This is illustrated in (23):

(23) né ke móndo ꜜ ahɛíꜜrɛ́ moanákɛ́ *t* ro:cî:nê
FP what person gave boy this-morning
'What did someone give the boy this morning?'

(By rules of question intonation, a final low tone or low tone sequence becomes extra-low, and a final rising tone becomes a falling tone.) In the case of subject questions,

[8] *Wh*-questions in Kikuyu obey the island constraints held in Chomsky (1977) to be diagnostic of *Wh* Movement. We therefore assume in this article that Kikuyu *wh*-questions involve *Wh* Movement. If, however, it can be shown that Kikuyu *wh*-questions are formed by deletion rather than movement (see Clements (1979)), the facts considered in this section would not bear on string-vacuous rule application itself, but only on the Generalized Left Branch Condition discussed in the introduction.

there is no overt movement of the subject pronoun /o/ 'who':

(24) nóo (né + o) ohɛirɛ́ moanákɛ́ káɣokó ro:cî:nê
who gave boy chicken this-morning
'Who gave the boy a chicken this morning?'

Thus, just as in Icelandic, inspection of word order alone is insufficient to determine whether the questioned subject occurs in subject position (4b) or whether it has been moved outside the clause (4a). When we take the tone rules into account, however, it is possible to determine that the subject has indeed been "extracted". In *wh*-questions the expected postverbal downstep is absent, as shown in (23) and (24). The following sentences provide further illustration:[9]

(25) a. né káɣokó karékó móndo ! ahɛí!rɛ́ moànàkɛ̀ *t*
FP chicken which person gave boy
'Which chicken did someone give to the boy?'
b. né ré móndo ! ahɛí!rɛ́ moanákɛ́ káɣòkò *t*
FP when person gave boy chicken
'When did someone give the boy a chicken?'

The postverbal downstep has been deleted in these examples. If it had been present in (25a), it would appear to the right of the object *moanakɛ*, preserving its final high tones as in (22a). Similarly, if it had been present in (25b), it would have shifted across *moanakɛ* and then been in position for further displacement into *kaɣoko* just as in derivation (20). We see, then, that in examples of this type the downstep has been removed from the phonological representation at an early point, prior to the operation of the normal tone rules.

The discussion so far might suggest the following hypothesis: delete a postverbal downstep in *wh*-questions. However, it can easily be shown that this hypothesis is wrong. First, the postverbal downstep *does* appear in *wh*-questions when the *wh*-word is left in situ, an alternative and equally favored way of forming *wh*-questions in Kikuyu. The following sentences illustrate this:

(26) a. mondo ! ahɛírɛ́ moanákɛ́ káɣó!kó kàrèkò
person gave boy chicken which
(synonymous with (25a))
b. mondo ! ahɛírɛ́ moanákɛ́ káɣó!kò rè
person gave boy chicken when
(synonymous with (25b))

Here, the downstep occurring internally in *kaɣoko* is the postverbal downstep which

[9] In these examples, as well as in (24), the initial high tone of *kaɣoko* results from a regular tone rule which raises the initial member of a sequence of two or more low tones to high after a word ending in a high tone. Verbs in certain tenses fail to condition this rule. Among them is the immediate past tense, used in the examples given here, which accounts for the failure of the rule to apply after the verb in sentences like (22b).

has been shifted rightward by the usual processes. Second, downstep is deleted in focus constructions, which are structurally analogous to the *wh*-questions of (25) in that they leave a syntactically bound "trace" in the extracted position:

(27) a. né káɣokó móndo ˡ ahɛíˡré moanakɛ *t*
FP chicken person gave boy
'Someone gave the boy A CHICKEN.'

b. né ro:cí:nĕ móndo ˡ ahɛíˡré moanákɛ́ káɣoko *t*
FP this morning person gave boy chicken
'Someone gave the boy a chicken THIS MORNING.'

Here, the fact that the final high tones of *moanakɛ* have become low in (27a) while no downstep appears in *kaɣoko* in (27b) shows that the underlying postverbal downstep has once again been eliminated from the representation; compare the analogous portions of (25). Third, when the extraction involves a *higher* clause in *wh*-questions, the downstep is not deleted:

(28) nóo óɣwecí:ria móndo ahɛíré moanákɛ́ káɣóˡkó ro:cî:nê
who thinks person gave boy chicken this morning
'Who thinks someone gave the boy a chicken this morning?'

Here, the presence of the downstep in *kaɣoko* informs us that the underlying postverbal downstep has survived to the surface.

There is another hypothesis, consistent with the above data, that also proves to be wrong. According to this hypothesis, the postverbal downstep is deleted just in case the clause of which the verb is the head is introduced by the focus particle *ne*. The following example shows, however, that deletion takes place equally well in clauses not introduced by *ne* on condition that the clause contains a trace. The noun here is *mote* /motĕ/ 'tree':[10]

(29) nóo káma.ú ɛ́:ˡríré ka:nákɛ́ áte *t* otɛmíré mòtè
who Kamau tell Kanake that cut tree
'Who did Kamau tell Kanake that *t* cut the tree?'

Here the trace in the embedded clause is bound by the pronoun *o* (incorporated in the form *noo*) in the higher clause. If the postverbal downstep of the lower clause were not deleted, it would permute to the right of *mote,* preserving its underlying rising tone, which would be realized as a falling tone by the question intonation rule stated earlier. Instead, the rule of Final Lowering applies. Compare the following question, analogous to (29); here, *ne* also introduces the higher clause, but the lower clause contains no trace:

(30) nóo káma.ú ɛ́:ˡríré *t* ate karioki áˡtɛ́míré motê ˡ
who Kamau tell that Kariũki cut tree
'Who did Kamau tell *t* that Kariũki cut the tree?'

[10] By an independent rule of Kikuyu, the third person singular subject prefix *a-* is replaced by *o-* after a subject trace.

In this sentence, the postverbal downstep of the lower clause remains behind, shifting to the end of the sentence as expected and protecting the final tone from the lowering rule which it would otherwise undergo as in (29). Thus, we see that the tonal contrast in the word *mote* in (29) and (30) depends solely upon the location of the trace: in the lower clause in (29), in the higher clause in (30).

These examples, together with the preceding ones, suggest the following generalization, which accounts for all of our data:[11]

(31) The postverbal downstep is deleted if the verb commands a trace.

Returning now to our earlier example of subject questions (24), we observe that the postverbal downstep has been deleted, as shown by its failure to appear in *kaɣoko*. We therefore conclude that questioning the subject in Kikuyu involves extraction of the subject from subject position as shown in (4a), even though this extraction is string-vacuous.[12]

3. Irish

Another argument for string-vacuous rule application can be made on the basis of a rightward movement rule in Irish, which can apply string-vacuously to direct objects. In Modern Irish, a Celtic language with VSO word order, the progressive aspect is expressed by means of the structure given in (32) and exemplified in (33):

(32) Verb *to be* + Subject + Progressive V + (Direct Object) + ...

(33) Tá sé ag tógáil tithe i nDoire.
is he build (prog) houses in Derry
'He is building houses in Derry.'

The progressive form of the verb is constructed from the verbal noun (the only nonfinite form of the verb in Irish) by prefixing to it a particle represented in spelling as *ag*. Orthographically and historically, this particle is identical to the preposition meaning roughly 'at', but synchronically the two elements are quite distinct (O'Brien (1956), McCloskey (1980), Ó Murchú (1981)). Following the progressive verb, the order of elements in the clause is the usual one; that is, the direct object will in general come next,[13] followed by any adverbs there might be.

Of particular interest here is that under certain conditions a different particle appears in the progressive form of the verb. This particle is spelled *a* and differs from the regular

[11] The complete statement of the deletion rule is: the verbal downstep suffix is deleted if the verb S-commands a trace and does not S-command its antecedent. See Zaenen (1981) for further examples and discussion. This explains the absence of the otherwise expected verbal downstep after the verb *ɛ:rirɛ* in the higher clause in (29).

[12] The alternative in situ strategy for subject questions is not an available option in Kikuyu. We suggest that this restriction is due to a surface filter which prohibits questioned (and more generally, all focused) NPs from occurring in subject position.

[13] Traditional grammars normally also require that the direct object of a progressive verb appear in the genitive case. This rule is not now observed in normal colloquial speech, but only in writing and in the most formal spoken registers. For the purpose of this article, we will ignore this phenomenon.

particle *ag* in a number of ways, most notably by inducing on the initial of the following verbal noun the set of phonological changes known collectively as the *Lenition Mutation*. Lenition is represented orthographically by an *h* following the initial segment of a word. Thus, compare (33) with its clefted counterpart (34):

(34) Tithe a tá sé a thógáil i nDoire.
houses Comp is he build (prog) in Derry
'It's houses that he's building in Derry.'

The progressive verbs in (33) and (34) have different forms: in (34) the leniting particle *a* has been substituted for the regular nonleniting article *ag*.[14]

The context for the application of this rule is fairly clear: if the direct object of a progressive verb is a trace, then the substitution of *a* for *ag* takes place. Thus, for instance, the phenomenon occurs in relative clauses, in *wh*-questions, and in clefts when the relativized, questioned, or clefted constituent is the direct object of a verb in the progressive. The (b)-examples of (35)–(37) represent cases in which the direct object of a progressive verb is a gap, while the corresponding (a)-examples contain lexical direct objects. Notice that in the (a)-examples the progressive verb takes the normal particle *ag*, while in the (b)-examples it takes the leniting particle *a*.[15]

(35) a. Tá siad ag dathú na báid.
are they paint (prog) the boats
'They are painting the boats.'

b. na báid a tá siad a dhathú *t*
the boats Comp are they paint (prog)
'. . . the boats that they are painting.'

(36) a. Tá sé ag ceannach teach.
is he buy (prog) a-house
'He is buying a house.'

b. Cén teach a tá sé a cheannach *t*.
which house Comp is he buy (prog)
'Which house is he buying?'

(37) a. Tá mé ag cuartú fear an tí.
am I look-for (prog) the-man-of-the-house
'I am looking for the man of the house.'

b. Fear an tí a tá mé a chuartú *t*.
the-man-of-the-house Comp am I look-for (prog)
'It's the man of the house that I'm looking for.'

[14] For discussion of this phenomenon, see De Bhaldraithe (1956), Christian Brothers (1961, section 522(a)(iii)).

[15] There is some question whether this trace *t* should properly be placed before or after the progressive forms of the verb. This is because the pronominal objects of progressive verbs always appear in front of the verb in the form of possessive pronouns. If these traces result from the deletion of pronouns, or if traces are thought to have essentially the properties of pronouns, then presumably they should also appear before the progressive verb. We assume here that both movement rules and (unbounded) deletion rules leave a trace.

McCloskey (1979) argues at length that these constructions—relative clauses, questions, and clefts—involve unbounded deletion rather than movement; even under a *Wh* Movement analysis, however, these constructions could not be used to argue for string-vacuous rule application, since Irish is a VSO language. Nevertheless, there is at least one movement rule which does interact with this particle substitution phenomenon and does provide evidence for string-vacuous rule application, as we will show.

The 'only' construction in Irish is similar to French *ne . . . que* or the colloquial English *NEG . . . but* construction, in that a particle *ach,* which is at least homophonous with the conjunction meaning 'but', is prefixed to some constituent, and the clause is negated in the usual way. This is illustrated in (38):

(38) Ní tháinig ach mo mháthair féin.
neg came but my mother reflex
'Only my own mother came.'

The constituent on which *ach* focuses may occur in its normal position (as determined by the base rules), but it is generally placed in clause-final position. Thus, for instance, although a subject must normally appear immediately after its verb in Irish, if the subject is prefixed by *ach,* it then normally appears in clause-final position:

(39) Ní raibh sa teach ag an am ach mo mháthair.
neg was in-the house at the time but my mother
'Only my mother was in the house at the time.'

It is this rightward movement that provides evidence for string-vacuous movement. The rule will apply vacuously in several situations, in particular, when the focus of *ach* is a direct object and no adverbs follow. In an example like (40), there is no obvious way to tell whether or not the constituent prefixed by *ach* (the direct object) has been moved, since it would appear in clause-final position anyway:

(40) Ní fhaca mé ach mo mháthair féin.
neg saw I but my mother reflex
'I saw only my own mother.'

However, evidence involving the progressive particle substitution rule suggests that it is in fact proper to consider the *ach*-constituent to have moved in such examples.

The *Ach* Movement rule (as we may call it), or rather the trace it leaves, triggers the particle substitution in progressive verbs. Example (41a) illustrates the progressive which does not contain *only;* its progressive verb shows the normal *ag*-particle. In (41b) the direct object of the progressive verb has been prefixed by *ach* and moved to clause-final position.

(41) a. Bhí mé ag fáil an gnáth-thuarastal ag an am.
was I get (prog) the usual salary at the time
'I was getting the usual salary at the time.'

b. Ní raibh mé a fháil ag an am ach an gnáth-thuarastal.
neg was I get (prog) at the time but the usual salary
'I was getting only the usual salary at the time.'

Notice that in (41b) the particle substitution has in fact taken place, triggered presumably by the trace left by the rightward movement of the *ach*-constituent.

What is important is that the substitution also takes place when *Ach* Movement applies string-vacuously. Compare the progressive verbs in (42a) and (42b):[16]

(42) a. Bhí mé ag fáil an gnáth-thuarastal.
was I get (prog) the usual salary
'I was getting the usual salary.'

b. Ní raibh mé a fháil ach an gnáth-thuarastal.
neg was I get (prog) but the usual salary
'I was getting only the usual salary.'

Since this substitution is triggered by the trace left by movement or deletion, such data indicate that an example like (42b) contains a trace following the progressive verb and therefore that movement—although leaving behind no visible or audible evidence—has in fact taken place.

4. Conclusion

Rules of grammar in Icelandic and Kikuyu show that *wh*-questions involve the string-vacuous movement of subjects to a position outside of their S-domain, as illustrated in (4a); the interaction between rightward movement and particle selection in Irish shows that string-vacuous movement from object position is also possible. We conclude that a constraint against string-vacuous rule application cannot be maintained as a principle of Universal Grammar.

Appendix

We return in this appendix to the question of whether Stylistic Fronting (SF) could be allowed to apply freely in Icelandic, subject to a filter rejecting surface forms in which it has applied in clauses containing surface subjects. We will show that such a solution is untenable.

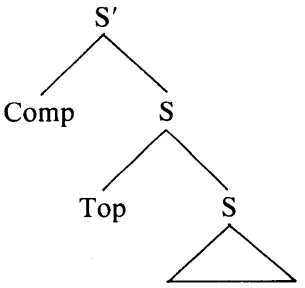
The precise formulation of such a filter would depend on the structural change effected by SF. In the framework we are assuming here, the only structural changes allowed are substitution and "Chomsky-adjunction". Since this is a clause-bounded rule, we exclude movement into Comp from the possibilities, because we would then have to prevent successive cyclic application of that movement. Hence there are three possibilities:

[16] See De Bhaldraithe (1956, 253, section 4).

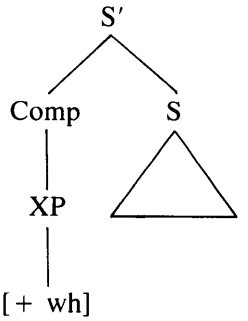
(43) a. subject replacement
b. Chomsky-adjunction to VP
c. Chomsky-adjunction to S

Of these, only the last two would be consistent with the rule order under consideration. Chomsky-adjunction to VP would mean that *Wh* Movement will still be string-vacuous in the derivation of sentences like (12a). Chomsky-adjunction to S makes it difficult if not impossible to distinguish SF from Topicalization. Zaenen and Maling (1977) argue that the derived structure of embedded topic sentences is (44a), whereas the structure of embedded questions is (44b).

(44) a.



b.



One reason for postulating the different structures is to account for the word order of embedded clauses in Icelandic. The fronting of any constituent to clause-initial position obligatorily triggers inversion of the subject and the finite verb; note the position of the finite verb in example (15). Since the *wh*-constituent is not under an S-node, however, it does not trigger Subject–Verb Inversion; cf. (10). See also Maling and Zaenen (1981). Thus, if we assume that SF Chomsky-adjoins lexical items to S, as in (44a), then SF would be indistinguishable from Topicalization.

Ignoring this problem, let us consider the output. If Subject–Verb Inversion (SVI) does not apply, the sentence will be ruled out because it will violate the V/2 Constraint (see fn. 5) unless the subject is extracted by a later application of *Wh* Movement. If SVI does apply (as it clearly must be allowed to do), we will need a filter to reject sentences in which the subject remains in the clause to which SF has applied. The necessary filter would look something like (45):

(45) $*[\left\{\begin{array}{l}\text{nonfinite verb}\\ \text{particle}\\ \text{adjective}\end{array}\right\} \underset{[+\text{fin}]}{\text{V}} \underset{\substack{[+\text{lexical}]\\ [+\text{subject}]}}{\text{NP}} \text{X}]$

Even making the problematic assumption that the subject NP can be identified *structurally* after the application of SVI, linear order alone will not suffice to distinguish between subjects and objects; nor will it suffice simply to refer to the presence of a trace without distinguishing further between NP Movement traces and *Wh* Movement traces. Second, the filter would have to distinguish between definite and indefinite subjects,

since "Indefinite Subject Postposing" is one of the ways of creating "subjectless" clauses in Icelandic. It seems clear that the filter as stated in (45) is far more powerful than we would like.

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