Head Movement and Morphological Strength

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Summary

In the Principles and Parameters framework of Generative Grammar, the various positions occupied by the verb have been identified as functional heads hosting inflectional material (affixes or features), which may or may not attract the verb. This gave rise to a hypothesis, the Rich Agreement Hypothesis (RAH), according to which the verb has to move to the relevant functional head when the corresponding inflectional paradigm counts as "rich."

The RAH is motivated by synchronic and diachronic variation among closely related languages (mostly of the Germanic family) suggesting a correspondence between verb movement and rich agreement. Research into this correspondence was initially marred by the absence of a fundamental definition of "richness" and by the observation of counterexamples, both synchronically (dialects not conforming to the pattern) and diachronically (a significant time gap between the erosion of verbal inflection and the disappearance of verb movement). Also, the research was based on a limited group of related languages and dialects. This led to the conclusion that there was at best a weak correlation between verb movement and richness of morphology.

Recently, the RAH has been revived in its strong form, proposing a fundamental definition of richness and testing the RAH against a typologically more diverse sample of the languages of the world. While this represents significant progress, several problems remain, with certain (current and past) varieties of North Germanic not conforming to the expected pattern, and the typological survey yielding mixed or unclear results. A further problem is that other Germanic languages (Dutch, German, Frisian) vary as to the richness of their morphology, but show identical verb placement patterns.

This state of affairs, especially in light of recent minimalist proposals relocating both inflectional morphology and verb movement outside syntax proper (to a component in the model of grammar interfacing between narrow syntax and phonetic realization), suggests that we need a more fundamental understanding of the relation between morphology and syntax before any relation between head movement and morphological strength can be reliably ascertained.

Keywords: inflection, head movement, Rich Agreement Hypothesis, morphology–syntax relation, verb movement, agreement

Subjects: Linguistic Theories, Morphology, Syntax

1. The Rich Agreement Hypothesis

In the Principles and Parameters framework of Generative Grammar (roughly 1980–1991), the various positions occupied by the verb have been identified as functional heads, leading to a standard model of the structure of the clause, punctuated by head positions to which verbs could

move. To explain these movements, and especially the variation observed, the concept of *strength* was introduced as a property of functional heads (or of the features residing in these functional heads).[1] The idea was that a strong functional head would attract the verb, whereas a weak functional head would fail to do so, at least in Surface Structure (i.e., overt syntax).[2]

If verb movement is caused by the strength of a functional head, what causes a functional head to be strong? This turned out to be a complicated question, with choices constrained or informed by views on the relation between morphology and syntax (section 5). But ultimately, a hypothesis emerged (the Rich Agreement Hypothesis or RAH) according to which "richness" of an inflectional subject-agreement paradigm reflects the strength of the relevant functional head, and hence determines the presence or absence of verb movement.[3]

The idea of an RAH immediately presents several questions: (a) how is "rich" defined?, (b) is the correlation between rich agreement and verb movement strong (i.e., movement if *and only if* rich agreement) or weak (i.e., if rich agreement, then movement), and (c) what is the rationale underlying a correlation between rich agreement and verb movement? These questions are taken up in sections 3–5, but to sketch the history of the research, it should first be noted that considerable fine-tuning went into the definition of "rich agreement" before a satisfactory level of empirical coverage could be attained (see Vikner, 1997, pp. 192f; for a survey, see Tvica, 2017, ch. 2); in fact, a principled definition of richness was not formulated until Koeneman and Zeijlstra (2014, p. 576). Second, it should be noted that initially researchers appeared to converge on the untenability of any strong version of the RAH (see Bobaljik, 2003), again until the strong RAH was forcefully revived in Koeneman and Zeijlstra (2014) and Tvica (2017).

This article discusses the various versions of the RAH as it took shape in the late 20th century (section 3), the early-21st-century revival of the RAH in its strong form (section 4), and the assumptions on the relation between morphology and syntax underlying presumed correlations between verb movement and morphological strength/richness (section 5). We start with a brief presentation of the relevant facts from (mostly) Germanic languages (section 2).[4]

2. Verb Movement Patterns

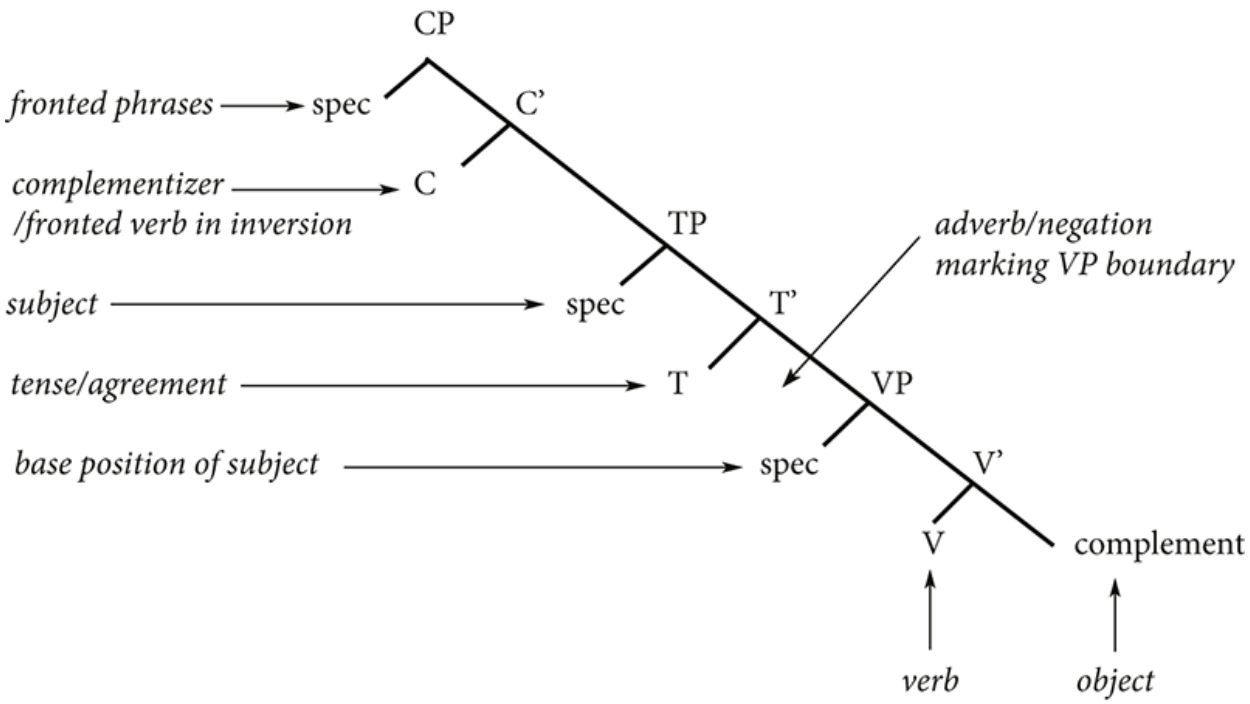
The sections that follow should be understood against the backdrop of some common assumptions about clause structure that were held from around 1980 on.

On these assumptions, the verb is generated as the head of a verb phrase (VP), along with its object, which is the verb's complement (either to the left or to the right of the verb, but crucially adjacent to the verb unless either is moved out of the VP). It was also generally assumed that the subject is generated in the specifier position of VP, even if it typically moves out of the VP to the structural subject position.[5]

In addition to VP, the clause structure involves TP, a functional projection headed by T (tense), which takes VP as its complement, and the subject as its specifier.[6] T is the head of the clause.[7] Importantly for what follows, the boundary between VP and TP was taken to be marked by adverbs, including negation markers, providing clear diagnostics for verb movement and noun phrase movement out of VP.

Clausal embedding typically requires the presence of a further functional head, C (complementizer), which developed out of the generic COMP-position proposed in earlier work as a category hosting fronted material (including the verb in verb-second constructions).[8] C takes TP as its complement, and has its own specifier position for fronted phrases (A'-movement).[9]

(1)



The structure just discussed is illustrated in fig. 1. With this structure in mind, consider the following contrast between Danish (2) and Icelandic (3) (Platzack, 1986, p. 209).[10]

(2)

...	at	han	*ikke*	**køb-te**	bog-en	(Danish)
	COMP	3SG.M	NEG	buy-PST	book-DEF	

'... that he did not buy the book.'

(3)

...	að	hann	**keyp-ti**	*ekki*	bók-ina	(Icelandic)
	COMP	3SG.M.NOM	buy-PST.3SG	NEG	book-DEF.F.ACC	

'... that he did not buy the book.'

Since we assume that the negative adverb *ikke*/*ekki* marks the VP-boundary, the facts show that the finite verb stays inside VP in Danish, but moves out of the VP in Icelandic (presumably to T, if C is occupied by the complementizer *að*, but see note 11). The examples show:

(4)

Closely related languages may vary in the position of the finite verb.

It should be kept in mind that in main clauses, the verb moves out of the VP in both Danish and Icelandic:

(5)

Han	**køb-te**	*ikke*	bog-en	(Danish)
3SG.M	buy-PAST	NEG	book-DEF	

'He did not buy the book.'

(6)

Hann	**keyp-ti**	*ekki*	bók-ina	(Icelandic)
3SG.M.NOM	buy-PST.3SG	NEG	book-DEF.F.ACC	

'He did not buy the book.'

This verb movement in main clauses is ascribed to a special rule, *verb-second*, which forces the finite verb into the position following the first clausal constituent. Verb-second typically applies to main clauses only, although some languages (like Icelandic and Yiddish) have generalized verb-second across all clause types.

The standard analysis of Germanic verb-second around 1980 (going back to the analysis of Dutch and German in Koster, 1975, and Den Besten, 1977) involved a structure of the clause without T, such that all fronting operations inevitably targeted COMP (later C). Applied to Scandinavian, this led to an analysis of (5)–(6) where the finite verb is in COMP/C, and not in T as in embedded clauses in Icelandic (see example (3)) (e.g., Platzack, 1986, pp. 211–213). This introduced a distinction between V-to-T movement (parameterized, as illustrated in examples (2) and (3)) and V-to-C movement (uniform, as illustrated in examples (5) and (6)).[11]

The synchronic variation illustrated in examples (2) and (3) is also found when we compare different stages of a single language. Thus, the finite verb *sivngær* 'sings' appears to the left of the negation marker *ægh* in the Old Swedish example in (7) (Platzack, 1988, p. 230).[12]

(7)

...	æn han	**sivng-ær**	*ægh*	thigianda	messu	(Old Swedish, 1290)
	if 3SG.M	sing-SG	NEG	silent	mass	

'... if he does not sing Silent Mass.'

So we conclude:[13]

(8)

Diachronic stages of the same language may vary in the position of the finite verb.

Finally, less closely related languages, such as French and English, show a similar variation in the position of the finite verb (Pollock, 1989):

(9)

Jean	**embrasse**	*souvent*	Marie	(French)
John	kiss:3SG	often	Mary	

'John *often* **kisses** Mary.'

Using the familiar diagnostics (the position of the verb to the left or to the right of adverbials), we conclude that French finite verbs move out of the VP, while English finite verbs stay inside VP.[14] Thus:

(10)

Less closely related languages may also vary in the position of the finite verb.

The Rich Agreement Hypothesis (RAH) is an attempt to provide a single explanation, rooted in morphology, for the variation observed in (4), (8), and (10).

The subject agreement paradigm is clearly richer in Icelandic than in Danish:

(11) *Subject agreement paradigms: Scandinavian (present tense)*[15]

a. Icelandic: (i) SG and PL endings are different for all three persons

(ii) first and second person endings are different for both numbers

(iii) second and third person endings are different for PL number

b. Danish: endings are the same for all persons and numbers

Earlier stages of Danish (and Swedish and Norwegian) had richer agreement paradigms (initially the same as Icelandic, later impoverished to reflect only a distinction in number; e.g., Vikner, 1997, p. 206).[16]

Likewise, subject agreement is richer in French than in English:

(12) *Subject agreement paradigms: French vs. English (present tense)*[17]

a. French: (i) SG and PL endings are different for all three persons

(ii) all three person endings are different for PL number

(iii) the second person ending is different for SG number

b. English: only 3SG has an ending

So in all cases where we see the position of the verb varying from language to language (understood both synchronically and diachronically), subject-verb agreement is richer in the language variety in which the verb moves out of the VP. Hence:

(13) *Rich Agreement Hypothesis*

A language has verb movement to T if (and only if) it has rich agreement

It remains to determine, then, how exactly "rich" is to be defined (section 3), whether the generalization in (13) is correct, either in its strong or weak interpretation (section 4), and lastly, how a correlation like (13) might be explained or conceptually motivated (section 5).

3. The Definition of "Rich" Agreement

It is fair to say that the definition of "rich" in the context of the Rich Agreement Hypothesis (RAH) as formulated in example (13) was initially established *a posteriori*: after gaining the preliminary impression that verb movement was related to paradigm structure, the search was on for the key factor distinguishing rich from poor agreement, based on what was already known about the distribution of verb movement in a very limited range of languages (essentially Germanic VO-languages).[18]

This culminated in the following descriptive generalization (Rohrbacher, 1999, p. 116, where Infl = T):[19]

(14) *Paradigm-Verb raising correlate*

A language has V-to-Infl raising if and only if in at least one number of one tense of the regular verb paradigm(s), the person features [1st] and [2nd] are both distinctively marked.

This generalization does the trick: it makes the desired distinction between a language like Icelandic, which has verb movement and rich agreement, and a language like Danish, which lacks verb movement and does not distinctively mark 1st and 2nd person (see note 15). It also separates diachronic stages of the Mainland Scandinavian languages, where earlier stages still marked 1st and 2nd person distinctively in the plural (see note 16) and showed verb movement. Finally, the line between English and French is also drawn correctly, as French marks 1st and 2nd person distinctively in the past tense plural (see Vikner, 1997, p. 197).[20] As Rohrbacher (1999, pp. 117f) points out, the definition in (14) even covers certain finer distinctions not mentioned here before, such as the distinction between the Swedish Älvdalsmål dialect (rich agreement and verb movement, cf. note 13) and the Norwegian Hallingdal dialect (no verb movement, and only number marking, essentially like Middle Danish as illustrated in note 16; see Trosterud, 1989).

But (14) is remarkably particular, and seems to owe its exact formulation to fact rather than principle, leaving one to wonder whether the world could have been different.[21] A more principled formulation of the RAH was proposed in Koeneman and Zeijlstra (2014, p. 576). Koeneman and Zeijlstra note that personal pronoun paradigms minimally display three oppositions: speaker vs. nonspeaker, participant vs. nonparticipant, and singular vs. plural (going back to Greenberg, 1963, p. 6).[22] Their proposal is that an agreement paradigm is rich when it minimally replicates these three oppositions (Koeneman & Zeijlstra, 2014, p. 574):[23]

(15) *Rich Agreement*

A language exhibits rich subject agreement if and only if agreement involves at least the same featural distinctions as those manifested in the smallest (subject) pronoun inventories universally possible.

The RAH then states that a language displays verb movement to T if and only if its verbal agreement is rich in the sense of (15).

On the definition of (15), the RAH covers the known cases as well as Rohrbacher's: distinctive marking of first and second person expresses the required speaker and participant oppositions, and we find these in Icelandic, Old Danish, and French, but not in modern Danish, Middle Danish, or English. The value of (15), then, lies not in its empirical coverage (for which see section 4), but in its being grounded in the typology of pronominal feature expression.

In assessing the relation between verb movement and morphological strength (rich agreement), then, we will take (15) as our starting point.

4. The Descriptive Adequacy of the Rich Agreement Hypothesis

4.1 Weak Versus Strong Interpretation

Both the Paradigm-Verb raising correlate (14) and the Rich Agreement Hypothesis (RAH) of (15) are biconditional, meaning that rich agreement forces verb movement, and less rich agreement excludes verb movement. Bobaljik (2003) argues that the facts support only a weak interpretation of the agreement/movement correlation, meaning that rich agreement forces verb movement, but verb movement is not necessarily excluded when agreement is poor.

The weak interpretation of the movement/agreement correlation is supported by a range of observations from regional and diachronic varieties of mostly Northern Germanic languages. For example, Swedish dialects spoken in northern Finland (Northern Ostrobothnian; Bentzen, 2008) and Norwegian dialects spoken in the Tromsø area (Regional Northern Norwegian; Bentzen, Hrafnbjargarson, Hróarsdóttir, & Wiklund, 2007) show no subject agreement, yet the verb appears to the left of certain adverbs (Bentzen, 2008, ex. 9a):[24]

(16)

Jag	förstär	int					(Kronoby Swedish)
1SG.NOM	understand	NEG					
för vad	han	**tvätter**	*så*	*tökält*	sin		bil
for what	3SG.ACC	clean	so	often	3SG.M.POSS		car

'I don't understand why he cleans his car so often.'

'I don't understand why he cleans his car so often.'

This is not possible under a strong interpretation of the RAH, but is consistent with a weak interpretation (where no predictions follow from the absence of rich agreement).

In these dialects, the embedded verb cannot move past other, "higher" adverbs, including negation (Bentzen, 2008, ex. 9b):[25]

(17)

* Jag minns för vad Anna **drats** *alder* mjölts (Kronoby Swedish)

1SG.NOM recall for what Anna drink never milk

'I remember why Anna never drank milk.'

This fact has been taken to show that the verb movement in (16) is in fact not V-to-T movement, but a shorter movement (Koeneman & Zeijlstra, 2014, p. 586).[26] If so, the strong interpretation of the RAH can still be entertained, albeit at the cost of further narrowing down the range of movements covered by it.

The weak interpretation of the RAH is also supported by the observation of a significant time gap between the loss of inflectional morphology and the loss of verb movement (e.g., Roberts, 1999, p. 292). To take Danish as an example, where we have seen that verb inflection had become poor by 1350 (see note 16), verb movement in relevant constructions (preceding both adverbs and negation, and not allowing an analysis in terms of embedded verb-second) can be shown to disappear only gradually, with verb movement numbers staying between 35% and 50% throughout the 16th century, and not dipping below 10% before 1650 (Heycock & Sundquist, 2017, p. 178).

In response to these observations, which are not contested, Koeneman and Zeijlstra (2014, pp. 606–607) argue that children who acquire verb movement in the absence of rich morphology in the primary linguistic data reinterpret either the verb movement as not targeting T, or the agreement as being rich after all (as a resolution of what they describe as "paradoxical" input).[27] But as Heycock and Sundquist (2017) note, none of these escape routes seem to apply to the situation of Danish. Moreover, a strong interpretation of the RAH excludes any model of a grammatical system in which verb movement to T occurs in the absence of rich verbal agreement, and the diachronic data strongly suggest that we do need such a model to describe certain natural language data.

A further problem to the strong interpretation of the RAH is posed by the situation in Faroese, a Northern Germanic language historically closely related to Icelandic, but politically associated with Denmark and hence under pressure from Modern Danish. By Koeneman and Zeijlstra's definition, verbal agreement in Faroese is poor, identifying only number and first person

(Lockwood, 1964, p. 76).[28] Initial reports on Faroese suggested that speakers produce embedded verb movement to T optionally (Jonas, 1995). After correcting for possible cases of embedded verb-second, the proper generalization appeared to be that Faroese lacks embedded verb-movement to T, as predicted by the RAH (Heycock, Sorace, & Hansen, 2010). However, a follow-up study suggests that embedded verb-movement to T is still residually present, at least significantly more so than in Danish (Heycock et al., 2011). If so, present-day Faroese may be at the tail end of a diachronic change completed several centuries earlier in the Mainland Scandinavian languages, posing the same problem to the strong interpretation of the RAH as the earlier stages of Mainland Scandinavian.

4.2 Rich Agreement Without Verb Movement

Of the Continental West-Germanic languages, only Yiddish is typically included in discussions of the relation between verb movement and morphological richness. Yiddish subject agreement is rich (showing special forms for 1SG and 2SG and a singular/plural opposition), and the verb precedes the relevant adverbs in both main and embedded clauses (Vikner, 1997, p. 138):[29]

(18)

Es	iz	nisht	tsu	dervart-n	az			(Yiddish)
EXPL	be:3SG	NEG	INF	expect-INF	COMP			
dos	yingl	**zol**	*oyfn*	*weg*	ze-n	a	kats	
DEF	boy	AUX:SG	on.the	road	see-INF	INDF	cat	

'It is not to be expected that the boy will see a cat on the way.'

Yiddish is like Icelandic in not restricting verb movement in embedded clauses (cf. example (3)).[30] Since Yiddish verbal agreement is rich, this is predicted by the RAH.

The other Continental West-Germanic languages—Dutch, German, and Frisian—behave more like Mainland Scandinavian: the finite verb moves to the second position in main clauses, but stays inside the verb phrase in embedded clauses (except when the embedded clause shows main clause characteristics, which we will ignore here):

(19)

a.	Ik	**kocht**	het	boek	*niet*		(Dutch)
	1SG.NOM	buy:PST	DEF.N	book	NEG		
	'I didn't buy the book.'						
b.	... dat	ik	het	boek	*niet*	**kocht**	
	COMP	1SG.NOM	DEF.N	book	NEG	buy:PST	
	'... that I didn't buy the book.'						

Richness of agreement in these languages varies. Subject agreement in German and Frisian is rich, showing special forms for 1SG and 2SG, and a singular/plural opposition, but in Dutch there is syncretism of 2SG and 3SG, so that the feature [participant] finds no expression (Vikner, 1997, p. 191).[31]

On the face of it, then, no relation between richness of agreement and verb movement can be established in Continental West-Germanic, as both rich agreement German and Frisian and poor agreement Dutch lack verb movement in embedded clauses. This makes it *a priori* less likely that the contrast between Icelandic (verb movement in embedded clauses) and Mainland Scandinavian (no verb movement in embedded clauses) has anything to do with richness of agreement.

To save the RAH, Koeneman and Zeijlstra (2014, p. 604) refer to an analysis of Dutch/German/Frisian clause structure that was standard in the 1980s, but is no longer self-evident. On this analysis, both VP and TP are taken to be head-final, so that V and T are adjacent. Assuming this configuration, either the verb moves to T vacuously in embedded clauses, or movement is made unnecessary because of the adjacency of the verb to T.[32]

A problem with this analysis is that the final position of T could not be independently established: it was taken to be a corollary of the head-final status of the verb phrase. But as argued by Zwart (1994b), all other known lexical phrases and functional projections in languages like Dutch and German can be shown to be head-initial, leaving the VP the odd man out. It is unclear why the structure of TP should be patterned after VP and not after all the other projections.

Moreover, as argued by Zwart (1991, 1993, 1997), following Travis (1984), the position of T in languages like Dutch can be deduced from the position of the verb in subject-initial main clauses, on the plausible assumption that the subject occupies the structural subject position specifier of TP in unmarked situations.[33] As can be seen in (19a), this would locate T to the left of the verb phrase, of which the boundary is marked by the negation marker, as always.

On this analysis, verb-second is a more flexible operation: it positions the finite verb to the immediate right of the first constituent, regardless the position of the first constituent in terms of clausal cartography (i.e., specifier of CP or TP). Koeneman and Zeijlstra (2014) may still be right that this type of operation, verb-second, is different from V-to-T movement, in that it is not triggered by morphology, and may even be a postsyntactic operation (as argued by Chomsky, 2001). This takes care of the fact that the Continental West-Germanic languages display verb movement in main clauses (cf. example (19a)), regardless of the richness of their verbal agreement. But the converse, general absence of verb movement in embedded clauses (cf. example (19b)), regardless of the richness of verbal agreement, remains deeply problematic for the RAH.

4.3 Typological Evidence

Following the literature, our discussion of the relation between morphological richness and verb movement has so far been limited to a restricted number of closely related languages. In the early 21st century, however, the RAH (as understood in Koeneman & Zeijlstra, 2014) has been put to the test in a typological survey (Tvica, 2017).

Tvica considers both poor agreement languages (which should not show verb movement) and rich agreement languages (which should), and concludes that "the evidence consistently supports the RAH" (2017, p. 279). Space prevents me from doing full justice to the many careful analyses found in Tvica's dissertation. The intention here is merely to highlight a number of observations that are relevant to the current discussion.

Of the thirteen poor agreement languages treated by Tvica, only three (N|uuki, Martuthunira, and Haitian Creole) appear to show no verb movement whatsoever.[34] Of the remaining ten, eight show the word order pattern in example (20), with the verb and the object adjacent to each other, but appearing to the left of certain adverbs.

(20)

$^{(*)}$ADV ... V+O ... ADV

Assuming, as before, that adverbs mark the verb phrase boundary, it would seem to be the case that these languages feature VP-movement.[35] Since we know that phrasal movement creates a freezing effect, not allowing further subextraction of any of its subparts (Ross, 1967, p. 295), we cannot exclude that the absence of verb movement is the function of verb phrase movement, and hence unrelated to richness of agreement.[36] If so, the facts of this set of languages should not be further considered as supportive of the RAH, as the absence of head movement can be explained independently.

The remaining two languages in Tvica's poor agreement set are Hawaiian and Kadiwéu. Hawaiian sentences show a VSO word order, which Tvica, following the literature, takes to be the result of remnant VP-movement (i.e., the verb is fronted as part of a VP, out of which other elements, most notably the object, have been removed). If so, Hawaiian is another VP-movement language, and should be discarded as irrelevant to the RAH. Kadiwéu, by contrast, is not a VP-movement language, but its data (from Sandolo, 1997, pp. 63f) suggests that the language shows rich agreement without verb movement, presenting a counterexample to the RAH.

The problem with verbal morphology in Kadiwéu is that it presents two slots for person markers, one initial and one post-stem (marked bold in (21)) (Sandolo, 1997, p. 63):[37]

(21)

j-aqape-t-**e**-gi (Kadiwéu)

1SG-meet-REL-3SG-GOAL

'I meet him.'

Tvica (2017, p. 136) argues that person markers in both slots are clitics rather than agreement markers, as they are associated with thematic markers (such as *gi* in (21)). But Sandolo (1997, p. 43) designates only the postverbal indirect object markers as clitics, and the preverbal person markers as regular agreement markers.[38] Since these initial markers distinguish for 1st and 2nd person and number, agreement should be counted as rich on the definition of Koeneman and Zeijlstra (2014), and the absence of verb movement that Tvica observes is problematic for the RAH.

Of the eleven rich agreement languages considered by Tvica (not including Kadiwéu), six are claimed to involve V-to-T movement, three are claimed to lack V-to-T movement, and two are inconclusive.[39] In the three languages that lack V-to-T movement (Hausa, Tiwi, Wari'), subject agreement is not realized on the verb, so no verb movement as a function of rich agreement is expected.[40] However, the possibility of alternative realization of subject agreement (i.e., not on the verb) does raise questions about the rationale of verb movement as a function of agreement, for which see section 5.

In this context, it is remarkable that Wolof can also realize subject agreement on a separate element from the verb, as illustrated in (22b). Crucially, verb movement (shown by the nonadjacency of the verb and the direct object) takes place regardless of the location of subject agreement (compare (22a) and (22b)).

(22)

a. **lekk-naa** *ndànk* jën wa (Wolof)

eat-1SG slowly fish DEF

'I ate the fish slowly.'

b. di-naa **lekk** *ndànk* jën wa

AUX-1SG eat slowly fish DEF

'I will eat the fish slowly.'

Here the verb movement is apparently independent of richness of agreement, posing a problem for the RAH (Tvica, 2017, p. 236).

It remains to be seen to what extent the RAH is supported by the facts from Kaqchikel. Kaqchikel has several possible word orders, and Tvica (2017, p. 227) argues that both verb movement and VP-movement are needed to derive the complete range. This is somewhat problematic, since one would expect the RAH to force verb movement all the time in case of rich agreement. More seriously, it seems entirely possible to derive all word orders by a combination of noun phrase movements and (remnant) VP-movement.[41] If so, Kaqchikel is a rich agreement language without verb movement, unexpected under the RAH.

All in all it seems that only three of the rich agreement languages (Ayoreo, Egyptian Arabic, and Finnish) show the behavior expected under the RAH, not an unexpected score in the absence of any correlation between head movement and morphological strength.[42]

The typological research, then, raises many interesting questions, but it seems fair to conclude that more investigations are needed to determine the validity of the RAH beyond the limited range of languages usually studied in this context, as well as a deeper probing of the fundamental assumptions underlying the various analyses (see section 5).

4.4 Discussion and Conclusion

This section has identified a range of problems for the RAH, as understood by Koeneman and Zeijlstra (2014), correlating verb movement and rich subject agreement.

First, the existence of Germanic dialects with verb movement (outside of verb-second contexts) and poor subject agreement argues for a weak interpretation of the RAH, which allows verb movement to take place for reasons other than richness of subject agreement.

Second, the existence of Germanic dialects without verb movement (outside of verb-second contexts) and either rich (German and Frisian) or poor (Dutch) subject agreement is incompatible with any interpretation of the RAH. This problem is raised by a plausible analysis of the clause structure in the relevant languages where TP is head-initial, and its head T is occupied by the verb in subject-initial main clauses, but not in embedded clauses (Travis, 1984; Zwart, 1993), leading proponents of the RAH to reject this analysis without appropriate discussion.

Third, the typological evaluation of the RAH across languages with rich and poor agreement fails to provide unequivocal support for the hypothesis. In particular, when languages that arguably show verb phrase movement are taken out of the equation, sample size of both types of languages is seriously compromised.

For a proper understanding of the relation between head movement and morphological strength, we need to investigate beyond mere statistical co-occurrence. For example, it does not suffice to observe that Mainland Scandinavian languages lost both verb movement and subject agreement in the course of their long history. What needs to be established is by what mechanism these languages came to undergo these drastic changes. Arguably, language contact was a major factor in the development, with the coastal areas of Denmark and Sweden heavily involved in North and Baltic Sea trade in the context of the Hanseatic League. We know that language contact situations may give rise to simplification as a result of imperfect learning (see Thomason & Kaufman, 1988, for much relevant discussion). The correlation we observe in the Scandinavian languages between verb movement and richness of agreement may be the outcome of a centuries-long process in which both instances of simplification (loss of verb movement and loss of agreement) had a similar cause (language contact), without one necessarily causing the other. From this historic perspective, a gap of several centuries between the dates of the two instances of simplification is not problematic, given a situation of prolonged language contact.

5. Conceptual Issues

In contemplating the Rich Agreement Hypothesis (RAH), we should also ask why movement and morphology should be related in this particular way. In other words, can a correlation between head movement and morphological strength be explained as something inevitable within the theory of grammar?[43]

Inflectional morphemes (including abstract morphemes) and verbal roots were identified as separate syntactic categories from the earliest stages of generative grammar.[44] That is, they were introduced by rewrite rules and could be manipulated by transformations (e.g., Chomsky, 1957, pp. 39, 113). This carried over into the Principles and Parameters framework, with the only innovation being that inflectional elements were conceived as functional heads (Infl, T, Agr) projecting their own phrase (see Figure 1) in accordance with the rules of X'-theory (Stowell, 1981; Chomsky, 1986). Reordering of verbs and affixes was done by head movement, already a familiar concept (e.g., Emonds, 1976, p. 213) that now became a subcase of 'Move α' (Chomsky, 1981, p. 5) and assumed the status of a separate research topic (e.g., Koopman, 1984; Travis, 1984).[45]

Essentially two types of explanation for verb movement/affix movement were proposed. The first explanation was in terms of a filter that required inflectional affixes to be combined with a lexical stem at S-structure (Lasnik, 1981, p. 162; Baker, 1988, p. 140), essentially a restatement of the problem.[46] Another explanation capitalized on the emerging notion that inflectional elements play a key role in various syntactic licensing processes proposed in the Principles and Parameters framework (such as theta-role and Case assignment), and that the feature settings of these inflectional elements are the locus of parametric variation (Borer, 1984). This led to the idea that verb movement to T takes place in order to enable T to license the subject (e.g., Koopman, 1984, p. 140) or to allow theta-role assignment by the verb to proceed (e.g., Pollock, 1989, p. 385). On this explanation, head movement ties in with the intricate fabric of syntactic licensing mechanisms developed in the Principles and Parameters framework.

Both explanations leave a choice as to whether the verb moves up to the inflectional affix, or the affix moves down to the verb. The licensing approach might hypothesize that the beneficial effect of verb movement occurs only if agreement is rich/strong (e.g., Chomsky, 1991, p. 423).[47] But the filtering approach has no way of capturing the perceived connection with richness of subject-verb agreement: the filter would apply as soon as the paradigm involves a single inflectional morpheme.

Both Rohrbacher's original RAH and Koeneman and Zeijlstra's rehabilitation of it are cast within a filtering approach (Rohrbacher, 1999, pp. 132f; Koeneman & Zeijlstra, 2014, p. 601). The idea is that the functional head associated with subject agreement is projected if and only if the verbal paradigm allows us to conclude that the inflectional morphology is sufficiently referential (i.e., refers unambiguously to speaker, participant, etc.). In weak agreement languages, then, the relevant functional head will not be projected, no morphemes will be generated there, and the filter prohibiting stray affixes will not have any effect.

A conceptual problem with this approach is that a consistent view of the relation between syntax and morphology is abandoned: depending on the richness of verbal agreement, our analysis of a language will either be strong lexicalist (in the case of poor morphology, with verbs generated in fully inflected form and no stray affix problem) or weak lexicalist (in the case of rich morphology, with verbs and inflectional affixes generated separately, and the stray affix filter forcing verb movement). This is problematic since the question of the relation between syntax and morphology ideally calls for a consistent view, not one that varies with the data at hand.

In early minimalism, the starting point that inflectional morphemes and lexical stems are generated separately was abandoned (Chomsky, 1992, p. 139).[48] Instead, inflected verbs are generated in fully inflected form, with a set of matching features being generated in Infl/Agr/T. It was then hypothesized that these features need to be checked by the verb. Parameterization was done by declaring the features in the functional heads strong or weak, with strong features triggering verb movement in overt syntax (Chomsky, 1992, p. 43). A natural implementation of the RAH in this model would be to say that the strength of an inflectional feature is reflected in the richness of the relevant verbal paradigm (but this interpretation does not seem yet to have been developed).[49]

But in later minimalism, this strong lexicalist view of the relation between morphology and syntax was also abandoned, in favor of a model in which the core syntactic component manipulates only features (not morphemes), and morphology is relegated to a postsyntactic component where the features associated with syntactic terminals are realized by fully inflected forms taken from the morphological paradigms residing in the lexicon.[50] These paradigms may be more or less rich, involving more or less underspecification, while the features present in syntax are essentially universal and show no variation in terms of richness. Within this model, it is not easy to see how syntactic operations can be conditioned by richness of morphology, jeopardizing any theoretical basis for the RAH.[51]

In the model of grammar entertained in this later version of minimalism, a compelling case can be made that head movement is a postsyntactic linearization effect (Chomsky, 2001, pp. 37f; Zwart, 2017).[52] This calls for a new conceptualization of the triggers for verb movement, such as has been proposed for verb-second in Zwart (2005). Assuming binary Merge, syntax produces a nested set of pairs of elements, and verb-second can be described as the requirement that the left edge of the second member of the top pair be marked by (features carried by) the verb. It might be proposed that poor inflectional morphology disqualifies the verb for performing this edge-marking function, but note that verb-second has always been regarded as a process for which richness of morphology is irrelevant.

It remains to be seen, then, whether a different mechanism, based on richness of agreement, but relevant to postsyntactic linearization, can be identified to account for the variation between Icelandic and Mainland Scandinavian that gave rise to the formulation of the RAH in the first place. Possibly not—which would suggest that the proposed relation between head movement and morphological strength fails to live up to its intuitive appeal for explaining the distribution of finite verbs across the languages of the world.

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Notes

1. See for example Koster (1986, p. 13) and, more famously, Chomsky (1991, p. 422), who proposed substituting "strong/weak" AGR for Pollock's (1989, p. 365) "transparent/opaque" AGR (AGR referring to the agreement features). Parameterization in terms of strength of features carried over into early minimalism (Chomsky, 1992, p. 44, 1995, p. 232; and, e.g., Zwart, 1993, p. 91), before the development of the probe-goal mechanism of Agree (see note 2).

2. The meta-feature of "strength" was abandoned as the minimalist framework developed, and the function of the strong/weak opposition was essentially replaced by a different meta-feature, *interpretability*, the setting of which would trigger the mechanism of Agree (i.e., feature valuation as a function of c-command), but not verb movement per se, which was (somewhat controversially) proposed by Chomsky (2001) to take place not in syntax but in an interface component reponsible for the externalization of syntactic structure (formerly called 'PF').

3. The main point of reference here is Rohrbacher (1999), based on his 1994 University of Amherst dissertation. It seems that the connection with paradigm structure was first suggested in Platzack and Holmberg (1989, pp. 54, 72), building on earlier proposals found in, for example, Roberts (1985, p. 32) and Holmberg and Platzack (1991, p. 89, presented in 1988), where the key factor was taken to be the presence or absence of AGR, not the richness of the agreement paradigm.

4. The discussion will be limited to verb movement, as similar questions in the domain of noun movement have hardly been broached, it would appear.

5. We abstract away from a further structuring of the VP into VP (“big VP”) and vP (“little vP”), the latter headed by “little v,” which is the verbal element that brings in agentivity and causativity, and exists only in transitive verb phrases, at least in nondefective form (see Chomsky, 1995, p. 315).

6. TP (also known as IP, for Inflection Phrase) may be split (as discussed in Pollock, 1989, and Chomsky, 1991) into one TP and one or more agreement phrases (AgrP, following Kayne, 1989). Split TP provides additional specifier positions that could be occupied by shifted objects (scrambling) and multiple subjects, as in transitive expletive constructions. In minimalism, agreement phrases have become deprecated (Chomsky, 1995, pp. 349f), with multiple specifiers of vP (see note 5) and TP providing the required landing sites for moved categories. Throughout this article, T can be read as ‘Infl’ or ‘Agr’ as well.

7. As proposed by Stowell (1981, p. 67) and Pesetsky (1982, p. 252), apparently following a suggestion by Ken Hale (see Zwart, 1994a, note 8).

8. That the verb in verb-second constructions occupied the complementizer position was shown by Paardekooper (1961), and later by Koster (1975), and Den Besten (1977). Strictly speaking this could only be shown for verb-second constructions that involve subject-verb inversion.

9. Chomsky (1986, p. 3). CP, too, could be shown to involve multiple layers (Müller & Sternefeld, 1993; Hoekstra & Zwart, 1994; Rizzi, 1997).

10. Both Danish and Icelandic are languages from the North Germanic (Scandinavian) group, one of two extant groups of Germanic languages (the other is West Germanic, which includes English, Dutch, German, Yiddish, and Frisian). Swedish and Norwegian show the same verb placement as Danish.

11. The question of what triggers V-to-C movement was never answered satisfactorily (for a survey see Vikner, 1991), but the consensus remained that V-to-C movement is qualitatively different from V-to-T movement, and discussion of the relation of verb movement and morphological strength invariably abstracts away from V-to-C movement (e.g., Rohrbacher, 1999, p. 28; Koeneman & Zeijlstra, 2014, p. 576 note 3). This raises the question of how to tell V-to-C and V-to-T movements apart. A telltale sign of V-to-C movement is subject-verb inversion, a feature of topicalization in all Germanic languages except English. The classic analysis of verb-second in Den Besten (1977) generalizes the V-to-C movement in inversion (*XVS*) constructions to subject-initial (*SVX*) constructions, forcing for subject-initial constructions an additional movement of the subject to Spec,CP (this generalization is not adopted in more flexible approaches—such as Travis, 1984, and Zwart, 1993—making the additional subject movement unnecessary). Note that topicalization *cum* inversion is also possible in Icelandic embedded clauses, suggesting an additional C-position in the complement of *að*, which would entail, on the strength of Den Besten (1977), that the verb is in C in (3) as well, eroding much of the initial evidence for the RAH in the domain of Germanic.

12. Recall that Modern Swedish is like Modern Danish in this regard (note 10). Modern Danish/Swedish do allow verb movement in embedded clauses under certain conditions (identified by De Haan & Weerman, 1986, on the basis of similar facts from Frisian), but not in conditional clauses, relative clauses, and embedded questions. The Old Swedish example (7), involving a conditional clause, is therefore significant.

13. The same variation predictably shows up in a comparison of Modern Swedish with conservative dialects of Swedish, such als Älvdalsmål (Platzack, 1988, p. 233, referring to Levander, 1909).

14. Auxiliaries in English do appear to the left of adverbs/negation, a crucial observation in the analysis of Pollock (1989) and Chomsky (1991), which is somewhat problematic in many analyses, and also for the RAH (cf., Rohrbacher, 1999, p. 184; Koeneman & Zeijlstra, 2014, p. 607). Interestingly, the verb and the object may both appear to the left of (some) adverbs, as in *John kissed Mary often*, suggesting to Cinque (1999, p. 225) and Koster (2000) that the syntax of English involves (short) VP-movement to the left.

15. Examples: forms of Icelandic *horfa* ‘look’ in the present indicative are 1sg *horfi*, 2/3sg *horfir*, 1pl *horfum*, 2pl *horfið*, 3pl *horfa* (Thráinsson, 2007, p. 8), while Danish *høre* ‘hear’ has just the single form *hører* for all persons and numbers (Vikner, 1997, p. 191).

16. Old Danish (c. 1050) *døma* ‘judge’ had in the present tense 1sg *dømi*, 2/3sg *dømir*, 1pl *dømum*, 2pl *dømið*, 3pl *døma*, while Middle Danish (c. 1350) *dømæ* ‘judge’ had just sg *domær* vs. pl *domæ* (Vikner, 1997, p. 206).

17. Statements about French refer to the written language. In spoken French, endings are the same (in fact, zero) for all three persons in sg and for 3pl, leaving special endings for 1pl and 2pl only. Thus (spoken French in brackets), for *donner* ‘give’: 1/3sg *donne* [dɔn], 2sg *donnes* [dɔn], 1pl *donnons* [dɔnɔ], 2pl *donnez* [dɔne], 3pl *donnent* [dɔn]. But the 1pl pronoun *nous* is typically replaced by impersonal *on*, triggering 3sg agreement [dɔn], rendering spoken French inflectionally poor on most definitions (Bauche, 1951, p. 102).

18. The Continental West-Germanic languages Dutch, Frisian, and German (all OV-languages) were considered irrelevant, as they either lacked T altogether (e.g., Bayer, 1984, p. 241; Weerman, 1989, p. 99), or had T positioned to the right of VP (e.g., Den Besten & Edmondson, 1981, p. 22, going back to Bach, 1962, p. 266). Since VP was supposed to be head-final in OV-languages, this would cause V and T to be adjacent, and it would be impossible to detect verb movement (Rohrbacher, 1999, p. 42). See section 4.

19. Rohrbacher (1999, pp. 116–117) understands “distinctive marking” to mean that the forms bearing the 1st/2nd person feature are distinct from the forms lacking those features, including the infinitive.

20. In the present tense in French, 1st and 2nd person are also marked in the plural, but 2nd person is not marked distinctively from the infinitive *donner* [dɔne] (cf. note 17).

21. See Vikner (1997) for pertinent critique. Vikner proposes a slightly less particular definition of rich agreement, according to which a language has rich agreement when it has inflection for person in all tenses. As Vikner (1997, p. 208) admits, both definitions raise questions as to the learnability of the verb movement-agreement correlation in the course of first language acquisition.

22. ‘Participant’ subsumes 1st and 2nd person. An example of this minimal pronoun paradigm is Kuman, which shows the following pronoun inventory: 1sg *na*, 1pl *no*, 2 *ene*, 3 *ye* (Foley, 1986, p. 70).

23. Other than Rohrbacher (1999) and Vikner (1997), Koeneman and Zeijlstra (2014, p. 576) propose that richness be decided on the basis of “the most regular paradigm,” typically the present tense indicative.

24. In this particular construction, with a negative matrix clause, an analysis in terms of embedded verb-second can be excluded (cf., De Haan & Weerman, 1986, p. 84).

25. For the distinction between high and low adverbs, see Jackendoff (1972) and Cinque (1999).

26. Koeneman and Zeijlstra (2014, p. 586) argue that the shorter verb movement needed to account for (17) targets “little v” (cf. note 5). On this analysis, the lower adverbs that the verb may cross must be merged inside the verb phrase, eroding one of the key diagnostics for verb movement out of the verb phrase.

27. As an example of reinterpretation of agreement, Koeneman and Zeijlstra (2014) argue that in French, clitics were reinterpreted as subject agreement markers to counteract the erosion of the verbal agreement paradigm. Note that Infl is called ‘Arg’ in Koeneman and Zeijlstra (2014).

28. Thus for *kasta* ‘throw’: 1sg *kasti*, 2/3sg *kastir*, pl *kasta*. In the past tense paradigm a dental past tense marker appears, and agreement is reduced to a singular/plural opposition: sg *kastaði*, pl *kastaðu*.

29. Thus for *hern* ‘hear’: 1sg *her*, 2sg *herst*, 3sg/2pl *hert*, 1/3pl *hern* (Vikner, 1997, p. 191).

30. Note that (18) has a negative matrix clause, so that the verb movement in the embedded clause cannot be analysed as a case of verb-second.

31. Thus German *kaufen* 'buy': 1sg *kaufe*, 2sg *kaufst*, 3sg/2pl *kauft*, 1/3pl *kaufen*; Frisian *pakke* 'take': 1sg *pak*, 2sg *pakst*, 3sg *pakt*, pl *pakke*; Dutch *pakken* 'take': 1sg *pak*, 2/3sg *pakt*, pl *pakken* [pɑkə].

32. The idea that adjacency of V and T suffices necessitates a redefinition of the RAH, according to which rich agreement requires the verb to be string adjacent to Infl/T (Koeneman & Zeijlstra, 2014, p. 605).

33. In the traditional analysis of verb-second, the verb moves to C in main clauses, and the subject moves to the specifier position of CP in subject-initial main clauses. The subject movement in that analysis is unmotivated, and should therefore not be postulated without further evidence.

34. These thirteen languages are: Bilua, Haitian Creole, Hatam, Hawaiian, Hmong Njua, Igbo, Kadiwéu, Martuthunira, N|uuki, Pwo Karen, Quiegolani Zapotec, Thai, and Vietnamese.

35. The relevant languages are: Bilua, Hatam, Igbo, Vietnamese, Quiegolani Zapotec, and Hmong Njua, Pwo Karen, and Thai. The latter three languages do not allow adverbs to the left of the V+O complex; the others do. Of course one could assume that clause-final adverbs are right-adjoined to VP, but that would further undermine the diagnostics of verb movement based on adverb positions which is crucial to the RAH to begin with.

36. Moreover, we might consider the possibility that poverty of agreement in these cases is the *result* of VP-movement, if (as seems reasonable) a verb contained in a moving VP is a less suitable candidate for realizing subject agreement. However, the rich agreement languages in Tvica's sample—Wari', Lango, and Kaqchikel—arguably also involve VP-movement.

37. The relative element REL marks the beginning of a post-stem clitic string (Sandolo, 1997, p. 118).

38. The initial person markers co-occur with full noun phrases, one of the hallmarks of agreement in Tvica's diagnostics section (2017, p. 79). The verb-initial slot for person markers is filled according to the following person/case hierarchy: 1pl object > 2 subject > 1sg object > 1 subject > 3, irrespective of thematic roles (Sandolo, 1997, p. 47). A marker *-d-* appears when the verb-initial person marker is associated with the semantic role theme (i.e., it is the object of a transitive clause, or the subject of an unaccusative/passive/reflexive clause). It seems possible to analyse this *d*-marker as a regulatory device, not unlike inverse markers, associating grammatical functions with thematic roles. It should also be noted that the postverbal thematic markers co-occurring with postverbal person markers (clitics) seem to function more like adpositions (Sandolo, 1997, p. 63).

39. The languages are: Ayoreo, Bukiyip, Egyptian Arabic, Finnish, Kaqchiquel, and Wolof (V-to-T movement); Hausa, Tiwi, and Wari' (no V-to-T movement); and Lango and Moro (inconclusive). It should be noted, though, that Bukiyip is also inconclusive, in that the sources used by Tvica do not allow us to conclude whether the (few) postverbal adverbs appear before or after the direct object (Tvica, 2017, p. 185).

40. Of these three languages, Tvica argues that Wari' has VP-movement, while Hausa and Tiwi show no movement at all.

41. A crucial observation about Kaqchikel word order appears to be that definite noun phrases must not precede indefinite noun phrases (Tvica, 2017, p. 226). Assuming that both subjects and objects are generated inside the verb phrase, this fact follows if definite noun phrases are triggered to move out of the verb phrase, after which remnant movement takes the verb and any noun phrases remaining inside the verb phrase to the left of the definite noun phrase(s). As Tvica points out, SVO constructions in Kaqchikel show more flexibility in adverb placement, but he takes these to be derived by further operations, suggesting we should abstract away from the complications these constructions bring (Tvica, 2017, p. 227).

42. Moro and Lango are deemed inconclusive for different reasons: Moro arguably has verb movement, but this is apparently related to aspectual features, not to subject agreement; and Lango adverbs always follow the verb+object combination, rendering them useless for diagnosing verb movement (but again, a VP-movement analysis suggests itself).

43. The question of the relation between head movement and morphological strength is more generally considered in terms of plausibility, but here intuitions vary and it is in fact not inconceivable that the correlation would be the inverse from what the RAH states (i.e., that verb movement is necessary to come to the rescue of a weak inflectional category, but not needed with a strong inflectional category). We need to look beyond plausibility, therefore.

44. In this respect, generative grammar was a direct continuation of the theory of morphology in (postbloomfieldian) American structuralism (Matthews, 1993, p. 87). This view of the relation between syntax and morphology, where inflectional affixes are generated separately from lexical stems (unlike derivational affixes, which form part of stems), came to be known as ‘weak lexicalism’.

45. Chomsky (1981, p. 55) initially suggested that the union of verbs with their affixes could take place at PF, a precursor to his later suggestion that head movement is postsyntactic (Chomsky, 2001, p. 37).

46. Baker (1988, p. 139) presents the filter (his ‘Stray Affix Filter’) in the context of a theory of morphological subcategorization (cf., Lieber, 1980), but the proposed explanation remains teleological. See Koopman (1984, pp. 149–150) for some pertinent critique.

47. Again, the logic is not entirely compelling, as it might equally well be the case that only weak/poor agreement needs support from a lexical verb.

48. In a weak lexicalist approach, lowering from T to V leaves a trace that cannot be governed by the moved category, requiring covert movement of the V-T complex back up to T to eliminate the trace (Chomsky, 1991, p. 426), in violation of the emerging ideal of derivational economy. This then motivated the adoption of a “strong lexicalist” view of the relation between morphology and syntax (Chomsky MIT class lectures, Fall 1991).

49. But note that the functional head is supposed to host both N-features (for licensing noun phrases) and V-features (for licensing the verb) (Chomsky, 1992, p. 42). The RAH essentially claims a connection between the number of opposed N-feature values (person, number) and the structure of the verbal paradigm. But verb movement is triggered by the need to license V-features, and has nothing to do with N-features, unless a relation between the two is stipulated.

50. For example Chomsky (2004). This view of the relation between morphology and syntax is due mostly to Halle and Marantz (1993), see also Zwart (1997, pp. 161f).

51. Bobaljik and Thráinsson (1998) present a version of the hypothesis relating head movement to morphological strength that is consistent with a view of inflectional morphology as being postsyntactic, in which the presence of inflectional functional heads co-varies with the richness of inflectional morphology. This analysis proposes a locality requirement between V and the functional head, such that the presence of additional functional heads requires the verb to move up. As pointed out by Bobaljik (2003), this approach is not inconsistent with a weak interpretation of the RAH, given the possibility of zero morphology associated with the projected functional heads.

52. Chomsky (2001) argues for the postsyntactic nature of verb movement from the observation that verb movement seems to lack semantic effects; Zwart (2017) argues from the observation that periphrastic tense forms must be created postsyntactically just like inflectional verb forms, and since the auxiliaries featuring in the periphrastic tense undergo verb movement, verb movement cannot take place in Narrow Syntax.