

**Canonic and non-canonic deliberations about epistemic modality:
its emergence out of where?**

1. The canonic background: Polyfunctionality of modal verbs controlled by semantics and syntax.

The present article deals with somewhat free deliberations about the question where epistemic (as opposed to root/deontic) modality as expressed by modal verbs (MV) in German(ic) come from. The course of these deliberations will cover typological as well as diachronic routes.

Modal verbs (MVs) in German are polyfunctional to the extent that they admit both epistemic (EMV) and deontic (DMV; also 'root') readings. Some authors distinguish 'evidential' MVs as a subclass of EMV (something I deem redundant for syntactic reasons). This is a well-known fact, and it has been held to be mirrored in other languages. The latter, however, is highly debatable for at least the following reasons. German(ic) MVs are clustering verbs without any infinitival preposition mediating with the embedded verb(s); German(ic) MVs stem from preterit presents still fully paradigmaticized in the immediately preceding states of the Germanic languages (Middle High German, in the German case), and this heritage is still traceable in the distributional behavior of MVs. None of this holds for verbs denoting modality in the European languages outside the Germania. Moreover, while Old English had MVs in the quality range of Modern German, Modern American English has lost its root paradigm except for a few frozen uses (Abraham 2002). The remaining uses in Modern American English are epistemic and temporal (a paradigm that German lacks completely, but which all other Germanic languages share with Modern English).

While many aspects of the polyfunctionality of the German MVs have been resolved (ever since Öhlschläger 1982; see, most recently, Müller & Reis (eds.) 2000) one is still debating how exactly and exhaustively how the two readings can be distinguished on a sound distributive basis. In her fundamental discussion Reis (2001) concluded that the only parameter that stands final scrutiny with respect to polyfunctionality of the MVs is strict coherence (i.e., verbal clustering with leftward embedding). Every other criterion discussed in the rich literature on the topic, Reis claimed, does not permit any clear-cut syntactic classification – more concretely and in particular, no distinction of DMV and EMV in terms of raising vs. control mechanisms (see Axel 2001, echoing this on the basis of material from Old High German). More concretely even, according to Reis 2001, the distinction boils down to a purely semantic one and is far from transparent (Reis 2001: 298). Reis suggested without specifying that the semantic distinction is at the bottom of the often diagnosed vagueness of MVs.

Abraham (2003) took up the last question. It was shown that there is indeed a semantic correlate motivated by clear distributional facts separating DMV and EMV in terms of perfective Aktionsart. In terms of event properties, the concrete distinctive characteristics is punctual resultativity (as opposed to monotonous incremental resultativity). This met Reis' first open area. As to the second typological question, i.e., what is at the bottom of strict coherence, it is assumed here that scrambling characteristic of German and left-extending cluster formation admit and motivate coherence. No doubt, this is a characteristic of syntactically derivable discourse configurationality. As a consequence, Reis' doubtful position with respect to a clear typological dis-

inction was taken issue with: at the least, German as opposed to English was shown to permit a distinct typological position that can be extended to the historical development of English.

2. Modal polyfunctionality: a typological Rubikon

The property of polyfunctionality between root and epistemic readings is idiosyncratic to the Germanic languages. No language outside the Germanic ones has this property.¹ Needless to say that any language expresses modality in some way, notably by adverbials. But the Germanic way is special. And there is ample common empirical ground to assume that modal adverbs expressing epistemicity cannot live up to the rich function of the epistemicity of modal verbs since the latter carry with them the modal janus-face (see Abraham 2001). Given the many readings of what evidentiality is in the different languages (see our brief terminological discussion in the beginning) it may be interesting to see what the exact evidential background to each modal verb of German is. Quite clearly, the discussion of EMVs as relating to DMV-meanings allows - or, rather, forces - a more concrete understanding of the retained lexical specifics despite the encompassing bleaching results, which are due to grammaticalization. In the following list of EMV-inferentials in German, the evidential meanings of each lexical are in some way weakly reflecting the original deontic meaning. Quite clearly, (1a,b) correspond closely to the auditive, possibly also to the admirative, while (1c,d) mirror more closely the concepts of *subjective* or *inferential*; all *subjective*, *vremya neočevidnogo deystviya*, *Nichtaugenzeugenschaftsmodus* and *epistemic* fit as cover concepts for the four meanings as a whole.

- (1a) X [_{EMV} **will-**]+V = "X will/wants others to believe V"
= 'X **pretends** to V'
- (1b) X [_{EMV} **soll-**]+V = "X soll/must be the case according to others"
= 'X Vs by **hear-say**'
- (1c) X [_{EMV} **muß-**]+V = "X muß/must be due to the accompanying facts"
= 'X Vs by **factual conclusion**'
- (1d) X [_{EMV} **mag-**]+V = "X is capable of V-ing"
= 'X is **possibly** V-ing'

There is thus a common source to this array of evidentials in German, i.e. inferentiality. However, none of them has bleached to the point where the original lexical source (deontic meaning) is depleted completely. There is no reason to assume that, in some future time, the four meanings will merge to one common evidential function: not because the different meanings are meaningful distinctions upon the common reading of non-veridical evidentiality; and, second, because of the ever virulent principle of one form, one meaning in German.

¹ In the ensuing discussion, wherever the notion of grammatic(al)ization turns up it is taken as a diachronic process which turns lexical items into grammatical formatives and renders grammatical formatives still more grammatical possibly ending in zero marking (cf. MEILLET 1921/1926, 131f.; 139; KURYŁOWICZ 1965/1975: 52; LEHMANN 1982/1995: 11 f.). Grammatic(al)ization is contingent upon morphological erosion. With respect to other levels of linguistic description, linguistic units lose in semantic complexity, pragmatic significance, syntactic freedom, and phonetic substance, respectively. However, I here wish to extend this notion to cover grammatical diachronic changes triggered by covert notions such as semantic oppositions of an implicative nature. In fact, this is the crucial drive-way of the present essay: to make amenable that grammaticalization and the notion of diachronic re-analysis needs to be extended to paradigms and hidden semantic oppositions.

3. The developmental stages of epistemics

According to Vikner (1988), in the case of verbal clusters as the ones under inspection, the subject may adopt, next to its main and strong thematic role assigned by the full lexical verb, one, but not more than one, extra and weak thematic role. See the following examples from Danish. Note that Danish, as each of the other Germanic Scandinavian languages, has two passives: a periphrastic one using *blive* "become" as an AUX; and the synthetic *s*-passive. The crucial observation is that the two passives have different distributions under embedding under the two types of modals (German translations added because German is more telling than English).

- | | | |
|------|---|---|
| (2a) | Hun vil blive arresteret
he AUX become arrested
German: "... wird verhaftet werden" | ... *DMV, EMV
... participial passive
... purely temporal |
| (2b) | Hun vil arresteres
he will arrested (become)
German: "... will verhaftet werden" | ... DMV, *EMV
... reflexive passive
... voluntative-deontic |

Since Vikner assumes that the Danish auxiliaries (auxiliary uses of) *blive*, *få* and *komme* assign extra semantic roles the subject in (2a) would collect three thematic roles (one for *vil*, another one for *blive*, and yet another one for *arresteret*) on *hun*, which is out irrespective of any specific assumption made with respect to assignment of semantic roles. This renders the deontic reading in (21a) ungrammatical. This is different in the case of EMV, which does not assign a semantic role of its own. Under the specific suspension of the strict Projection Principle ("each clausal constituent has only one semantic role"), (2a) receives an epistemic interpretation: *vil* in the function of an AUX (for German "werden", not, however, "wollen"!) does not assign the subject, *hun*, a third semantic role. In other words, (2b) also restricts the discharge of the semantic role on *hun* to two semantic roles, but different from that in (2a): one, under lexical government, executed by the participle of the main verb, *arresteres*, and a second, weaker one discharged by *vil*. So far the specific assumption made by Vikner (1988).

It should be clear why we refer to these findings by Vikner. His attempt to account for the distinct distribution of the two Danish passives embedded under the specific modal readings demonstrates beyond doubt that root (DMV) and epistemic modal verbs have separate syntactic and semantic distributions in Danish, something that has been hammered down in a series of presentations for German and Dutch (see Abraham 2001, 2003, Barbiers 2001). Recent work on first language learning confirms this on the basis of totally independent arguments (HYAMS 2003). See Table 1.

Table 1: The Ontological Aspect-Modal Correlation

ASPECTUALITY	DMV-PRODUCTION	EMV-PRODUCTION
PERFECTIVE	Non-finite verb forms	–
IMPERFECTIVE	–	Finite verb forms

Hyams calls the specific stage in which L1-learners use non-finite perfective verbs to establish modal event reference the "bare perfective stage". By contrast, finite verbal forms are employed to express temporal event reference. As soon as finite agreement emerges with the perfective verbs the modal reading is suppressed. This temporary stage correlates with the emergence of other modality markers such as modal partic-

les. According to HYAMS, these aspectual markers never completely disappear from the linguistic inventory of the adult modality system despite the fact that adults do not make use of the early “bare perfective” strategy. Rather, under specific conditions (which excludes temporal usage) the former system is reactivated to generate a modal reading. The correlation between modality (root vs. Epistemics) and aspect/ perfectivity and temporality remains virulent although the has relation received less focus under the emergence of other, non-verbal expressive means.

Notice that this forces the conclusion that aspectual perfectivity is lexical (non-finite). In other words, Perfectivity cannot be a category higher than VP/vP; it certainly does not reach AgrP, TP or any FinP (as held all along on the basis of careful and exhaustive distributional tests by Abraham 1989, 1995, 2003). From this follows that DMV, as sensitized for perfective embeddings and occurring in non-finite form, is generated in VP/vP, while EMV, which does not occur in non-finite form, emerges from AgrP/ TP or higher. This holds for German/Dutch just as well as for English (Abraham 2001). Needless to say, such a finding, in turn, leads to the conclusion that perfectivity is not generated in the same category as imperfectivity. In other words, no unified syntactic aspect category is a possible host given the divergent aspectual phenomena.²

There is a path toward typological speculation implied by the ontogenetic correlation sketched above. It is plausible to assume that there is an underlying reactivation potential of modality even in languages that do have a complete paradigm of nmodal verbs of the Germanic type. All we have to check is whether or not the language in question has had a functioning aspectual system and whether this system is in longitudinal demise. Old High German is a case in point, and Old English is another albeit in reverse emergence. OHG provides complete modal D-paradigm, but only one undebatable EMV, *mugan* “be able” (Modern English formal cognate *may*). See Leiss (2002: 37-39). Naturally, one has to assume that the paradigm of MV in OHG existed by the grace of their opposition between root and epistemic functions in expressive patterns beyond those of the category of modal verb. In other words, OHG modal verbs were polyfunctional from scratch. But, possibly, epistemic functions were not represented by MV-lexicals alone. They were cocoded by other lexical and morphosyntactic means. The full-fledged aspectual opposition in OHG might have contributed to epistemic functions. Consider the aspectual shibboleths for the distinction of EMV and DMV in Modern German (Abraham 1983, 1995, 2001). The full paradigm of EMV-lexicals emerged as soon as the aspectual distinctions (perfectivity vs. imperfectivity signalled by derivative morphology, among which prominently lexical *ge-*) eroded in the course of Middle High German. This does not imply that the epistemic notion emerged, but, much rather, that all of the modal verbs adopted the expressive function of epistemicity.

It is essential to include all modal expressions, even those outside of verbal expressions, in this multi-component modality scenario (Leiss 2002, 2003). After all, Modern German still encompasses a live and active Aktionsart system and perfective syntax. The history of English, on the other hand, characteristically lost its perfective-imperfective distinctions long ago. Yet, its system of modal verbs, no doubt in full bloom not long ago, is in the process of being pruned of its root meanings, while a new aspectual system has emerged.

² Undoubtedly, Cinque’s conclusion that epistemicity is located much higher in the semantically motivated categorical clausal setup than deontics has a place in this chain of argument also (Cinque 1999).

What this small typological scenario suggests confirms our former assumptions (due in part to Leiss 2002, 2003). See Table 1 again. Below we shall develop this idea further by adding new empirical correlations.

4. Diachronic conclusions

Let us draw more focussed conclusions from the above in Section 3. For one, the historical change from the pure perfect to the regularized readings of the perfect evidential which, at the bottom of the phenomenon, has nothing to do in any direct fashion with what Traugott (1988: 409), and, in a less direct way, also Sweetser (1990), have called the general tendency of change from external, fact-bound, relations to internal, speaker-oriented relations, and, consequently, from external to internal causality. Much rather, and a lot more pointedly and empirically soundly, this turns out to be a result of, and thus dependent upon, the weakening of selection constraints of the subject actants in the agreement carrying predicates (from fact-bound to person-bound subjects; thus from ‘objectification’ to ‘subjectification’). There is no need to assume that a term such as ‘subjectification’ is in any way explanatory in a sense truly committed to detailed linguistic analysis unless this term in itself is explained on the basis of the weakening selection constraints on the part of the predicates.

The diachronic account that EMVs, just as EVs in general, are derived historically, and, thus, are diachronic dependents upon, DMVs is correct only to the extent that the basic selection restrictions do not appear to have been relaxed as often from scratch, i.e. relaxed already in historical times. In fact and to the contrary, Traugott (1986) has observed numerous cases where such selection relaxations force readings much in the sense of modern EVIDENTIALS. Notice that this observation also nags on the triggering status of ‘subjectification’ as a historical explanation. EMVs, to recall the point of departure of the present section of this paper, are thus to be seen as diachronically concomitant with DMVs from scratch depending purely on the linguistic ‘stringency’ of the language user.

The various features of sensitivity of the German MVs under perfect and perfective weight is thus no longer surprising if judged against the two obvious parameters of historical weight: the fact that MVs were preterites with a resultative meaning at stages of the Germanic languages when these, for one, were still highly aspectual, and, second, when the synchronic constraints under perfect and perfective weight in Modern German (and Dutch, Yiddish, and West Frisian) apply. It is to be noticed in this context that the perfect in Georgian triggers the observed evidentials only in the temporal-aspectual context of an aspectual system, where the aorist contrasts eminently in function with the perfect. German, in this sense, is no longer a language aspect-prominent in any paradigmatically based way. Yet, there are sufficient syntactically distributional characteristics retained which reflect the previous former aspectual status of German, in what may be called a ‘retrieving syntagmatic-combinatorial syntactic and semantic sector of a former temporal-aspectual paradigmatics’.

The distinct evidential meanings of EMV in Modern German support the more general observation that the resultative perfect and evidentials are interlinked in other, less subclassifying languages. See the following illustration from OHG (Leiss 2002: 26-27).

- | | | |
|------|--|---|
| (3a) | Thaz wir Kriste sungun in únsera zungun
that we Christ sang.3sgpret in our tongue
“in order that we were <u>able to/could</u> praise Christ in our tongue” | Otfrid <i>Weißburger</i>
<i>Evangelienbuch</i> I,1,122 |
| (3b) | thaz wir imo hiar gisúngun in frénkiska zúngun | Otfrid <i>Weißburger</i> |

that we him here pv.sang. 3sgpret in Frenkish tongue *Evangelienbuch* I,1,125
 “in order that we performed/completed his praise in the Franconian language”

Consider the underscored translations: in (3b) the action perspective is that of a completed performance, while the first illustration describes potentially limitless and generic. The root (alethic?) modality in (3a) is transported by the verb which is imperfective as opposed to the morphologically more complex prefixed verb in (3b). The simple, imperfective verbs, thus, carried modal predicative meanings. Often this implies different lexical translations in modern German (*preisen* vs. *singen* in the (3a,b) above).

Modern German lends support to this general findings by retaining some of the deontic (root) semantics of DMV in its evidential intension, while echoing the common factor of perfectivity in the verbal subclass of ‘preterite presents’. Proof of this can be derived from studies on oral German texts entertained by Letness (1998: 9) with the result that occasionally the specific EMV *soll-* cannot be substituted by one of the other MV.

As a general conclusion with respect to Lightfoot's general assumption that the Middle English MVs relinquished the main paradigm of verbs, one may assume on the basis of our insights that this is due to the fact also that aspect as well as morphologically reflected aktionsart was totally lost as a determining factor. This, in turn, must have been a consequence mainly of the pervasive attrition of verbal inflectional and derivational morphology during the Middle English period – certainly a revolutionary development not reflected in the other Germanic languages, which were never under such profound exposition to, and influence of, a fundamentally different language as Old English, and thus never subject to such profound creolizing influences as Middle English.

5. Modal polyfunctionality and the typological correlation

The most interesting correlation suggested by Leiss (2003) is that only aspectless languages possess modal verbs of the type German and the rest of the Germania provide. The motivation behind this assumption is twofold. For one, the modals were not represented in any systematic way in Gothic or Old High German so as to form anything even close to the modal paradigm visible in Middle High German and Modern German or any of the other modern Germanic languages. In Old High German, e.g., only *mugan*, etymological cognate of Modern English *may*. Moreover, its function is far from unambiguous: it occurs in functions ranging from the necessity pole (sharply deontic) down to the possibility pole including epistemic uses. In other words, EMV-*mugan* was among the earliest historically documented occurrences. The second reason is linked to the first one: What existed as modals in the early stages of the Germanic languages were perfectives with full verb status. In other words, they were not only auxiliaries or control verbs.³ What is more, the emergence of modals in the modern polyfunctional sense is causally linked with the demise of aspectuality or Aktionsart. However, this process of regression of the modern Germanic modals has not reached its finalized stage yet; the trace of the original perfectivity is still reconstructable through their distributional behavior (Abraham 1989, 1995, 2003).

Table 2: The Aspect-Modal Polyfunctionality Correlation

³ Witness the existence of Gothic *witan*, OHG *wizzan*, MHG *wizen* (Modern German *wissen*, Dutch *weten*, English *wit*, Danish *vide*, Icelandic *vita*) among the paradigm of the present perfects, no modal but a transitive verb with full verb status.

ASPECTUALITY	FULL POLYFUNCTIONAL MV-PARADIGM	NO POLYFUNCTIONAL MV-PARADIGM
(IM)PERFECTIVE PARADIGM	-	English, Russian, Armenian
NO (LONGER) (IM)PERFECTIVE PARADIGM	German(ic)	-

If this main dividing criterion has any empirical validity the status of English, a truly Germanic language and one which definitely had modals in its early period, needs to be explained. All I wish to say at this point is that it has lost the early aspectual status in Middle English (**Denison** 19..). The most notable evidence for this is the fact that it gave up early on all derivative morphology attesting to its verbal perfectivity such as OE participial *gi-*. Notice that the present perfect of Modern Standard English is not continuing the old perfectivity, but is a novel development. Its meaning is not equivalent to true perfectives, which entail the future (as it does in Russian)⁴; the present perfect does not. What it entails is the past (see the terminology in logical semantics “extended now”⁵; **Parsons** 19..).

If we can believe historical philologists the epistemic function emerged slowly and with delay (**Traugott** 1986 for English, **Fritz** 1997a,b for German). This yields another longitudinal correlation. See Table 3.

Table 3: Historical Epistemic-Perfectivity Correlation Reversal

	Epistemic Function
Old High German/Old English: [+ Perfectivity]	-
Modern German/Modern English: [- Perfectivity]	+

See Abraham 2001 for frequency counts in Modern American English. Except for frozen formulae, Present Day American English has restricted modal verbs to epistemic (and temporal) usage.

We do not know why it is that just the preterit presents (which did exist in other old languages such as Classical Greek, Latin (verbs on *-(e/o/a)sco*), and Gothic (weak *nan*-verbs)), but which have no correlate in the Modern Indo-European languages that developed modal meanings. The fact that *wait-witan* “know”, also a present perfect, did not join the modern modals is sufficient fact to blur the correlative picture. However, the fact that root and epistemic/evidential meanings are distributed differently serves to reliably draw a longitudinal line from perfectivity to deontic/root modality, on the one hand, and from imperfectivity to modal epistemicity (Abraham 1989, 1995, 2003). See Table 4 for such links visible on distributional properties of Deontic (= root) Modal Verbs (DMV) and Epistemic Modal Verbs (EMV) (Abraham 1989, 1995, 2003).

Table 4: Aspect-Deontic/Epistemic Correlation

⁴ In German future reference is always entailed by verbal present tense. This status may be inherited from the old aspectual system still preserved in a pervasive, albeit not quite systematic, derivative *Aktionsart* lexicon.

⁵ ‘Extended *now*’ is not precisely signalling the relevant distinction. While Russian, as other aspect languages, is extending *now* ‘into the future’, MstE is ‘backward extending’. For the principled typological criterion of ‘forward’ (or ‘ascending’) vs. ‘backward’ (or ‘descending’) perfectivity see Abraham 1999.

	EMBEDDING UNDER DMV-READING	EMBEDDING UNDER EMV-READING
EMBEDDED PERFECTIVE V	√	*
EMBEDDED IMPERFECTIVE V	*(/√)	√

The complementary distribution is almost perfect. It thus appears that EMV emerge at the same rate as the systematic morphologically supported distinction perfective is in continuing demise. English is the forerunner in this development among the Germanic languages, with German lagging behind because of its extended derivative morphology and syntactic support of perfectivity (Abraham 1995, ch. 10).

The most convincing typological case in confirmation of the assumption that aspect and modality interact with one another comes from languages with an explicit aspectual system. Russian and Armenian are cases in point. Gevorgyan-Ninness (1999, 2002, 2003) has pointed out that while neither Russian nor Armenian have a complete paradigm of modal verbs (i.e., exhausting the modal space as well as representing modal polyfunctionality; for reference see the section below). Yet, the perfective aspect tends to express hypothetic modality (expressed by Russian *moč*+perfective infinitive as well as Armenian perfective *karol ēi*, both in wide scope construction) as different from an epistemic meaning (which is linked to the imperfective: see (30)-(31) below).

6. The synchronic environments of modality

6.1. Assumptions

In order to place diachronic questions and claims in perspective, the following criteria are taken to be ascertained empirical and theoretical conclusions:

- (4) EMV (just as EvMV) are thetaless. EvMV are only an semantically idiosyncratic variant of EMV (con de Haan 2001, Fagan 2002). No distributional distinctions hold. In particular, the generalization of the “Non-finiteness gap” for E(v)MV (Abraham 1995) holds. Only false, namely quodlibet-generalizations can be drawn from hapax legomena (con Fagan 2002).
- (5) The event typology appears to require that raising verbs inherit both the theta properties and the event characteristics of the embedded full verbs. This entails the following with respect to MV in general: Due to their theta marking, DMV are not raising verbs, but control verbs. More specifically, due to their idiosyncratic theta marking, DMV must avoid any mapping between theta grids in order to avoid clashes. Only the syntax of control avoids successfully the mapping incongruence as well as the non-finite gap. Therefore, DMV cannot be raising verbs (con Reis 2001, Axel 2001).
- (6) If the event role is closely associated with a functional head in the clausal architecture then, due to the thetaless property of E(v)MV, EMV are not bearers of a event role of their own. Only DMV are. The syntactically serializing control property of DMV allows for different event types to cluster. Raising would require syntactic theta-mapping, which in turn would lead to clashing of incongruent theta grids.
- (7) The locus of the event role of DMV, just like that of perfective resultatives, is low in the clausal architecture, i.e. inside the lexical VP/vP. Its spell out structure is that of a small clause, the general and syntactically unique form of resultativity (Abraham 1993).

The claim forwarded by Reis (2001) that, before the background of the widely un-systematic observations of syntactic cases of distribution the polyfunctionality of Modal verbs in German can have nothing but a semantic explanation has been confirmed – albeit due to reasons that had to remain covert to her since she had not taken notice of distributional generalizations which had been established for quite a while: i.e. the Aktionsart sensitivity of German MV. Yet, I leave open the question whether mapping construals between event types, such as those in (30)-(31), render theoretically adequate accounts. See, however, Abraham (1993) the phase-graphical distinction between (lexical as well as phrasally complex) perfectives and imperfectives and their syntactic representations (small clauses).

It has been argued by Abraham (2001) that the striking erosion of D-readings of MV in American English is due to the historical loss of perfective Aktionsart and its derivational morphology in English.⁶ This is in support of the present line of argumentation and con Reis (2001). Notice that we have looked for, and found, a syntactic correlate to perfective Aktionsart on modern German MVs, not a particular surprise in a language like German which provides ample derivational morphology to reflect such semantic distinctions.

6.2. The structural complementarity between DMV and EMV

It has been a long-held assumption (Abraham 1991 for German; Ross 1969, Bresnan 1993 for English) in syntax that non-epistemic, or ‚root‘ (often also ‚deontic‘) modal verbs (DMV) assign a theta role to the overt external (subject) argument, which in turn controls the PRO-argument of the embedded infinitival predicate. The complementarity is spelled out in (6a), which is a (bi-sentential) control structure, as opposed to (mono-sentential) (6b), which is a raising structure. Correspondingly, epistemic modal verbs (EMV) do not assign a theta role to the overt external (subject) argument. The overt external argument predicate is s- and c-selected by the embedded infinitival verb.

- (8a)  $[_{CP} \text{ that Peter}_i(\text{AG}) \text{ must } [_{CP/IP/VP} \text{ PRO}_i \text{ do his homework}]]$ DMV, *EMV
- (8b)  $[_{CP} \text{ that Peter } [_{IP} \text{ must } [_{VP} \text{ do his homework}]]]$ *DMV, EMV

DMV and EMV are thus seen to be complementary both semantically (Kratzer 1991) and, as a consequence, also syntactically: DMV are (modal, coherent) control verbs, EMV are (modal, coherent) raising verbs. The status of the so-called evidential variety of EMV is not accounted for by either (1a) or (1b), naturally. We will turn to that presently.

6.3. Full verb MV and DMV as Θ -role assigners

6.3.1. Overt thematic roles

⁶ No doubt, the ‚present perfect‘ makes English an aspectual language. However, this is not the perfective of early English, early Germanic or Slavic. Not only is the present perfect a novel development in the history of English, but it is also fundamentally different. Notice the telling terminology in semantic logic for the present perfect: „extended now“. In particular, true perfectives have a future implication, which the present perfect has not. See Abraham (1999).

Do DMVs and EMVs have different characteristics in terms of semantic roles? Note that, if this were indeed the case, this would yield a further correlation between root ('deontic') or epistemic reference, on the one hand, and distinct event identification, on the other hand. Let us first consider semantic theta specifications of MV in German. The fact that German MV can be used as full lexical verbs is indicative enough for the following discussion. See the selection of semantic roles by German DMVs in the left-hand column of (9a-f). German DMV, thus, behave as full verbs (i.e. with nominal objects; generally, at least in German, also with person subjects).

(9) TYPICAL SUBJECT SELECTION OF SEMANTIC ROLE		READING AS		
	MV	THETA GRID	DMV	EMV EVIDENTIAL
(9a)	<i>wollen</i>	G[+hum][TH__]	velle	praetendere
(9b)	<i>mögen</i>	AG[+hum][TH__]	(praeferre)	possibile esse
(9c)	<i>müssen</i>	EXP[+hum][TH__]	debere	implicatum esse
(9d)	<i>sollen</i>	EXP[+hum][TH__]	debere	- dicitu/dicuntur
(9e)	<i>dürfen</i>	EXP[+hum][TH__]	decet	(?)
(9f)	<i>können</i>	EXP[+hum][TH__]	facultas	possibile esse (alethic)

According to (9a,b), *wollen* and *mögen* are not on a par with the other MVs since in their deontic uses, they project agentive subjects. This is supported by the finding that non-volitional MVs are demonstrably raising verbs also in their non-epistemic readings (Reis 2000: 5-6). Wurmbrand (1998, 1999) has argued that, in all their uses, irrespective of their root vs. epistemic function, modal verbs are raising verbs. Although different conceptually, Wurmbrand's view is comparable to that of IJbema (1997) and IJbema & Abraham (2000), who argue that what are called 'control' complements do not require the concept of PRO. Rather, the infinitival preposition (German *zu*, Modern English *to*) and the infinitival suffix (German *-(e)n*) (as much as the circumfix of the passive participle) occupy the Spec of vP and Spec of VP respectively, which would block the embedded subject from surfacing in those Spec-positions. A look at American English (Abraham 2002) yields that the almost total demise of DMV as well as full verb uses of MV correlates with the well documented historical demise of perfective Aktionsart/ aspect in all verbal paradigms of English. Think of the total lack of the participial morpheme *gi/ge-* as well as the fact that English modal verbs erased all remaining characteristics of the former preterit presents in terms of ablaut variations, which German and Dutch have preserved. There is no reason to follow Reis' (2001) defeatist conclusion that there is nothing that allows, let alone invites, typological comparison of the MV across languages and that everything that matters is individual contexts to disambiguate, but not classify grammatically, DMV and EMV. Note that American English uses modals to render the root readings of the German MV only in two cases (i.e. *must* and *may*). In American English, *must*, *may*, and *can* are the only members of the class of modals left. Quite likely, such occurrences, which are unsupported by full paradigmatic status, are doomed to eventually vanish altogether.

6.3.2. Covert thematic roles

My claim that root readings, but not epistemic readings, go hand in hand with thematic role assignment may seem disputable. Consider the sentences in (9)-(10) which appear to be incompatible with this claim.

- (10a) *Der Schlüssel muß immer an den Schlüsselhaken.*
the key must always onto the keyboard
- (10b) *Zwei Wachen müssen jedenfalls da sein.*
two guards must in any case be there
- (10c) *Wieviel darf es denn sein?*
how much may it be
- (10d) *Das darf ja nicht wahr sein.*
this must not be true

The argument against theta assignment in root MV-readings runs as follows: in these sentences, no single argument is projected that can be taken to be the bearer of the obligation expressed by *must*. Consequently, the deontic meaning cannot be linked to any specific theta role. Note, however, that, irrespective of this argument, the subjects in (9)-(10) do have a theta role; compare also (9c) above. More importantly, there is clearly an ‘obligor’ involved in (9) and (10), although it is not represented in the overt argument grid of the verbs (an observation due already to Bech 1957). I have argued elsewhere (Abraham 1995: 480 ff.), following Zubizarreta (1982) and Vikner (1988), that root modals of this type are causatives involving covert agents responsible for the obligation that is part of the meaning of root/deontic *müssen* or *dürfen*.⁷

The idea of assuming covert thematic roles for the root readings of modals is based on the generalization that modal verbs implicitly or explicitly realize an argument referent, *x*, that extends a commitment or permission to someone, *y*, to do or let happen an event, *z*. See, more precisely, (11).

- (11a) The Modal Valency Generalization
The root readings of the modal verbs *müssen*, *sollen*, implicitly or explicitly realize an argument referent, *x*, that extends a commitment (OBLIG) to someone, *y*, to do or let happen an event, *z*.
- (11b) The root readings of the modal verbs *dürfen*, *können* implicitly or explicitly realize an argument referent, *x*, that extends a permission (PERMIT) to someone, *y*, to do or let happen an event, *z*.

As a variant to a-b above, an argument referent, *x*, is projected that by way of *wollen*, *mögen* directly expresses the desire to execute an event *z* to happen.

Distributed to the seven different MV, Table 5 sketches the thematic characterizations for D- and E-readings: *x,y* for nominal referents, *z* for event reference; *x* is the covert external argument, *y* is the overt external argument of MV.

Table 5: MV-argument distribution

MV-argument Grid	Possible covert origo	Possible overt external	EMV-reading	DMV-reading

⁷ In a way, this assumption concerning the covert causative character of *must* is similar to Pesetsky’s assumption that psych- or *preoccupare*-verbs (cf. Latin *verba dicendi et sentiendi*) are covert causatives and, as a result, cannot be regarded as unaccusatives (Pesetsky 1995, contra Belletti & Rizzi 1988), since causatives have an argument structure and theta-grid totally different from those of unaccusatives.

	argument	argument		
will x,z		Agent(x)	x PRAETENDIT z	x VULT z
mag x,(y),z		Agent(x)	y/Sp CONCLUDIT z DE x	x VULT z
soll x,y,z	x(z)	Patient(y)	z DICITUR DE y (x DICIT/DICUNT z esse)	x OBLIG y/z
muß x,y,z	x(z)	Patient(y)	y/Sp CONCLUDIT z DE x	x OBLIG y/z
Kann x,(y),z	x(z)	Thema(y)	y/Sp CONCLUDIT z DE x	x POTEST z
darf x,y,z	x(z)	Patient(y)	-	x PERMIT(y CONCLUDIT) z

More concretely, argument stacking for illustrations in Table 5 looks like (12a-c). [brackets symbolize covert arguments and relations; x and y always denote persons; z is the event variable; x is the covert external argument].

- (12a) $\lambda x \lambda y \lambda z$: [x OBLIG [y DO]] z(Schlüssel an den Haken)
key onto the board
- (12b) $\lambda x \lambda y \lambda z$: [x PERMIT y] z(y ist wieviel?)
is how much
- (12c) $\lambda x \lambda z$: [x OBLIG] z(das ist nicht wahr) or
this is not true
- (12d) $\lambda x \lambda z$: [x NEG-PERMIT] z(das ist wahr)
this is true

For the option in (12c/d) see (14b) below. Other examples of MV [\equiv_D] means „definition under a deontic/root reading, \equiv_E ” „definition under epistemic reading“; brackets again denote covert arguments and relations; x and y are always persons; z is the event variable over which MV (by way of OBLIG/ PERMIT) extends its scope].

- (13) Mißtrauen soll nicht sein \equiv_D [x OBLIG [y NEG-DO]] z(es ist Mißtrauen)
suspicion shall not be there is suspicion
- (14) Das Wetter will/mag nicht besser werden \equiv_D [x NEG-VULT] z(das Wetter wird besser)
the weather will/may not better become the weather becomes better
- (15) Das muß Vater sein \equiv_E [x(circumstances) OBLIG] x \Rightarrow z (,from x follows z(ist-Vater)
this must father be is father
- (16) Das soll Vater sein \equiv_E [x(hearsay) OBLIG] x \Rightarrow z (,aus x folgt z(ist-Vater)')
this shall father be is father
- (17) Das mag/kann Vater sein \equiv_E [x(circumstances) PERMIT (y)] x(y) \Rightarrow z (,from x follows z(is-father)' or ,y concludes z on the basis of x')

We argued in this section that obligers and permitters are always persons, that it is these referents that are the bearers of thematic roles (Agents, in particular), and that these argument referents of the MV need not be overtly represented. I leave open the question whether such thematic constituents play any role for the control relation. In other words, I stick to the claim that control is but referent matching between matrix (MV) clause and the embedded non-finite (full verb) structure. More relevantly, the principled ambiguity of MV between DMV and EMV readings (‘polyfunctionality’) appears to boil down to one single change in the componential set up of the semantic constitutive: whether or not the highest argument variable, x, is filled in by ‘Context/Umstände’ or ‘Hearsay/Hörensagen’ or else a person extending obligation or permission. The remainder of the semantic set up is identical for each EMV-reading. Notice that the D-E pairs and their componential set ups in (17) make plausible the D-E rela-

tion (or, if diachronically documentable, the emergence of E-readings from the original D-readings). All that matters is how the deepest argument variable is filled in: by context or by hearsay or by a human agent, each forcing the conclusion z.

With respect to what was assumed in 4.1., i.e., that MV select overt theta roles, the discussion in 4.2. forces us to say the following. The overt theta role identifies simultaneously the covert one if the ‘obliger’ is the subject referent in the case of *wollen, mögen*, and if the ‘obliged’ is the subject in the case of *müssen, sollen, dürfen*. This takes place if x, the ‘obliger’ has the theta property of AGENT in the case of *wollen, mögen* and if the ‘obliged’ has the role of PATIENT for the MV-lexicals *müssen, sollen, dürfen, können*. This is, more or less, what the table in (17) tells us in connection with the illustrations in (18a,b) and (19a,b).

6.3.3. How complete is the system of modal verbs in terms of the modal space?

As far as I can see it has never been asked to which extent the range of the present modal verbs cover modality in a – let us say – logical sense.⁸ The question can also be turned around: Is there a logical net of relations covering all 6 or 7 modal verbs at least in their root meanings?

Let us start by considering *sollen*, which shares all meaning-constituting components with *müssen* except for the contingency argument (‘conditions’ vs. ‘hear-say’). (15)-(16) represent root readings of the MV, (17)-(19) epistemic ones (employing, in a telling way, the inferential symbol ‘ \Rightarrow ’). Presupposing that there is always some contrariness relation between p and not-p, *dürfen* ‘may; be permitted’ can be related to *müssen* ‘must; have to’ in the following way (valid only for Standard German, not for some of its dialects); cf. von Wright 1951. [N = ‘necessary’, M = *möglich* ‘possible’]

(20a)	<i>dürfen/können</i> p/	Mp	≡	<i>nicht müssen</i> p/	¬Np
(20b)	<i>nicht dürfen/können</i> p/	¬Mp	≡	<i>müssen nicht</i> p/	N¬p
(20c)	<i>nicht dürfen/können nicht</i> p/	¬M¬p	≡	<i>müssen</i> p/	Np
(20d)	<i>dürfen/können nicht</i> p/	M¬p	≡	<i>nicht müssen nicht</i> p/	¬N¬p

mögen/wollen and *sollen* can be related in this way, too (Bech 1949; Ehrich 2001: 165f.). The strong (Agent) reading of *wollen* is Np as is that of *sollen*. The weaker readings are accordingly are ¬N¬p.

For the two scopal relations of negation (‘internal’ vs. ‘external’ negation: *not Nec* p vs. *Nec not* p; ‘unnecessary’ vs. ‘superfluous’ mode of action) see Bech 1951 and, more recently, Ehrich 2001. Needless to say that languages assign different lexical items to these logical relations (Bech 1951: 8; Ehrich 2001). This divergence across languages includes dialects as well as different historical stages within one and the same language. We shall return to this.

The results of negating MV+V confirms our assumption that DMV is generated inside VP/vP (see Section above).

(21a)	Vater muß eben nachhause gekommen sein	*DMV, EMV
	dad must right now home have come	
(21b)	Vater muß eben <i>nicht</i> nachhause gekommen sein	DMV, *EMV

⁸ To be true, Boye (2001, Section 4.5) has explicitly asked this question for Danish modal verbs. His solution is based on criteria of ‘cognitive force’ and ‘cognitive barriers’ extending the modal space beyond Horn (1978). See the pertinent discussion in Ehrich (2001: 163f.).

dad must right now not home have come

Negation generally suspends the epistemic reading (Ehrich 2001: 161, 162f.). This is clear indication that DMV, the root reading, is inside VP, since Neg is clearly on the immediate left edge of VP/vP. German and Dutch are languages which show this on the surface structure.

I have highlighted what appears to be the closed systematics of the modern modals in Germanic because the early historical occurrences were far from such uniqueness. We pointed out above that OHG *mugan*, etymological cognate of Modern English *may*, was found in usages ranging from deontic necessity to epistemic probability. This is interesting not only in the light of the pervasive claim that epistemics was developing as secondary ‘subjectivization’ and metaphoric use (see, most prominently, Traugott 1986; Traugott&König 1991), but also from the point of view of the fact that quite evidently logical modality had not emerged yet in the form it presents itself in the present stages of the languages. Is there something like a drift, or natural suction, into an exhaustive modality system once the respective verbs are available? If so, then it is not implausible to assume that such a modality drift is likewise reached through other expression means, among which aspect and the lack of aspectual oppositions. In what follows we shall pursue this question further.⁹

6.4. What follows from DMV denoting perfective events?

Let us take up the aspect/Aktionsart criterion again on the D/E-split on MV. I restrict the following illustrations to *wollen* (D/*velle*-E/*praetendere*-type) and *sollen* (D/*obligatus*-E/*dicitur*-type).

		[±Perf] VELLE PRAETENDERE			
(28)	a.	Sie will/mag Primaballerina <u>werden</u> she will/may prima ballerina become	+	+	-
	b.	Sie will/mag Primaballerina <u>sein</u> she will/may prima ballerina be	-	-	+
	c.	Sie will/mag <u>sterben</u> she will/may die	+	+	-*
	d.	Es will/mag einfach nicht schön <u>werden</u> it will/may simply not nice become	+	+	-*
			OBLIGAT	DICITUR	
(29)	a.	Sie soll/muß Primaballerina <u>werden</u>	+	+	-*
	b.	Sie soll/muß Primaballerina <u>sein</u>	-	-	+
	c.	Sie soll/muß <u>sterben</u>	+	+	-*
	d.	Sie soll/muß reich <u>werden</u>	+	+	-*
	e.	daß sie reich <u>werden</u> hat sollen/müssen	+	+	-(+)**
	f.	daß sie reich <u>sein</u> hat sollen/müssen	-	-	+**

The *-cases represent unclear appreciations to the extent that these versions can be used grammatically also for explicit imperfective chains such as *im Sterben liegen/eine Primaballerina sein/nicht schön sein/reich sein* ‘to be dying/be a prima ballerina/be not beautiful/be rich’. (24b) and (25b), the tests to the opposite, support this con-

⁹ Methodologically, this methodological assumption has guided Leiss to explain the loss of the German genitive valence as well as the emergence of the definite article in late OHG. See Leiss (19., 2000).

clusion since no D-readings are admissible. The cases with ** violate, to all appearances, the generalization of the non-finiteness gap for epistemics. I shall return to this.

The correlation of perfective MV-root readings in (30a) and of imbedded event types in (30b) yields this. The critical predicates appear underscored.

- (30) a. Sie will/muß (N/V_i) sie will sie V
 she will/must |→→→→→→→|-----|
 t₁ ¬E₁ t_m E₁ t_n
- b. Sie wird A_i/V_i [+Perf] wird A_i/V_i [+Perf] sie V
 she becomes |-----|-----|
 t₁ ¬E₁ t_m E₁ t_n

The incremental-resultative readings of MV, t₁ - t_m, in (30a) and the perfective embeddings in (30b) are in complete congruence. The time point of the speech act, t_s, refers to the incremental phase just as much as to the resultative phase. See (25b) above. In (31a,b), on the other hand, both event representations are not directly congruent.

- (31) a. Sie will/muß (*N/V_i) sie will sie V
 she will/must |→→→→→→→|-----|
 t₁ ¬E₁ t_m E₁ t_n
- b. Sie ist A_i/V_i [-Perf] sie ist A_i/V_i [-Perf]
 she is |~~~~~|
 t_m t_s t_n

It is essential to see that the event phase of the imperfective embedding, t₁-t_n, can only be mapped onto the uniform process or state phase in (31b), t_m-t_n. This mirrors the non-incremental process phase of the epistemic MV-reading. The reference of t_s, the speech act time, is restricted to E₁ irrespective of the the tense of the embedded predicate.

We have assumed that, due to the distinct theta marking, DMV is inserted in the lexical domain of the syntactic tree. Consequently, non-finite representations are possible. EMV, on the other hand, is merged high in the functional domain of the clausal syntax. Finite inflection has been checked already. Non-finite occurrences are no longer possible in this domain. This is at the bottom of what we have called the ‚Non-finite gap’ of EMV. (47a,b) reached on the basis of independent observations is a direct reflection of this.

- (47) a. for EMV holds: [F_{INP} MOD[-PERF] [TP TEMP [VP V]]]
 b. for DMV holds: [TP TEMP [VP MOD[+PERF] V]]

More concretely, this holds not only for the Perfect and Future periphrasis but also for the synthetic Present tense – albeit without the scope relations in the periphrastic versions expressed in the linear sequence between MV and AUX.

7. Non-canonic deliberations: summary

What follows from this, typologically as well as diachronically?

For what are clear aspect languages today, such as the Romance and the Slavic languages, the prediction that they are likely to express modality by means of adverbs and, perhaps, perfectivity, appears to bear out. No doubt, this has to be investigated more closely before it can be accepted as evidenced. Notice that such languages, in the absence of the polyfunctionality of Germanic modal verbs, will have to refer to expression means for epistemicity other than by modal verbs.

English is another case since morphologically indicated perfectivity fell to demise in Middle English. Under the perspective of fading, but virtually still present perfectivity (at least on the basis of distributional characteristics), English is losing its root meanings – which bears out in US-English. Assume that the class of morphologically simple (i.e., *gi*-deprived) verbs in Modern Standard English are covert, inherent perfectives (*count nouns* in Greenberg's terminology; Elisabeth Leiss/Munich p.c.) and, consequently, implicitly deontic (= inherently implying a future event). See (48a-c).

- (48a) I write a book on semantics = I intend to/want to/will write a book on semantics
- (48b) You write a book on semantics = imperative function or „You should write a book on semantics“
- (48c) He writes a book on semantics. = He intends to/is able to write a book on semantics.

(48a-c) imply genericity, futurity and/or deontic commitment. Given this covert perfectivity (Leiss p.c.) the demise of the modal root verb meanings would be understandable, and would be in perfect congruence with the picture sketched above (compare Hyam's evidence of covert aspectuality and root modality in L1 acquisition). In other words, deonticity/root modality in MstE is not coded overtly by modal verbs, but covertly through the remainder of perfectivity in Modern English *count* verbs. Notice that this does not contradict our earlier claim that the loss of lexical Aktionsart/perfectivity ensues the loss of the DMV/EMV distinction. What happened is that the inherent perfectivity in the major part of the MstE verbal inventory has replaced the root expressivity of modal verbs without showing this on the sleeves of the language.

The indications that this link between overt paradigms and covert oppositions is indeed realistic has numerous instances of confirmation in discussions of various schools of thinking and under divergent horizons (BRØNDSTED 1989 on MV in Danish and Swedish; BURKHARDT 1990 on modal functions of verbal aspect in Russian; CHOI 1999 on the semantics and syntax of Russian МОЧ and СМОЧ AND their aspectual relationship; DOITCHINOV (2001) on L1-acquisition of epistemic *können*; XIAO 1996 on the German modal verbs and their equivalents in Chinese; MILLER 1974 on the relation between mood and aspect in Russian; WILSON 1990 on the aspectual base for the English modal system; and ZYBATOW 1986 on the German EMV and their equivalents in Russian; etc. etc.).

We have seen that the triggering impulse stemming from aspectual systematics as that in OHG and the loss thereof in the course of MHG, respectively, has borne out radical results for the emergence of Modern German and Modern English. In its course, the definite article has evolved (Leiss 2000a,b, 2002, Abraham 1997); as a result of this aspect revolution, the case system of German has undergone a radical change (Loss of the genitive as verbal valence: Leiss 2000a,b, Abraham 1997); a widely extending system of temporality developed and, in its course, full verbs were reanalyzed as formerly unknown auxiliaries (Abraham 1990a). In the present essay, another, completely independent area has been added to these grammar revolutions:

the link between aspect and modality and, more specifically, modal polyfunctionality. The erosion of aspectual oppositions led to profound reorganizations of the grammatical systems in historically cascading processes in the areas not only of ATM, but also of referential deixis and case marking. The focus that we have laid in the present discussion was on root and epistemic modality and their overt as well as covert representations. No doubt, this has wide and deep typological as well as diachronic implications.

It is in this sense that the notion of grammatic(al)ization traditionally taken as a diachronic process which turns lexical items into grammatical formatives needs to be extended. We have shown that there is another, extended, type of grammatic(al)ization beyond contingency upon morphological erosion, loss in semantic complexity, pragmatic significance, syntactic freedom, and phonetic substance, respectively. This notion covers grammatical diachronic changes triggered by covert notions such as semantic oppositions of an implicative nature.

Table 6: Cascading Reorganization of the Grammar of German from OHG onwards

Demise of aspectual oppositions (perfectivizing OHG <i>ge-</i>)	Auxiliarization	Temporality & Sequence of tenses	Case marking (loss of verbal genitive valence)	Definiteness marking by emergence of definite article	Modal polyfunctionality in terms of syntactic distinctions of DMV vs. EMV
Stage 1	+				
Stage 2		+			
Stage 3			+		
Stage 4				+	
Stage 5					+

We have dealt here with Stage 5 exclusively. It is crucial to see that, under the perspective developed here, notions such as epistemic modals arising through subjectivization, metaphorization, implicature, or “an invisible hand” are but superficial, if not epiphenomenal descriptions. They do not serve as explanatory clues to what happened diachronically. And what is more, one cannot speak of ‘epistemic modals’ arising in the course (‘of maturing’, which appears to be the linguists’ implication). Epistemic readings were there all along expressed, however, not necessarily by modal verbs. We saw that aspectual imperfectivity served as one of the clues and that modals took over the job later. It is certainly not plausible to assume that epistemic modality was beyond expressibility for literate speakers of Gothic or Old High German (or Latin or Classical Greek) – if literacy is a prerequisite for epistemic expressibility in the first place.

This opens another diachronic explanatory avenue. Diachronic linguistics is not served well enough if discussions and explanations are reserved to single visible phenomena. Leiss (2000a,b, 2002) has shown in number of discussions what is at issue. If, chiseled down to our range of phenomena, aspect served expressions of case, tense, definiteness, and modality in certain stages of languages this attests to its productive efficiency. But it may cut short linguistic goals under the parsing perspective. Thus, as we have shown, the fact that aspect served the expression of epistemicity in an inceptive stage underwent a therapeutic process under parsing requirements. The language, Middle High and Early New High German, in our specific case, tore apart

the different aspectual components and attributed that of epistemicity to the modal verbs thus rendering them polyfunctional. Note that this type of grammatic(al)ization requires a new type of discussant: one that cannot go only by visible lexical and grammatical phenomena, but one who will be able to read epistemicity in OHG *Thaz wir Kriste sungun in únsere zungun* and, likewise, can argue why EMV cannot occur non-finitely: because, in the absence of lexical theta marking, it has to be licensed outside of VP/vP, i.e. in an FP.

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