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Barbara Meisterernst

A new approach to the development of deontic markers: In Pre-Modern Chinese

Studies done on the early modal system of the Chinese language are usually confined to the so-called 'can-wish' verbs (Peyraube 1999, Liu Li 2000). The reason for this is that modal verbs in Late Archaic Chinese (LAC) (5th–3rd c. BCE) almost exclusively consist of different realizations of the 'first modal' (Leiss 2008: 16) 'can,' along with a small number of verbs that express volition. Modals expressing potentiality appear as the first modals in many languages. Root readings, including true deontic readings, depend on particular syntactic environments; epistemic readings of modal auxiliary verbs are almost exclusively attested in the complement of epistemic or evaluative verbs in Late Archaic Chinese. The category of epistemic modality is predominantly expressed by speaker-oriented modal adverbs having the entire proposition in their scope. The situation changes in Early Middle Chinese (EMC) (starting around the 1st c. BCE according to the periodization employed in this approach), when the modal system develops and new modal verbs derived from lexical verbs make their appearance. This development coincides with the emergence of the source structures of the aspectual markers of Modern Chinese. In Aldridge & Meisterernst (2018) it has been proposed that the change in the aspectual system can be connected to the loss of the morphological aspectual marking of the verb. In Meisterernst (2017a), it has been hypothesized that the loss of a former aspectual morphology also had an impact on the diversification of the system of modal markers in Early Middle Chinese, inspired by a similar proposal on the development of the Germanic modal system in Leiss (2008). Despite the typological differences between Chinese and the Germanic languages, the study of the aspect-modality system on the basis of insights from the Germanic system provides strong arguments for universal constraints on the relation of aspect and modality and for universal tendencies in the development of the modal system.

1 Modal expressions in Late Archaic Chinese

1.1 Modal expression of possibility

Modal verbs of POSSIBILITY and ABILITY constitute the basis of the modal system of Chinese (Peyraube 1999, Liu 2000, Li 2001, Meisterernst 2008a, b). The modal

kě 可 expresses participant-external or root possibility as its basic meaning, usually involving a non-volitional subject, as in (1). The modal *néng* 能 expresses participant-internal possibility, i.e. ability with a causer or agent (volitional) subject as in (2); with a non-volitional subject, it can also express circumstantial participant-external possibility. Volitional and non-volitional subjects show different syntactic constraints. Consequently, the syntax of the subject of the modal predicate can serve to distinguish *dé* 得 and *kě* 可 from *néng* 能 on the one hand, but also the different modal values of *néng* 能 on the other. The modal *dé* most typically has an opportunity reading (Xie 2012) as in (3) and an implicative reading in past tense contexts.

(1) 宋師不整，可敗也。*Zuozhuan, Zhuang* 10.2.1 (LAC)
    Sòng   shī   bù   zhěng,   kě   bài   yě
    Song army NEG in. good. order, KE defeat SFP
    'The Song army is not in good order, it can be defeated.'

(2) 父能生之， 不能養之。 *Xún* 75/19/110 (LAC)
    Fù   néng shēng   zhī, bù   néng yǎng zhī
    Father NENG reproduce OBJ, NEG NENG feed OBJ
    'The father is able to bring it to life, but he is not able to feed it.'

(3) 夫子之身，亦子所知也，唯無咎與偃是從，父兄莫得進矣。
    Zuozhuan, Xiang 27 (LAC)
    Fūzǐ   zhī   shēn, yì   zǐ   suǒ zhī   yě, wéi Wújiù
    Master GEN person, also address SUO know SFP, COP Wujiu
    yǔ   Yǎn shì cóng, fù   xiōng   mò dé jìn   yǐ
    CONJ Yan FOC follow, father older.brother none DE enter SFP
    'The personality of the master (your father) is something you also know, he only follows Wujiu and Yan, and none of our elder relatives can get entrance.'

The etymologies of the three verbs also differ: *kě* 可 'be possible', and *néng* 能 'be able' are derived from state verbs like in (4) and (5); *dé* 得 'get, obtain, manage to, able to, (must)' on the other hand is derived from an achievement verb as in (6). This is one of the features that distinguishes the modal *dé* from the other modal verbs and leads to the hypothesis that at least parts of its function are not, in the strictest sense, modal in Late Archaic Chinese. Of the three verbs, only *néng* expresses participant-internal modality on a regular basis; in this regard it resembles volitional modals (Portner 2009). All three modals are regularly attested as lexical verbs in Late Archaic Chinese. As circumstantial modal verbs they belong

to the category of Modal₂, this term refers to dynamic modals and is explained in the subsequent discussion. Dynamic modals are hosted in the lexical layer (e.g. Cormack and Smith 2002, Butler 2003, Tsai 2015).

a) *kě* 可 **as a lexical verb**
(4) 有無父之國則可也。 *Zuozhuan, Huan* 16.5.3 (LAC)
  Yǒu wú   fù   zhī guó zé   kě   yě
  Have not.have father GEN state then possible SFP
  'If there is a country without fathers, then it is possible.'

b) *néng* 能 **as a lexical verb**
(5) 能信不為人下，吾未能也。 *Zuozhuan, Zhao* 1.1.13 (LAC)
  Néng xìn   bù   wéi rén xià,   wú wèi néng yě
  Able believe NEG be man below, I   NEG able SFP
  'Those who are able to believe are not below others; I am not able to.'

c) *dé* 得 **as a lexical verb**
(6) 申侯由是得罪。 *Zuozhuan, Xi* 5.5.2 (LAC)
  Shēn hóu yú   shì dé zuì
  Shen hou from this get guilt
  'Shenhou had incurred guilt due to this.'

1.2 Expressions of deontic modality

Expressions of deontic modality in the strictest sense, i.e. performative speaker/ addressee oriented modals, expressing obligation, permission or prohibition, are relatively infrequent in Late Archaic Chinese; they only increase in number in Early Middle Chinese. Deontic modals have been proposed to belong to a different category than circumstantial or dynamic modals, the category of Modal₁, necessity modals which scope over negation. These have been analyzed as being hosted in a position in syntax different from dynamic modals (see e.g. Cormack and Smith 2002, Butler 2003, Tsai 2015).

In Late Archaic Chinese, the negative deontic value of prohibition is predominantly expressed by synthetic modal negative markers such as *wú* 無 / 毋 and *wù* 勿 'don't' as in (7a); in Early Middle Chinese these were successively replaced by analytic modal negation using a modal or a neutral NEG + modal verb, such as *wù dé* 勿得 with a modal negative marker + modal verb in (7b).

(7) a. 己所不欲，勿施於人。   *Lúnyǔ* 12 (LAC)
> *Jǐ   suǒ bù yù,   wù   shī   yú   rén*
> Self REL NEG wish, NEG_mod bestow PREP man
> 'What you do not wish for yourself, do not bestow on others.'

   b. 勿得違戾是非，爭分曲直。   *Hou Hanshu, Nüjie* (EMC)
> *Wù   dé   wéi   lì   shì   fēi,   zhēng fēn qū   zhí*
> NEG_mod DE_mod oppose rage right wrong, fight divide crooked straight
> 'She may not oppose and rage against [the distinction of] right and
> wrong nor fight against [the distinction of] crooked and straight.'

The only way to express deontic modality in a direct way is with the deontic modal verb *bì* 必 as in (8a). In Late Archaic Chinese *bì* 必 predominantly expresses 'certainty, necessity', usually corresponding to the English 'must' and the like if verbal, and to modal adverbs such as 'certainly, necessarily' if adverbial. Two functionally different instantiations of *bì* 必 have been proposed in Meisterernst (2013): a) a deontic modal auxiliary verb *bì* 必 'must/need', and b) an epistemic modal adverb 'certainly' (Meisterernst 2013). Since it predominantly refers to future contexts, the analysis of epistemic *bì* 必 as a modal adverb and not as a modal verb is semantically more conclusive. According to e.g. Coates (1983) and Bybee *et al.* (1994), future reference is usually not available for modal auxiliary verbs such as the English 'must' in their epistemic reading, whereas it is the default reference with deontic modals. Syntactically, the modal adverb operates on the level of Complementizer Phrase above aspect and negation, the position typical for epistemic markers, whereas the modal auxiliary verb *bì* 必 appears below and within the semantic scope of negation as in (8b) for the deontic and (8c) for the epistemic reading of *bì*. The low position is the default position of root (circumstantial) modal auxiliary verbs in Late Archaic and Early Middle Chinese, and it is the syntactic position possibility modals occupy in unmarked contexts. The employment of *bì* as a deontic modal is subject to particular semantic constraints and it is not particularly frequent in this function in Late Archaic Chinese.[1]

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1 For a more detailed discussion of *bì* 必 see Meisterernst (2017a and 2017b).

(8) a. 麇曰：必立伯也，是良材。 *Zuǒzhuàn, Ai* 17 (LAC)
    Jūn yuē bì lì   Bó yě, shì liáng cái
    Jun say: BI enthrone Bo SFP, this good talent
    'Jun said: "You must enthrone Bo; he is a talented man."'
    NECESSARY / NEED 'that you enthrone Bo'

   b. 我不必樂，祖父已來，以此為業，若捨此事，無以自濟。
    T04n0202_p0410c *Xianyujing* (EMC*)*
    Wǒ bù bì lè,   zǔfù   yǐ   lái,   yǐ cǐ wéi yè,
    I   NEG BI happy, grandfather already come, YI this make work,
    ruò shě   cǐ shì wú   yǐ zì jì
    if   abandon this duty, not.have YI self support
    'I need not be happy [about it], but since our grandfathers this has been
    made our work; if we abandon this duty, we cannot support ourselves.'
    NOT | NECESSARY / NEED ⇒ 'it is possible not to be happy about it'

   c. 若於身上剜千燈者，必不全濟， T04n0202_p0349c, *Xianyujing* (EMC)
    Ruò yú shēn shàng wān   qiān   dēng zhě, bì   bù
    If PREP body above scoop.up thousand lantern NOM, BI$_{epistemic}$ NEG
    quán   jì
    completely complete
    'If one scoops a thousand lanterns out of the body, it can certainly not
    be achieved completely.'

Another means of expressing deontic modality is to use a doubly negated con-
struction with the possibility modal *kě* 可: NEG *kě(yǐ)* 可(以) NEG *v*P. This con-
struction always codes strong deontic modality, i.e. a strong obligation 'have
to, must'. In contrast to the affirmative construction with *kě* (*yǐ*) 可(以) it never
expresses root possibility (Meisterernst 2008b). The obligation is conveyed in an
indirect way precisely expressing 'it is not possible that not *p* ¬◊¬ *p*' = □*p* 'it is
necessary that *p*'. (9) represents the two different syntactic variants of *kě* 可. The
variant in a. without *yǐ* 以 requires a passivized complement, the second variant
with *yǐ* does not. In (9b) the first modal predicate is contrasted to the second
modal with *bì* 必 which, in combination with negation, expresses deontic exemp-
tion, i.e. anankastic modality.[2]

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2 The relation of modal reading and negation will be discussed in more detail below. For a more
comprehensive discussion on *bì* and negation see Meisterernst (2017b). For the term 'anankastic
modality' see Sparvoli (2015).

(9) a. 君子曰：「位其不可不慎也乎！ *Zuǒzhuàn, Cheng* 2[3] (Late Archaic
Chinese)
Jūnzǐ   yuē: wèi   qí   bù   kě   bù   shèn   yě   hū
Gentleman say: rank MOD NEG KE NEG careful SFP SFP
'The gentleman says: "Rank has to be treated with [special] care!"'

b. 四鄰諸侯之相與，不可以不相接也，然而不必相親也，
Xún 12/10/6 (Late Archaic Chinese)
Sì   lín   zhūhóu   zhī xiāng yǔ,   bù   kě   yǐ bù
Four neighbour feudal.lord GEN mutual be.close, NEG can YI NEG
xiāng jiē   yě, rán'ér bù   bì xiāng qīn   yě
mutual connect SPF, but   NEG BI mutual close SFP
'Regarding the relationship between [the ruler and] the feudal
lords from the four neighboring directions, they must be mutually
connected, but they do not have to be close to each other.'

In Early Middle Chinese, the verb *dāng* 當 'match, correspond' increasingly
occurs as a deontic modal auxiliary verb 'ought, should' (Meisterernst 2011).[4]

(10) 群臣議，皆曰「長當棄市」。 *Shǐjì*: 10; 426 (EMC)
Qún chén   yì,   jiē yuē Cháng dāng qì   shì
All   minister discuss, all say Chang DANG abandon   expose.marketplace
'The ministers discussed it, and they all said: "Chang should be executed
and exposed in the marketplace."'

The following table presents the distribution of the most relevant expressions
of deontic modality. Of these, only the grammaticalization processes of KE (YI),
DANG and YING as markers of deontic modality are at issue in the ensuing dis-
cussion.

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3 There are only seven instances like this in the *Zuozhuan* and all of them have the same comple-
ment verb. In the corpus of *Zuozhuan*, *Lunyu*, *Mengzi*, *Xunzi* and *Zhuangzi* there are altogether 27
instances of *bùkěbù* 不可不, but there are 19 instances alone in the *Shiji*.
4 A comprehensive discussion of *dāng* 當 in LAC and EMC has been provided in Wu Xueru 巫
雪如 (2014). Wu Xueru claims that the deontic, epistemic, and the future readings of DANG are
attested earlier than has generally been proposed in the literature. However, she does not distin-
guish strictly between modal verbs and modal auxiliaries.

Table 1: Modals in LAC and EMC.

	Modal₁: deontic necessity	Circumstantial modals: Modal₂	Modal₂: necessity
LAC	NEG+KE/KEYI+(NEG) (may/must (not)); NEG+DE(+NEG (may/must (not));	(NEG+)KE/KEYI (cannot); (NEG+)DE (cannot); (NEG+) NENG (not able)	BI (necessary)
EMC	NEG+KE/KEYI/NEG+DE(+NEG); (NEG+)DANG (NEG+)YING(+NEG)	(NEG+)KE/KEYI; (NEG+)DE; (NEG+)NENG	BI; XU (need)

2 The interplay of aspect and modality

The analysis of the diachronic development of deontic modal marking proposed in this paper is, to a certain extent, based on observations made on the relation between aspect and modality and the development of the Germanic modal system, particularly in Abraham and Leiss's (2008: xiii). They propose that:
– Perfective aspect is compatible ("converges strongly") with root modality
– Imperfective aspect is compatible ("converges strongly") with epistemic modality.[5]
– Negated clauses as a rule select imperfective aspect only, without necessarily yielding epistemic modality.

Epistemic readings are difficult to obtain among German modal verbs with telic [+terminative] verbs, although this does not account for negation (Heindl 2009). Deontic and epistemic interpretations are possible with atelic [-terminative] verbs (Abraham 2009: 265). The features [+/-terminative] refer to Aktionsart or lexical aspect, i.e. the *telicity* or *boundedness* of a predicate, which refers to the natural initial and final points of a situation. Events (accomplishments and achievements) are [+terminative], bi-phasic (Abraham 2009), and compatible with the perfective aspect; states and activities are [-terminative], i.e. mono-phasic (Abraham 2009), and compatible with the imperfective aspect (e.g. Smith 1997).[6]

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5 Other authors (Maché 2009: 25) are less strict in their assumption with regard to the selectional restrictions of epistemic modals; under certain conditions they can also select the perfective aspect. According to him the main difference lies in the fact that epistemic modificators always operate on the propositional level, whereas non-epistemic modals modify events. His study concentrates mainly on German modals, but he includes some English modals as well.
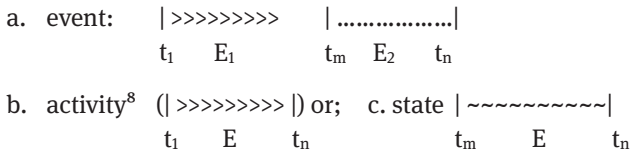**6** See also Vendler's (1967) seminal categorisation of lexical aspects, which distinguishes states, activities, accomplishments and achievements.

Telicity features can be checked by their respective compatibility with duration or time span adverbials. Atelic predicates are compatible with duration phrases, *for x time*, whereas telic predicates are compatible with time span adverbials *in x time*. In (11a) and (11c) the predicate is atelic and unbounded. In (11b) the quantified object shifts the verb 'run' from atelic to telic.
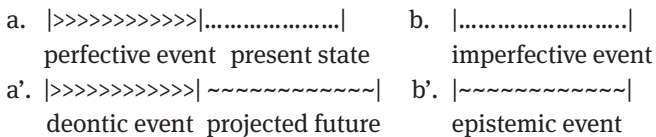
(11) a. Mary drove the car for an hour (-TERMINATIVE)
      b. Mary ran a mile in an hour (+TERMINATIVE)
      c. Mary ran for an hour (-TERMINATIVE)

(12) and (13) represent the event structure following Abraham (2008: 7), and the comparative structures of telicity features and modality by Abraham as summarized in Leiss (2008: 17). For the reading of modal verbs, Abraham (2008: 7 proposes a structure similar to that of telic (perfective) and atelic (imperfective) verbs. According to him, deontic events are bi-phasic, corresponding to [+TELIC/TERMINATIVE] events, and epistemic events are monophasic corresponding to [-TELIC/TERMINATIVE] events.[7]

(12) Event structure following Abraham (2008: 7)
      a. event: | >>>>>>>>> | ....|
                     t_1 E_1 t_m E_2 t_n

      b. activity[8]   (| >>>>>>>> |) or;   c. state | ~~~~~~~~~|
                        t_1 E t_n t_m E t_n

(13) Bi-phasic deontic and monophasic epistemic events
      a. |>>>>>>>>>>>|....................| b. |.........................|
          perfective event present state   imperfective event
      a'. |>>>>>>>>>>>| ~~~~~~~~~~~| b'. |~~~~~~~~~~~|
          deontic event projected future   epistemic event

In the diagrams above, t_1 refers to the initial point of the incremental phase E_1, t_m refers to the initial point of the second, the resultative phase E_2, and t_n refers to a final point of the situation. The point t_m belongs to both phases.

   The diachronic development of the articulate system of modal verbs has been connected to the loss of an earlier aspectual system in the Germanic languages

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7 See also Meisterernst (2017a).
8 The structure of (12b-c) is a version of the structure proposed in Abraham (2008: 7) modified to fit the purpose of this study.

(Leiss 2008: 16): "Languages which have lost an elaborate aspect system tend to develop articles ... as well as a class of modals with deontic and epistemic meanings ..." Germanic modal verbs start to grammaticalize from preterite-presents, and, even more importantly for the present discussion, they tend to embed a perfective infinitive (see Leiss 2008: 18).[9] The feature of perfectivity always includes the future-projecting features typical in deontic modals (Leiss 2008: 19).

This relation is most obvious in the Germanic languages which display a particularly complex modal system. But Abraham claims that even if modal readings are not directly and overtly caused by the aspectual structures of the embedded (infinitival) complement, they are still coded by aspect (Abraham 2009: 251). Two examples from Old English (OE) and from Old High German (OHG) with deontic modals selecting perfective infinitives demonstrate this relation (from Leiss 2008: 26). The infinitive is marked as perfective (resultative) by the prefix *ge-*.

(14) a. OE *thaet ic saenaessas ge-seon   mihte*
             that I sea-bluffs see [PFV-see] might
             'So that I could see the cliffs.' (*Beowulf* 571)

     b. OHG *uuer mag thaz gi-horen*
              who can that hear [PFV-hear]
              'Who can understand that?' (*Tatia*n (Masser-edition). 263, 30)

In Middle High German (MHG) the percentage of *ge*-verbs is highest when embedded by *mugen* 'may' and *kunnen* 'can' (both express possibility). It is also relatively high with *suln* 'should', but it decreases with the deontic verbs *müezen* 'must' and *dürfen* 'may' and the verb *wellen* 'want'. From Old High to Middle High German there is a tendency for *ge*-verbs to appear in contexts independent of their aspectual reading (Behagel 1924, cf Heindl). (Heindl 2009: 124). According to Heindl (idem 125) most of the *ge*-verbs attested in MHG with the verb *mugen* 'may' – but also with *kunnen* 'can' – appear when combined with negation. *Mugen* is most frequently seen with negation in contrast with the also-very-frequent verb *suln* 'should'. This picture resembles, to a certain extent, the situation in Late Archaic and Eearly Middle Chinese where the predominant modals are verbs of possibility along with the modal *dāng* 'should'. The verbs of possibility always require negation in order to obtain a deontic reading.

The following hypothesis will be proposed in this paper: Parts of the reconstructed aspectual morphology of Archaic Chinese may be comparable to the

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9 For a more extensive discussion and a comparison with Slavic languages see (Heindl 2009).

Germanic prefix *ge (ga)-*. The loss of the Chinese morphology may have had a similar effect on the Chinese modal system as the loss of the category of aspect had on the modals in Germanic languages, i.e. an increase in the number and functions of modal verbs and their functions.[10] The proposal is based on the following cross-linguistic insights:

a) In the Germanic languages, the complex modal system develops after the loss of aspectual distinctions. The close relation between aspectual readings of matrix and embedded verbs is evidenced by languages such as Russian or Greek (Rousseau 2009).

b) The aspectual morphology reconstructed for Chinese was no longer productive in Late Archaic Chinese and it most likely started to lose its transparency at that time. This loss led to a number of changes in the syntax of Chinese.

c) Modal verbs are, to a considerable extent, confined to different realizations of the 'first modal' (Leiss 2008: 16) 'can' in the early reported stages of German and Chinese.

d) The first modal KE, which only in combination with negation and in rhetorical questions allows a deontic reading, requires passivized verbs as its complement when unmarked. These refer to a resultant state, thus showing a reading similar to the *ge*-verbs in OHG and MHG.

e) True deontic modal verbs only emerge in the Early Middle Chinese period, and systematic and context free epistemic readings of modal verbs develop even later; this is the typical grammaticalization path for modal verbs reflected, for instance, by the Germanic languages. Epistemic readings are also infrequent in MHG (Heindl 2009: 153).

This study does not focus on the semantic development of modal markers from deontic to epistemic readings, frequently at issue in studies on grammaticalization paths of modal verbs including those on Chinese modal verbs (e.g. Peyraube 1999, Li 2001). The present approach attempts to figure out the earliest stages of the development of the Chinese modal system based on Abraham and Leiss's (2008) hypothesis on the early development of the Germanic modal system. Abraham and Leiss (2008) propose a strong and possibly universal relation between the verbal aspect and either the root/deontic or the epistemic reading of a modal verb. When the Germanic languages lose the former category of aspect (especially the perfective *ge*-verbs), they start to develop an elaborate class of deontic

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10 See also Sybesma's (1994): the aspectual marker *–le* in Modern Mandarin and its diachronic development can functionally be compared to the Germanic prefix *ge (ga)-*, which e.g. expressed completion in Middle Dutch (Sybesma 1994: 41).

and epistemic modal verbs. Modal distinctions had previously been expressed by the interplay of aspectual and temporal markings alone. The diachronic development in the Germanic languages in contrast to other Indo-European languages obviously points to a close and possibly universal relationship between the categories aspect (lexical and/or grammatical aspect) and modality.

Meisterernst (2017) proposes that some of the functions of the reconstructed aspectual morphology of Archaic Chinese may have been comparable to the Germanic prefix *ge (ga)-*, and that the loss of derivational morphology may have had a similar effect on the Chinese modal system than the loss of the category of aspect had on modals in Germanic languages.

3 The historical phonology and morphology of Chinese

Studies on the historical phonology of Chinese demonstrate that Chinese must have had a kind of morphology by affixation comparable to that of related languages such as Tibetan or Burmese (Sagart 1999, Gassmann and Behr 2005, Jin 2006, and Schuessler 2007). But this morphology was, to a great extent, obfuscated by the Chinese writing system. Additionally, the Chinese morphology disappeared much earlier than in e.g. Tibetan and Burmese; it had been entirely lost at the time of the earliest Tibetan written documents (6th c. CE). According to Schuessler (2007: 41), even one of the youngest derivational morphemes, i.e. the suffix *-s*, proposed in the literature (e.g. Jin 2006) as a marker of the perfective aspect, had "become a general purpose device to derive any kind of word from another" in Archaic Chinese. In many studies the verbal morphology reconstructed for Archaic Chinese is connected to distinctions within the grammatical aspect, i.e. the perfective and the imperfective aspect, a distinction between transitive and intransitive verbs and/or causative and unaccusative verbs (see e.g. Jin 2006, Mei 1988, 2015). In Meisterernst (2016) it has been argued that the aspectual distinctions expressed by the reconstructed verbal morphology concern lexical rather than grammatical aspect. Lexical aspect, Aktionsart, is generally derived by derivational morphology (Kiefer 2010: 145), the kind of morphology proposed as typical for the Tibeto-Burman languages. The aktionsart morphology adds semantic features to the verb such as ingressivity, terminativity, iterativity, etc. (Kiefer 2010: 145). This fits well the meanings proposed for a number of derivational affixes reconstructed e.g. in Sagart (1999). Two different derivational processes have been proposed for the distinction of verbal aspects (e.g. Unger 1983, Huang 1992, Jin 2006):

a) The suffix *-s* indicating perfective aspect (Haudricourt 1954, Downer 1959, Unger 1983, Sagart 1999, Jin 2006, etc.); or
b) A voiceless (imperfective) – voiced (perfective) alternation of the root initial possibly caused by a former sonorant nasal prefix or by the causative prefix *s- (Karlgren 1933; Mei 1988, Baxter and Sagart 1998, etc.).

The first of these processes, the 'derivation by tone change' *sì shēng bié yì* 四聲別意 is attested with words of any of the tonal categories A (*píng* 平), B (*shǎng* 上), and D (*rù* 入), which are transformed into Category C (*qù* 去).

(15) verbs with a *qùshēng* variant resulting from a reconstructed suffix *s-
    a. *chí* 治 *drɨ/drɨ* (*r-de*) 'govern' <> *zhì* 治 *drɨ*[h] (*r-de-s*) (Jin 2006: 511) 'well-governed'
    b. *guō* 過 *kwa* (*kor*) 'pass by' <> *guò kwa*[h] (*kor-s*) 'exceed, transgress(ion)'[11]

(16) Tone Change without change of meaning[12]
    a. A *píng* 平 >>> C *qù* 去
      guàn 貫 kwan <> (kwan[h])'pass through' 'perforate' (Jin2006: 332)
    b. B *shàng* 上 >>> C *qù* 去
      guàn 盥 kwan'[13] <> kwan[h] 'wash the hands or face' (Jin 2006: 79 voicing alternation)

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11 Schuessler (2007: 40) argues that "Word classes like 'noun' are unmarked in CH, hence tone C does not make a noun out of a verb, as is often maintained.". Derived *qùshēng* nouns were, in fact, originally verb forms, e.g. 'resultant state' (Jin 2006), or passive forms (Schuessler (exopassives by tone the suffix *-s* = Tone C)).

12 *Unger,* Hao-ku, 28.3.1983, 157. It has to be conceded that the system of morphological derivation in Archaic Chinese is still very unclear and regular patterns are difficult to determine (for a discussion see e.g. Harbsmeier 2016). Nevertheless, there is some evidence that part of the morphology reconstructed for Archaic Chinese was closely related to aspectual structures. Additionally, the fact that a new aspectual system develops in Early Middle Chinese is best explained, if we assume that a former system of aspectual marking was lost at that time which forced a new system to develop; this would be a natural development in human languages. This development is coincidental with a number of changes in the syntax of Chinese at the same time, which may also be connected to the loss of morphological marking.

13 Only Early Middle Chinese according to Pulleyblank (1991).

    c. D *rù* 入 >>> C *qù* 去

        bì 閉 pɛt[14] <> pɛj^h 'bar a door, shut' (not in Jin 2006)

Category C is supposed to have developed from a former derivational suffix *-s which changed into -h and further into the *qùshēng*. This process most likely took place at the end of the Late Archaic and in the Early Middle Chinese periods (beginning with the 1st c. BCE); the differences in pronunciation resulting from it are e.g. reflected in the *fǎnqiè* 反切 glosses to the Classics from the Han period on. Double readings and minimal pairs with readings in one of the mentioned categories and in Category C are relatively frequent. Jin (2006) proposes basically two different functions of the suffix *-s (e.g. 2006: 317, 321, 325f): a transitivization function and a deverbalization function (Jin 2006: 325).[15] For the latter, he claims that the change from verb to noun can often be subsumed under a change from the imperfective to the perfective aspect (Jin 2006). The latter form, referring to a resultant state, has subsequently been employed as an adjective or a noun, to the effect that the perfective aspect often involves a deverbalization process, resulting in deverbal adjectives and nominals (Jin 2006: 323f); sometimes this process is reflected by different graphic variants. The same process is also attested in Classical Tibetan (Jin 2006: 325, 329). The suffix (OC *-s, *-h) is probably related to the Tibeto-Burman suffix -s (Huang 1992, Jin 2006, Schuessler 2007: 42, etc.); this was the most productive derivational affix in Classical Tibetan and obviously had aspectual functions.[16] Together with the past it also appears in the imperative, i.e. in a clearly modal and future-projecting function.

(17)		Present	Past	Future	Imperative
	'finish'	*Sgrub*	*Bsgrubs*	*Bsgrub*	*Sgrubs*

When the aspectual system of Tibetan disappeared, it was gradually replaced by a new system consisting of a copula and the development of two new markers of perfective and imperfective aspect (Saxena 1997). According to Saxena (1997: 288), in the first documents in Written Tibetan, i.e. in *Dunhuang* manuscripts from the 6th century, the Tibetan morphological aspectual system is still largely attested, although first traces of its decay can already be perceived in these

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14 Only Early Middle Chinese according to Pulleyblank (1991).

15 These derivations are also discussed in Xing and Schuessler (this volume) as instantiations of transitivity, direction, and voice.

16 This −s never occurs following coronal finals *d n l r s*. (In some older texts, a −d allomorph exists after coronal finals.)

texts. In Classical Tibetan the consistent morphological marking of tense/aspect was already lost and the same structure is used for imperfective and perfective (Saxena 1997: 291) aspects. Saxena (1997: 304) concludes that the loss of the tense/aspect system coincides with the development of a new periphrastic construction expressing distinctions formerly marked by the tense/aspect morphology. Although the new Tibetan structures are somewhat different from the new aspectual structures developing in Chinese, the emergence of a new aspectual system at the beginning Early Middle Chinese period can similarly be connected to the loss of former aspectual morphology in Archaic Chinese. This has been proposed in Meisterernst (2016) and in Aldridge and Meisterernst (2018).

Example (18) from LAC shows the alternation between a Category A and a Category C reading. The *qùshēng* reading in (18b), which developed from a former *-s/*-h* suffix, evidently refers to an achievement and the state resulting from a preceding telic event while the reading in (18a) is transitive and causative.

(18) a. 政以治民， 刑以正邪。 *Zuǒzhuàn, Yin* 11 (LAC)
         Zhèng   yǐ chí (*r-de (*drì))mín, xíng   yǐ zhèng xié
         Government YI regulate people,   punishment YI correct bad
         'The government is necessary in order to correct the people; the
         punishments are necessary to correct the bad.'

      b. … 使為左師以聽政，於是宋治。*Zuǒzhuàn, Xi* 9 (LAC)
         …Shǐ wéi   zuǒshī yǐ   tīngzhèng, yúshì
         Cause become *zuoshi* and manage.government, thereupon
         Sòng zhì (*r-de-s (drìʰ))
         Song ordered
         '… he made him Zuoshi and let him manage the government, and
         thereupon Song was well ordered.'

Another form of derivation is the 'derivation by a voicing alternation' *qīng zhuó bié yì* 清濁別意, an alternation of a voiced and a voiceless initial with functions similar to the derivation by tone change. The voicing alternation is reflected by tonal differences and/or by differences in the initial consonant in Modern Mandarin (see also Xing and Schuessler, this volume).

(19)   Verbs with an alternation between a [-voice] and a [+voice] initial

Transitive variant				Intransitive, unaccusative (ergative) variant			
bài	paij^h	敗	destroy	*bài*	baij^h	敗	destroyed (unaccusative)
zhé	tɕiat	折	break	*shé*	dʑiat	折	broken[17]
jiàn	kɛn^h	見	see	*xiàn*	ɣɛn^h	見	be visible[18]

Baxter (2000: 218, following Pulleyblank 1973) attributes the voicing effect to a pre-initial element *-ɦ provisionally reconstructed for words with a cognate with a voiceless initial. Mei (2015) on the other hand proposes that a causative prefix *s- is responsible for a devoicing effect on an originally voiced initial. A causative prefix *s- has been reconstructed for Archaic Chinese and it is also well attested in Classical Tibetan (and other Tibeto-Burman languages) together with a voicing alternation. However, only very few cases of a causative prefix can be reconstructed with certainty in Archaic Chinese (Jin 2006). The situation is different with regard to a causative suffix (Jin 2006, Wang 2013).

Several arguments can be put forward in favor of the analysis of the voiced variant as the derived one and not the basic one. The first argument comes from Lin (2006: 52f) who shows that in Tibetan, no devoicing takes place following the s- prefix. According to him (Jin 2006: 109), the causative-unaccusative alternation is based on an earlier aspectual distinction. The second argument is that the unaccusative variant is always voiced. It would be difficult to account for that if it were the base form. Xing and Schuessler (this volume) argue with the straightforward active meaning of the voiceless variant against Mei's proposal. As an argument from Indo-European languages, one could add that the unaccusative form in pairs like 'break' 'broken' is always the derived form. In many Germanic languages, the 'ga/ge' prefix has basically the same function as the supposed *N-prefix (causing voicing) or the *-s suffix in Archaic Chinese.

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17 The Middle Chinese reconstructions follow Pulleyblank (1991). The two variants of both verbs *bài* 敗 *and zhé* 折 *are discussed in* Jin (2006: 82f) under the label of volitional verbs (*zìzhǔ dòngcí* 自主動詞*) and in the context of causation, and transitivity. Jin assumes that the change from voiceless to voiced causes a loss of volition and of transitivit*y (2006: 84). This argues for a localisation of these affixes in the domain of an articulated vP on a par with Travis's (2010) proposal.

18 The two readings of 見 are discussed in Jin (2006: 67f) under e.g. the label of agentivity (*shìshì xìng* 施事性*); a voiced initial appears with a theme subjec*t (*shòu shì* 受事*), and a voiceless initial with an agentive subject (*shī shì* 施事*). This analysis corresponds well to the change in the semantics of the other verbs presented in this group; however, the subject of the transitive variant of the ver*b *jiàn* 見 *is probably better labelled as an experiencer than as an agent of the verb. According to* Jin (2006: 71) the distinctive syntactic characteristic connected with a voiced initial is the lack of a subject which functions as the actor (*dòngzuò de zuòzhě* 動作的作者*) of the action expressed by the ve*rb.

This alternation of voiced-voiceless initials had already been connected to different verbal functions 'intransitive/passive – transitive' in the *Jīngdiǎn shìwén* (6th c. CE); the proposed functions are similar to the aspectual alternations assumed for the more frequent suffix *-s*, the source of the 'derivation by tone change'. Example (20) represents the voicing alternative with the verb *bài* 敗 'defeated, defeat', one of the verbs discussed e.g. in Mei (2015). This example seems to display the same alternation between an unaccusative and a causative variant of the verb as seen in example (18). The voiced variant is unaccusative, characterised by a theme subject; unaccusative verbs are typical telic (achievement) verbs compatible with the perfective aspect. The voiceless variant is transitive and causative.

(20) a. 蔡人怒，　故不和而敗。　　*Zuŏzhuàn, Yĭn* 10 (LAC)
   Cài rén nù,　gù　bù　hé　　ér　　bài (**blad-s, ɦprats*)[19]
   Cai man angry, there NEG harmonize CONJ defeated
   'The people of Cai were angry, and therefore they were not in harmony and were defeated.'

  b. 惠公之季年，敗宋師于黃。　 *Zuŏzhuàn, Yĭn* 1 (LAC)
   Huì gōng zhī jì　nián, bài (**plad-s, prats*) *Sòng shī　yú Huáng*
   Hui duke GEN last year, defeat   Song army at Huang
   'In the last year of Duke Hui, he defeated the Song army at Huang.'
   (see also Jin Lixin 2006: 83f)

The semantic differences between the two morphological alternations, i.e. between the reconstructed suffix *-s* and a reconstructed sonorant prefix have yet to be assessed. Possibly, verbs of the first category (*-s*) display distinctions between atelic and telic, i.e. resultative, and those of the second category (voicing alternation) display a distinction between causative and anticausative.[20] One argument for this could be that verbs of the second group do not seem to allow the introduction of an agent; if they are followed by a PP this usually introduces a

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20 Xing and Schuessler (this volume) propose that the voicing alternation is employed if the transitive variant already has an *-s suffix. However, this does not account for the possible difference in the passive constructions between verbs with the voicing alternation and those with a *-s suffix.

locative and not an agent in Archaic Chinese.[21] This would be typical for anticausative verbs. (Li Yin ms.) By contrast, at least the verb *zhì* 治 of the first category does allow the introduction of an agent as in example (21a).

(21) a. 勞心者治人，勞力者治於人； *Mengzi* 3.1.4 (LAC)
        Láo xīn   zhě chí   rén; láo lì zhě   zhì
        Exert mind-heart REL govern man; exert strength REL
        yú rén
        governed by man
        'Those who exert their minds, govern others; those who exert their strength are governed by others.'

      b. 十九年春，楚子禦之，大敗於津。*Zuozhuan, Zhuang* 19 (LAC)
        shí jiǔ   nián chū,   Chǔ zǐ yù   zhī, dà   bài   yú jīn
        ten nine year spring, Chuzi fend OBJ, great defeated at ford
        'In the spring of the nineteenth year, the Prince of Chu fought against them and was greatly defeated at the ford.'

These examples show the relevance of studies on historical phonology for the analysis of Chinese diachronic grammar and specifically for the analysis of the aspectual system of Chinese. If Abraham and Leiss (2008) are correct in their hypothesis on universal relations between modal readings and the aspectual feature of the complement verb, a loss of a morphological marking can be expected to induce changes in the syntax of the language.

    Early Middle Chinese was subjected to a number of substantial changes. Although Chinese never was a synthetic language comparable to the Indo-European languages, a drift from a more synthetic to a more analytic language can be observed particularly in the verbal system during this period. This includes changes in light verb constructions, the emergence of resultative constructions, disyllabification processes etc. (see e.g. Huang 2014, Feng 2014, Mei Guang 2015, Hu 2016, and others), a change from synthetic to analytic modal negation, from synthetic to analytic causative constructions, the development of the source structures of the aspectual systems in the Modern Sinitic languages and more. Some of these features and their changes in historical syntax have been discussed e.g. in Lin (2001) and briefly in Feng (2014) and others. The hypothesis proposed in this paper is that these changes can be

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21 This situation changes later and verbs such as *bài* 敗 are permitted in the *wéi* 為 ... *suǒ* 所 passive construction. The functional distinction between the two affixes still requires more research.

attributed to the entire loss of the former derivational morphological system of Chinese. In the aspectual system, distinctions are increasingly expressed by lexical means, i.e. by aspectual adverbs and possibly by sentence final particles, before a new structure for the marking of aspect develops in the EMC period. In the modal system, the entire loss of any morphological marking of aspectual distinctions may have triggered the development of a more complex system of modal marking and the emergence of the first true deontic verbs in Chinese.

4 Deontic markers in Late Archaic and Early Middle Chinese

4.1 The first deontic modal verbs in Late Archaic Chinese and Early Middle Chinese

In Late Archaic Chinese, deontic modality is almost exclusively expressed by verbs of possibility. A deontic reading of these modals requires negation or the particular syntactic context of rhetorical questions. But negation does not necessarily yield a deontic reading. The most frequent of modal verbs expressing obligation in Late Archaic Chinese is the possibility modal *kě* 可 appearing in combination with double negation BU KE (YI) BU: 'cannot not ≫ have to, must'. In this combination, the deontic reading is mandatory, whereas with simple negation preceding KE: BU KE(YI), both deontic or circumstantial possibility readings are available. The interchange between a deontic and possibility reading can be accounted for by the fact that the negation of possibility is semantically equivalent to necessity: it is not possible that not $p \neg \Diamond \neg p$' = $\Box p$ 'it is necessary that p'. The semantic differences between possibility and necessity become particularly obvious under the scope of negation (Cormack and Smith 2002). According to the scopal features of negation, two different categories of modal verbs can be distinguished in English: Modal$_1$ which scopes over negation (necessity), and Modal$_2$ which is in the scope of negation (possibility, circumstantial readings) (Cormack and Smith 2002, also Butler 2003). Of the modal verbs of Late Archaic Chinese, only *kě* 可 will be discussed here, because it most typically obtains deontic functions. One of the reasons for this may be its particular syntactic structure, requiring a passivized resultative complement in unmarked employment. *Dé* 得 can also have deontic readings, but because it differs structurally and semantically from *kě* 可, it will not be included in

the discussion. The possibility modal *néng* 能 basically expresses participant-internal ability; root (deontic) readings do not occur unless they are induced by an additional deontic marker, e.g. a deontic negative marker. The modal auxiliary verb *bì* 必 will also be excluded from the discussion because the scopal features of negation demonstrate that it remains in the lexical layer in Late Archaic and Early Middle Chinese (Meisterernst 2017b). The same accounts for the modal *xū* 須 which appears as a modal verb in Early Middle Chinese and which is syntactically and semantically similar to *bì*. Following the analysis of the modal verb *kě*, the newly emerging modal verbs *dāng* 當 and *yīng* 應 will be discussed briefly.

4.1.1 The modal verb *kě* 可

The basic modal reading of the verb *kě(yǐ)* 可(以) 'can, possible' is to express circumstantial root possibility (Meisterernst 2008a). This is a participant-external prospect that is due to factors and circumstances that fall outside the participant's control. In this function, it belongs to the class of 'first modals' (Leiss 2008: 16). Syntactically, it is located in the lexical layer according to Tsai's (2015) cartographic approach to modals in Chinese.

In contrast to the other modal auxiliary verbs discussed in this paper, for the complement of *kě* 可 different analyses are mandatory in LAC depending on the presence or absence of the functional head *yǐ* 以. These are:

a) *kě* 可+*v*P:[22] the complement verb is passivized referring to a resultant state; the internal argument of the event appears in subject position, the complement verb focuses on the change of state point; the causer (agent) of the event is not included;

b) *kěyǐ* 可以+ *v*P: the complement verb remains transitive or intransitive, the external argument of the complement verb appears in the subject position and can be the agent (causer) of a transitive verb, or the agent, or the experiencer (e.g. with adjectives or state verbs) of an intransitive verb. Only state verbs which can include an event variable are available for this construction.

In Early Middle Chinese, the stringent distinction between the complements of *kě* 可 and of *kě yǐ* 可以 weakens considerably (see Meisterernst 2008a) and the

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22 The complement of KE is not a simple VP, but has a more complex structure, which may contain a causative head and an Inner Aspect Phrase in which telicity is generated.

complement of *kě* 可 is not necessarily passivized any longer; this is exemplified in (22c).[23] (22a) represents the first structure, and (22b) represents the second structure.

(22) a. 紂 可 伐 矣 。 *Shǐjì*: 3; 108 (EMC)
   Zhòu kě fá yǐ
   Zhou can attack FIN
   'Zhou can/must be attacked.'

   b. 晉 其 可 以 逆 天 乎 ? *Shǐjì*: 39; 1653 (EMC)
   Jìn qí kě yǐ nì tiān hú
   Jin MOD can YI go-against Heaven FIN
   '... could Jin possibly go against Heaven = it may not go against Heaven?'

   c. 臣 愚 以 為 可 賜 爵 關 內 侯 *Hànshū* 36: 1947 (EMC)
   chén yú yǐ wéi kě cì jué guān nèi hóu,
   I stupid assume can bestow rank pass inner marquis,
   'I am stupid, but I assume that you can / should bestow upon him a position and make him marquis of Guannei, ...'

The possibility modal *kě* 可 is the only modal verb in Late Archaic and Early Middle Chinese which requires a theme subject and a passivized (resultative = perfective) complement on a regular basis. In this particular requirement it can be compared to the Old High German and Old English deontic verbs which have a perfective infinitive complement marked by the prefix *ge-*. Perfective infinitives with *ge-* most frequently appear with the verbs *mugen* 'may' and *kunnen* 'can', which both express possibility and are thus semantically similar to the verb *kě*. The external argument of the complement verb of *kě* can only be licensed in the presence of *yǐ*.[24] In both constructions KE+VP[25] and KEYI+VP, the complements selected refer to events or to states resulting from a previous event: with KEYI the complement verb retains its original lexical aspect, and with KE it always refers to an achievement, a resultant state. The complement verbs can belong to those verbs which show a morphological distinction between causative and unaccusative/resultative readings, but they do not have to. All verbs, for which either the suffix *-s* or the voicing alternation are reconstructed can appear as

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23 For a discussion on the different analyses of this construction and the role of *yǐ* 以 see Meistererernst (2008a).
24 I will not discuss the exact functional status of *yǐ* in this paper. This is still subject to debate (e.g. Meistererernst 2008a, Djamouri 2009, Aldridge 2012). But according to Aldridge (2012) it can be analysed as an applicative head, which has the function to add an argument to the structure.
25 Capitals refer to a construction or a functional category.

the complement of KE. Thus there is no constraint with regard to a distinction between verbs that are permitted in the *yú* 於 passive in Late Archaic Chinese and those that apparently are not. Although Li Yin (ms.) shows that verbs of all situation types can appear in the *yú* passive, i.e. in passive constructions in which the agent is introduced by the preposition *yú*, the verbs with a voicing alternation, such as *bài* 敗, do not seem to be permitted in this construction (see (20) and (21)). Possibly, verbs with the voicing alternation are marked morphologically as true anti-causative verbs which are characterized by the constraint of not permitting an agent.

As already mentioned deontic readings of possibility modals first appear in combination with negation or in rhetorical questions (see Liu 2000, Li 2001, Meister-ernst 2008b).[26] Following Tsai's (2015) analysis of modals in Modern Mandarin, circumstantial and deontic readings should differ syntactically. Tsai (following Rizzi 1997) proposes that the different modal readings are generated in different syntactic layers: epistemic modality is realized in the CP layer; deontic modality is realized in the TP layer, and dynamic/circumstantial modality is realized in the *v*P layer. Other approaches to the syntax of adverbials propose similar distinctions into two different modals (see e.g. Butler 2003). Cormack and Smith (2002) propose a functional head Pol(arity) (POS/NEG) in TP, which divides modals into two groups according to the semantic scope of negation:

1) Modal$_1$ in the pre-Pol (POS/NEG) position = deontic modality (necessity);
2) Modal$_2$ in the post-Pol position = dynamic / circumstantial) modality (possibility).

The pre-Pol position corresponds to the inflectional (TP) layer in which deontic modality is generated, and the post-Pol position corresponds to the lexical layer in which dynamic modality (possibility and root possibility) is realized (according to Tsai's cartographic approach). Since negation plays a vital role in the distinction of the different modal readings of KE, an analysis of the semantic scope of negation following Cormack and Smith (2002) will be employed to provide arguments for the different syntactic realizations of the originally dynamic modal in Late Archaic and Early Middle Chinese. The proposal of a polarity head accounts particularly well for the strong deontic reading of KE in combination with double negation.[27]

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26 The close connection between modal readings and negation was pointed out by Lü Shuxiang (1942).

27 The precise syntactic analysis is not at issue here; it will be discussed in a separate study.

- Simple negation with *kě* 可: NEG *kě* 不可

In simple negation, with a negative marker preceding *kě*, the modal verb is polysemous: two different readings, the circumstantial and the deontic reading are possible. In the circumstantial possibility reading, the modal verb is in the scope of the negative marker. It can be paraphrased by: 'not possible that V': NOT [POSSIBLE V = root / circumstantial possibility. In the second reading the modal functions as a necessity operator, the negation marker is within the semantic scope of the necessity marker. This can be paraphrased by: 'necessary that not V': NECESSARY [NOT V = deontic necessity reading. The circumstantial reading is represented by (23), and the deontic necessity reading is represented by (24).

(23) a. 鼻大可小，小不可大也。 *Han Fei zi* 23 (LAC)
          Bí   dà kě xiǎo, xiǎo bù   kě dà yě
          Nose big can small, small NEG KE big SFP
          'If the nose is big it can be made smaller, if it is small it cannot be made bigger.'
          Paraphrase: 'it is not possible that it is made bigger': NOT [POSSIBLE

      b. 此城最勝。諸方所推。不可破壞。 *Taishō* 1; no.1, p.12c (EMC)
          Cǐ   chéng zuì shèng,   zhū fāng   suǒ tuī,
          This city   most superior, PL direction REL press,
          bù   kě   pòhuài
          NEG can destroy
          'This city is most superior: from whatever direction it is pushed against, it cannot be destroyed.'
          Paraphrase: it is not possible that it can be destroyed; NOT [POSSIBLE

(24) a. 君子曰：「善不可失，惡不可長， ... *Zuozhuan, Yin* 6 (LAC)
          Jūnzǐ   yuē: shàn bù kě shī,   è   bù kě cháng
          Gentleman say: good NEG can neglect, evil NEG can prolong
          'The gentleman says: "The good may not be neglected; the evil may not be prolonged."'
          Paraphase: it is necessary that the good not be neglected ...
          NECESSARY [NOT

      b. 我今寧當捨此身命，不可毀破三世諸佛所制禁戒。 *Taishō* 4; no.202, p.381b (EMC)
          Wǒ jīn níng   dāng shě   cǐ   shēn mìng, bù   kě
          I now MOD_epistemic DANG abandon this body life,   NEG can

huǐpò   sān shì   zhū fó   suǒ zhì   jīnjiè
destroy three period PL Buddha REL determine precept
'I now should rather abandon this body and life; I must not destroy
the precepts which the Buddhas of the three periods determined.'
Paraphrase: it is necessary not to destroy ... NECESSARY [NOT

–Double negation with *kě(yǐ)*: NEG *kě(yǐ)* NEG 不可(以)不
The doubly negated construction NEG *kě(yǐ)* 可(以) NEG *v*P always codes strong
deontic modality, i.e. a strong obligation 'must'; it never expresses root possibil-
ity (Meisterernst 2008b). The literal meaning of the construction is 'it is not pos-
sible that not *p* ¬◇¬ *p*', resulting in the reading of □*p* as 'it is necessary that *p*'.
The deontic reading is derived from the strong positive polarity triggered by double
negation. The complements in this construction do not differ syntactically from
the complements of KE in its circumstantial reading. In (25), the verbs are both
transitive and passivized, referring to a resultant state that must be obtained in the
future; the patient of the passivized matrix verb appears in the subject position.

(25) a. 不敬二君，不可不討也。 *Zuǒzhuàn, Dìng* 6 (LAC)
      Bù   jìng   èr jūn,   bù kě bù tǎo   yě
      NEG respectful two prince, NEG can NEG punish SFP
      '... he is disrespecting the two princes, and [thus] he has to (< cannot
      not) be punished.'
      Paraphrase: it is necessary that he be punished: NECESSARY [POS

     b. 范、中行數有德於齊，不可不救。 *Shǐjì*: 32; 1505 (EMC)
      Fàn, Zhōngháng shuò yǒu dé   yú   Qí, bù kě bù jiù
      Fan Zhonghang often have favour PREP Qi, NEG can NEG rescue
      'The Fan and Zhonghang families have often done favors to Qi; they
      have to (< cannot not) be rescued.'
      Paraphrase: it is necessary that they be Ved: NECESSARY [POS

In (26), originally intransitive verbs appear as complement of *kě*. Since *kě* requires
the internal argument of the complement verb as its subject, originally intransi-
tive verbs are causativized in order to license an internal argument which can
move up to the subject position. The complement verb again refers to a resultant
state projected into the future.

(26) a. 君子曰：「位其不可不慎也乎！ *Zuǒzhuàn Chéng* 2 (LAC)
      jūnzǐ   yuē: wèi   qí   bù kě bù shèn yě hū
      gentleman say position_theme MOD NEG can NEG careful SFP SFP

'The gentleman says: "The rank has to be (< cannot not be) treated carefully!"'
Paraphrase: it is necessary that it be Ved: NECESSARY [POS

b. 親而不可不廣者，仁也； *Zhuāngzǐ* 11.5.10 (LAC)
Qīn   ér   bù   kě   bù   guǎng zhě,   rén   yě
intimate CON NEG can NEG broaden REL_{subj_theme}, benevolence SFP
'What is intimate but has to (< cannot not) be broadened – this is benevolence.'
Paraphrase: it is necessary that it be Ved: NECESSARY [POS

In (27), the passivization effect of KE is neutralized and the external argument of the complement verb is licensed in the subject position by the insertion of *yǐ* 以 following *kě*. In (27a) and (27b), the subject is agentive. The verbs in the complements of the modal all include an event argument. The verb in (27c) is an originally intransitive verb which remains intransitive due to the presence of *yǐ*, which is required to license an external argument as the subject of *kě*.

(27) a. 君子不可以不剀心焉。 *Zhuāngzǐ* 12.2.1 (LAC)
Jūnzǐ   bù   kě   yǐ bù   kū   xīn   yán
Gentleman NEG can YI NEG cut.open heart PP
'A gentleman must (< cannot not) cut open his heart for it.'
Paraphrase: it is necessary that V: NECESSARY [POS

b. 大將軍尊重益貴，君不可以不拜． *Shǐjì*:120; 3108 (EMC)
dà   jiàngjūn zūn   zhòng   yì   guì,   jūn
great general   venerable important more honour, prince
bù   kě   yǐ bù   bài
NEG can YI NEG bow
'The great general is very important and is receiving more and more honours; you have to (< cannot not) bow to show him your reverence.'
Paraphrase: it is necessary that V: NECESSARY [POS

c. 齊將伐晉，不可以不懼。」 *Zuǒzhuàn Xiāng* 22 (LAC)
Qí jiāng fá   Jìn, bù   kě   yǐ bù   jù
Qi FUT   attack Jin, NEG can YI NEG fear
'Qi will attack Jin; we have to (cannot not) be(come) afraid.'
Paraphrase: it is necessary that V: NECESSARY [POS

Due to its characteristics of always referring to a telic (accomplishment or achievement) event, the VP in the complement of KE(YI) is bi-phasic, the condition for non-epistemic modal readings. The complement of KE can refer either to the process event E_1 (including t_m) or to the resultant state event E_2 (including t_m) with verbs which have the structure proposed for event (terminative) verbs in Abraham and Leiss (2008: XIII). In LAC, the complement of KE always refers to E_2; in order to refer to E_1, the insertion of YI is required. Temporally, the predicate has the characteristic $S \neq E$ (speech time is not identical with, i.e. it precedes, event time), which structure is proposed for deontic modality in Japanese by Narrog (2008) and is the general structure for deontic modality which typically refers to an obligation performed in the future.,[28]

(28)   event: | >>>**[**>>>>>> | ....**]** ....|
           t_1 **[**E_1 t_m E_2**]** t_n
           不可不   不可不
           deontic event   projected future

4.2 New deontic modal verbs in Early Middle Chinese

The two verbs *dāng* 當 and *yīng* 應, which grammaticalized into modal verbs in Early Middle Chinese, will be discussed in this section.

4.2.1 The diachronic development of *dāng* and *yīng* from Late Archaic to Early Middle Chinese

The modal function of *dāng* 當 grammaticalized from a verb with the basic meaning 'match, correspond'.[29] As a modal auxiliary verb it expresses root/deontic necessity: □*p* 'it is necessary that p', roughly corresponding to modal 'should' in English. *Dāng* 當 is regularly attested as a modal verb from the Han period (206 BCE – 220 CE) on.[30] It occurs predominantly in indirect suggestions uttered by the speaker with regard to the – frequently unspecified –

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28 According to Reichenbach's distinction into speech time (S), reference time (R), and event time (E).
29 In Late Archaic Chinese, it can also function as a temporal and local preposition; and in Middle Chinese it can function as a future marker.
30 For a comprehensive discussion on modal DANG see Meisterernst (2011).

agent based on laws, rules, and norms (deontic modality), but it also expresses circumstantial modality. The verb *yīng/yìng* 應 occurs almost exclusively as a full verb in Late Archaic Chinese, mostly in the meaning 'answer, react, etc.',[31] or 'deserve to', correspond to'. It only very occasionally appears as an auxiliary verb. In Early Middle Chinese, particularly in the early Buddhist literature, its employment as a modal verb increases and, simultaneously, the number of its occurrences as a full verb decreases. According to its syntactic environment, different kinds of deontic modal values, from strict deontic modality, i.e. contexts of direct command and advice, to bouletic and teleological modal values are attested; the latter rather belong to the category of circumstantial modality.[32]

(29) and (30) represent the development of *dāng* and *yīng* from lexical verbs to modal auxiliary verbs. In (29a) DANG appears as a lexical verb; in（29b）it has an unaccusative verb as its complement; in (29c) it has an unergative; and in (29d) it has a transitive verb as its complement.

(29) a. 孤子當室，冠衣不純采 (*Lǐjì* 禮記, *Qūlǐ shàng* 曲禮上)
    gū   zǐ   dāng   shì,   guān   yī   bù   zhǔn   cǎi
    orphan son correspond house, cap   dress NEG border colourful
    'And if the orphaned son has taken care of the house, his cap and clothes are not decorated with colours.'

   b. 我真王嗣，當立，吾欲求之 (*Shǐjì* 史記 31,1463)
    wǒ zhēn wáng sì,   dāng lì,   wú yù   qiú   zhī
    I   true king   successor, DANG enthrone, I   want require OBJ
    'I am the true successor to the king who should be enthroned, and I want to insist on it.'

   c. 朱公長男以為赦，弟固當出也 (*Shǐjì* 41,1754)
    Zhū gōng zhǎng nán yǐwéi shè   dì   gù
    Zhū father older   son   think   release younger.brother certainly
    dāng chū   yě
    DANG go.out   SFP

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31 See also Li (2004: 234f).

32 Anderl (2004: 417) assumes that *yīng* 應 also serves to express epistemic modality in the *Zǔtáng jí* and that this function was possibly "introduced by Indian Buddhist logic which was introduced to China through the translation of Sanskrit scriptures." On the other hand, the development of an epistemic reading from originally deontic readings is well attested e.g. in the Germanic languages.

'The oldest son of father Zhu thought that since there was an amnesty, his younger brother should certainly get out.'

d. 天子儀當獨奉酌祠始皇廟 (*Shǐjì* 6,266)
tiān   zǐ   yí   dāng dú   fèngzhuó cí
heaven son   ceremony DANG alone   offer.wine sacrifice
Shǐ Huáng miào
Shǐ Huáng temple
'According to the rites of the Son of Heaven, you alone should offer wine as a sacrifice at the temple of Shi Huang.'

In (30a) *yīng* appears as a transitive lexical verb in a Late Archaic Chinese text, while in (30b) it appears followed by a complement which could be analyzed as either nominal or verbal. Constructions like this pave the way for the grammaticalization of a verb to an auxiliary verb. In (30c) *yīng* appears with an unaccusative verb as its complement and in (30d) with a transitive verb.

(30) a. 叔向弗應。 (*Zuozhuan, Xiang* 21, Late Archaic Chinese)
*shú xi*àng *fú   yīng*
Shu Xiang NEG$_{tr}$ respond
'Shu Xiang did not respond to it.'

b. 匹夫熒侮諸侯者，罪應誅，請右司馬速刑焉。 (*Kongzi jiayu* 1.1, Early Middle Chinese)
Pǐfū   yíng wǔ *zhūhóu   zhě, zuì   yīng zhū,*
Common.man mock   feudal lord NOM, crime YING punish,
qǐng yòu sīmǎ   sù   xíng yán
ask   right marshal quick punish him
'If a common man mocks the feudal lords he deserves punishment/ should be punished; I ask the marshal to the right to punish him quickly.'

c. 此白象寶，唯轉輪王，乃得之耳，今有小過，不應喪失。
Xianyujing (*Taishō* 4; no.202 p. 372c Early Middle Chinese)
Cǐ   bái   xiàng bǎo,   wéi zhuǎnlúnwáng nǎi dé
This white elephant precious, only turn-wheel-king then get
zhī ěr   jīn yǒu xiǎo guò bù   yīng sāngshī
OBJ SFP, now have small fault, NEG YING forfeit
'This white elephant is precious, only a wheel-turning king can obtain it; even though it has a small fault, it should not be forfeited.'

    d. 王告之言：『象若不調，不應令吾乘之；
       (*Xianyujìng, Taishō* 4; no.202, p. 372c Early Middle Chinese)
       Wáng gào zhī yán xiàng   ruò bù tiáo, bù yīng líng
       King   tell OBJ say elephant if   NEG tame, NEG YING make
       wú chéng zhī
       me ride   OBJ
       'The king told him: "If the elephant is not tamed, you should not
       make me ride it."'

The modal meaning of both verbs derives from a lexical meaning implying an appropriate reaction to something. The complement verbs of DANG and YING are mostly telic agentive verbs; they can be either transitive or they can – similar to the construction with KE – appear passivized in resultative constructions. But in contrast to KE, for which a passivized complement is required in Late Archaic Chinese unless it is followed by YI, DANG and YING do not require a passivized complement. This may be connected to the fact that at the time when the latter emerged any possible morphological distinctions between causative and result-ant state and/or anticausative readings had certainly become entirely opaque. Similar to the construction with KE, the modal predicates with DANG and YING show a semantic sensitivity of the subject to the complement verb rather than to the modal; this is typical for raising constructions (Lin 2011): the subjects of the complement verb and the modal verb are not identical. Apart from *néng*,[33] which is probably a control verb, modals seem rather to be raising verbs in Late Archaic and Early Middle Chinese.[34] That *kě*, *dāng,* and *yīng* are raising verbs can be evi-denced by the passivization test (Ademola-Ademoye 2011): all three verbs require or allow passive constructions in their complements.

4.2.2 A brief discussion of *dāng* and *yīng* as deontic markers

Unlike with the strong deontic construction NEG *kě(yǐ)* 可(以) NEG *v*P and the modal auxiliary verb *bì* 必, with *dāng* and *yīng* the speaker does not necessar-ily expect compliance on the side of the frequently only-implied agent. As with 'should' in English, the modal force of obligation is weaker than with 'must'. The strength of obligation is induced by the strength of the ordering source for the

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33 The status of *dé* 得 as an auxiliary verb is unclear and begs further research.
34 This distinction between raising and control constructions of modal verbs is difficult to main-tain in Chinese (see e.g. Lin and Tang 1995), and it has been abandoned by a number of scholars.

modal. When the necessity is induced by laws and regulations, these ordering sources imply a stronger obligation than when the necessity follows predetermination by destiny (Meisterernst 2011). True epistemic values are not attested with any of these verbs in LAC and EMC, unless they appear in the complement of an epistemic, for instance, an attitude verb; they do not depend on the modal.[35] In contrast to the possibility modal KE which only obtains a true deontic reading in the syntactic context of negation and rhetorical questions, YING and DANG can express deontic readings independently of any syntactic trigger. Additionally, their complements are not confined to passivized, i.e. to telic resultative complements, unless otherwise marked. Accordingly, their syntactic structure clearly distinguishes them from the deontic marker KE. Thus, they are the first verbs (apart from *bì* 必) which do not require a particular syntactic trigger to function as deontic markers. These syntactic triggers can be negation or rhetorical questions. Additionally, the verb in their complement can be either unaccusative/passive or transitive without any additional marking.[36]

– The deontic modal *dāng*

Early deontic readings of DANG are represented by (31) in sentences from the Western and the Eastern Han period respectively.[37] The complement verb in (31a) is passivized, the patient/theme appears in the subject position. In (31b), and (31c), the complement verb is transitive, so the non-overt external argument is licensed in the subject position. Similar to the construction with KE, the identification of a particular agent is irrelevant. This is the most typical employment of *dāng* 當 in its earliest instances as a modal verb. In (31c) the modal verb *dāng* is negated. In contrast to the modals of possibility, for which the readings 'NOT [POSSIBLE and NECESSARY [NOT' are not necessarily equivalent (although they are logically equivalent), this is not the case with *dāng*. The reading 'NOT [APPROPRIATE' always corresponds to the reading 'NECESSARY [NOT'. The ambiguity between the different possibility readings and the necessity of a particular trigger in order to express obligation together with the entire loss of former morphological distinctions of resultant states and passivization may well have served as a trigger for the development of a more complex modal system in early Middle Chinese and the emergence of true markers of deontic modality.

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35 A comprehensive discussion of the development of *dāng* has been provided in Wu Xueru (2014), see note 4.

36 For the requirements of a deontic reading of *bì* 必, see Meisterernst (2017a). A deontic reading is not possible with a theme or patient subject of the complement verb.

37 For more examples and a more comprehensive discussion on DANG see Meisterernst (2017a and 2017b).

(31) a. 群臣議，皆曰「長當棄市」。(*Shǐjì*: 10; 426, Early Middle Chinese)
   Qún chén   yì,   jiē yuē Cháng dāng qì   shì
   All   minister discuss, all say Chang DANG abandon expose.marketplace
   'The ministers discussed it, and they all said: "Chang should be
   executed and exposed in the marketplace."'

   b. 我方先君後臣，因謂王即弗用鞅，當殺之.
   (*Shǐjì*: 68; 2227, Early Middle Chinese)
   Wǒ fāng xiān   jūn hòu   chén, yīn   wèi wáng jí
   I   ASP forward ruler put.behind vassal, therefore say king   if
   fú   yòng   Yǎng, dāng shā zhī
   NEG employ Yang, DANG kill OBJ
   'I am just putting the ruler first and the vassal last, and therefore
   I told the king that if he did not employ you, Yang, he should kill you.'

   c. 說所不當道，觀所不當視，此謂不能專心正色矣。
   (*Hou Hanshu, Nüjie,* Early Middle Chinese)
   Shuō suǒ bù   dàng dǎo, guān   suǒ bù   dāng shì,
   Say   REL NEG DANG tell, observe REL NEG DANG see,
   cǐ   wèi bù   néng zhuān   xīn   zhèng sè   yǐ
   this call NEG able concentrate mind correct appearance SFP
   'To mention what one should not tell, to observe what one should not
   see, this means that one is not able to concentrate the mind and to
   keep the appearance correct.'
   Paraphrase: it is not appropriate that V: NOT [APPROPRIATE = it is
   necessary that not NECESSARY [NOT

(32) shows DANG as a fully developed deontic auxiliary verb. In (32a) and (32b) a
direct obligation is issued towards a 2nd person addressee subject; additionally,
(32b), and (32c) demonstrate that DANG precedes an adverbial *wh*-word, which
argues for its high syntactic position in TP.

(32) a. 諸族姓子，悉當信佛誠諦至教，勿得猶豫.
   (*Taishō* 9, no.263, p.113a, Early Middle Chinese)
   Zhū zúxìng   zǐ, xī   dāng xìn   fó   chéngdì,
   All good.family son, completely DANG believe Buddha truth
   zhìjiào   wú   dé yóuyù
   excellent.teaching, NEG$_{mod}$ get doubt
   'All you sons of good families should believe in the Buddha's truthful
   and most excellent teachings, and should not have any doubts.'

b. 設有是問者。汝當云何答。 (*Taishō* 1, no.1, p.112b, Early Middle Chinese)
  Shè yǒu shì wèn zhě, rǔ dāng yúnhé dá
  If have this question REL, you DANG how answer
  'If there are any with these questions, in which way should you answer?'

c. 我當云何令諸眾生心歡喜耶？ (*Pusa benyuan jian zhong,* Early Middle Chinese)
  Wǒ dāng yúnhé líng zhū zhòng shēng xīn huānxǐ yé
  I DANG how make PL multitude living heart happy SFP$_{quest}$
  'In which way should I make all the living beings happy in their hearts?'

The aspectual characteristics of the complement verb of DANG resemble those of KE(YI).

a) The complement verb appears in an unaccusative (passive) construction referring to a resultant state similar to the construction with *kě* 可. The theme/patient of the complement verb moves to subject position.

b) The complement appears in an agentive/causative construction without any additional marking; in its earliest instances the external argument of the agentive verb is not realized overtly. This changes particularly in the early Buddhist literature (from the 2nd c. CE on).

(33) event: | >>>>   **[**>>>>>> >| ....**]** ....|
        t$_1$ **[**E$_1$ t$_m$ E$_2$**]**   t$_n$
              當   當
        deontic event   projected future

– The deontic modal *yīng*

Deontic readings of YING are represented in (34). In (34a) and (34d), the complement verbs are passivized. In (34b) and (34c) the complements are transitive; in (34b) the external argument, the addressee of the obligation, appears in the subject position. In (34c) and (34d), YING occurs in combination with negation; in (34c), with simple and in (34d), with double negation. Identical to DANG, the original reading of BU YING 'not correspond (appropriately) ⇒ NOT [APPROPRIATE' always corresponds to the reading 'NECESSARY [NOT'. The negation marker is within the semantic scope of the necessity marker and YING functions as a deontic auxiliary. In contrast to DANG, though, and similar to KE, YING also occurs in double negation: NEG+Mod$_{deontic}$+NEG ⇔ 'not appropriate that not p = it is necessary that p: $\neg\Diamond\neg p$' = $\Box p$'; in these cases, an interpretation NOT NECESSARY NOT does not seem to be appropriate. Although negation is not necessary to trigger the deontic reading of YING, in cases such as (34d), the circumstantial

reading derived in the lexical layer is still present. This construction may provide some evidence for a similar path of grammaticalization for all modal verbs discussed in this section. And it also provides some evidence for the existence of a polarity head dividing Modal₁ and Modal₂ with regard to the modal verbs *dāng* and *yīng*.

(34) a. 汝今為我等作平等主。應護者護。應責者責。應遣者遣。當共集米。 以相供給。 (*Taisho* 1, no.1, p.38b25, Early Middle Chinese)

    Rǔ jīn wèi wǒ děng zuò píngděng zhǔ, yīng hù   zhě
    You now for I   PL   make equality master, YING protect REL
    hù,   yīng zé   zhě zé,   yīng qiǎn zhě qiǎn,
    protect, YING correct REL correct, YING banish REL banish,
    dāng gōng   jí   mǐ, yǐ   xiāng   gōngjǐ
    DANG together collect rice, in.order.to mutually provide
    'You will now be the master of equality for us; those who have to be protected, protect; those who have to be corrected, correct; those who have to be banished, banish; we will collect rice in order to provide you in turn.'

    b. 汝等天、人、阿修羅眾，皆應到此，為聽法故。 (*Taisho* 9, n.262, p.19b, Early Middle Chinese)

    Rǔ děng tiān, rén, āxiūluó zhòng,   jiē yīng dào   cǐ,
    You PL   deva, man, Asura   multitude, all YING arrive this,
    wèi tīng fǎ   gù
    for listen dharma reason
    'All you devas, people, Asuras, you should all come here in order to listen to the dharma.'

    c. 又人子禮，不應竭用父母庫藏令其盡也。 (*Xianyujing* T04n0202_ p0411b, Early Middle Chinese)

    Yòu rén zǐ lǐ,   bù yīng jié   yòng fù   mǔ
    Again man son propriety, NEG YING exhaust use father mother
    kùzàng   líng qí jǐn   yě
    treasure.house make GEN exhaust SFP
    'Furthermore, according to the proper behaviour for a son, he should not completely use up his parents' treasure house and cause it to be used up completely'
    NECESSARY / SHOULD [NOT

    d. 今得用施，不應不與。 (*Xianyujing* T04n0202_p0392b, Eary Middle Chinese)
      Jīn dé yòng shī,   *bù yīng bù yǔ*
      Now can use   distribute, NEG YING NEG give
      'Now they can be used and distributed and they should be given.'
      Paraphrase: it is not appropriate/possible that they not be given:
      SHOULD [POS

The aspectual characteristics of the complement verb of YING resemble those of DANG and of KE(YI).

a) The complement verb appears in an unaccusative (passive) construction referring to a resultant state similar to the construction with *kě* 可. The theme/patient of the complement verb moves to subject position.

b) The complement appears in an agentive/causative construction without any additional marking; from the earliest instances on the external argument of the agentive verb can either be overtly realized or covert.

(35) event: | >>>> **[**>>>>>> >| ....] ....|
                   t_1 **[**E_1 t_m E_2**]** t_n
                   當   當
              deontic event   projected future

5 Conclusion

Syntactically, in LAC and EMC all modal auxiliary verbs, including possibility modals and true deontic modals, seem to occupy the same position in the lexical layer below TP and aspect. But an analysis of the semantic scope of negation based on a proposal by Cormack and Smith (2002) confirms that deontic readings are actually generated in a higher position than circumstantial readings. Cormack and Smith (2002) propose a functional head Pol(arity) (POS/NEG) in TP which divides modals into two groups according to the semantic scope of negation: 1) Modal$_1$ expressing deontic modality (necessity) appears in the pre-Pol (pos/neg) position; 2) Modal$_2$, expressing possibility (dynamic/circumstantial) modality appears in the post-Pol position. The pre-Pol position corresponds to the inflectional syntactic layer in which deontic modality is generated and the post-Pol position corresponds to the lexical layer, typical for dynamic modals (possibility and root possibility circumstantial modals) according to Tsai's cartographic approach (e.g. Tsai 2015).

Of the different categories of modal verbs within the range of deontic readings only the three most prominent ones in Late Archaic and Early Middle Chinese have been discussed in this paper:

1) The modal verb of possibility *kě(yǐ)* 可(以), expressing root possibility (Modal$_2$) as its basic reading, characterized by the particular syntactic constraints of its complement, i.e. the requirement of a resultant (passivized and perfective) complement in the default case without YI.

2) The deontic modals *dāng* 當, and *yīng* 應 (ex. 2), expressing deontic modality (Modal$_1$); the complement verb is not subject to particular syntactic constraints.

The similarities and differences between the two categories are as follows:

a) All three modal verbs derive from lexical verbs and they start as modal verbs in the lexical layer (Modal$_2$), before they grammaticalize or partly grammaticalize into Modal$_1$.

b) A – possibly morphologically marked – resultant state complement is required as the default complement of KE (without YI), the 'first modal'. A resultant state, perfective reading can refer to a completed 'ideal' situation in the future typical for deontic readings without any additional marking. This may have sufficed to express the different shades of root readings with this one verb: circumstantial modal meanings are expressed in the lexical layer and deontic modal readings are expressed when the modal is raised to a polarity head in the TP layer.

c) All three modal verbs allow passivization and a resultant state complement; i.e. all three modals are raising verbs. YING and DANG allow, but do not require passivization of their complements, different from KE, which does. In contrast to KE, YING and DANG permit a transitive/causative complement without any additional licensing in their original structure. At the time of their emergence as fully grammaticalized modals any morphological differences between resultant state and causative verb forms had certainly disappeared.

d) Independent of any marking, the temporal structure of the complements is identical in all three modals; it always includes the feature of telicity.

e) Only KE(YI) requires a particular syntactic context, i.e. negation (including double negation) or rhetorical questions, in order to license a deontic reading; both YING and DANG do not require any additional syntactic licensing. The semantics of the construction NEG+YING+NEG argue for a similar basis of grammaticatization of all verbs.

Although it is very difficult to prove the connection between the loss of an aspectual morphology and the rise of new modals expressing deontic modality, there

is a high probability for a temporal coincidence of this loss and the emergence of new linguistic systems to replace the lost morphology. Both a new aspectual system and a more elaborate modal system emerge at the same time, and in particular the aspectual constraints on the complement of KE, which may have been morphologically marked in Archaic Chinese, provide an indirect argument in favor of the connection between a lost aspectual morphology and the rise of an elaborate modal system. This claim is also supported cross-linguistically by the development in the Germanic languages caused by a loss of their aspectual morphology. The modal systems of languages with an explicit aspectual morphology are frequently poorer than those of languages which lost this kind of morphology. In the Russian language, which has an explicit aspectual system, the system of modal verbs is less complex than in the Germanic languages. De Haan (2006) mentions that the "main ways of expressing strong modality in Russian, for instance, are with adjectives (*dolžen*) and adverbs (*nado* or *nužno*)." In addition, Heindl (2009) discusses the verb *moč* 'can' which displays different readings according to the combination with perfective of imperfective aspect.[38]

(35) a. *Ivan možet rešit'   etu zadaču* (*ability*)
          Ivan can   solvePerf this task
          'Ivan can solve this task.' (Heindl (2009: 137,)

      b. *Ty ne   možeš postroit'   zdes' garaž* (*deontic possibility*)
          You NEG can   build.IMPF here garage
          'You may build a here.' (Heindl 2009: 139,)

Rousseau (2009: 2815) points out different readings of the modal *bori* 'can' in Greek, which are obtained according to the aspectual features of its complement; they also arise according to "the variety of inflectional combinations in the matrix and embedded clauses."   For the deontic modals in Late Archaic Chinese, I propose that all modals grammaticalize into deontic markers by upward movement to a functional category within the TP in the sense of Roberts and Rousseau (2003), in which deontic modality is hosted. The deontic category of prohibition was marked by synthetic modal negative markers from the earliest documents of Chinese on. The precise syntactic derivation of these modal markers is still pending, but it can be suggested that they appear as part of a functional modal head in the TP layer in which modal markers have to be located in order to express deontic modality. The deontic values of obligation (non-negative

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[38] In her article, Heindl (2009) particularly discusses differences in aspectual readings in combination with negation.

deontic modality) may have been expressed by a combination of morphological and lexical/functional features. The frequency of unaccusative and passive complements (subject to frequent morphological marking) of modal verbs suggests the possibility that morphologically marked verb forms were employed to express deontic modality, possibly in combination with deontic adverbs or in future contexts, before the entire loss of transparency of verbal morphology induced the development of a new and more analytical system of modal marking. But this issue still has to be confirmed by future research on the morpho-syntax of Archaic Chinese and its diachronic development.

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