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Polarity and the diachronic development of deontic modality in Chinese

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Abstract—**In this paper, first instantiations of deontic modality in Archaic Chinese (Early Archaic Chinese EAC, 10th – 6th c. BCE, and Late Archaic Chinese LAC, 5th – 2nd c. BCE) are at issue. Deontic expressions predominantly include synthetic modal negative markers and verbs of possibility in combination with negation and in rhetorical questions; i.e. they are closely related to polarity. In this brief study, a syntactic analysis of deontic modal readings mainly in LAC will be proposed. The discussion is inspired by Cormack and Smith (2002), who propose a polarity head, which distinguishes a $Modal_1$ connected to necessity readings and a $Modal_2$ connected to possibility readings.**

Keywords—Modality, Polarity, Historical Linguistics, Archaic Chinese

I. Modality in Archaic Chinese

Modal verbs in Archaic Chinese are almost exclusively confined to the category of 'can-wish' verbs, i.e. verbs of possibility and of volition (Peyraube 1999, Liu 2000, Li 2001, Meisterernst 2008). Cross-linguistically, verbs of possibility belong to the category of 'first' modals (Leiss 2008); these also constitute the basis of the system of Germanic modals. The most important modal auxiliaries expressing POSSIBILITY are *néng* 能 *able to*, *kě* 可 *possible*, and *dé* 得 *manage to, able to*. All three modals appear first as lexical verbs in Archaic Chinese; they start to grammaticalize into different modal markers at different times. The verb *kě* appears earliest as a marker of deontic modality in combination with negation and in rhetorical question. Example (1) represents early instances of the different modal verbs.

(1) a. 牆有茨，不可埽也。 (*Shījīng* 046/1A, EAC)
Qiáng yǒu cí,   bù   kě sǎo yě,
wall   have tribulus, NEG KE wipe SFP,
On the wall there is a tribulus, it cannot be wiped away.
b. 靜言思之，不能奮飛。 (*Shījīng,* 026.5, EAC)
Jìng yán sī   zhī, bù   néng fèn fēi
Quiet word think 3Obj, NEG NENG rise fly
'In quietude thinking about it, I am not able to rise and fly away.'
c. 寡君知不得事君矣。 (*Zuozhuan, Zhao* 13, LAC)
guǎ   jūn   zhī bù dé shì jūn yǐ
Lonely prince know NEG DE serve ruler SFP
'My prince knows that he cannot serve you, my prince.'

The deontic modal reading of prohibition in Archaic Chinese was expressed by a set of modal negative markers. The deontic reading of obligation was expressed predominantly by the root possibility verbs *kě* and *dé*, and

by the modal verb *bì* 必 *necessary, must*; the latter is infrequent and appears mostly as an epistemic adverb.[1] The deontic reading of root possibility modals was confined to particular syntactic constraints: 1) Combination with negation a) NEG + KE/DE; b) KE/DE + NEG; c) NEG + KE/DE + NEG, and 2) the reverse polarity of rhetorical questions (see e.g. Han 1998). Nevertheless, in both syntactic contexts the root possibility markers remained polysemous and could express both necessity and possibility. An example for the polysemy of the modal reading of *kě* in combination with negation is provided in section 2, ex. (4b). Only in Early Middle Chinese (EMC 2nd c. BCE – 2nd c. CE), new and unambiguous deontic markers emerged, particularly *dāng* 當 *should*, and *yīng* 應 *should, ought*. The deontic reading of the new modals was not subject to particular syntactic constraints.

In this study, I propose that the possibility and the deontic readings differ syntactically, although they surface in the same position in the sentence. The analysis is inspired by a proposal by Cormack and Smith (2002) who argue that a functional head Pol(arity) (POS/NEG) 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).

According to the cartographic approach employed by e.g. Tsai 2015, based on Cinque (1999) and Rizzi (1997), epistemic modality is generated in CP, deontic modality is generated in IP ($Modal_1$), dynamic modality (possibility and root possibility modals) is located in the lexical layer (*v*P, $Modal_2$). In a first step in section 2, I will show that there is a position for deontic modality outside the *v*P layer in CP in Archaic Chinese; this is where the synthetic deontic negative markers are hosted. In section 3, possibility modals in combination with negation will be analyzed; section 4 is devoted to possibility modals in two kinds of rhetorical questions, questions with *wh*-words, and *yes-no* questions.

II. Deontic modality 'prohibition' in Late Archaic Chinese: modal negative markers

Prohibition in LAC is expressed by a class of synthetic modal negative markers, which constitute a morphological class of their own, or by a possibility modal + NEG. The different modal negative markers are 1) *wú (muəˇ)* 毋/無, and 2) *wù (mut)* 勿 (the latter appears particularly in the negation of transitive verbs. *Wú (muəˇ)* 毋/無 is located in CP, it seems to be higher than *wù* 勿. Djamouri (1991)

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[1] The latter is not at issue in this study due to its particular syntactic and semantic constraints.

proposes an epistemic reading for *wú* 毋 in the earliest inscriptional literature; *wù* 勿 has a deontic reading. The semantic function of the negative markers is: → NECESSARY NOT. In EMC, synthetic modal negation starts to be replaced by analytic modal negation: → NEG + AUX$_{mod}$, seen in ex. (2b), also with the reading: → NECESSARY NOT.

(2) a. 禁舊客勿出於宮。 (*Zuozhuan Zhao* 18, LAC)
Jìn   jiù kè   wù   chū yú   gōng
Prohibit old guest **NEG$_{mod}$** leave PREP palace
'he (forbade) **ordered** older visitors **not to** leave the palace.'
b. 淨人益食不得相喚。但以手指麾。 (*Taishō* 51, 2085, 857b, *Faxian* 5th c. CE)
Jìngrén yì shí bù dé xiāng huàn, dàn yǐ
Server add food **NEG DE** mutual call.out, only with
shǒu zhǐ   huī
hand show wave
'If the servers are supposed to add food, one **must not call** them, only wave with the hands.'
Paraphrase: it is **NECESSARY** NOT to call (out loud) to them; → NECESSARY [NOT = clear obligation, the theoretical possibility to call still exists.

Evidence for the high position of deontic negation outside *v*P in a functional projection within CP comes from the combination with high adverbials. In (3a), the high modal adverb *yōng* 庸, marker of rhetorical questions, follows the negative *wù* 勿; b. shows the high position of *yōng*; it precedes the high epistemic adverb *bì* 必 *certainly, necessarily* in a rhetorical question corresponding to the force head, SFP/Q *hū* 乎; the rhetorical question has epistemic modality. *Wù* usually follows *bì*. In c. the negative *wú* 毋 precedes the high adverb *nǎi* 乃 *thus, thereupon*, usually following the subject in the CP layer; the reading is epistemic.

(3) a. 不如聽之以卒秦，**勿庸**稱也以為天下。
Bù   rú   tīng zhī yǐ zú   Qín, wù
NEG be.like listen 3OBJ CON finish Qin, **NEG$_{mod}$**
yōng chēng yě   yǐwéi tiānxià
YONG mention NOM make empire
'It would be better to listen to them and let Qin succeed, but it **should not** be announced and made to [an affair of] the empire.' *(Zhangguo ce* 11.10.2, 2nd c. BCE)
b. 所效者庸必得幸乎？
Suǒ xiào zhě yōng bì   dé   xìng
REL follow REL **RHETQ necessarily** obtain favor
hū
SFP/Q
'Is what follows that they are really **necessarily** obtaining favor?!' *(Zhanguo ce* 25.25.5, 2nd c. BCE)
c. 將待後，後有辭而討焉』，**毋乃**不可乎？ *Jiāng*
dài hòu,   hòu   yǒu cí   ér
FUT wait successor, successor have excuse CON
tǎo   yán
hold.accountable PREP.3Obj
wú   nǎi bù kě   hū
NEG$_{mod}$ then NEG possible SFP/Q

'If we will wait for a successor, and if the successor has excuses and we hold him accountable for it, **should** that **not** be inappropriate?!' (*Zuozhuan Xuan* 15, LAC)
→ Different positions for the modal negative markers in the CP and the TP layer
d.[$_{CP}$ [$_{ForceP}$ *yong* [$_{ModPepist}$ BI/WU$_1$ [$_{TP}$ [$_{ModPdeont}$ WU$_2$ [$_{PolP}$ [$_{vP}$]]]]]]]

III. DEONTIC MODALITY AND POSSIBILITY MODALS + NEGATION

Negation and rhetorical questions as a trigger for deontic readings have been noted already e.g. in Liu (2000) and Li (2001). The deontic reading does not seem to be distinguished in the linear order in PF from the possibility reading; additionally the possibility markers remain polysemous and can express both necessity and possibility. The situation is different from Modern Mandarin, where different modal readings are reflected in different syntactic positions (see e.g. Tsai 2015) in the linear order of the sentence. Since it is difficult to provide purely syntactic evidence for the generation of the possibility and the deontic readings in different positions, the semantic scope of negation has been employed in order to show that MOD$_{POSS}$ can be merged in two different positions at LF, following Cormack and Smith (2002). This approach is particularly promising, since both syntactic environments in which deontic readings first emerge involve a change of polarity. Because the semantic scope of negation is not necessarily reflected by the syntactic position of NEG, the approach provides only indirect evidence for the realization of possibility modals in two different syntactic positions as Modal$_1$ and Modal$_2$ in LAC and Early Middle Chinese (EMC) (2nd c. BCE–2nd c. CE). The two readings are represented by (4) a. and b., and simplified analyses are provided in c. and d. respectively.

(4) a. 終不可就, 已而棄之 .
zhōng bù kě jiù, yǐ ér qì   zhī
finally **NEG can** finish, then abandon OBJ
'… when eventually it **could not** be finished, they gave it up.' *(Shǐjì*: 112; 2961, EMC 100 BCE)
NOT[POSSIBLE
b. 臣聞敗軍之將，不可以言勇，
chén wén bài   jūn zhī jiàng, bù kě yǐ
subject hear defeat army GEN general, **NEG can** YI
yán   yǒng,
speak bravery,
'I have heard that the general of a defeated army should not speak about bravery.' *(Shǐjì*: 92;2617, EMC 100 BCE)
1) It is not possible that the general of a defeated army speaks about … = a general of a defeated army is not able to speak about … NOT [POSSIBLE / CAN, →
2) It is not permitted that the general of a defeated army speaks about … = it is advisable that a general of a defeated army does not speak about …' NECESSARY [NOT
c. [$_{vP}$ [$_{Mod2P}$ BU [$_{Mod2'}$ KE [$_{vP}$ *jiù*$_i$ [$_{VP}$ [$_{v}$ t$_i$]]]]]]
d. [$_{TP}$ [$_{Mod1P}$ BU [$_{Mod1'}$ KE [$_{PolP}$ [$_{vP}$]]]]]

Logically, the necessity reading is possible, because 'it is necessary that not *p* is logically equivalent to 'it is not possible that *p*: □¬*p* = ¬ ◊ *p*.' However, the example in (4a) demonstrates that the logical possibility does not have to be realized.

Obligation in LAC is most frequently expressed by the possibility modal KE with double negation 'NEG+KE+NEG cannot not = have to' (Chinese does not have negative concord), or in rhetorical questions involving reverse polarity as in the examples in (5); a. contains double negation, and b. is a rhetorical question only marked by a Q sentence final particle. In the next section, rhetorical questions marked by *wh*-words, or modal adverbs/particles will be presented.

(5) a. 君子一言以為知，一言以為不知，言**不可不慎也**。 (*Lunyu* 19.25, LAC)
Jūnzǐ   yī yán yǐ   wéi zhī, yī yán
gentleman one word APPL make know, one word
yǐ   wéi bù   zhī,
APPL make NEG know
yán bù kě bù   shèn yě
word **NEG KE NEG** careful SFP
'A gentleman will be considered wise according to one word, or he will be considered unwise according to one word, words **cannot not (=have to)** be treated with care!'
¬ POSS ¬ → NECESSARY [THAT (positive polarity)
b. 勢之於人也，**可不慎與**？
shì   zhī yú rén yě, kě bù   shèn yú
influence GEN at man SFP, **can NEG** careful SFP/Q
'And in using one's power with regard to human beings, **must** one not be careful / one must (it is necessary to) be careful!?' (*Shǐjì*:40;1737, EMC (100 BCE))
Paraphrase: is it possible that one is not careful? = it is not possible that one is not careful; the negative operator cancels out the negation marker following the modal.
Op[possible not careful] Q (following Han 1998)
¬[possible not careful] → NECESSARY [THAT to be careful

IV. RHETORICAL QUESTIONS AND DEONTIC MODALITY

In this section, adverbial *wh*-words of the meaning *how* in rhetorical questions and *yes-no* questions marked by a modal adverb will be discussed briefly. In Modern Mandarin different positions are available for *wh*-words *how* and *why* according to Tsai (2008). Contrastingly, in LAC, *wh*-words seem to occupy always the same position, i.e. a position following aspect-temporal adverbs, but preceding auxiliary verbs (Meisterernst 2015), i.e. they appear outside of *v*P in the CP/TP layer. Adverbial *wh*-words are always in preverbal position; object *wh*-words undergo a change from preverbal to *in-situ* position in EMC (see Aldridge e.g. 2013). *Wh*-words in rhetorical questions differ syntactically from modal Q markers, adverbs, or modal particles, which in rhetorical *yes-no* questions seem to have functions similar to German modal particles, such as *etwa*, *wohl*, *doch*. In linear order, they always precede adverbial *wh*-words.[2] The

2 'Adverbial' *wh*-word merely refers to their status as not referring to an argument. Nothing is said about their status as NPs, DP, or actual adverbs. Adverbial *wh*-words have received much less interest in diachronic studies of Chinese than argument *wh*-words.

order of *wh*-words with respect to modals starts to change in EMC, where also adverbial *wh*-words are allowed following modals as in example (6a) with the deontic modal DANG in a real question with a manner *wh*-word. This provides some evidence for the upward movement and grammaticalization of DANG from a lexical verb to a functional category (following Roberts and Roussou 2003). In a rhetorical question, the *wh*-word continues to appear preceding the modal (6b).

(6) a. 設有是問者。汝**當云何**答。
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, **how should** you answer?' → You should answer with the following speech … (*Taishō* 1, 1, p. 112b, 5th c. CE)
b. 此比丘唯知此一偈。**云何當能**教誡我等。
Cǐ bǐqiū wéi zhī cǐ yī jì,   yúnhé dāng
This bhikṣu only know this one gatha, **how   DANG**
néng jiàojiè wǒ děng
able teach I   PL
'This bhikṣu knows only this one gatha, **how will he** be able to advise us?' → he will not be able to advise us. (*Taishō* 22, 1421, 46a, 5th c. CE)

Rhetorical questions function as assertions of opposite polarity from what is apparently asked (Han 1998). According to Han, rhetorical questions are the strongest way to implicate the speakers expectations, "It asserts that the speaker believes that the set of individuals that satisfy the question is empty." This strong assertion makes them liable for modal interpretations. Han (1998) proposes a polarity operator in [Spec, CP] in rhetorical questions, the polarity of which is unspecified in rhetorical *yes-no* questions. In rhetorical *wh*-questions, "the *wh*-phrase maps onto an empty set, which is semantically equivalent to a negative quantifier." In English evidence comes from the behaviour of NPI in rhetorical questions. This test is not applicable in Archaic and Early Middle Chinese. The examples in (7) provide some evidence for both a deontic (a.) and a possibility reading (b.) in a rhetorical question. The situation thus does not differ from AUX_{POSS} + NEG.

(7) a. 在位數世，世守其業，而忘其所，僑**焉得**恥之？
Zài wèi shù shì,   shì shǒu
Be.at position several generation, generation keep
qí yè, ér wàng qí   suǒ,
POSS work, CON forget POSS place,
Qiáo yān dé chǐ   zhī
Qiao **how DE** be.ashamed OBJ
'He is in his position for several generations, and from generation to generation he has kept his position, but he forgot his place, how could I, Qiao, be ashamed of it?' → I should not be ashamed of it. (*Zuozhuan, Zhao* 16, LAC)
¬∃x[Qiao x can be ashamed of it] = NEG [POSSIBLE that Qiao is ashamed → NECESSARY [NOT Qiao is ashamed
b. 我是女人。**何由得**先見佛。
Wǒ shì nǚrén, hé yóu dé xiān jiàn fó
I   COP woman, **how from DE** first see Buddha

'I am a woman, how could I see the Buddha first?' → I am not able (according to my disposition … (*Taishō* 51, n.2085, p. 859c, 5th c. CE)

¬∃x[pro x can first see Buddha] = NEG [POSSIBLE that I first can

The following examples represent rhetorical *yes-no* questions marked by a modal adverb. In addition to an adverb, a Q sentence final particle, the head of the ForceP can mark the question. Following Han (1998), an operator in [Spec CP] is proposed, equivalent to negation and thus reversing the polarity of the proposition. We propose that the modal adverb *qǐ* functions as a realization of the operator in [Spec CP]. In b. the proposition contains a negative marker in the complement of the modal verb; accordingly, the polarity reverses to positive NECESSITY in a rhetorical question. In c., with the ability modal *néng* 能, the rhetorical question has a dynamic reading and not a deontic reading. Deontic readings are particularly infrequent with this modal verb; the negative operator scopes over the modal.

(8) a. 臣竊以事觀之，秦**豈得**愛趙而憎韓哉？
*Chén qiè   yǐ shì guān zhī, Qín **qǐ dé** ài*
Subject permit YI affair consider OBJ, QIN **Q DE** love
Zhào ér   zēng Hán zāi
Zhao CON hate Han SFP
'If I take the liberty to consider it according to this affair, could Qin love Zhao, but hate Han!?' → Qin could not/should not love Zhao … (*Zhànguó cè* 18, LAC)

QI[Qin can love Zhao …]?
¬[Qin can love Zhao …] = NEG [POSSIBLE ≠/= NECESSARY [NEG

b. 爾時世尊告舍利弗：「汝已慇懃三請，**豈得不**說。
Ěrshí   shìzūn   gào Shèlìfú: rǔ
That time world.honoured.one tell Śāriputra: you
yǐ   yīnqín sān qǐng,
already eager three ask,
Q DE NEG preach
***qǐ dé bù**   shuō* (*Taishō* 9, n. 262, p. 7a, 5th c. CE)
'At that time the World Honoured One told Śāriputra, "You already earnestly asked three times, could I possibly not preach?!" → it is necessary that I preach
QI[pro can NEG preach]?
¬[pro can NEG preach] = NEG [POSSIBLE [NEG → NECESSARY [THAT

c. 「鳥則擇木，木**豈能**擇鳥？」 (*Zuozhuan, Ai* 11)
*Niǎo zé zé   mù, mù **qǐ néng** zé niǎo*
Bird TOP choose tree, tree **Q able** choose bird
'The bird chooses the tree; the tree, can it choose the bird?! → it cannot choose the bird

QI[tree able choose bird]
¬[tree able choose bird] = NEG [ABLE

V. CONCLUSION

This brief discussion has shown that although the different readings of the possibility modals of LAC and EMC are not reflected in the linear order of the sentence, the modals are merged in different positions at LF. As necessity operators, they are merged in CP, scoping over negation and selecting for Pol[NEG/POS], a polarity head, which can be positive or negative. In both, the syntactic context of negation and in rhetorical questions, characterized by reverse polarity, two interpretations are available according to the scope of negation: a) the possibility reading within the scope of negation, and b) the necessity interpretation with the necessity operator scoping over negation. The fact that possibility modals remain polysemous may be one of the triggers for the emergence of unambiguous markers of deontic modality.

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