Modal Auxiliaries and Evidentiality in Classical Greek

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Evidentiality

▶ a semantic-functional domain that covers the source of information that is expressed in the proposition
▶ varying degrees of grammaticalization
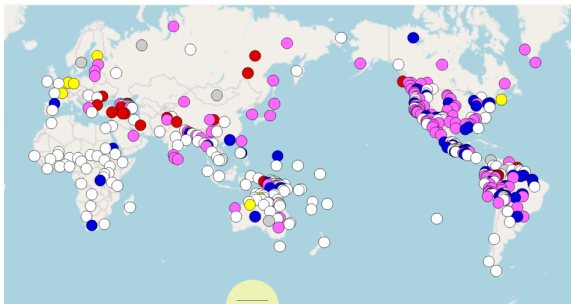▶ possible choices: visual, auditory, **inference based on visual cues**, **logical inference**, reported

Figure: Coding of evidentiality. Pink = verbal affix or clitic; red = part of the tense system; blue = particle; **yellow = modal morpheme**. WALS online, Ferdinand de Haan.

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Observational basis

Synchrony

Modal auxiliaries in some languages may express both *deontic* and *epistemic* modality

(1) The ship **must** have been hit by missiles.

Markers of 'likeness' can evolve to signify inference

(2) *Ano X-saN=wa,*   *onusi=ni yoppodo ki=ga*
     dem (name)-TOA-TOP 2S-DAT very   feeling-NOM
     *ar.u=**rasi**.i*
     be-NPS-EVI-NPS

     'X seems to have feelings for you.'   (Narrog 2012: 138)

Diachrony

(*pre-modal*) → ⟨ *deontic* → *epistemic* ⟩
Scope increase, category climbing

Clause layers and speaker orientation

Functional (Discourse) Grammar (Hengeveld and Mackenzie 2008):

individual entities $<$ | state-of-affairs $<$ proposition | $<$ illocution

- ▶ deontic modality operates on the level of SoAs
- ▶ epistemic modality:
    - ▶ objective: SoA level; somewhat quantifiable probability that a SoA obtains
    - ▶ subjective: propositional; speaker commitment to the truth value of the proposition p
- ▶ subjectification (Traugott and Dasher 2002, Narrog 2012)
    - ▶ shift from event-oriented to speaker-oriented modality
    - ▶ SoA operators (ideally) conform to real-world events
    - ▶ propositional operators may encode the stance of the speaker

Deontic through evidential to epistemic – English *must*

Figure: Diachronic stepping stones for Eng. *must*. Goossens (2000: 163).

The position of inference

(3) He **moste** kunne muchel of art, | ðat þu woldest geve þerof part.
'He **must** know much of art since you are willing to give part of it.'   (c. 1300 (?1250), Traugott and Dasher 2002: 129)

▶ +objective: 'In the light of what is known, it is necessarily the case that *p*'

▶ +subjective: 'I confidently infer that *p*' (Coates 1983: 41–42)

Evidentiality more conceptually

- Boye (2010) argues that evidentiality operates on the level of proposition
- evidentials ought to occupy a position above deontic and 'objective epistemic' modals, which operate on SoAs
- evidentials indexically refer to the consciousness of the speaker → more speaker-oriented that 'objective epistemic' modals
- evidential qualification is not subject to the will of the speaker, it is a function of real-world events → less subjective than 'subjective epistemic' modals
- thus properties and diachronic behavior of 'evidentialized' modals conform to the tendency of subjectification in the process of grammaticalization

Zooming in on 'evidentialized' modals

deontic necessity $\rightarrow$ | inference | $\rightarrow$ 'subjective epistemic' necessity

Is it possible to trace the process of subjectification operating *within* the evidential part of the cline to get a more coherent picture?

Going recursive...

Enhanced view of inference

Definitions from Douven and Verbrugge (2010: 303):

1. **Deduction**: "The truth of what is inferred is $\boxed{\text{guaranteed}}$ by the truth of the premises from which it is inferred."

2. **Induction**: "The conclusion follows with a certain $\boxed{\text{statistical probability}}$ from the premises."

3. **Abduction**: "The conclusion follows on the basis of explanatory considerations because it is thought to be $\boxed{\text{the best explanation}}$ of something $\boxed{\text{thought to be known}}$."

...this has implications for the use of 'evidentialized' modals

Some examples

Krzyzanowska, Wenmackers, and Douven (2013):

(4) a. (D) *Context*: All Indian elephants have small ears.
If Babou is an Indian elephant, then it has small ears.

b. (I) *Context*: 99% miners develop silicosis.
If Rudolph has worked in the mines for all his life, then he has developed silicosis.

c. (A) *Context*: There is a nearby village located in a valley below a dammed reservoir and the dam has been in a rather bad state for some time.
If the village has been flooded, then the dam has broken.

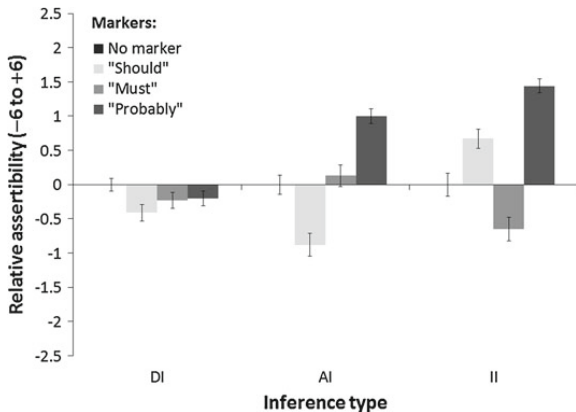# Interaction between evidentials and inference type

Figure: Effect of the various English markers on relative assertability for different types of inference. Krzyzanowska, Wenmackers, and Douven (2013: 327).

A hypothesis

	Deduction	**Induction**	**Abduction**
Conclusion	quaranteed	probable	contingent
Status	objective	intermediate	subjective

(5) Given the tendency of subjectification, 'evidentialized'
     modals ought to gradually cover deductive, inductive, and
     abductive contexts in this order in their diachronic
     development.

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Sources

Epistemic from deontic:

- ἀνάγκη (ἐστὶ), δεῖ, ὀφείλω, ἐχρῆν, and εἰκός (ἐστὶ)

Epistemic from pre-modal:

- ἔοικε, κινδυνεύω

Allan (2013), Ruiz Yamuza (2008b), Ruiz Yamuza (2008a)

General objective necessity

(6) [First of all is the ability to know against whom and with whose help to make war; for this is the first requisite of good strategy,]
ἧς ἢν διαμάρτῃ τις, **ἀνάγκη** τὸν πόλεμον ἀσύμφορον καὶ χαλεπὸν καὶ περίεργον <u>εἶναι</u>.
'[A]nd if one makes any mistake about this, the result is **inevitably** a war which is disadvantageous, difficult, and to no purpose.'   (Isoc. 15 117)

The conditional is a restatement of a deductive premise rather than a conclusion:
Premise I: Every bad strategist wages difficult wars. (A entails B)
Premise II: Timotheus was a good strategist. (C is not A)
Conclusion: Timotheus waged succesful wars. (C does not entail B)

Wider context

(7) a. [Timotheus] showed his ability in the very things
         which it is necessary for a good general to know.

     b. And if one makes any [strategic] mistake, ἀνάγκη a
         war which is disadvantageous, difficult, and to no
         purpose.

     c. [Timotheus] brought [all the wars he waged] to a
         successful issue.   (Isoc. 15 17–18)

- ▶ b. is premise I (if x is A, then x is B ∼ A entails B)
- ▶ a. is premise II (C is not A)
- ▶ c is a concluding proposition, which follows from a. and b. (C
  is not B)

Restated premises

The classic:
Every human is mortal / must die. $\sim$ A is B
Socrates is a human. $\sim$ C is A
Socrates is mortal. $\sim$ C is B

A conditional / iterative / generic statement with a placeholder x (e.g., τις):
If someone is a human, they must die. $\sim$ if x is A, x must B

Takeaway points:

- this use of ἀνάγκη does not entail any conclusion
- it restates a deductive premise by introducing an empty slot into an iterative/generic conditional (note that no additional predication vis-a-vis the classic formulation occurs)
- such clauses with ἀνάγκη serve to motivate a more specific assertion that precedes or follows

One more example

(8) a. [Athens are in a bad state.]

  b. It is not altogether surprising that those who wish to tender you advice do not readily find the words.

  c. ὅταν γὰρ τὰ πράγματ᾽ ἔχῃ φαύλως περὶ ὧν δεῖ σκοπεῖν, δυσχερεῖς **ἀνάγκη** περὶ αὐτῶν <u>εἶναι</u> καὶ τὰς συμβουλίας.
  'When the conditions that require consideration are bad, it is **inevitable** that the recommendations made concerning them should also be disagreeable.' (D. Ex. 38)

▶ c. is premise I (A entails B)

▶ a. is a tacit premise II (the current situation, C, is A)

▶ b. is a concluding proposition (C entails B; disagreeable recommendations are manifested by the orators' struggling)

Generalization itself can be inferred

(9) a. Poor speakers have **often** before now been disbelieved because they spoke the truth, and the truth itself has been their undoing because they could not make it convincing: just as clever speakers have **often** gained credit with lies, and have owed their lives to the very fact that they lied.

b. **ἀνάγκη** <u>οὖν</u>, ὅταν τις ἄπειρος ᾖ τοῦ ἀγωνίζεσθαι, ἐπὶ τοῖς τῶν κατηγόρων λόγοις <u>εἶναι</u> μᾶλλον ἢ ἐπ᾽ αὐτοῖς τοῖς ἔργοις καὶ τῇ ἀληθείᾳ τῶν πραγμάτων. 'Thus the fate of one who is not a practised pleader inevitably depends less upon the true facts and his actual conduct than upon the version of them given by his accusers.' (Antipho 5 3)

...the speaker posits a general rule 'A entails B' based on a recurring pattern

▶ ἀνάγκη is still deontic and signifies 'general objective necessity', but it is embedded in an inferred proposition

A shift to inductive contexts

- this use of ἀνάγκη to posit 'general objective necessity' is based on statistical considerations and involves extrapolating from particular cases to a general rule – i.e. **standard induction**

- the clause posits a generalization that membership in a category is associated with an outcome – e.g., being a poor speaker (A) is associated with unfavourable ruling (B)

- **Instantial induction**: "Inference from a statistical generalization to a conclusion concerning an *instance* of that generalization." (Kyburg 1990: 59)

(10) a. *Pr.* Practically all A's are B's.
      b. *Con.* This C is A, so it is also B.

Instantial induction in conclusions

(11) a. Furthermore, men of the jury, they have dealt in much the same way with the ivory and iron which were left me. They do not produce them.

b. καίτοι κεκτημένον μὲν τοσούτους κλινοποιούς, κεκτημένον δὲ μαχαιροποιοὺς οὐχ οἷόν τε μὴ οὐχὶ καὶ σίδηρον καὶ ἐλέφαντα καταλιπεῖν, ἀλλ' **ἀνάγκη** ταῦτά γ᾽ ὑπάρχειν.
'Yet it is impossible that one who possessed so many sofa-makers and so many sword-makers should not also have left iron and ivory. These things **must have been** available.' (D. 27 30)

Premise I: Practically all manufacture owners possess iron and ivory.
Premise II: Demosthenes's father was a manufacture owner.
Inductive conclusion: ἀνάγκη there was iron and ivory

One more inductive conclusion

(12) **ἀνάγκη** γάρ, ὦ ἄνδρες δικασταί, πρῶτον μὲν ὀρεωκόμον καὶ προηγητὴν <u>ἀκολουθεῖν</u> τῷ ζεύγει, ὃ ἦγεν τὴν γυναῖκα, ἔπειτα δὲ παῖδας τοὺς προπέμποντας αὐτὴν <u>ἀκολουθεῖν</u> καὶ Διώξιππον.

'There **must have been** attenders, gentlemen of the jury, with the carriage that conveyed the bride: first a muleteer and a guide, and then her escort of boys, and also Dioxippus.'   (Hyp. 1 5)

Premise I: Practically all weddings involve attenders.
Premise II: The described situation was a wedding.
Inductive conclusion: ἀνάγκη attenders were there.

A shift to abductive reasoning

- instantial inductions is motivated by the need to establish correlations (e.g., miners $\sim$ silicosis, weddings $\sim$ attenders, manufacturers $\sim$ ivory & iron)
- $\rightarrow$ correlated facts do not *necessarily* cause membership in the category
- abduction is motivated by the need to establish the underlying cause for a known fact (e.g., flooded village $\sim$ failed dam)
- **abduction**: "The conclusion follows on the basis of explanatory considerations because it is thought to be *the best explanation* of something thought to be known."
- **bridging context**: an inferred correlated fact also explains membership in a category

A bridge from instantial induction to abduction

(13) a. [Timarchus enjoys luxuries while other men are paying for them.]

b. οὐκ εὔδηλον ὅτι πᾶσα **ἀνάγκη** τὸν τὰ τηλικαῦτα ἐπιτάγματά τισιν ἐπιτάττοντα καὶ αὐτὸν ἀντὶ τούτων ἡδονάς τινας <u>παρασκευάζειν</u> τοῖς τὸ ἀργύριον προαναλίσκουσιν;

'Is it not perfectly plain that the man who makes such demands **must** himself **necessarily** be furnishing in return certain pleasures to the men who are spending their money on him?' (Aeschin. 1 57)

Premise I: Most men who enjoy luxuries for 'free' provide sexual favours to others.

Premise II: Timarchus enjoys luxuries for 'free'.

Inductive conclusion: Timarchus's behavior is *correlated* with providing sexual favours.

Abductive conclusion: Timarchus's behavior is *caused* by him providing sexual favours.

One more abductive conclusion

(14) a. [Aeschines has not proposed any profitable decree.]

b. καίτοι δυοῖν αὐτὸν **ἀνάγκη** θάτερον, ἢ μηδὲν τοῖς
πραττομένοις ὑπ᾽ ἐμοῦ τότ᾽ ἔχοντ᾽ ἐγκαλεῖν
<u>μὴ γράφειν</u> παρὰ ταῦθ᾽ ἕτερα, ἢ τὸ τῶν ἐχθρῶν
<u>συμφέρον</u> ζητοῦντα <u>μὴ φέρειν</u> εἰς μέσον τὰ τούτων
ἀμείνω.
'Now one of two things: either he made no
alternative proposal because he could find no fault
with my policy, or he did not disclose his
amendments because his object was the advantage
of the enemy.'   (D. 18 139)

Background knowledge: Aeschines is a treacherous politician.
Observation: Aeschines has not proposed any profitable decree.
Abductive conclusion: ἀνάγκη he *either* found no fault with D's
policies *or* strove to aid Philip

The grammaticalization chain of ἀνάγκη

prototypically deontic → 'general objective necessity' as an
asserted generalization → inductively inferred generalization →
inductively inferred particular conclusion → abductively inferred
particular conclusion

	Deduction	Induction	Abduction
ἀνάγκη	6[1]	9	3
ἀναγκαίον	1	4	0

Table: Statistics of auxiliaries in conclusions about particulars, The ten
Attic orators.

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[1]Specific contexts with laws as generalizations from which a conclusion
follows.

Epistemic ὀφείλω

(15) εἰ δὲ ἐρίζων πρὸς πᾶν τὸ λεγόμενον μὴ τὸ βέβαιον
      ἀποδέξεις, σφάλλεσθαι **ὀφείλεις** ἐν αὐτοῖσι ὁμοίως καὶ ὁ
      ὑπεναντία τούτοισι λέξας.
      'But if you quarrel with whatever is said yet cannot put
      forth a secure position, you **must** be proved as wrong on
      your part as he who holds the contrary opinion.'   (Hdt.
      7.50.2)

▶ no cases of epistemic ὀφείλω in the studied corpus
▶ one secure example, cited by Ruiz Yamuza (2008b: 79) and
  Allan (2013: 14) is **inductive** (i.e. an event is associated with
  an outcome)

Epistemic δεῖ

(16) a. I don't understand why the question of your
          receiving a benefit from me should cause such
          excitement among our friends here.

      b. **δεῖ** γὰρ αὐτοὺς ἤτοι ἀμαθεστάτους <u>εἶναι</u> πάντων
          ἀνθρώπων, ἢ τῇ πόλει ταύτῃ δυσμενεστάτους.
          'They must either be the most stupid of mankind or
          the worst of public enemies.'   (And. 2 2)

	Deduction	Induction	Abduction
δεῖ	2^1	$3+1^2$	$1+1^3$

Table: Counts based on the CG examples cited in Allan (2013)

and Ruiz Yamuza (2008b).

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[1] Hdt. 7.51.2, Pl. Prm. 163e
[2] X. HG 7.4.36, Pl. Smp. 202b, Pl. Prm. 127e, bridge: E. Ion 291–293
[3] And. 2 2, bridge: E. Ion 291–293

Epistemic χρῆναι and ἐχρῆν

Questioned inductively inferred conclusion

(17) a.   [Aristophanes's personal finances were stretched.]

   b.   ἔτι δὲ πρὸς τούτοις οἴεσθε **χρῆναι** ἔπιπλα πολλὰ
        <u>καταλελοιπέναι</u>;
        'Do you suppose that, besides doing all this, he
        must have left many personal effects?' (Lys. 19 30)

▶ contexts with ἐχρῆν are specific: counterfactual conditionals
  aiming to establish falsity of the proposition in the protasis;
  inductive in force

Epistemic εἰκός

(18) εἰ δ᾽ εὐθὺς ἀδικεῖν βουλόμενος ψευδεῖς ἔθηκεν ἐκείνους
[τοὺς ὅρους], **εἰκὸς** καὶ τούτους οὐκ ἀληθεῖς ὑπάρχειν.
'But if he set up a false inscription in the former case with
the intent to commit fraud, it is probable that the latter
one was false also.'   (D. 31 3)

▶ semantic kernel: 'is fitting / appropriate' in both deontic and
   epistemic sense

▶ **epistemic sense**: some SoAs are thought of as correlated
   with other SoAs → inductive reasoning underlies posited
   'objective' probability

▶ epistemic εἰκός may be tensed and can be questioned

Summary of the cline deontic > 'inferential' epistemic

	Deduction	**Induction**	**Abduction**
ἀνάγκη	✓	✓	✓
ἀναγκαίον	✓	✓	
ὀφείλω		✓	
δεῖ	✓	✓	✓
χρῆναι		✓	
εἰκός		✓	

Table: Attested epistemic uses according to the type of reasoning.

ἔοικα + PTC.DAT

(19) a. Ἥρη τίπτε βέβηκας; ἀτυζομένῃ δὲ **ἔοικας**.
  'Hera, why have you come? You look (like someone) distraught.' (Hom. Il. 15 90)

b. **ἔοικας**, ὦ Ἀντιφῶν, τὴν εὐδαιμονίαν οἰομένῳ τρυφὴν καὶ πολυτέλειαν εἶναι.
  'You seem, Antiphon, to imagine that happiness consists in luxury and extravagance.' (X. Mem. 1.6.10)

► semantic kernel: 'resemble the one who X's'

► the subject of the verb resembles the prototypical instance of a SoA

► used in real comparisons and as a politeness strategy

ἔοικα + INF

(20) a. [Despite the poor outlook, I did not die.]

b. εἰς γὰρ τοὺς θεοὺς ἔχοντα ὀνείδη οὗτοί με μᾶλλον
τῶν ἀνθρώπων **ἐοίκασι** κατελεῆσαι.
'Although I stood disgraced in the eyes of the gods,
they, **it seems**, had more pity on me than did men.
(And. 2 15)

(21) Αἴας· ἰώ μοί μοι.
Χορός· ἀνὴρ **ἔοικεν** ἢ νοσεῖν ἢ τοῖς πάλαι | νοσήμασιν
ξυνοῦσι λυπεῖσθαι παρών.
'Ajax: O! Ah, me! Ah, me!
Chorus: The man **seems** to be sick, or else to be still
pained by the disease which was recently with him.' (S. Aj.
336–338)

▶ the complement of ἔοικα provides an explanation for what is
observed or known → **abductive** conclusion

Epistemic κινδυνεύω

(22) a. ταῦτ᾽ ἀκούσας εἰπεῖν ἔφη ἴσως μέντοι **κινδυνεύσω**
          καὶ ἐγὼ οὐχ ὡς σὺ λέγεις, ὦ Σώκρατες, ἀλλὰ καθ᾽
          Ὅμηρον φαῦλος ὢν ἐπὶ σοφοῦ ἀνδρὸς <u>ἰέναι</u> θοίνην
          ἄκλητος.

          "To this my friend's answer, as he told me, was: 'I
          am afraid mine, **most likely**, is a case that fits not
          your version, Socrates, but Homer's–a dolt coming
          unbidden to the banquet of a scholar.'"   (Pl. Smp.
          174c; Ruiz Yamuza 2008a: 386)

      b. ἀλλὰ **κινδυνεύει** τὸ λίαν εὐτυχεῖν ἐνίοτ᾽ ἐπαχθεῖς
          <u>ποιεῖν</u>.

          'Too much success is apt sometimes to make people
          overbearing.'   (D. 21 205)

▶ 'I undergo the risk of X-ing' > 'I might X' ('objective'
  epistemic possibility) > 'perhaps *p*' ('subjective' epistemic
  possibility)

▶ underlying reasoning / evidential justification seems omitted

Conclusions

Deontic source: ἀνάγκη, ἀναγκαῖον, ὀφείλω, δεῖ, χρῆναι, εἰκός

- ▶ epistemic contexts are often underpinned by rather 'objective' inductive reasoning
- ▶ rather 'subjective' abductive reasoning is rare
- ▶ 'objective' deductive reasoning is rare perhaps because perfect deduction is rare *per se*
- ▶ fuzzy boundary between the layer of SoAs (tensed / questioned / negated modals; dynamic INF) and propositional content (declarative INF)
  $\rightarrow$ lower degree of subjectification, more event-oriented meaning

Pre-modal source: ἔοικα + INF

- ▶ more 'subjective' abductive reasoning
- ▶ declarative infinitives, which are more amenable to propositional reading
  $\rightarrow$ greater degree of subjectification and speaker-oriented meaning

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