To have in Old and Pre-Modern Ukrainian

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Three steps

1. HAVE, obligation, futurate, and the peculiarity of Ukrainian *maty*
2. Double-assertion analysis for Old Ukrainian *maty*
3. Modelling double-assertion items: hard installation, easy maintenance
Primer on modal meaning change
Pipelines of modal meaning change

- Modals undergo regular semantic change.

![Diagram showing pipelines of modal meaning change](image)

Figure 8. To possibility and beyond

from [van der Auwera and Plungian, 1998]

- The timing of change is not predetermined.
- There might be backflow.

(can be meaningfully analyzed using new population-genetics-based models of semantic change, but won’t talk about it today).
Example: *can* from Old to Present-Day English

(1) Old English, Ælfric’s homilies (late 10th century)

> hi ne cunnon minne Fæder ne me
> they not can.3pl my father not me
> ‘They don’t know my Father or me.’

(YCOE: +AHom_9:13.1310_ID)

(2) Middle English, *The Cloud of Unknowing* (late 14th century, or early 15th)

> I trow þat þou schalt cun betir lerne me þen I þee
> I trust that you will can.inf better teach me than I you.acc

(3) **Can** I borrow that book from you, please?

(4) After all, it **could** be raining outside.

**CAN:** knowledge ⇒ ability ⇒ circumstantial possibility ⇒ permission; epistemic possibility
Pipelines of modal meaning change

- Exact pipelines are still being discussed.
- Still, change is largely unidirectional, and follows similar patterns across languages.

Figure 7. Modality’s semantic map from [Hansen, 2004]
Important consequence

- The diachrony of modality has been studied reasonably well for Germanic, Romance, Slavic, some East Asian languages, etc.

⇒ When we find a new pattern, it is a big deal.
HAVE, obligation, futurate, and the peculiarity of Ukrainian *maty*
Lexical HAVE and possessive constructions generally are a well-known lexical source for deontic modality and futurates.

HAVE ‘to have’ \[\rightarrow\] obligation; futurate
Examples: Romance

- Latin \textit{habeo} ‘have’ $\rightarrow$ obligation, futurate

  (5) \textit{Grammarian Sacerdos, 3rd cent.}:

  tempora sunt tria, praesens, praeteritum ... et futurum. quidam tempus presens esse negant, dicentes res aut factas esse aut \textit{habere fieri} ‘There are three tenses, present, past and future. Some deny that there is present tense, saying that things are either done, or HAVE to be done’ from [Pinkster, 1987, ex. (36)]

- Romance: further development of HAVE into an inflectional future

  (6) French: \textit{lir-ai} ‘I’ll read’ $<$ inf. \textit{lire} ‘to read’ + ai ‘I have’
Examples: Germanic, Baltic

- **Present-Day English**: *have to* conveys obligation (and epistemic necessity)

- **Pre-Modern English**: futurate uses; still may be seen as a fossil:
  
  (7) We *have* yet *to* see whether this approach will bear fruit.

- **Old and Pre-Modern Latvian**:
  
  *to.me is X* ‘I have X’ $\rightarrow$ *to.me is INF* ‘I must INF’

  (8) Man *ir galds.*
  
  *to.me is table*
  
  ‘I have a table.’

  (9) Vai man *par savu labu sirdi vēl būs rupjības dzirdēt?*
  
  *Q to.me for my good heart more will.be impertinences to.hear*
  
  ‘Will I have to listen to such impertinences in return for my goodness?’

  from [Holvoet, 2007, p. 199]
HAVE in Slavic languages

- Proto-Slavic *iměti* ‘have’ ⇒ obligation/futurate/future tense in many Slavic

- Descendants in historical and modern Slavic languages:
  - Old Bulgarian (OCS): *iměti* obligation, futurate
    - Modern Bulgarian: *ma* future tense; *imam* obligation/futurate
  - Old Czech: *jmieti* obligation, futurate
    - Modern Czech: *mít* obligation
  - Old Polish: *mieć* obligation, futurate
    - Modern Polish: *mieć* obligation, futurate in the past, hearsay
  - Modern Belarusian: *mec’, mecc’a* futurate
The peculiar situation in Ukrainian

- Present-Day Ukrainian *maty* ‘have’: obligation, futurate

- However, “strange” examples sometimes pop up...

E.g. from a 1890 letter by Lesja Ukrajinka:

(10) ale mene žalj bere, ščo u nas na Ukrajini nijak but me pity takes that at us in Ukraine in no way ne skinčatjsja odvichni siji spory, ta j jak not end eternal those quarrels, and PART how *majutj* skinčytysj, koly sperečnyky odno odnogo ne MATY end if quarrelers one another not rozumijutj. understand

‘[Well, *es ist eine alte Geschichte*, and surely by now you’ve had enough of it already,] but still it pities me that for us in Ukraine, those eternal quarrels never end, and indeed how could they end if the quarrelers don’t understand each other.’

Lesja Ukrajinka’s plays from the turn of the 20th century are some of the earliest examples of postcolonial and feminist writing.
Parallel-text evidence from the 19th-20th century

- Fortunately, there is a parallel Ukrainian-Russian corpus of literary translations, in both directions, compiled by the Russian National Corpus project (www.ruscorpora.ru).

- Parallel texts from historical languages allow us to probe the meaning without direct access to speakers.

(11) (1882) Ta j čym by to ja mala gorduvaty?

Rus translation (1951): “And what would I then be able to be proud of?”

(12) (1901) Koly podumaju tiljky, ščo ja takogo druga maju vtratyty!..

Rus translation (1956): “Only to think about it, that I can lose such a friend!”

Pre-Modern Ukrainian *maty*: obligation, futurate, possibility
Old Ukrainian *maty* also had the possibility reading

- Both my primary research into 16th-century texts and the Dictionary of Old Ukrainian (14-15 centuries) confirm the possibility reading in OUkr.

(13) *Peresopnytsjke Gospel (1556-1561), Matthew 9:15:*

```
egda li imajutj synove bračnyi plakati donelě estj is nimi EMPH Q maty.pres.3pl sons marriage.adj mourn while is with them ženix groom
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‘Is it really *permissible* for those feasting at a marriage to mourn while the bridegroom is with them?’

(14) *Matthew 9:15 in potential source texts for Peresopnytsjke Gospel:*

- Old Church Slavonic *Codex Marianus* (11th cent.): *mogytə ‘can’*
- Middle Bulgarian *Curzon Gospel* (14th cent.): *mogętə ‘can’*
- Middle Bulgarian *Makarius* (early 16th cent.): *mogytə ‘can’*
- Old Czech *Dresden Bible* (14th cent.): *mohu ‘can’*
- Old Czech *Olomouc Bible* (15th cent.): *mohú ‘can’*
- Cf. also Latin *Vulgata: possunt ‘can’*
The peculiarity of Ukrainian *maty*

- Normal: \( \text{HAVE} \rightarrow \text{obligation+futurate} \)
- Not normal: \( \text{HAVE} \rightarrow \text{obligation+futurate+possibility} \)

- *Some* possibility overtones for \( \text{HAVE} \) are not unheard of.
  - Cicero’s Latin: *I HAVE to say* \( \approx \) ‘I can/could say’
  - Old Polish:

    (15) Biblia królewej Zofii (ante 1455):

    czso bichom *myely* dacz
    what SUBJ HAVE.1pl to.give

    ‘What *can/should* we give ...?’
    Cf. Vulgata Tobit 12:1: *quid possumus dare*

- But importantly, known cases do not lead to a stable \( \Box + \Diamond + F \) system.
The puzzle of Ukrainian *maty*

- The □+♦+F HAVE-system is typologically very rare, unlike □+F. Yet Ukrainian preserved the □+♦+F system for ca. 5 centuries.

- Typological rarity could stem from the low likelihood of ♦-reanalysis. But HAVE can receive *occasional* possibility interpretations, as we just saw.

  Thus the rarity of the Ukrainian system can not be due to lack of reanalysis.

- **Conclusion:** there must be something special in the Ukrainian □+♦+F HAVE-system that glues it together.

- Side note: generally, ♦/□ ambiguity for modals (as opposed to “true” variable force which is neither ♦ nor □) seems to be fairly diachronically unstable. See [Yanovich, 2015] for Middle English.
Double-assertion analysis for Old Ukrainian *maty*
The 16th century Old Ukrainian dataset

- *Lutsjk Castle Book* (1560-1561); first 50 folios exhaustively examined (N=67).
- *Peresopnytsjke Gospel* (1556-1561); Matthew exhaustively examined (N=17).
- Selective examination of the rest of L and P, as well as the *First Lithuanian Statute* (1527) and *Legal acts from Volynj* from 1560-s.
The main dataset is geographically focused: Lutsjk, Zaslav/Izjaslav (where P was started) and Peresopnytsja (where P was finished) are within 100 miles from each other.

Peresopnytsjke, being a gospel translation, is under the influence of the Old Church Slavonic tradition, but the whole point of producing a new translation was to obtain a Gospel that is close to the Ukrainian vernacular.

Lutsjk Castle Book is an instance of the official, codified Ukrainian-Belarusian legal language of the Grand Duchy of Lithuania (so-called prosta mova ‘simple language’).
The main findings

- Obligation and futurate readings are indisputably present in all texts.
- Possibility readings are harder to prove decisively, but Matthew 9:15, which we saw already in (13), settles the issue when taken together with other, less crystal-clear, examples.
- However, a peculiar and unexpected pattern is present: almost all examples make perfect sense on two of the three readings, in all three combinations.
Systematic contextual ambiguity

(16) □+F (Lutsjk 29v):
“then that side loses its claim, and maty pay the costs and damages”
Likely primary reading: “the side that lost must pay the damages”.
Secondary reading: “(under the normal course of events,) the side that lost will make the payments”.

(17) ♦+F (Lutsjk 68v):
“if Vartik receives any injustice from them, he maty call them into court”
Likely primary reading: “Vartik has the right to sue in case of unfair treatment”.
Secondary reading: “If injustice is done, Vartik will sue”.

(18) □+♦ (Lutsjk 23v):
“she gave that property to me, and as of now maty-not challenge my rights”
□ > ¬ reading: “she must not challenge my rights”
¬ > ♦ reading: “she may not challenge my rights”
That is, this point follows automatically from the equivalence btw. □¬ and ¬♦
Side note: where ambiguity might be absent

(19) (Lutsjk 29)
“if ... for whatever reasons [pan Vojutinskij] maty breach [the agreement] and withdraw his written statement, he maty pay the fine of 200 coins to his Royal Kindness”

- The futurate reading is clearly possible in 19.
  In principle, a □ analysis is also possible (‘if Mr. Vojutinskij were bound to breach...’), but it’s much more doubtful than in other cases.

- This is not, however, generally characteristic of F-primary cases:

(20) Peresopnytsjke Matthew 12:36:
“but I will tell you that for every empty word which people will say, they maty give an answer for it at the Judgement Day”.

Primary: “will answer for it”
Secondary: “are bound to answer for it”
Vulgata: reddent rationem ‘return an account’
Double-assertion analysis for Old Ukrainian MATY

Double-meaning contexts are specific to *maty*

- **vinna** ‘obliged’: only □

(21) (Lutsjk 42:28) ‘And after his death, they said, his mistress Romanovaja is vinna to stamp her husband’s stamp on it, and she does not do that.’

- **povinna** ‘obliged’: only □

(22) (Lutsjk 24:13v) ‘They do not want to give 1000 kopeykas. Which, they said, payment to the serving people, they were povinny to give already on the Intercession, October the first.’

- **budu** ‘will (future)’: only F

(23) (Lutsjk 3:2v) ‘I, they said, reside in that property, budu defend it, and will not allow anyone to take it.’

- Possibility modals **moč** ‘can’ and **voljna** ‘be allowed’ can give rise to F implicatures, and with negation, ¬◊ is equivalent to □¬.

So the case is less clear here, but 1) the F-implicatures seem less plausible than for *maty*, and 2) there are no primary-□ or primary-F examples for moč and voljna.
Double-meaning is preserved in Pre-Modern Ukrainian

(10) (1890) ale mene žalj bere, ščo u nas na Ukrajini nijak ne
       but me pity takes that at us in Ukraine in.no.way not
skinčatjsja odvichni siji spory, ta j jak majutj skinčytysj, koly
end eternal those quarrels, and PART how MATY end if
sperečnyky odno odnogo ne rozumijutj.
quarrelers one another not understand

Primary ◊: ‘but still it pities me that for us in Ukraine, those eternal quarrels
never end, and indeed how could they end if the quarrelers don’t understand
each other.’
Secondary $F$: what’s the manner in which the quarrels will end if ...

(12) (1901) Koly podumaju tiljky, ščo ja takogo druga maju vtratyty!..
as I.think only that I such.ACC friend.ACC have to.lose

Primary ◊: ‘Only to think about it, that I can lose such a friend!’
Secondary $F$: ...that in the future, there’s an event of my losing such a friend.
Double assertion analysis

- The Ukrainian puzzle: a stable ♦+□+F HAVE-system
- Empirical generalization: in Old Ukrainian, maty almost exclusively occurs in double-meaning contexts
- Proposal: Ukrainian maty was lexically marked as the tool for making double statements.
  - Explains the 16th-century data
  - Treats Ukrainian HAVE as a special case — opening the path to explaining its peculiar stability
Semantic analysis for *maty*: double assertion

- Idea by [von Fintel and Gillies, 2011], employed for epistemics:
  - When an utterance contains an ambiguous item, it might *put into play* more than one proposition, based on the different disambiguations.
  - The assertion rule is that the speaker is warranted for asserting (in the traditional sense) at least one of the propositions put into play.
  - As the result, the hearer does not really know which proposition just got asserted: the effect of *quasi-multiple assertion*.

NB: It is not clear if this is really needed for epistemics. Here we just use the formal apparatus developed by vF&G for an entirely different purpose.

- Analysis for *maty*:
  - *maty* is specified in the lexicon as ambiguous between ♦, □ and $F$.
  - *maty* is also conventionally specified as making “double assertions”, i.e. putting more than one proposition into play.
    The multiple propositions *maty* puts into play are generated by its three meanings ♦, □ and $F$. 
Modelling double-assertion items: hard installation, easy maintenance
The iterative learning paradigm

- A chain of learners each of which learns its grammar from the predecessor’s output:

  \[ \ldots \rightarrow x_{k-1} \rightarrow x_k \rightarrow x_{k+1} \rightarrow \ldots \]

  A good introduction: [Griffiths and Kalish, 2007].

- The basic setup:
  - Nature selects \( n \) states from a fixed set, e.g. \( T = \{\text{nec}, \text{fut}, \text{nec-fut}\} \)
  - \( x_k \) translates each state into a signal from a fixed set, e.g. \( F = \{\Box, F, M\} \).
    \( x_k \)'s grammar: a probabilistic mapping from \( T \) to \( F \).
  - \( x_{k+1} \) observes the states and the signals for them produced by \( x_k \).
    From that information and its prior expectations about which grammars are more likely, \( x_{k+1} \) constructs its own grammar.

- Today, we only look at one step, but with the bigger picture in mind.
Double-assertion signaling: two types of grammars

\[ \alpha \text{ and } \beta \text{ control the share of } M \text{ in pure } nec \text{ and } fut \text{ states.} \]

**Single**: nec-fut is not specially signalled, but treated as nec or fut, with \( \gamma \) controlling it.

**Double**: nec-fut is not reduced to nec and fut. \( \delta_1 \) and \( \delta_2 \) directly control the shares of \( \Box, F \) and \( M \).
Double-assertion signaling

- In system **Single**, there are no double-assertion items, though one signal, $M$, is ambiguous.

  The rates with which $M$ appears in the double $\text{nec-fut}$ state are completely determined by its rates in single states $\text{nec}$ and $\text{fut}$.

- In system **Double**, $M$'s rate of appearance in $\text{nec-fut}$ ($= 1 - \delta_1 - \delta_2$) is dissociated from its rates in $\text{nec}$ ($= 1 - \alpha$) and $\text{fut}$ ($= 1 - \beta$).

- **Single**: $X$, $Y$ and $Z$ are (stochastically) dependent of $\alpha$, $\beta$ and $\gamma$.

  **Double**: $X$, $Y$ and $Z$ do not depend on $\alpha$ and $\beta$.

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<td>nec-fut</td>
<td>$X$</td>
<td>$Y$</td>
<td>$Z$</td>
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Double-assertion signaling

- **Single** is much less expressive than **Double**.

Under **Single**, $M$’s expected share in *nec-fut* is within the purple rectangle. If $x_k$ observes $M$’s share far outside that region, it is very unlikely that $x_{k-1}$’s grammar was of the **Single** type.
Double-assertion signaling: grammar-type selection

- How should the learner choose between Single and Double?
- One conventional means of model selection is the Akaike Information Criterion (AIC). The smaller the AIC, the better the model.

\[ AIC(data, model) = -2\log(p(data|model)) + 2(\# \text{ of model params}) \]

Igor Yanovich (CMU / Tübingen)
Double-assertion signaling: grammar-type selection

- $\Delta \text{AIC}=10$ corresponds to 150 times better likelihood for the data.
- AIC punishes **Double** for its additional parameter by making it $e \approx 2.7$ times worse for the same $p(data|model)$.
- This may be too mild given the linguistic interpretation. We can instead punish **Double** by making it work 100 times harder to get equal with **Single**.
Modelling double-assertion items

**Hard installation, easy maintenance**

- **Double** is a much less parsimonious grammar type:
  - **Double** has one more parameter than **Single**.
  - Double-assertion signals themselves may incur costs.
  - Distinguishing double states may also be costly.

  ⇒ no need to go to **Double** as long as **Single** works well.

  **Hard installation!**

- But if stochasticity leads one into a **Double**-favoring state, and such a grammar is indeed innovated, then subsequently produced distributions can remain very far from the **Single** region for a long time.

  **Easy maintenance!**
Predictions and open questions

- Our simple modelling predicts that double-assertion systems should emerge rarely, but be persistent once they arise.

- This is the right pattern for Ukrainian *maty*: it has a typologically rare $\Diamond + \Box + F$ HAVE-system, yet that system was stable for 5 centuries.

Open issues:

- We looked at a case with 2 pure states. (i) *maty* has 3 pure states. (ii) We don’t seem to observe double-assertion items with 2 states. (Or do we? What about fused modals?)

- We have not made any reference to the actual meanings of *maty*, though they are likely relevant for its emergence.
Conclusion
Ukrainian *maty* ‘have’ maintained a rare ♦+□+F ambiguity for many centuries.

In 16th century Old Ukrainian, *maty* was predominantly used in contexts where two of its meanings would be appropriate.

The double-assertion analysis for *maty* says that it was conventionally marked for use in double-assertion contexts. This (i) explains the 16th century data, and (ii) suggests what might have made the Ukrainian HAVE-system so special.

Simple learning analysis predicts that double-assertion systems should be hard to install, but easy to maintain.

Establishing the link between conventionalized double-assertion items and ♦+□+F requires further research.
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*Might* made right.

Language evolution by iterative learning with Bayesian agents.

Vyrazhenije modal’nosti v berestjanyx gramotax [expression of modality in birch bark letters].
*Slavia*, pages 411–422.

*Mood and modality in Baltic*.
Wydawnictwo Uniwersytetu Jagiellońskiego.

The strategy and chronology of the development of future and perfect tense auxiliaries in Latin.

Modality’s semantic map.

Old English *motan*, variable-force modality, and the presupposition of inevitable actualization.