THE COMPOSITION OF WEAK NECESSITY MODALITY: THE VIEW FROM JAVANESE

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I. INTRODUCTION

Modal expressions have at least two main components of meaning:

MODAL FLAVOUR:
• epistemic: in view of the evidence available
  (1) Jordan may buy a lottery ticket today because she’s feeling lucky.
• deontic: in view of rules or regulations
  (2) Jordan may buy a lottery ticket today because she just turned 18 years old.
• circumstantial: in view of facts of the actual world
  (3) a. Jordan can swim.
     b. Jordan had to sneeze.

MODAL FORCE:
• possibility (existential quantification)
  (4) Jordan may buy a lottery ticket because she turned 18 years old.
• necessity (universal quantification)
  (5) Jordan must buy a lottery ticket because her boss ordered her to.

MODAL STRENGTH:
• weak necessity
  (6) a. Jordan ought to buy a lottery ticket today since her boss suggested it.
     b. Jordan should buy a lottery ticket today if the odds are good.
• strong / weak possibility
  (7) a. It is easily possible to climb Mount Toby.
     b. It is barely possible to climb Mount Everest without oxygen. (Kratzer 1991:643)

Our main goals
① Towards providing tools to better establish weak necessity modal expressions
    • Using a variety of field linguistic methodologies
② Show how weak necessity modality is compositionally derived in Javanese
    • part of a larger on-going enterprise to bring new data from underrepresented languages to better understand the building blocks of modality

How is weak necessity modality expressed?
• Lexically-specific modal expressions
  ➔ English should, ought to; Dutch horen
• Necessity modal + counterfactual (CF) morphology (von Fintel & Iatridou 2008)
  ➔ French, Spanish, Greek, Russian, Croatian, Dutch, Icelandic, Hungarian
  (8) a. To do the dishes. faire les vaisselles, mais tu n’es pas obligé. (French)
     2SG must/COND do the dishes but 2SG not+are not obliged
     "You ought to do the dishes but you are not obliged to do them." (vF & I 2008: 121)
• Javanese uses a different strategy: Necessity modal + suffix -ne
  (9) Kowe kudu-ne maca petunjuk manual-e.
     2SG ROOT.NEC-ne read safety manual-DEF
     ’You ought to read the safety manual.’

Modal expressions can be considered to have a third component of meaning:
(Horn 1972; Kratzer 1991; von Fintel & Iatridou 2008; Rubinstein 2012; a.o.)

① Towards providing tools to better establish weak necessity modal expressions
    • Using a variety of field linguistic methodologies
② Show how weak necessity modality is compositionally derived in Javanese
    • part of a larger on-going enterprise to bring new data from underrepresented languages to better understand the building blocks of modality

The focus of today’s talk is (2).
Outline of the talk

I. Introduction
II. Background on Javanese modal system
III. Weak necessity modality in Javanese: Necessity modal + the suffix -ne
   I. -ne derives weak necessity
   II. -ne does not change modal flavour
   III. -ne is not counterfactual morphology
   IV. -ne does not attach to possibility modals
IV. Analysis: the suffix -ne is a scalar operator
V. Conclusions & future outlook

II. BACKGROUND ON JAVANESE & METHODOLOGIES

- Mainly spoken on central and east Java, Indonesia
- Dialectal groups: West, Central, East Javanese (e.g. Hatley 1984)
- The data presented are ngoko (Low Javanese) and primarily come from fieldwork in Paciran (East Javanese).

METHODOLOGIES

- elicitation
  - acceptability judgments of sentences given a discourse context
  - (translation from English)
- storyboards (Burton & Matthewson 2015)
  - story created to target a specific construction/meaning
  - language consultants narrate a set of pictures in the target language after the research first narrates it in the contact language
- Modality questionnaire (Vander Klok 2014)
  - MPI "Typological tools for field linguists"
  - recordings of natural conversation
II. JAVANESE MODAL SYSTEM

Javanese modal system
• Javanese has a ‘mixed’ modal system
  • most modals lexically specify for both modal force & modal flavour
    → e.g., mesthi ‘EPIS.NEC’
  • Modal kudu allows for referential ambiguity along the modal flavour axis

Table 1. Paciran Javanese modal system of pure possibility & necessity modals (Vander Klok 2013)

<table>
<thead>
<tr>
<th>MODAL FLAVOUR</th>
<th>Epistemic</th>
<th>Deontic</th>
<th>Circumstantial</th>
<th>Telesological</th>
<th>Bouletic</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODAL FORCE</td>
<td>necessity</td>
<td>possibility</td>
<td>kudu</td>
<td>-</td>
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</tbody>
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Example: establishing the semantics of mesthi ‘EPIS.NEC’
• only has necessity modal force
• only compatible with epistemic modal flavour

Modal force of mesthi as necessity (universal quantification)
> offered in epistemic necessity contexts

[(10) Context: ‘Jono and Siti can’t be hiding in the box’, says the policeman. ‘It’s too small. And they can’t be hiding under the bed. It’s too low...’ (Storyboard ‘On the Lam’ TFS 2011)]
  → mesthi nak ngguri/ne salambu epis.nec at behind/curtain
  ‘...[they] must be behind the curtain.’
  (Vander Klok 2013:350)

Modal force of mesthi as necessity (universal quantification)
> infelicitous in epistemic possibility contexts

[(11) Context: Dewi is looking for her necklace. She’s not sure if she lost it or if it is still somewhere in the house because she doesn’t remember the last time that she wore the necklace. She looks in her wardrobe and on top of the wardrobe. It’s not there. She looks on top of the tv. It’s not there. She looks in her sister’s wardrobe. It’s not there! She didn’t check her sister’s wardrobe yet.]
  → kalung-e Dewi mesthi ilang
  ‘Dewi’s necklace might be lost.’
  (Vander Klok 2013:351)

Semi-forced choice questionnaire results:
14/15 chose sentence with paleng; 0/15 chose sentence with mesthi

Modal flavour of mesthi as epistemic
> felicitious in epistemic necessity contexts (cf. Storyboard ‘On the Lam’)
> infelicitous in other contexts.

[(12) Deontic Context: A while later, Mary gets better from her cold. Her friends come over and ask her to come play outside. Mary says, “Sorry, I can’t come out to play...”]
  → PR-ku <uw/ak> yik kudu / homework-my <less/much> yes kudu/epis.nec
  PR-ku <uw/ak> yik kudu / homework-my <less/much> yes kudu/epis.nec
  ‘I have so much homework, I have to work on it’
  (Vander Klok 2013:352)

Modal flavour of mesthi as epistemic
> felicitious in epistemic necessity contexts (cf. Storyboard ‘On the Lam’)
> infelicitous in other contexts.

[(13) Circumstantial context: You are on the road to Yogya. You haven’t had time to go pee for 6 hours; you really need to go. You send a text to your friend:]
  → PR-ku <uw/ak> yik kudu / homework-my <less/much> yes kudu/epis.nec
  → PR-ku <uw/ak> yik kudu / homework-my <less/much> yes kudu/epis.nec
  ‘I have to pee!’
  (Vander Klok 2013:354)

Semi-forced choice questionnaire results:
15/15 chose sentence with kudu; 0/15 chose sentence with mesthi
IV. WEAK NECESSITY MODALITY IN JAVANESE

The suffix -ne

A. Necessity modal + -ne derives weak necessity in Javanese

Identifying weak necessity modality

• Robustian’s (to appear) definition: A modal word α is a weak necessity modal if (i) to (ii) hold, for any proposition p.
  i. The conjunction of α(p) and α¬p is a contradiction.
  ii. There is a necessity modal β such that (βp) entails α(p).
  iii. There is a possibility modal γ such that α(p) entails γp.

Evidence for weak necessity

• WN(p) and WN¬p is a contradiction (where WN is a weak necessity modal)

[15] Context: Your friend Lisa is visiting you at your house, and now it is after 90am and getting late. You offer to Lisa that she can sleep overnight at your house. You also offer to walk with her to her house. It is up to her to decide. A is free either way. Then your Mom asks: Do you know what Lisa is going to do? You respond:

- *Meak Lisa mesthi ngsep nek home. Dei go mesthi nek home.
  Miss Lisa mesthi ngsep nek home. Dei go mesthi nek home.
  Lisa might stay over here. She also might go home."

[16] Context as above.

- *Meak Lisa mesthi-ne ngsep nek home. Dei go mesthi-ne nek home.
  Miss Lisa mesthi-ne ngsep nek home. Dei go mesthi-ne nek home.
  Lisa might stay over here. She also must go home."

[17] Context as above.

- Miss Lisa paling ngsep nek home. Dei go paling nek home.
  Miss Lisa mesthi-ne ngsep nek home. Dei go mesthi-ne ngsep nek home.
  Lisa might stay over here. She also might go home."

[18] Context: You see there is a light on at Yu Dur’s house, and her sandals are there too. You think... [a], But then you remember that Yu Zum has the same sandals, and she often stays over at Yu Dur’s place. You think... [b]

a. Yu Dur mesthi nek omah sa’iki. sister Dur EPISEC at house now
   'Our must be at home now.’

b. Yu Dur mesthi-ne nek omah taipi gak mesthi.
   sister Dur EPISEC-at home but NEG EPISEC
   'Our should be at home, but it’s not certain.’

[19] Context: You see there is a light on at Bu Del’s house. You think... [a]. Then you see there are DELL’s sandals in front of the door. You think... [b]

   Mrs. Dell EPISEC-at / [b] mesthi nek omah sa’iki.
   'Mrs. Del [a] should [b] be at home now.’

   Mrs. Dell EPISEC-NEG-at / EPISEC at house now
   'Mrs. Dell [a] should [b] be at home now.’
B. Necessity modal + -ne does not change the modal flavour
- mesthi-ne is only compatible with epistemic modality, just like mesthi 'EPST.NE'.
- kudu-ne is only compatible with root modality, just like kudu 'ROOT.NEC'.

(20) Context: Commenting on weather based on what you see the sky to look like.
Mesthi-ne / #Kudu-ne pes terang udane.
EPST.NE / ROOT.NEC (25) already downpour rain-DET
'It should be done downpouring.'

(21) Kowa kudu-ne / #mesthi-ne maca petunjuk manual-e.
2SG ROOT.NEC-NE EPST.NE-NE /KU.DEAF safety manual-DET
'You ought to read the safety manual.'

D. -ne cannot attach with possibility modals in Javanese
- -ne cannot occur with possibility modals
(25) Joli paleng 'e
Joli EPST.NE to WBL
'You might go to WBL.'
(26) Aku isti 'e
nge-langi.
1SG CRC.PST-NE live-swim
'I can swim.'
(27) Awakmu oleh 'e
lungo kematian-an.
2SG DIO-PST-NE go marriage-AN
'You may go to the wedding.'

- 'Counterfactual' morphology can occur with possibility modals in some languages, e.g. French
(28) le pourrais faire la vaisselle, le ménage, le repassage et passer l’aspirateur.
I can/COND do the dishes, the cleaning, the ironing and pass the vacuum
'I could do the dishes, the cleaning, the ironing, and the vacuuming.'

V. ANALYSIS OF JAVANESE WEAK NECESSITY

Weak necessity modality in Javanese
- Our analysis needs to capture the established properties that
  A. Necessity modal + -ne derives weak necessity
  B. -ne does not change modal flavour
  C. -ne is not counterfactual morphology
  D. -ne does not attach to possibility modals

<table>
<thead>
<tr>
<th>MODAL FLAVOUR</th>
<th>EPSTIC</th>
<th>ROOT</th>
<th>DEONTIC</th>
</tr>
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<tbody>
<tr>
<td>necessity</td>
<td>mesthi</td>
<td>kudu</td>
<td>-</td>
</tr>
<tr>
<td>weak necessity</td>
<td>kudu-ne</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>possibility</td>
<td>-</td>
<td>-</td>
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</tbody>
</table>

Table 1. Paciran Javanese modal system (Vander Klok 2013)

C. -ne is not counterfactual morphology
- Many languages derive weak necessity with necessity modal + CF morphology:
  French, Spanish, Greek, Croatian, Dutch, Icelandic, Hungarian (van Lier & van den Bosch 2008)
(22) Tu devrais faire la vaisselle, mais tu n’es pas obligé.
2SG Must/COND do the dishes but 2SG not are not obliged
'You ought to do the dishes but you are not obliged to do them.' (Vf & I 2008: 121)
(23) Si il n’est pas soil, Si il était soil, il parlerait plus fort.
3SG not was soil, if he were soil, he would talk louder. (Vf & I 2008: 122)

- Javanese -ne is not CF morphology
  - CF interpretation does not arise in out-of-the-blue contexts with -ne
  - Not required in the consequent of a counterfactual conditional
  - There is no fixed grammatical strategy to indicate counterfactuality in Javanese.

(24) Context: Luckily, Dewi wasn’t hit by a car!
Nasi mobil itu was nuhraf Dewi,
masi/ne deweke was muti
if car (loc) already nu/hit Dewi
is not+is drunk, 3sg already die
... deweke xep mati-ne
... 3sg already die-NE

'If the car had hit Dewi, she would have been killed.'

Analysis of weak necessity modality in Javanese

Intuition from the nominal domain (cf. Carlson 1981; Partee 1986):
(29) a. All students came to the party.
   b. Some students came to the party.
(30) a. Almost all students came to the party.
   b. *Almost some students came to the party.

- Analyses of almost rely on scalarity and proximity
  (e.g., Weems 1990; Rapp 1999; Perk distribution 2008; Socher 2010; Broekhoven 2014)

Our proposal:
- -NE is a scalar modifier that asserts that the proposition is true in a subset of the set of worlds that would make the actual quantification true.
- (i) -NE imposes a proximity condition that requires that the cardinality of the subset has to be still fairly close to the cardinality of the set of worlds that would make the quantification true, and (ii) and is only defined if that subset is entailed by the original quantification
  - -NE almost expresses universal quantification over the favored worlds.
A. Necessity modal + -ne derives weak necessity

(29) Bu Deli mesti-ne omah saksi. Mrs. Deli must be at home now.

- Assume that in some utterance context, the epistemic modal base plus the ordering source allow us to access the following set of worlds, whose cardinality is 6

\[ W = \{w_1, w_2, w_4, w_6, w_8, w_{10}\} \]

- For Mrs. Deli must be at home(-a necessity claim) to be true, the proposition Mrs. Deli be at home would have to be true in each of the 6 worlds

- NE now requires that the p is T in the proximal worlds → e.g., in some subset of these worlds whose cardinality is still close enough to 6, e.g. 4 or 5.

- NE also takes for granted that the proximal alternatives are entailed by the modal quantifier → e.g. That Mrs. Deli is at home is T in all 6 worlds entails that she is home is T in 4 or 5 worlds.

- The resulting meaning for the modal claim will be weaker than necessity, but stronger than mere possibility, which only requires a non-empty set of possible worlds to make the proposition that Mrs. Deli be at home true.

Our proposal:
- -NE is a scalar modifier that asserts that the proposition is true in a subset of the set of worlds that would make the actual quantification true.
- (i) -NE imposes a proximity condition that requires that the cardinality of the subset has to be still fairly close to the cardinality of the set of worlds that would make the quantification true, and
- (ii) and is only defined if that subset is entailed by the original quantification.

-NE almost expresses universal quantification over the favored worlds.

B. -ne does not change modal flavour
- -NE does not affect that modal flavour of the stem it attaches to.

C. -ne is not counterfactual morphology
- -NE does not add any meaning of counterfactuality.

D. Possibility modal + -ne cannot derive weak (or strong) possibility

(31) Awakmu daleh(-e) di longo kementan-an. You may go to the wedding.

- Assume that in some utterance context, the deontic modal base plus the ordering source allow us to access the above set of worlds, whose cardinality is 6.

For You may go to wedding(-a possibility claim) to be true, the proposition that You go to the wedding would have to hold true in at least one of these six worlds.

- -NE now requires that the proposition is true in the proximal worlds.

- NE also takes for granted that the proximal alternatives are entailed by the modal quantifier→ but this fails:
  - it being possible that the addressee attends the wedding, for instance, does not entail that there is no favored worlds in which they attend
  - Them attending the wedding in some of the favored worlds also does not entail that they get to go to the wedding exactly two, three, four or five of the favored worlds (by virtue of the monotonicity properties of the existential quantifier)

- There is no resulting meaning for the possibility modal claim plus ~ne because the definedness conditions of ~ne are not met.

V. CONCLUSIONS & FUTURE OUTLOOK

Summary of weak necessity modals in Javanese
- compositional derivation of necessity modal + suffix -ne
- captures the facts that...
  - -ne does not change the modal flavour of the necessity modal
  - necessity modal + -ne does not express counterfactuality
  - necessity modal + -ne cannot occur with possibility modals
- Scalar analysis shows a new way of deriving weak necessity cross-linguistically
  - Different from a secondary ordering source (e.g., von Fintel & Iatridou 2008)
  - Different from specific requirements on the nature of the context: Rubenstein (2012) proposes that weak necessity presupposes that not all conversational participants are committed to additional considerations.

Future outlook
- Weak necessity in ‘Indonesian-type’ languages also seem to be compositionally derived:
  - Indonesian se-mesti-nya, se-harus-nya (Sneddon 2010:371)
  - se-harus-nya (Sneddon 2010:371)
  - Madiunese sa-onggo no ‘apparently’ (epistemic adverb; Davies 2010:393-4)

- is there a cross-linguistic gap in grammaticalized markers for ‘weak possibility’?
References


Formal implementation

1. For any semantic type α, any Q ∈ Dp,q(α)(α), and any p and q ∈ Dα:C:
   \[\#(Q,p,q) = \text{the least u such that } Q(p,q) = 1 \text{ if } n\text{-many } p \text{ are } q.\]

2. For any degree d that is an element of some scale S:
   \[(U\text{-}\text{ORDERED})\] is a computably-determined function on S that includes d.

3. For any Q ∈ Dp,q(α)(α) and any p ∈ Dα:C:
   \[\text{[\text{NE}(Q),p,q]} = \begin{cases} \text{false}, & \text{if } \exists u \in \text{ORDERED}(\#(Q,p,q)) \text{ s.t. } \#(Q,p,q) < \#(Q,p,q) \text{ and there are } n\text{-many } \alpha \text{ s.t. } p\text{-many } q \text{ are } q\text{.} \\ \text{true}, & \text{otherwise.} \end{cases}\]

4. For the formal definition:
   \[\text{[\text{NE}(Q),p,q]} = \text{false if } \#(Q,p,q) = 1 \text{ entails that there are } n\text{-many } \alpha \text{ s.t. } p\text{-many } q \text{ are } q\text{.} \]

5. For the formal implementation:
   \[\text{[\text{NE}(Q),p,q]}(\text{domain}) = \text{false if } \text{[\text{NE}(Q),p,q]} = \text{false}.\]

Quantification can be defined via cardinalities (von Stechow 2010).

APPENDIX

References

- von Fintel, Kai & Iatridou, Sabine. LSA 2009 notes.

Thank you...

- Javanese consultants Lathif Khuluq, Fina Aksanah, Titis Subekti, Bahrul Ulum, Nasrullah, Lijatis Hakim, Haris Noffitasari, Fanhi, Khoim, Zumanion, Nunung, Rohmah in Pacitan, East Java. *Matu mawan senk akehi*
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