

# 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:  
(Kratzer 1977, 1981, 1991; Portner 2009; Hacquard 2011; a.o.)

### 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.

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

### 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)



Cartoon by Carolita Johnson, New Yorker, July 31, 2006 (cited in von Stechow & Iatridou 2008)

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## How is weak necessity modality expressed?

- Lexically-specific modal expressions  
→ English *should, ought to*; Dutch *horen*
- Necessity modal + counterfactual (CF) morphology (von Stechow & Iatridou 2008)  
→ French, Spanish, Greek, Russian, Croatian, Dutch, Icelandic, Hungarian  
(8) Tu **devrais** faire la vaisselle, 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. (Javanese)  
2SG **ROOT.NEC-NE** AV.read safety manual-DEF  
'You ought to read the safety manual.'

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## 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

The focus of today's talk is (2).

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## 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

### Javanese (Western Malayo-Polynesian, Austronesian)



[http://www.nationsonline.org/neworld/map/indonesia\\_map.htm](http://www.nationsonline.org/neworld/map/indonesia_map.htm) (Accessed July 12, 2012)

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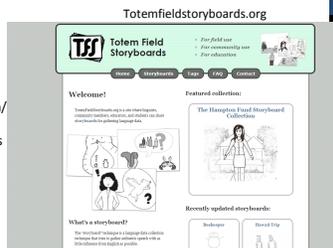
- Mainly spoken on central and east Java, Indonesia
- Dialectal groups: West, Central, East Javanese (e.g. Hatley 1984)
- The data presented are *ngoko* (Low Javanese) and primarily come from fieldwork in Paciran (East Javanese).



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## 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



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## METHODOLOGIES

- **elicitation**
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  - language consultants narrate a set of pictures in the target language after the research first narrates it in the contact language
- **Modality questionnaire** (Vander Klof 2014)
  - MPI 'Typological tools for field linguists'
- **recordings of natural conversation**



<https://www.eva.mpg.de/lingua/tools-at-lingboard/questionnaire/cross-linguistic-use.php>

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## 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)

		MODAL FLAVOUR				
		EPISTEMIC		ROOT		
		Epistemic	Deontic	Circumstantial	Teleological	Bouletic
MODAL FORCE	necessity	<i>mesthi</i>		<i>kudu<sub>1</sub></i>		<i>kudu<sub>2</sub></i>
	possibility	<i>paleng</i>	<i>oleh</i>	<i>iso</i>	-	-

**Example:** establishing the semantics of *mesthi* 'EPIS.NEC'

- only has **necessity** modal force
- only compatible with **epistemic** modal flavour

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### 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* nek ngguri-ne selambu  
 EPIS.NEC at behind-DEF curtain

'...[they] must be behind the curtain.'

(Vander Klok 2013:350)



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### 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 some-where 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 backpack; it's not there. Wait! She didn't check her sister's wardrobe yet.* (Modality Questionnaire)

a. # kalung-e Dewi *mesthi* ilang  
 necklace-POSS Dewi EPIS.NEC lose

b. kalung-e Dewi *paleng* ilang  
 necklace-POSS Dewi EPIS.POS lose

'Dewi's necklace might be lost.' (Vander Klok 2013: 351)

Semi-forced choice questionnaire results:

14/15 chose sentence with *paleng*; 1/15 chose sentence with *mesthi*

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### Modal flavour of *mesthi* as epistemic

- felicitous 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..."* (Storyboard 'Sick Girl', TFS 2011)

PR-ku <uw>akeh yo *kudu*/  
 homework-my <INT>many yes ROOT.NEC /

# *mesthi* tak=kerjak-no  
 EPIS.NEC 1SG.CL=WORK-APPL

'I have so much homework, I have to work on it!'

(Vander Klok 2013: 353)



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### Modal flavour of *mesthi* as epistemic

- felicitous in **epistemic** necessity contexts (cf. Storyboard 'On the Lam')
- infelicitous** in other contexts.

(13) **CIRCUMSTANTIAL context:** *You are on the road to Yogyakarta. You haven't had time to go pee for 6 hours; you really need to go. You send a text to your friend:*

a. # aku *mesthi* nguyoh!  
 1SG EPIS.NEC AV.urinate

b. aku *kudu* nguyoh!  
 1SG ROOT.NEC AV.urinate

'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*

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

MODAL FORCE	necessity possibility	MODAL FLAVOUR				
		EPISTEMIC		ROOT		
		Epistemic	Deontic	Circumstantial	Teleological	Bouletic
		<i>mesthi</i>		<i>kudu<sub>1</sub></i>		<i>kudu<sub>2</sub></i>
		<i>paleng</i>	<i>oleh</i>	<i>iso</i>	-	-

**Example:** establishing the semantics of *mesthi* 'EPIS.NEC'  
 • only has **necessity** modal force → Universal quantification (∀)  
 • only compatible with **epistemic** modal flavour  
 → **presupposition** on the type of conversational background  
 (cf. Rullmann et al. 2008)

(14)  $[[MESTHI(f)(g)(\alpha)]^{w,c}]$  is only defined if  $c(f)$  is an epistemic modal base and  $c(g)$  is a stereotypical ordering source.  
 If defined,  $[[MESTHI(f)(g)(\alpha)]^{w,c}] = T$  iff  $\forall w' \in \max_{c(g)(w)} (\cap c(f)(w')): [\alpha]^{w'} = T$

## IV. WEAK NECESSITY MODALITY IN JAVANESE

The suffix *-ne*

### Weak necessity modality in Javanese

- Weak necessity modality is compositional in Javanese: Necessity modal + suffix *-ne*
  - ne* derives weak necessity
  - ne* does not change modal flavour
  - ne* is not counterfactual morphology
  - ne* does not attach to possibility modals

MODAL FORCE	necessity weak necessity possibility	MODAL FLAVOUR				
		EPISTEMIC		ROOT		
		Epistemic	Deontic	Circumstantial	Teleological	Bouletic
		<i>mesthi</i>		<i>kudu<sub>1</sub></i>		<i>kudu<sub>2</sub></i>
		<i>mesthi-ne</i>		<i>kudu-ne</i>		-
		<i>paleng</i>	<i>oleh</i>	<i>iso</i>	-	-

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

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

#### Identifying weak necessity modality

- Rubinstein's (to appear) definition: A modal word  $\alpha$  is a weak necessity modal if (i) to (iii) hold, for any proposition  $p$ .
  - The conjunction of  $\alpha(p)$  and  $\alpha(\neg p)$  is a contradiction.
  - There is a necessity modal  $\beta$  such that  $\beta(p)$  entails  $\alpha(p)$ .
  - There is a possibility modal  $\gamma$  such that  $\alpha(p)$  entails  $\gamma(p)$ .

### 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 *isya'* 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. It is fine either way. Then your Mom asks: Do you know what Lisa is going to do? You respond:

\* Mbak Lisa *mesthi* nginep nek kene. De'e yo *mesthi* muleh.  
 Miss Lisa EPIS.POS AV.stay.over at here 3SG YES EPIS.POS AV.go.home  
 'Lisa might stay over here. She also might go home.'

(16) Context as above.

\* Mbak Lisa *mesthi-ne* nginep nek kene. De'e yo *mesthi-ne* muleh.  
 Miss Lisa EPIS.NEC-NE AV.stay.over at here 3SG YES EPIS.NEC-NE AV.go.home  
 ('Lisa must stay over here. She also must go home.')

(17) Context as above.

Mbak Lisa *paleng* nginep nek kene. De'e yo *paleng* muleh.  
 Miss Lisa EPIS.POS AV.stay.over at here 3SG YES EPIS.POS AV.go.home  
 'Lisa might stay over here. She also might go home.'

### stronger → weaker context: modal → modal+*-ne*

(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. [a] #*mesthi-ne*  
 sister Dur EPIS.NEC at house now [b] #*mesthi*

'Dur must be at home now.'  
 b. Yu Dur *mesthi-ne* nek omah tapi *gak mesthi*.  
 sister Dur EPIS.NEC-NE at house but NEG EPIS.NEC  
 'Dur should be at home, but it's not certain.'

### weaker → stronger context: modal+*-ne* → modal

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

Bu Deli [a] *mesthi-ne* / [b] *mesthi* nek omah sa'iki. [a] #*mesthi*  
 Mrs. Deli EPIS.NEC-NE / EPIS.NEC at house now [b] #*mesthi-ne*

'Mrs. Deli [a] should / [b] must 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* 'EPIS.NEC'.
- *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**    wes    terang    udan-e.  
 EPIS.NEC-NE    ROOT.NEC-NE    already    downpour    rain-DEF  
 'It should be done downpouring.'

EPISTEMIC

(21) Kowe **kudu-ne** / **#mesthi-ne**    maca    petunjuk    manual-e.

2SG    ROOT.NEC-NE    EPIS.NEC-NE    AV.read safety    manual-DEF  
 'You ought to read the safety manual.'

DEONTIC

### C. -ne is not counterfactual morphology

- Many languages derive weak necessity with necessity modal + CF morphology: French, Spanish, Greek, Russian, Croatian, Dutch, Icelandic, Hungarian (von Stechow 2008)

(22) Tu    **devoirs**    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) Il n'est pas soûl. Si il était soûl, il **parlerait** plus fort.  
 3sg not-is NEG drunk. if 3sg were drunk, 3sg talk/COND more loud  
 'He is not drunk. If he were drunk, 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 conditionals
- There is no fixed grammatical strategy to indicate counterfactuality in Javanese.

(24) Context: Luckily, Dewi wasn't hit by a car!

Nek mobil iku wes    nubruk Dewi,    **mesti(-ne)**    deweke    wes    mati  
 if    car    DEM already AV.hit Dewi    EPIS.NEC-NE    3SG    already die  
 \*... deweke    wes    **mati-ne**  
 ... 3SG    already die-NE

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

### D. -ne cannot attach with possibility modals in Javanese

- -ne cannot occur with possibility modals

(25) Jozi **paleng(\*-e)**    reng    WBL.  
 Jozi EPIS.POS-NE    to    WBL  
 'Jozi might go to WBL.'

(26) Aku **iso(\*-ne)**    nge-langi.  
 1SG CIRC.POS-NE    AV-swim  
 'I can swim.'

(27) Awakmu **oleh(\*-e)**    lungo    kementan-an.  
 2SG    DEON.POS-NE    go    marriage-AN  
 'You may go to the wedding.'

- 'Counterfactual' morphology can occur with possibility modals in some languages, e.g. French

(28) Je **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.'

<https://yoopies.fr/femme-de-menage-paris/femme-menage-recherche-d-un/1319913>  
 Accessed June 14, 2019

## V. ANALYSIS OF JAVANESE WEAK NECESSITY

### Weak necessity modality in Javanese

- Our analysis needs to capture the established properties that
  - Necessity modal + -ne derives weak necessity
  - ne does not change modal flavour
  - ne is not counterfactual morphology
  - ne does not attach to possibility modals

		MODAL FLAVOUR				
		EPISTEMIC		ROOT		
MODAL FORCE	necessity	<i>mesthi</i>		<i>kudu<sub>1</sub></i>		<i>kudu<sub>2</sub></i>
	weak necessity	<i>mesthi-ne</i>		<i>kudu-ne</i>		-
	possibility	<i>paleng</i>	<i>oleh</i>	<i>iso</i>	-	-

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

### 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.**    (30) a. **Almost all students came to the party.**  
 b. **Some students came to the party.**    b. **\*Almost some students came to the party.**

- Analyses of *almost* rely on scalarity and proximity (e.g., Hitzemann 1992; Rapp 1999; Penka 2006; Stechow 2010; Brockmann 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 **mesthi-ne** nek omah sa'iki.  
Mrs. Deli EPIS.NEC-NE at house now  
'Mrs. Deli should 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

(30)  $W = \{w_1, w_2, w_3, w_4, w_5, w_6\}$

- 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.

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

(31) Awakmu oleh(\*-e) lungu kementan-an. (32)  $W = \{w_2, w_3, w_4, w_5, w_6, w_{13}\}$   
2SG DEON.POS-NE go marriage-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 world 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 in exactly two, three, four or five 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.**

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#### 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.

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## 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 Stechow & 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

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#### Future outlook

- Weak necessity in 'Indonesian-type' languages also seem to be compositionally derived:
  - Indonesian** *se-mesti-nya, se-harus-nya* (Sneddon 2010:371)
 

(33) Saya **se-harus-nya** berangkat tanggal dua.  
1SG one-must-NYA leave date second  
'I should have left on the second.' (my glossing)
  - Peranakan Javanese** *mesti-ne, harus-e* (David Moeljardi p.c.)
  - Madurese** *sa-onggu-na* 'apparently' (epistemic adverb; Davies 2010:393-4)
- Is there a cross-linguistic gap in grammaticalized markers for 'weak possibility'?

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## APPENDIX

### Formal implementation

- (1) For any semantic type  $\alpha$ , any  $Q \in D_{((\alpha,t),((\alpha,t),t))}$ , and any  $p$  and  $q \in D_{(\alpha,t)}$ :  
 $\#(Q, p, q)$  = the lowest  $n$  such that  $Q(p)(q) = 1$  iff  $n$ -many  $p$  are  $q$ .
- (2) For any degree  $d$  that is an element of some scale  $S$ ,  
 $UMGEBUNG(d)$  is a contextually-determined interval on  $S$  that includes  $d$ .
- (3) For any  $Q \in D_{((\alpha,t),((\alpha,t),t))}$ , and any  $p, q \in D_{(\alpha,t)}$ :  
 $[-NE](Q)(p)(q) = 1$  iff  
 $\exists n' [n' \in UMGEBUNG(\#(Q, p, q)) \ \& \ n' \neq \#(Q, p, q) \ \& \text{there are } n'\text{-many } w \text{ s.t. } p(w) = q(w) = 1]$   
 $[-NE](Q)(p)(q)$  is defined iff  
 $Q(p)(q) = 1$  entails that there are  $n'$ -many  $w$  s.t.  $p(w) = q(w) = 1$
- (4) *Bu Deli mesthi-ne nek omah sa'iki.*  
 Mrs. Deli EPIS.NEC-NE at home now  
 'Mrs. Deli should be at home now.'
- (5)  $[w^* [Aw [ [_{((\alpha,t),t)} [ [_{((\alpha,t),((\alpha,t),t))} MESTHI NE] (\text{domain}) ] ]_{(\alpha,t)} \text{Mrs. Deli be at home} ] ] ]$   
 with  $(\text{domain}) = [_{(\alpha,t)} \text{MAX ORDER}_w \text{ACCESS}_w]$

Quantification can be defined via cardinalities (von Stechow 2010)