Universal and Existential Quantification in Chadic and Beyond

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1. Introduction

- **Plan for this talk:**

  Discussion of two semantic phenomena of potential interest to a general Africanist audience:

i. coding and interpretation of universal quantification
ii. coding and interpretation of indefiniteness / existential quantification

  in a number of West African languages

1. Introduction

- **Structure of the talk:**

  §2: Semantic Background on Quantification

  §3: $\forall$-Quantification in Hausa and Wolof and cross-linguistic implications

  §4: Indefinites & $\exists$-Quantification in Hausa, Akan, Wolof and cross-linguistic implications

  §5: Conclusion

2. Quantification - Background

- **Quantification in Predicate Logic:**

  One universal and one existential quantifier: $\forall$, $\exists$

  Both quantifiers are unrestricted and operate over (open) propositions:

(1) a. $\forall \mathbf{x}$ [linguist'(x) $\rightarrow$ happy'(x)]

  $\approx$ All the linguists are happy/ Every linguist is happy.

  b. $\exists \mathbf{x}$ [linguist'(x) $\wedge$ happy'(x)]

  $\approx$ A / some / (at least) one linguist is happy.

2. Quantification - Background

- **Quantification in Predicate Logic: Problems**

i. Compositionality - Meaning assignment only at sentential level $\Rightarrow$ no local interpretation for quantificational NPs: *every linguist*, *some linguist* etc.

ii. Expressiveness - No meaning assignment to proportional quantificational NPs: *most linguists*

iii. Lack of Restrictiveness: No possibility to restrict the domain of quantification to a contextually given subset

2. Quantification - Background

- **Quantification in Natural Language: GQ-Theory**

  Quantificational NPs in natural language denote Generalized Quantifiers (GQs) [Montague 1973, Barwise & Cooper 1981]

$\Rightarrow$ Quantifiers like *some* and *every* denote (second order) relations between sets.

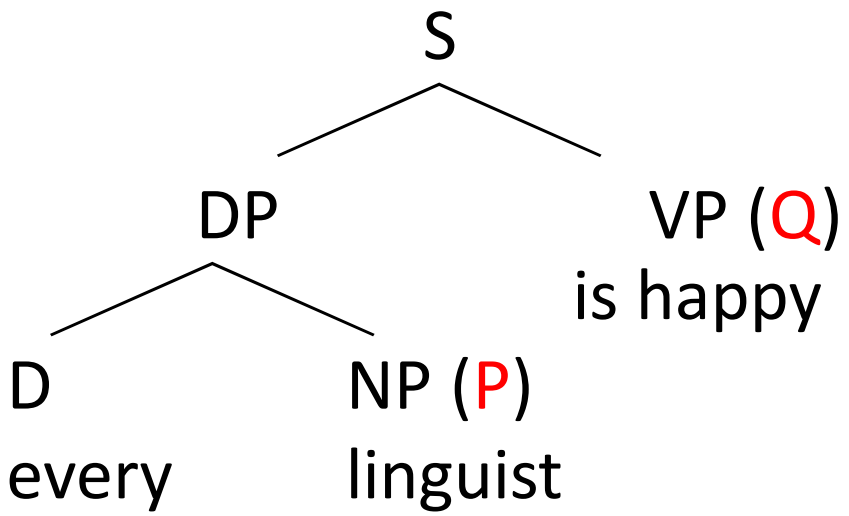
(2) a. $[[\text{every}]] = \lambda P.\lambda Q.\ P \subseteq Q$

b. $[[\text{some}]] = \lambda P.\lambda Q.\ P \cap Q \neq \varnothing$

2. Quantification - Background

- **Quantification in Natural Language: GQ-Theory**

(3)



= true iff the set of linguists$_{NP}$ is a subset of the set of happy individuals$_{VP}$

2. Quantification - Background

- **Quantification in Natural Language: GQ-Advantages**

i. Compositionality – Local meaning assignment to quantificational NPs possible ✓

ii. Expressiveness - Meaning assignment to proportional quantificational NPs possible ✓

iii. Restrictiveness: Contextual restriction of NP-set possible ✓

2. Quantification - Background

- **Quantification in Natural Language**

BUT: Not clear how to capture the different distribution and interpretation of *all* and *every/each*

[e.g. Vendler 1967, Gil 1995, Matthewson 2013]

(4) a. All the sugar/students is/are gone. [N_{PL}, N_{MASS}]
b. *Every sugar/students is/are gone. [N_{SG}]

(5) all the students vs *every/each the student

(6) a. All the students gathered in the yard. (COLL✓)
b. *Each/every student gathered in the yard. (*COLL)

2. Quantification - Background

- **Quantification in Natural Language: Flexibility**

  In response to observed variability in the syntactic & semantic behavior of universal quantifiers within and across languages, Matthewson (2001, 2013) postulates flexibility in the coding of quantificational meanings :

  Two types of adnominal quantifiers:

  NP-selecting: [Q NP] $\Rightarrow$ each, every

  DP-selecting: [Q DP] $\Rightarrow$ all

2. Quantification - Background

- **Quantification in Natural Language: Flexibility**

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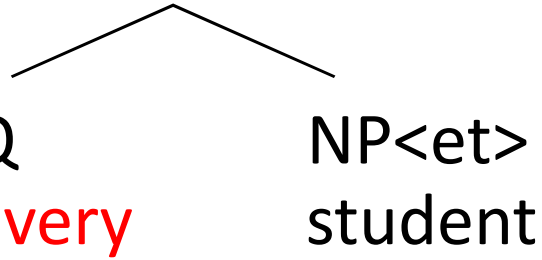
(7) a.



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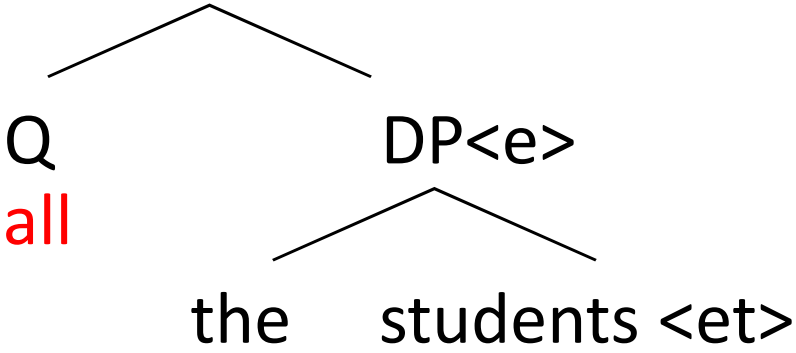


2. Quantification - Background

- **Quantification in Natural Language: Flexibility**

  In response to observed variability in the syntactic & semantic behavior of universal quantifiers within and across languages, Matthewson (2001, 2013) postulates flexibility in the coding of quantificational meanings :

(8) a. $[[\text{every}_{NP}]] = \lambda P_{<et>}.\lambda Q_{<et>}.\ \forall x\ [x \in P \rightarrow\ Q(x)]$

b. $[[\text{all}_{DP}]] = \lambda y_{<e>}.\lambda Q_{<et>}.\ \forall x\ [x \leq y\ \rightarrow\ Q(x)]$

2. Quantification - Background

- **Flexible Q-meanings: Predictions**

i. No collective interpretations for Q_{NP}

   because elements of singular NP-sets are atomic!

ii. Flexible interpretation (DIST and/or COLL) for Q_{DP}

   because subpart-relation $\leq$ holds for atomic individuals and collections alike (x=y possible)

iii. Further lexical specifications possible with Q_{DP}:

   subparts can be further specified, e.g. as [+/- atomic]

2. Quantification - Background

- **Flexible Q-meanings: Predictions**

i. No collective interpretations for Q_{NP}
   because elements of singular NP-sets are atomic!

ii. Flexible interpretation (DIST and/or COLL) for Q_{DP} ✓
   e.g. English *all*

iii. Further lexical specifications possible with Q_{DP}: ✓
   distributive Q_{DP}s in St'át'imcets [Matthewson 1999]
   ≥ 2 $\forall$-quantifiers in a language: Kwaio (5-6),
   Basque (4), Cuzco Quechua (4), Malagasy (8) [Keenan 2008]

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in African Languages:**

  This section looks at the structure and interpretation of universal quantification in two major African languages:

i. Hausa (Chadic, Afro-Asiatic) [Zimmermann 2008, 2009, 2013]

ii. Wolof (Atlantic, Niger-Congo) [Tamba et al. 2012]

⇒ African languages are under-represented in the survey of Matthewson (2013): only 4 out of 37

Igbo (Igboid), Koromfe (Gur), Fongbe (Kwa), Xhosa (Bantu)

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa and Wolof: Findings**

  The findings on ∀-quantification in Hausa and Wolof support the flexible approach in Matthewson (2013):

⇒ Hausa has two different ∀-quantifiers: a Q_{DP} and a Q_{NP} with characteristic semantic and syntactic properties

⇒ In Wolof, a single ∀-quantifier (*epp*) behaves as as Q_{DP} or Q_{NP}, depending on the overall NP/DP-syntax!

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa:** [Jaggar 2001, Zimmermann 2008]

  Hausa has two Q-elements with universal force:

  duk(à) vs *koo+wh*

(9) duk(à) Hàusàwaa, duk àbinci
∀ Hausa_{PL} ∀ food
'all Hausa people' 'all the food'

(10) koo-wàcè mootàa, koo-wànè ɗaalìbii
DISJ-wh_{F} car DISJ-wh_{M} student

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa:**

  Hausa has two Q-elements with universal force:

  duk(à) vs *koo+wh*

⇒ *duk(à)* shows the typical properties of Q_{DP}

⇒ *koo+wh* shows the typical properties of Q_{NP}

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa: Q_{DP} *duk(à)* vs *koo+wh***

  Syntactic differences I:

  duk(à) shows no agreement and can precede or follow the nominal constituent

(11) duk faasinjoojî-n vs faasinjoojî-n dukà
∀ passengers-DEF passengers-DEF all
'all the passengers' [Newman 2000: 388]

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa: Q_{DP} *duk(à)* vs *koo+wh***

  Syntactic differences I:

  koo+wh shows agreement, cf. (10), and precedes the nominal constituent.

(12) * ɗaalìbii koowànè
student DISJ-wh_M

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa: Q_{DP} *duk(à)* vs *koo+wh***

  Syntactic differences II:

  duk(à) combines with (definite) mass nouns and PL definites (13), but not with bare SG count nouns (14).

(13) duk(à) Hàusàwaa, duk àbinci, duk ɗàalìbâ-n
∀ Hausa people, ∀ food ∀ students-DEF
'all Hausa people' 'all the food' 'all the students'

(14) *duk ɗàalìbii
∀ student

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa: Q_{DP} *duk(à)* vs *koo+wh***

  Syntactic differences II:

  koo+wh combines with bare SG count nouns (15), but not with definite nouns or mass nouns (16)

(15) koowàcè mootàa
DISJ-wh.F car
'every car'

(16)*koowàcè mootà-ɾ̃, #koowàcè shìnkaafaa
DISJ-wh.F car-DEF DISJ-wh.F rice

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa: Q_{DP} *duk(à)* vs *koo+wh***

  Syntactic differences: Summary

⇒ *duk(à)* combines with DPs or generically interpreted mass nouns and plural nouns (≈DP): Q_{DP}

⇒ *koo+wh* shows DET-properties (agreement, fixed position) and combines with SG count NPs (set-denoting): Q_{NP}

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa: Q_{DP} *duk(à)* vs *koo+wh***

  Semantic differences I: COLL vs DIST

  duk(à) allows for collective (17) and distributive (18) interpretation [Jaggar 2001]: Q_{DP}

(17) duk ɗàalìbâ-n sun tàaru à gàba-n makaɽantaa
∀ students-DEF 3pl.PFV gather at front-LINK school
'All the students gathered in front of the school.'

(18) duk ɗàalìbâ-n sun yi muɽ̃nàa ƙwarai
∀ students-DEF 3pl.PFV do gladness extremely
'All the students were very happy.'

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa: Q_{DP} *duk(à)* vs *koo+wh***

  Semantic differences I: COLL vs DIST

  koo+wh only allows for distributive interpretation

  [Jaggar 2001]: Q_{NP}

(19)* koo-wànè ɗàalìbii yaa tàaru à gàba-n makaɾantaa
DISJ-wh.M student 3sg.PFVgather at front-LINK school
*‘Each student gathered in front of the school.’

(20) koo-wànè mùtûm$_i$ yaa sayar dà gida-n-sà$_i$ / *sù$_i$
DISJ-wh.M man 3sg.PFV sell house-of-his them
‘Every man sold his house.’

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa: Q_{DP} *duk(à)* vs *koo+wh***

  Semantic differences I: COLL vs DIST

  This difference falls out on Matthewson's analysis:

i. because of $x \leq y$, Q_{DP} *duk(à)* can quantify either over atomic subparts of DP-denotation, or over the DP-denotation as a whole ($x = y$): DIST or COLL

ii. Q_{NP} *koo+wh* only has access to atomic elements of a set: only DIST

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa: Q_{DP} *duk(à)* vs *koo+wh***

  Semantic differences II: NEG

  Different interpretation of *duk(à)* and *koo+wh* under negation [Jaggar 2001: 377, Zimmermann 2008: 459]:

i. NEG > duk(à) $\Rightarrow$ not all (21a)

ii. NEG > koo+wh $\Rightarrow$ not any = every not (21b)

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa: Q_{DP} *duk(à)* vs *koo+wh***

  Semantic differences II: NEG

(21) a. **bà**-n karàntà duk lìttàttàafâ-n **ba**
NEG-1sg read ∀ books-DEF NEG
'I didn't read all the books.' [Jaggar 2001: 377]

b. **bà**-n ga koo-waa **ba**
NEG-1sg see DISJ-wh NEG
'I didn't see anyone.' [Zimmermann 2008: 450]

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Hausa: Q_{DP} *duk(à)* vs *koo+wh***

  The difference in interpretation of *duk(à)* and *koo+wh* under negation does not fall out on Matthewson's analysis: both nominal expressions are of semantic type <et,t> ⇒ non-referring expressions

⇒The difference would fall out on Brisson's (1998) analysis, which treats *all-DPs* as referring expressions (<e>):

(21a) ≈ 'I didn't read the books in their entirety.'

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: *CL-epp***

  Unlike Hausa, Wolof has only one lexical universal quantifier (CL-*epp*) [Tamba et al. 2012]

⇒This ∀-quantifier exhibits Q_{NP} or Q_{DP}-behaviour depending on its syntactic context!

[see Gil 1995 for similar observations on Hebrew]

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: *CL-epp***

(22) a. xale (%y-i) **y**-epp
child CL.PL-DEF.PROX CL.PL-∀
'all the children'

NP > epp, CL.PL-epp, epp+DEF

b. b-epp xale (* b-i)
CL-∀ child CL-DEF.PROX
'every child'

epp > NP, CL.SG-epp, *epp+DEF

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: *CL-epp***

  Other differences I: [+/- mass]
  Preposed *epp* cannot combine with mass nouns (= *every*)

(23) *B-epp ceeb tuuru-na
CL-∀ rice spill-FIN
intended: 'All the rice spilled.'

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: *CL-epp***

  Other differences I: [+/- mass]
  Postposed *epp* quantifies over mass Ns + CL.SG+DEF (= *all*). Impossible with count N+CL.SG+DEF

(24) a. ceeb b-i y- ëpp
rice CL.SG-DEF.PROX CL.PL-∀
'all the rice'

b.*xaj b-i y-ëpp
dog CL.SG-DEF.PROX CL.PL-∀

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: *CL-epp***

  Additional observations I:
  without CL.SG-DEF marking, (24a) expresses ∀-quantification over a plurality of portions/ kinds (=22a).

(24) c. ceeb y- ëpp
rice CL.PL-∀
'all the rices'

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: *CL-epp***

  Additional observations II:
  without CL.SG+DEF marking, postposed CL.SG-*epp* functions as a modifier on SG count nouns (cf. 24b)

(25) Jàng-na-a téére **b**-épp
read-FIN-1SG book CL-∀
'I read the whole book'

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: *CL-epp***

  Consequences for NP-semantics:

i. *y* not a PL-marker, but a LATT(ice)-marker (mass, PL) [Link 1982] (22a, 24a, 24c).

ii. CL+DEF marking *b-i* in (24a) has semantic import:

iii. ∀-quantification over parts of atomic entities possible with postposed *b-epp* (25): *all the apple*

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: *CL-epp***

  Semantic differences: COLL vs DIST

  Preposed *epp* does not allow for collective interpretations (= Q_{NP}: *every*, *koo+wh*), whereas postposed *y-epp* does (= Q_{DP}: *all the*, *duk(à)*).

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: *CL-epp***

  Semantic differences: COLL vs DIST

(26) a. Xale y–ëpp daje-na-ñu
child CL-∀ gather-FIN-3PL
'All the children gathered.'

b. *B-epp xale daje-na
CL-∀ child gather-FIN

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: Data Summary**

  Unlike Hausa, Wolof has only one lexical universal quantifier: CL-*epp*

  This ∀-quantifier exhibits Q_{NP} or Q_{DP}-behavior in its combinatorial possibilities and interpretation, depending on its syntactic context!

⇒ How to account for the two Q-instantiations on a Matthewson-style analysis?

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: Uniform analysis of *CL-epp***

  A uniform analysis is possible on the assumption that *CL-epp* is lexically underspecified for the set_of/part_of-relation relating the individuals quantified over with the quantificational domain as a whole:

⇒*epp* expresses ∀-quantification over constituents of a larger whole (sets, pluralities/masses/atomic individual):

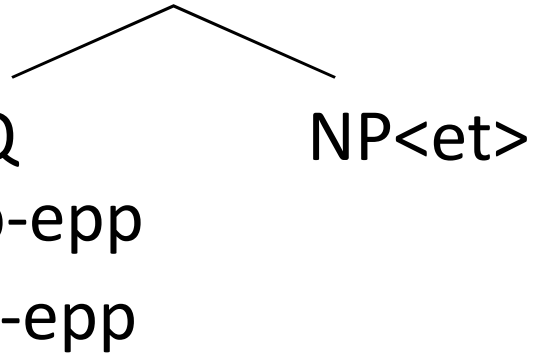
(27) [[CL-epp]] = $\lambda P_{<et>}.\lambda Q_{<et>}.\ \forall x\ [x \mathbf{R_{CONST}} P \rightarrow Q(x)]$;

with $xR_{CONST}P$: 'x is a constitutive component of P'

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: Uniform analysis of *CL-epp***

(28) a.



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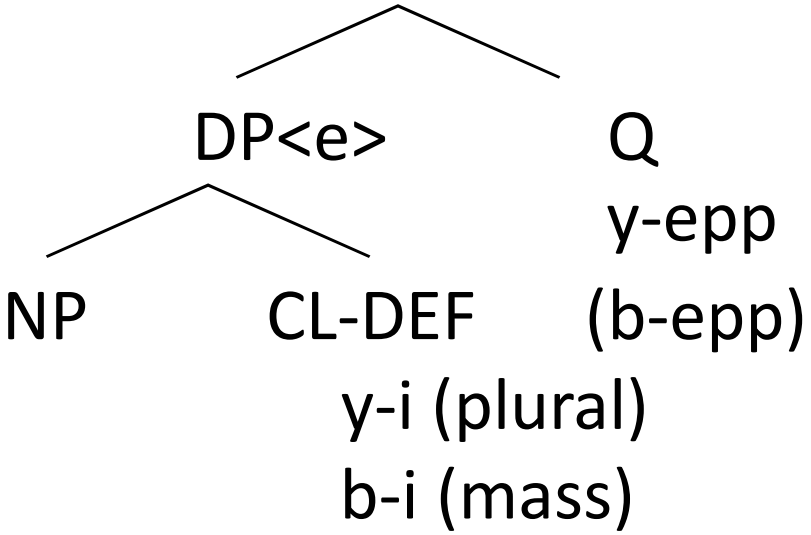


3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in Wolof: Uniform analysis of *CL-epp***

$\Rightarrow$ Differences in distribution, combinatory possibilities and semantic interpretation follow from CL-marking [+/- lattice: *y*- vs *b*-] and the different status of the nominal complement [NP vs DP].

Q: Do the Q_{NP} and Q_{DP}-instantiations of *epp* show different semantic behavior under sentential negation, as observed for Hausa? $\Rightarrow$ future research!

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification: Cross-linguistic implications**

i. There is variation in the status of lexical adnominal ∀-quantifiers as Q_{NP} and Q_{DP} not only between languages [Matthewson 2013], but also within individual languages (English, Hausa) ⇒ no parameter-setting!

ii. Wolof has only one lexical ∀-quantifier, showing Q_{NP}- or Q_{DP}-behavior depending on syntactic context;
(= *kol* in Hebrew, Gil 1995)

Q: Which factors decide on the realization of ∀ as Q_{NP}, or Q_{DP}, or both in a given language?

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification: Methodological Guidelines**

i. Mere translation and corpus findings insufficient for establishing semantic nature of ∀-quantifiers as Q_{NP}/Q_{DP}

ii. Minimal check-list for *Semantic Field Research*:

- NP or DP-complement?
- Combination with mass, $count_{PL}$, $count_{SG}$ nouns?
- COLL and/or DIST-interpretations possible?
- Scope behavior under negation?

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in under-researched languages**

  Ngamo (West Chadic; Mira Grubic, p.c.): $\forall_{NP}$ vs $\forall_{DP}$

(Ng1) kultama=s siya ke $\forall_{NP}$: NP-wh-ADD
eggplant=link.f which.f also
'every eggplant'

(Ng2) Biya shap(=su) $\forall_{DP}$
people all(=of.them)
'all the people'

3. ∀-Quantification in Hausa and Wolof

- **∀-Quantification in under-researched languages**

  $\forall_{NP}$s with wh+DISJ marker also observed in:

  - Margi (Central Chadic, Hoffmann 1963),
  - Mupun (Central Chadic, Frajzyngier 1993),
  - Hdi (Central Chadic, Frajzyngier 2002),
  - Gùrùntùm (West Chadic, Haruna 2003),
  - Nigerian Fulani (Jungraithmayr & Abu-Manga 1989)

4. Indefinites in Hausa, Akan, Wolof

- **Indefiniteness in African Languages:**

  This section looks at the structure and interpretation of ***indefinites*** in three major African languages:

i. Hausa (Chadic, Afro-Asiatic) [Zimmermann 2008, 2013]

ii. Akan (Kwa, Niger-Congo) [Amfo 2009]

iii. Wolof (Atlantic, Niger-Congo) [Tamba et al. 2012]

4. Indefinites in Hausa, Akan and Wolof

- **Indefiniteness: Semantic Background**

  Indefinite NPs introduce new individuals into the discourse [Heim 1982, Kamp & Reyle 1993]:

i. They are associated with ∃-quantificational force.

ii. They are non-referential ≠ definites, proper names

(29) a. A student entered the room. He was smiling.

b. The student entered the room. He was smiling.

4. Indefinites in Hausa, Akan and Wolof

- **Indefiniteness: Semantic Background**

  Indefinites are standardly analyzed as generalized quantifiers [Montague 1973, Barwise & Cooper 1981, Heim & Kratzer 1998]

(30) a. [[a/some]] = $\lambda P.\lambda Q.\ P \cap Q \neq \emptyset$ (= 2b)

OR

b. [[a/some]] = $\lambda f.\lambda g.\ \exists x\ [f(x) \wedge g(x)]$

4. Indefinites in Hausa, Akan and Wolof

- **Indefiniteness: Semantic Background**

BUT: Indefinites differ from other (∀-) GQs in scope taking behavior: Indefinites take exceptional wide scope out of syntactic islands [Fodor & Sag 1982, Reinhart 1997]

(31) **Someone** will be offended
[if we don't invite **most** philosophers]

i. 'A certain person will be offended if we don't invite most philosophers.' ∃ > MOST

ii. *'For most philosophers, there will be a (different) person that will be offended if we don't invite her.' *MOST > ∃

4. Indefinites in Hausa, Akan and Wolof

- **Indefiniteness: Semantic Background**

BUT: Indefinites differ from other (∀-) GQs in scope taking behavior: Indefinites take exceptional wide scope out of syntactic islands [Fodor & Sag 1982, Reinhart 1997]

(32) **Most** guests will be offended
[if we don't invite **some** philosopher]

i. 'Most guests will be offended if we don't invite a (different) philosopher'

ii. 'There is a/some philosopher such that most guests will be offended if we don't invite her' ∃ > MOST✓ (= specific)

4. Indefinites in Hausa, Akan and Wolof

- **Indefiniteness: Semantic Background**

  In addition, indefinites allow for intermediate (wide) scope readings [Reinhart 1997]

(33) [Most linguists have looked at
[every analysis [that solves **some problem**]]]

= For most linguists z, there is a problem x, such that z looked at each analysis solving x.

4. Indefinites in Hausa, Akan and Wolof

- **The problem of indefinites:**

  Indefinite expressions appear to be sometimes referential (<e>, on specific/wide scope -interpretation), sometimes non-referential (<et,t>),

  but even on their referential use they are still indefinite in not giving away the identity of their referent!

4. Indefinites in Hausa, Akan and Wolof

- **The problem of indefinites: Solution I**

  In response to the double nature of English and German indefinites, Reinhart (1997) and Kratzer (1998) propose lexical ambiguity accounts:

  Two interpretations for indefinites:

  (i.) a Q_{NP}-$\exists$-interpretation (see above)

  (ii.) an interpretation as CHOICE FUNCTION variable f_{CH}

4. Indefinites in Hausa, Akan and Wolof

- **The problem of indefinites: Solution I**

  A function f is a choice function (f_{CH}) if it applies to any non-empty set and yields a member of that set [Reinhart 1997: 372]

(34) $[[f_{CH}]] = \lambda P_{<et>}.\ x_{<e>}$, such that $x \in P$

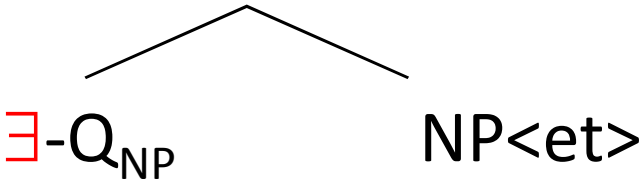
$\Rightarrow$ output of f_{CH} of type <e> = referential

$\Rightarrow$ output of f_{CH} underdetermined (any element of P will do) = indefinite

4. Indefinites in Hausa, Akan and Wolof

- **The problem of indefinites: Solution I**

(35) a.



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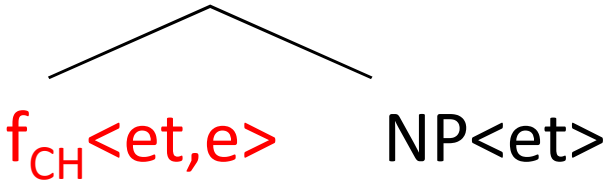


⇒ Choice function variable existentially bound at sentential level (Reinhart 1997) or contextually bound at matrix level (Kratzer 1998), thus giving rise to exceptional wide scope phenomena.

4. Indefinites in Hausa, Akan and Wolof

- **The problem of indefinites: Solution I**

(32) Most guests will be offended
[if we don't invite some philosopher]

i. ∃**f** [most guests will be offended
if we don't invite **f**([[philosopher]])

ii. [most guests will be offended
if we don't invite **g(f$_1$)**([[philosopher]])

4. Indefinites in Hausa, Akan and Wolof

- **The problem of indefinites: Solution II**

  In response to empirical problems with the ∃-bound choice function approach of Reinhart (1997), and with conceptual problems of the context-bound choice function approach of Kratzer (1998) [see Chierchia 2001, Schwarz 2001], ...

  Schwarzschild (2002) proposes a more conservative analysis of indefinites as unambiguously denoting ∃-Q_{NP}s

4. Indefinites in Hausa, Akan and Wolof

- **The problem of indefinites: Solution II**

  The difference in interpretation (apparent narrow vs (exceptional) wide scope) follows from a difference in the size of the Q-restricting NP-set:

  In the extreme case, the NP-restriction is contextually delimited to denote a singleton set containing only one element $\Rightarrow$ exceptional wide scope $\approx$ scope neutralization

4. Indefinites in Hausa, Akan and Wolof

- **The problem of indefinites: Solution II**

(36) a. Everyone at the party voted to watch **a movie that Phil liked**. [Schwarzschild 2002: 294]

b. [[movie that Phil liked]] =

{ x : x is a movie that Phil liked and x was proposed as a candidate movie for the vote on what to watch by the guests}

$\Rightarrow$ Shift of semantic burden to implicit contextual restriction, which is required with Qs anyway !

4. Indefinites in Hausa, Akan and Wolof

- **The problem of indefinites: Solution II**

  Apart from the reliance on contextual factors (hard to control for), the singleton set analysis of indefinites is not entirely unproblematic either. [Heim 2011]

4. Indefinites in Hausa, Akan and Wolof

- **The problem of indefinites: Cross-linguistic perspective**

  What can Non-European languages with ≥ 1 indefinite form tell us about the proper analysis of indefinites?

  $\Rightarrow$ Evidence in favor of choice functions?

  $\Rightarrow$ Evidence in favor of Q_{NP}s (with singleton restrictor)?

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Realization and Interpretation**

  Hausa has two kinds of indefinite expressions, which differ in semantic interpretation (scope), morpho-syntax, and discourse-semantic behavior (anaphoric potential). [Jaggar 1988, Zimmermann 2008]

bare NPs		vs	*wani/wata/wasu* NPs	
mùtûm	'(a) man'		wani mùtûm	'some man'
mace	'woman'		wata màcè	'some woman'
mutàanee	'people'		wa(d'an)su mutàanee	'some people'

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Realization and Interpretation**

$\Rightarrow$ The existence of two structurally different classes of indefinite expressions is not an uncommon feature of (West) African languages; see below

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Scope**

  The two indefinite forms differ in scopal behavior:

  - bare NPs always take narrow scope

  - *wani*-NPs can take narrow or wide scope relative to other operators (NEG), including exceptional wide scope and intermediate scope.

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa:** NEG > INDEF - wide scope context

[Matthewson 2011]

(37) CONTEXT: Audu bought a lot of fish, but ...

a. #Audu **ba**-i sayi kifi **ba** *#bare NP*
Audu neg-3sg.m buy fish neg

i. # 'Audu didn't buy any fish.'
[Comment: "This is contradictory!"]

ii. *'There is a certain fish Audu didn't buy.'

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa:** NEG > INDEF - wide scope context

(37) CONTEXT: Audu bought a lot of fish, but ...

b. Audu **ba**-i sayi wani kifi **ba** ✓*wani-NP*
Audu neg-3sg.m buy WANI fish neg
'Audu didn't buy a certain fish'

[Comment: "This sentence can mean either 'Audu didn't buy any fish' or 'Audu didn't buy a certain fish'. Here is has the second meaning, but in isolation one would think it has the first meaning."]

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa:** NEG > INDEF - narrow scope

(38) CONTEXT: Musa couldn't find any Daura girl that he liked, so…

a. Musa **ba**-i auri yarinya 'yar Daura **ba**. ✓*bare NP*
Musa neg-3sg.m marry girl daughter-of D. neg
'Musa didn't marry any girl from Daura.'

b. Musa **ba**-i auri wata yarinya 'yar Daura **ba**. ✓*wani-NP*
Musa neg-3sg.m marry WANI girl daughter-of D. neg
'Musa didn't marry any girl fom Daura.'

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa:** Exceptional wide scope with COND

(39) CONTEXT: Many people will come to the meeting, but…

a. **#Idan** mutum ya zo taro-n, *#bare NP*
if man 3sg.m come meeting-DET
Musa zai yi farin ciki sosai.
Musa fut-3sg do happiness very

'If a person comes to the meeting, Musa will be particularly happy'

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa:** Exceptional wide scope with COND

(39) CONTEXT: Many people will come to the meeting, but…

b. **Idan** wani mutum ya zo taro-n,
if WANI man 3sg.m come meeting-det
Musa zai yi farin ciki sosai.
Musa fut-3sg do happiness very

'if SOME person comes to the meeting, Musa will be particularly happy.' ✓*wani-NP*

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa:** Narrow scope under COND

(40) CONTEXT: Mary doesn't know if there are any elders, but ...

a. **Idan** dattijo ya zo, Mary za ta yi farin ciki. ✓*bare NP*
if elder 3sg.m come, Mary fut 3sg.f do happy
'If any elder comes, Mary will be happy'

b. **Idan** wani dattijo ya zo, Mary za ta yi farin ciki.
if WANI elder 3sg.m come, Mary fut 3sg.f do happy
'If any elder comes, Mary will be happy.' ✓*wani-NP*

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa:** Intermediate Scope

(41) Context: I am married to Asabe and Hawwa. My mum and my sister are my only relatives. My mum only likes Asabe, and my sister only likes Hawwa.

Kowane dangina yana **sô**-n
every relative-1sg 3sg.m.prog like-link

wata yarinya daga cikin yara-n da na aura.
wani girl from inside girls-def rel 1sg marry

'For every relative of mine there is a certain girl that I married such that she likes her.' ✓*wani-NP*

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Summary Scope Behavior**

i. *wani*-NPs show the flexible scope behavior attributed to choice functions or singleton set restrictions in the semantic literature!

Q: Is there independent evidence as to whether Hausa *wani*-NPs denote choice function variables or Q_{NP}s?

ii. Bare NPs show the narrow scope behavior attributed to a generalized quantifier-interpretation in the literature

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Form**

  Complex *wani*-NPs show the structural properties of universal Q_{NP}-quantifiers (*koo+wh*) [Zimmermann 2008]:

  - indefinite marker occurs in the same prenominal slot
  - indefinite marker shows gender agreement with noun

  formal properties $\Rightarrow$ Q_{NP}

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa:**

  Further evidence for singleton Q_{NP}s:

  wani can combine with overt singleton-denoting restrictors: NP+DEF

(42) wata mootà-**r** taa b'aacì
wata car-DEF 3sg.PERF break.down
'A specific (previously mentioned) car broke down.'

⇒ sequences of *wani/wata*-NPs translate as 'the one…, the other…'

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Form**

  Bare NPs show no structural evidence of functional Q-elements:

  formal properties $\Rightarrow$ predicative interpretation: <et>

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Discourse semantics**

  New discourse referents to be referred to in subsequent discourse are preferably introduced by *wani*-NPs

  '[…] its essence is that it conveys new information, introduces a new character into a story […] if this new thing is felt to be sufficiently important to the story, e.g. you are going to hear more about it, then *wani/wata/wad'ansu* is generally put in front of it." [Jaggar 1988: 46, quoting from Parsons, .n.d.]

$\Rightarrow$*Bare NPs* do not (easily) introduce discourse referents

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Discourse semantics**

$\Rightarrow$ Obligatory narrow scope and the lack of discourse transparency displayed by *bare NP*-indefinites is a characteristic property of pseudo-incorporated NPs [Farkas & deSwart 2003].

Pseudo-incorporation:
Semantic modification of a V- or VP-denotation with an NP-meaning of type <et>

$\approx$ Chung & Ladusaw's (2004) RESTRICT

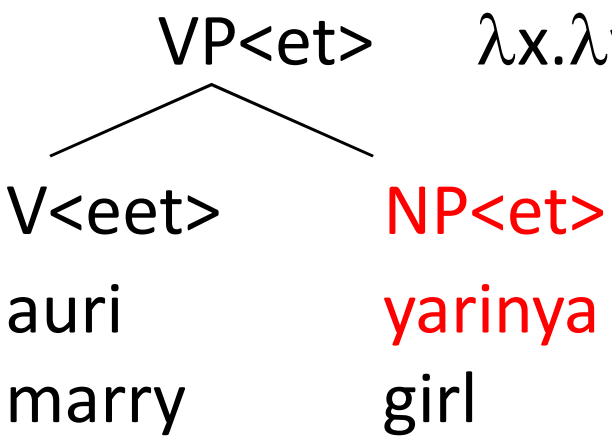
4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Discourse semantics**

(43) *RESTRICT:* If there is a node α with two syntactic daughters β of type <eet> and γ of type <et>, then

$[[\alpha]] = \lambda x.\lambda y.[[\beta]](x)(y) \;\&\; [[\gamma]](x) = \lambda x.\lambda y.\, R(y, x) \;\&\; P(x)$

(44)



4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Summary**

  The two indefinite forms in Hausa come with two different semantic interpretations:

i. *wani*-NPs: $[Q_{NP}\ [NP]]$; semantic type <et,t>
   can be restricted by singleton NP-sets: exceptional scope

ii. Bare indefinite NPs are of semantic type <et> and combine with their syntactic sisters qua RESTRICT

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Cross-Linguistic Implications**

Hausa: two forms

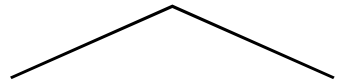
	wani-NP	bare NP
	Q_{NP}<et,t>	<et>
scope:	flexible	narrow

$\Rightarrow$ prima facie, the existence of two different indefinites in Hausa would appear to support lexical ambiguity analyses for indefinites in English

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Cross-Linguistic Implications**

English ambiguity analyses: two interpretations



	f_{CH}<e>	Q_{NP}<et,t>
scope:	flexible	narrow

BUT: Ambiguity analyses for English assume a choice-function interpretation, for which there is no evidence in Hausa. Moreover, the quantifier interpretation is used to account for obligatory narrow scope, which is expressed by non-quantificational NPs in Hausa.

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Hausa: Cross-Linguistic Implications**

  The Hausa data provide no support for choice function analyses of indefinites in English, rather suggest that:

⇒English indefinites headed by indefinite article *a/some* consistently denote generalized quantifiers: Q_{NP}

In addition, there are bare indefinite NPs (plurals, mass nouns), which take obligatory narrow scope (Carlson 1977) and which may denote into type <et>

English ≈ Hausa

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Akan (Kwa):** Same picture

  Akan also has two indefinite forms: a complex form headed by an indefinite determiner *bí* and bare NPs [Amfo 2009]

  NP-bí: wide scope, specific readings

  bare NP: narrow scope, unspecific

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Akan (Kwa):** Same picture

(45) a. Me re-kɔ-tɔ mpaboa. [Amfo 2009: 1787,(1)]
1sg prog-go-buy shoes
'I am going to buy a pair of shoes.'

⇒ type-identification

b. Me re-kɔ-tɔ mpaboa bi. [Amfo 2009: 1787,(2)]
1sg prog-go-buy shoes some
'I am going to buy a certain pair of shoes.'

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Akan (Kwa):** Same picture

  Parallels Akan *bí* – Hausa *wani*:

i. *NP bi* allows for specific interpretations (45b)

ii. The use of NP bi 'is quite common in introductory sentences where the speaker introduces a referent that will be mentioned recurrently in the ensuing discourse' [Amfo 2009: 1791]

iii. *bí* has procedural semantics of an ∃-quantifier [Amfo 2009: 1792]

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Akan (Kwa):** Same picture

  Future research: Scope behavior of *NP-bí :*

Q: Does *NP-bí* also allow for narrow scope interpretations?

If so, the analysis of Hausa indefinites would directly extend to Akan (and presumably many other Kwa and Chadic languages…)

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Ngamo and Bura (Chadic):** Same picture

  Ngamo (Yobe State, West Chadic):

(Ng3) Ngo sal-ko bano. Bare NP
person build-pfv house
'A person / Somebody built a house.'

(Ng4) Ngo=i yo'oto sal-ko bano. NP+INDEF
person=linker INDEF.m build-pfv house
'A (specific) person / Somebody built a house.'

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Ngamo and Bura (Chadic):** Same picture

Bura (Central Chadic):

(Bu1) mda mwala — Bare NP
woman

(Bu2) (mda) mwala laga — NP+INDEF
woman INDEF

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof (Atlantic):** Three forms!

  Tamba et al. [2012] show that Wolof has three indefinite forms, raising the question of how these differ in semantic meaning and semantic behavior (scope)?

  i. $Q_{<et,t>}$, $NP_{<et>,}$???

  ii. flexible, narrow, ???

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Three forms!

  Three indefinites in Wolof [Tamba et al. 2012]:

  i. CL-enn NP

  ii. u/a-CL NP

  iii. Bare NP

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Three forms!

  i. *CL-enn* NP [Tamba et al. 2012:897]:

(46) a. b-enn xaj
CL.SG-some dog
'a/some dog', 'one dog'

b. y-enn yaj
CL.PL-some dog
'some dogs'

cf. *b-epp*, *y-epp* from above!

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Three forms!

  ii. u/a-*CL* NP [Tamba et al. 2012:897]:

(47) u/a-b xaj
INDEF-CL.SG dog
'a dog'

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Three forms!

iii. Bare NPs [Tamba et al. 2012:897]:

(48) Gis-na-a xaj
see-FIN-1SG dog
'I saw a dog (i.e. some dog or other)'

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Three forms!

(49) Xadi gis-na a-b/ b-enn /∅ sàcc
Xadi see-FIN NDEF-CL CL- some thief
'Xadi saw a thief', 'Xadi saw a certain thief'

⇒ All three forms can give rise to specific interpretations in episodic sentences, but otherwise they differ in distribution, combinatory possibilities and semantic interpretation.

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Three forms!

  Combinatorial differences: Plural and mass NPs

  Bare NPs only have singular interpretations (no CL.PL):

(50) Awa jàpp-na sàcc vs
Awa catch-FIN thief
'Awa caught a thief.'
NOT: 'Awa caught some thieves.'

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Three forms!

  Combinatorial differences: Plural and mass NPs

  Overt INDEF-forms cannot combine with mass nouns:

(51) Jënd-na-a ∅/*a-b / *b-enn ceeb
buy-FIN-1SG NDEF-CL/CL-some rice
'I bought rice'

⇒ *a/u-CL & CL-enn* related to countability, atomicity

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Three forms!

  Distributional differences: subjecthood

i. Bare NPs can function as the subject of generic sentences, whereas *a/u-CL* and *CL-enn* cannot

ii. *a/u-CL* and *CL-enn* can function as the subject of episodic sentences, whereas bare NPs cannot.

⇒ Bare NPs have non-referential predicative meaning: <et>

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Three forms!

  Interpretive differences: Scope

  u/a-CL and *CL-enn* differ in scopal behavior:

i. *CL-enn* takes obligatory scope under NEG, but can scope over conditional operators

ii. *u/a-CL* cannot take scope over conditional operators, but it can take scope over NEG

iii. Bare NPs always take narrow scope (as expected)

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Scope relative to NEG

(52) a. Awa dóór-**ul** a-b xale NEG>∃, ∃>NEG
awa hit-NEG NDEF-CL child
'Awa did not hit any / a certain child'

b. Awa dóór-**ul** b-enn xale NEG> ∃
awa hit-NEG CL-some child
'Awa did not hit a single child'

c. Awa dóór-**ul** **xale** NEG> ∃
awa hit-NEG child
'Awa did not hit any child(ren)'

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Scope relative to COND

(53) a. Su sama a-m mbokk gañ -u-ee,
if my NDEF-CL relative hurt-REFL-PERF
di-na-a donn-u kër
IMPERF-FIN-1SG inherit-REFL house
'If any relative of mine dies, I will inherit a house'

$\Rightarrow$ COND > $\exists$

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Scope relative to COND

(53) b. Su sama m-enn mbokk gañ -u-ee,
if my CL-some relative hurt-REFL-PERF
di-na-a donn-u kër
IMPERF-FIN-1SG inherit-REFL house
'If any/ a certain relative of mine dies, I will inherit a house'

$\Rightarrow$ $\exists$ > COND, COND > $\exists$

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Analysis of *CL-enn* & *u/a-CL*

  While the analysis of bare NPs in Wolof as type <et> predicative expressions is straightforward and adequate,

  The different scope behavior of *CL-enn* and *u/a-CL* is puzzling: Neither of them seems to behave like a bona fide choice-function denoting or (singleton-restricted) Q:

$\Rightarrow$either analysis predicts possible wide scope from NEG- and COND-environments with no additional restrictions!

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Analysis of *CL-enn* & *u/a-CL*

  Another difference: Only *u/a-CL* licit in existentials:

(54) a. Am-na a-y góór ci arme b-i NDEF
exist-FIN NDEF-CL.PL man P army CL-DEF.PROX
'There are men in the army'

b.*Am-na y-enn / ∅ góór ci arme b-i NDEF
exist-FIN CL.PL-some man P army CL-DEF.PROX
'There are men in the army'

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Analysis of *CL-enn* & *u/a-CL*

  In the absence of further evidence I tentatively propose the following analysis:

  CL-enn: Q_{NP}, with *enn* inducing atomicity restriction on NP-meaning (≈ *a single* = Spanish *uno* vs *unos*, Martí 2008)

  structurally parallel to ∀-quantifier CL-*epp*;
  *with mass Ns; *in EXISTs and GENs

  Assumption: Q interpreted/ no singleton restriction under NEG. *Depending on focus?*

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Analysis of *CL-enn* & *u/a-CL*

⇒ Similarity to *a single*-phrases in English!

(55) If a single relative of mine dies I will inherit a fortune.
COND > ∃, ∃ > COND

(56) a. I didn't see a single child. only NEG > ∃ !

b. A SINGLE child I didn't see. ∃ > NEG

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof:** Analysis of *CL-enn* & *u/a-CL*

  In the absence of further evidence I tentatively propose the following analysis:

  u/a-*CL:* f_{CH}, with clausal ∃-binding of f-variable

  *with mass Ns and GENs; ✓ in EXISTs

  Assumption: ∃-binding above or below NEG, but within the clause

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof: Future Research**

  Closer study of *CL-enn* and *u/a-CL*

- In comparison to *a single* NPs in English
- Controlling for focus
- In environments that have shown to be problematic for choice function approaches with local ∃-binding

  [Chierchia 2001, Schwarz 2001]

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites in Wolof: Summary**

  Wolof has three indefinite forms that differ in their semantic interpretation

  … posing problems for European-based analyses, which at most assume a twofold lexical ambiguity…

  … pointing to the need for more fine-grained distinctions in the formal semantic representation of indefinites in natural language (*a certain, a single,* …).

4. Indefinites in Hausa, Akan and Wolof

- **Indefinites: Methodological Guidelines**

i. Mere translation insufficient for establish the semantic nature of indefinites as Q_{NP}, f_{CH} , or NP-predicates

ii. Minimal check-list for *Semantic Field Research*:

- Combination with mass, $count_{PL}$, $count_{SG}$ nouns?
- Occurrence in different clause types: GEN, EPIS, EXIST?
- Scope behavior relative to negation and conditionals; Exceptional (inermediate) wide scope?
- Discourse-anaphoric potential

5. Conclusion

i. Empirical description and formal semantic analysis of ∀-quantification and indefinites/ ∃-quantification in 2 ½ major West African languages: Hausa, Wolof, Akan
ii. Highlights cross-linguistic variation and cross-linguistic parallels in coding of quantification
iii. Has potential to shed light on the proper analysis of these quantificational concepts in European languages
iv. In some cases, points to the need for more fine-grained distinctions in the formal analysis: *all – every*; three indefinite forms in Wolof, …
v. Formal semantic analysis of smaller African languages will increase understanding of quantification in general

THANK YOU!

COMMENTS, SUGGESTIONS AND POINTERS TO OTHER LANGUAGES/REFERENCES WELCOME !!!

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