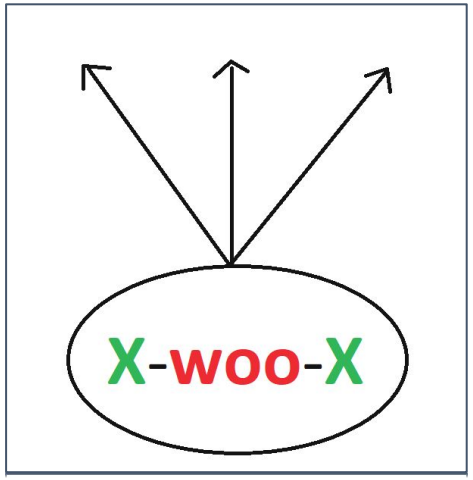
Reduplicated distributivity in Mandinka



Triple-A 10

Potsdam, Germany, June 2023

Ousmane Cisse & Elizabeth Coppock

Boston University

Outline

Part 1: Introduction

Part 2: One-by-one effects

Part 3: Exhaustivity effects

Part 4: Analysis

Part 1

Introduction

Introduction

Reduplicated nouns are sometimes understood universally (Moravcsik 1976):

YORUBA: ọ̀sọ̀ọ̀sẹ̀ 'every week' (ọ̀sẹ̀ 'week')
alaalẹ́ 'every enemy' (alẹ́ 'enemy') (Bamgboṣe 1966: 151)

TAGALOG: araw ᶜáraw 'every day' (araw 'day') (Blake 1917: 425ff)

MANDARIN: renren 'everybody' (ren 'man') (Chao 1968: 202)

TZELTAL: hi?hi?tik 'very much sand' (hi? 'sand')
nanatik 'very many houses' (na 'house') (Berlin 1963: 212)

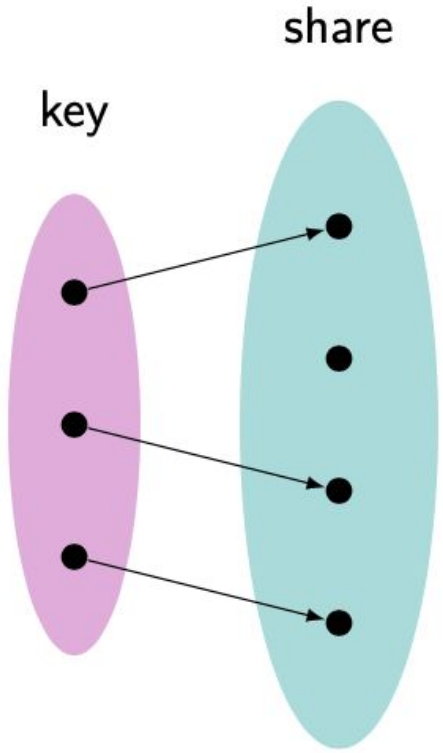
Gil (1995): "Although at first blush reduplication appears to bear the denotation of **distributive-key universal quantifier**, closer inspection reveals subtle distinctions."

Introduction

Binominal *each* distributes a **share** over a **key**:

(1) The kids (Key) carried five balloons (Share) each.

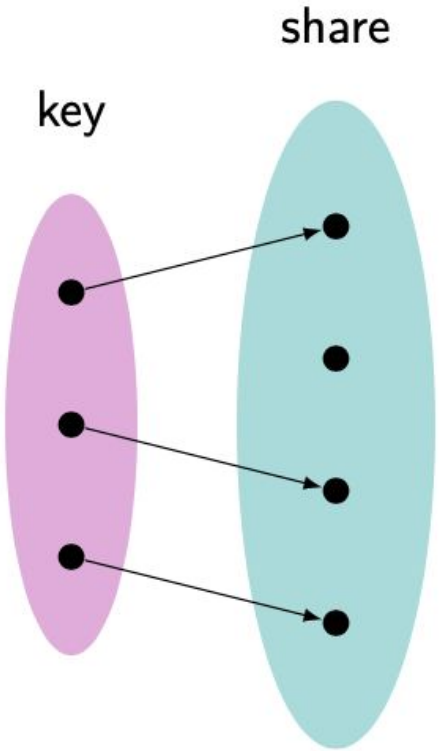
Mnemonic: Share per Key (Gil, 2013)



Introduction

Korean -ssik behaves much like binominal *each*:

(2)
ai-tul -i [phwungsen-hana **-ssik**-ul] sa-ess-ta
child-PL -NOM [balloon-one -SSIK-ACC] bought
'The children bought a balloon each.'
Key: Subject / Share: Object



(3) But also has **event-key** readings:

na-nun phwung-hana **-ssik**-ul sa-ess-ta
I-TOP balloon-one-SSIK-ACC bought

(Choe 1987)

Introduction

Event-key readings for **reduplicated numerals** in Telugu:

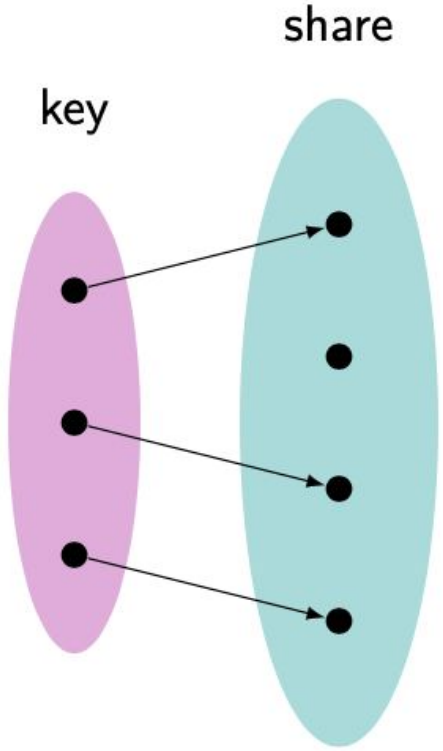
(4)

ii pilla-lu	renDu renDu kootu-lu-ni	cuus-ee-ru
these kid-PL	2 2 monkey-PL-ACC	see-PAST-3PL

lit. 'These kids saw 2 2 monkeys'

a. ... each saw 2 monkeys. — Participant key
b. ... saw 2 monkeys each time. — Temporal key
c. ... saw 2 monkeys in each location. — Spatial key

(Balusu, 2006)



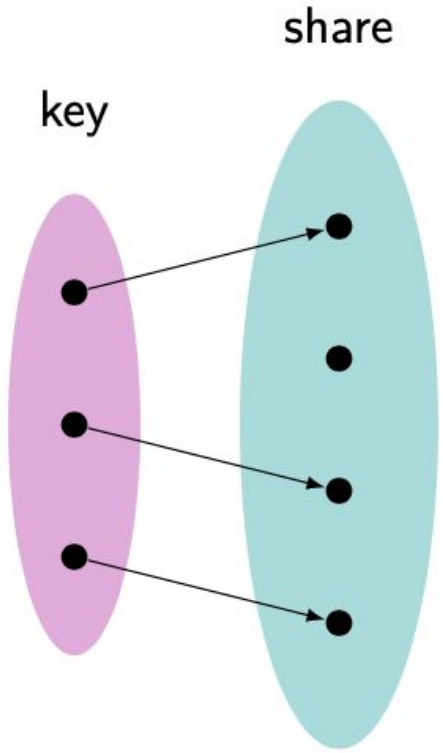
Introduction

Event-key readings for **reduplicated numerals** in Telugu:

(5) renDu renDu kootu-lu egir-i-nyiyyi
2 2 monkey-PL jump-PAST-3PL
lit. '2 2 monkeys jumped'

(6) Raamu rendu renDu kooto-lu-ni cuus-ee-Du
Ram 2 2 monkey-PL-ACC see-PAST-2PL
lit. 'Ram saw 2 2 monkeys'

a. ... each time. Temporal key
b. ... in each location. Spatial key



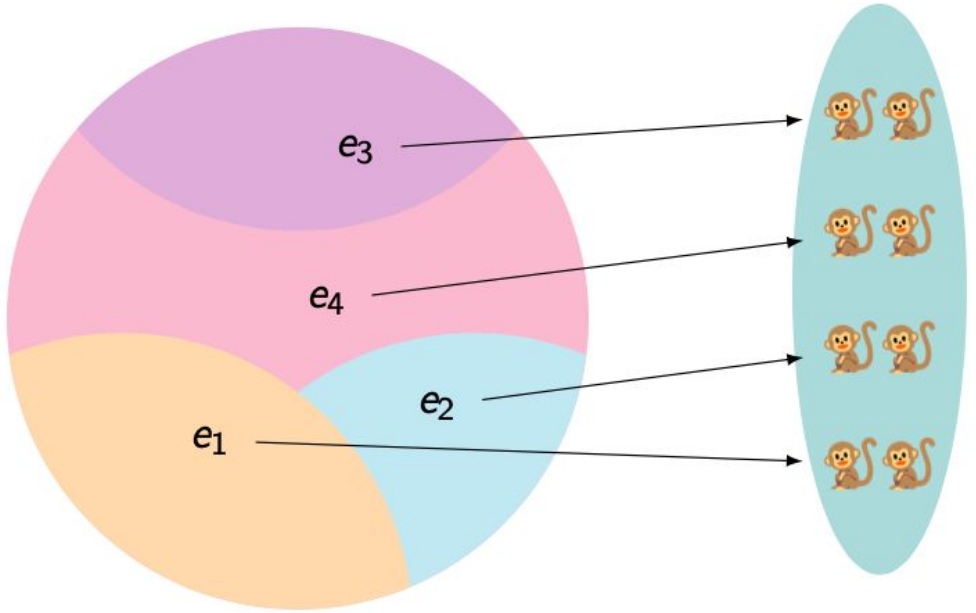
Introduction

Event-key readings for **reduplicated numerals** in Telugu:

(7) renDu renDu kootu-lu egir-i-nyiyyi
2 2 monkey-PL jump-PAST-3PL
lit. '2 2 monkeys jumped'

(8) Raamu rendu renDu kooto-lu-ni cuus-ee-Du
Ram 2 2 monkey-PL-ACC see-PAST-2PL
lit. 'Ram saw 2 2 monkeys'

a. ... each time. Temporal key
b. ... in each location. Spatial key



$\pi(e) = \{e_1, e_2, e_3, e_4\}$

(Balusu 2006)

Introduction

(24) *Hebrew*

a.	haʔanašim	saħvu	mizvada	yom	yom	
	the-man-PL:M	carry-PAST-3:PL	suitcase	day	day	
b.	haʔanašim	saħvu	mizvada	mizvada		
	the-man-PL:M	carry-PAST-3:PL	suitcase	suitcase		
c.	haʔanašim	saħvu	et	hamizvadot	aħat	aħat
	the-man-PL:M	carry-PAST-3:PL	ACC	the-suitcase-PL:F	one-F	one-F
d.	haʔanašim	saħvu	et	hamizvadot	šaloš	saloš
	the-man-PL:M	carry-PAST-3:PL	ACC	the-suitcase-PL:F	three-F	three-F

Gil (1995): “(24b) is nearly synonymous with (24c)... Thus, in (24c) and (24d), reduplication marks the numeral as **distributive-share**, and selects the verb as **distributive-key**.”

Introduction

Gil (1995):

“From an iconic perspective, it is of course more natural for reduplication to mark distributive-shares than distributive-keys; however, it is also natural for reduplication to express the notion of universal quantification.”

“Whether there exist bona fide instances of reduplication with the interpretation of distributive-key universal quantifier must remain open for future investigation.”

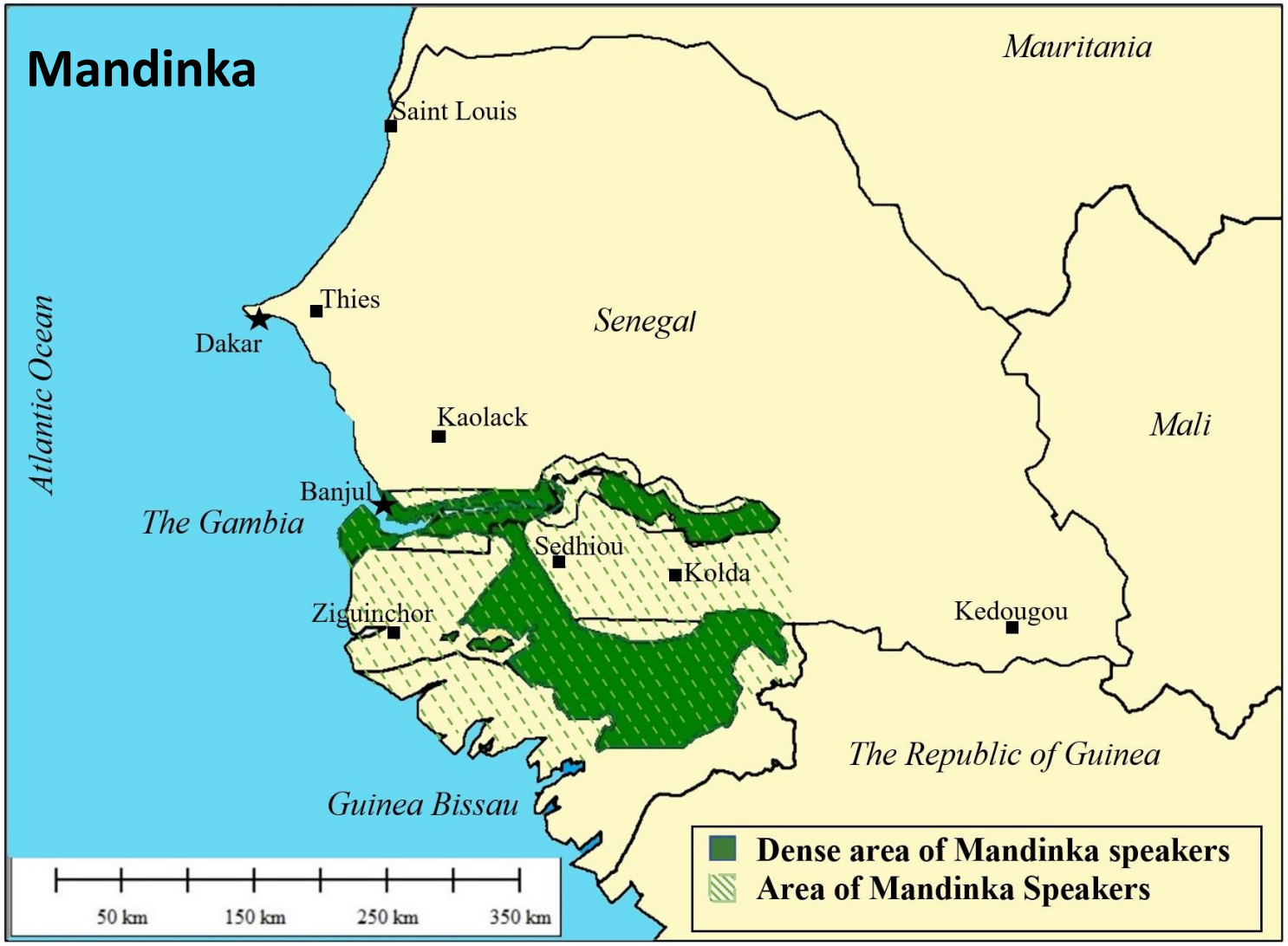
Introduction

Gil's Conjecture*

Distributivity markers that are **reduplicated** (numerals or nouns) always mark the **share** in a distributive relation.

*granted, we are reading between the lines here

Introduction



- **As spoken in**: Senegal, The Gambia, Guinea Bissau
- **Population**: 888,000 in Senegal (2017), growing
- **Classification**: Niger-Congo > Mande
- **Alt. Names**: Mande, Manding, Mandingo, Mandingue, Mandinque, Socé

Introduction

X-woo-X construction

In Mandinka, reduplicating a noun or a numeral by interposing the morpheme -*woo*- gives rise to a distributive reading.

(9) **Musu-woo-musu** ye kini taboo noo le
woman-DIST-woman PRED rice cooking know PERF
'Each woman knows how to cook rice.'

(10) Binta ye mangu saamu **kiliŋ-woo-kiliŋ** saŋ ne
Binta PRED mango pile one-DIST-one buy PERF
'Binta bought the mangoes one by one / each mango.'

It's natural to translate X-woo-X as *each* (which suggests X is the **key**).
But is X really the **share** in an event-key distributive relation (à la Gil)?

Introduction

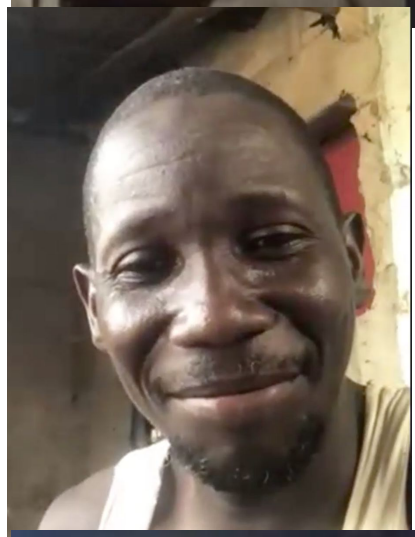
Participants

Phase I: 10 native speakers of Mandinka from Ziguinchor

- 5 men, 5 women
- 20-50+ years old
- WhatsApp conference calls in groups of two or three (2 groups of 2, 2 groups of 3)

Phase II: 12 native speakers of Mandinka from Ziguinchor

- 9 men, 3 women
- 20-50+ years old
- Zoom video calls with individual participants



Part 2

One-by-one effects

One-by-one effects

Suppose that in the X-woo-X construction, X is the **distributive share**.

Then there are multiple subevents, one per instance of X.

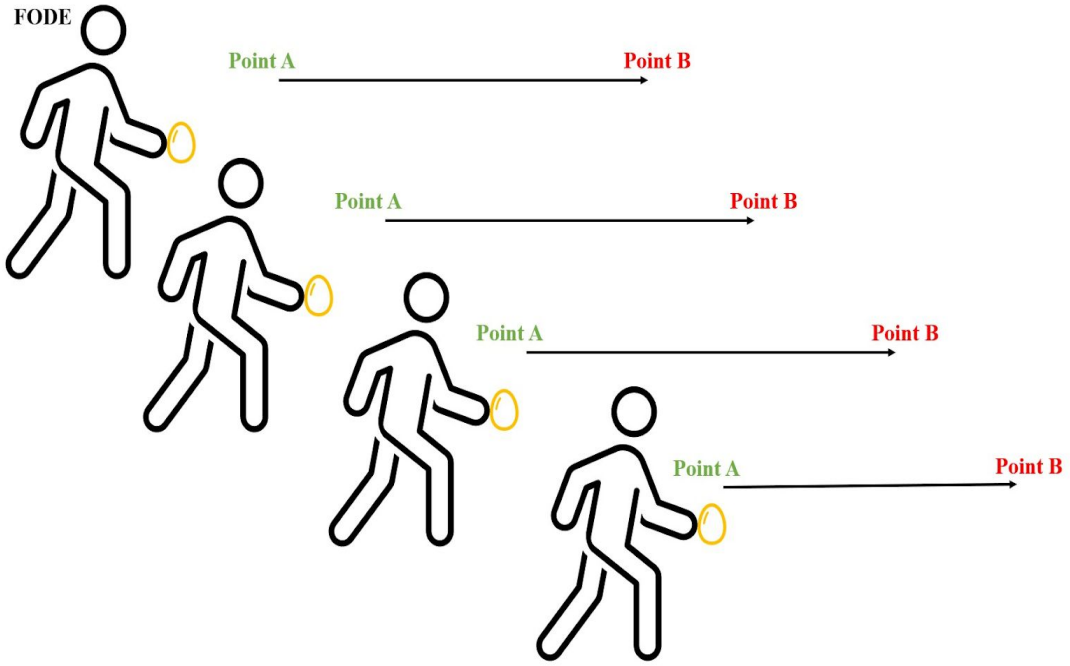
Prediction:

X-woo-X should be **more felicitous** as a way of describing scenarios where the X's are affected **one by one**, rather than **all at once**.

One-by-one effects

All-at-once scenario

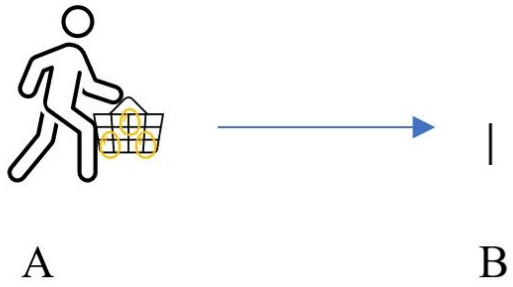
One-by-one scenario



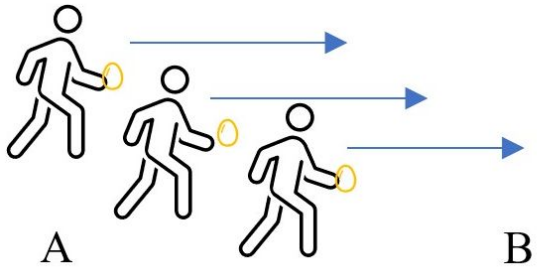
Phase I participants were asked for acceptability judgments wrt both contexts.

One-by-one effects

All-at-once scenario



One-by-one scenario



Fode ye siise-e **kili-woo-kili** samba le Fode PRED chicken egg-**DIST**-egg carry PERF 'Fode carried **each** chicken egg' (**X-woo-X**)
Fode ye siise-e **kil-o-lu** samba le. 'Fode carried **the** chicken egg**s**' (**DEF PL**)
Fode ye siise-e **kil-o-lu bee** samba le 'Fode carried **all the** chicken egg**s**' (**ALL**)

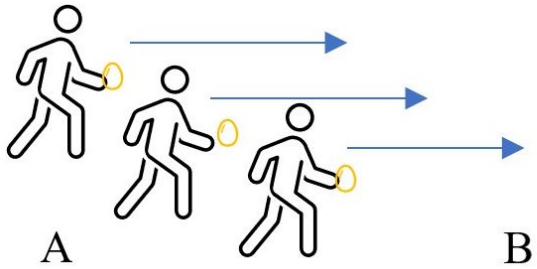
One-by-one effects

All-at-once scenario

Fode ye siise-e **kili-woo-kili** samba le Fode PRED chicken egg-**DIST**-egg carry PERF 'Fode carried **each** chicken egg' (**X-woo-X**)	**Infelicitous** *unless different kinds*
Fode ye siise-e **kil-o-lu** samba le. 'Fode carried **the** chicken egg**s**' (**DEF PL**)	**Good**
Fode ye siise-e **kil-o-lu bee** samba le 'Fode carried **all the** chicken egg**s**' (**ALL**)	**Good** **best sentence for context**

One-by-one effects

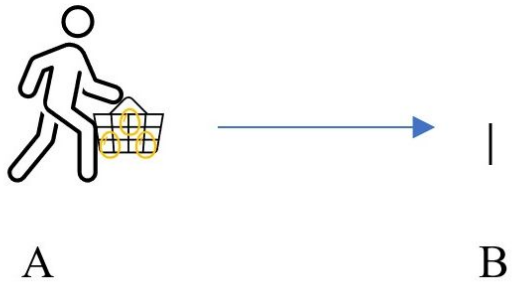
One-by-one scenario



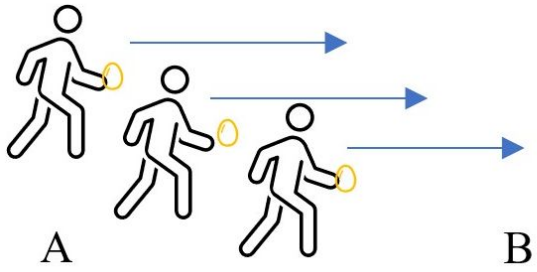
Fode ye siise-e **kili-woo-kili** samba le Fode PRED chicken egg-**DIST**-egg carry PERF 'Fode carried **each** chicken egg' (**X-woo-X**)	**Good** **best sentence for context**
Fode ye siise-e **kil-o-lu** samba le. 'Fode carried **the** chicken egg**s**' (**DEF PL**)	**Infelicitous**
Fode ye siise-e **kil-o-lu bee** samba le 'Fode carried **all the** chicken egg**s**' (**ALL**)	**Infelicitous**

One-by-one effects

All-at-once scenario



One-by-one scenario



Fode ye siise-e **kili-woo-kili** samba le Fode PRED chicken egg-**DIST**-egg carry PERF 'Fode carried **each** chicken egg' (**X-woo-X**)	**Infelicitous** *unless different kinds*	**Good** **best sentence for context**
Fode ye siise-e **kil-o-lu** samba le. 'Fode carried **the** chicken egg**s**' (**DEF PL**)	**Good**	**Infelicitous**
Fode ye siise-e **kil-o-lu bee** samba le 'Fode carried **all the** chicken egg**s**' (**ALL**)	**Good** **best sentence for context**	**Infelicitous**

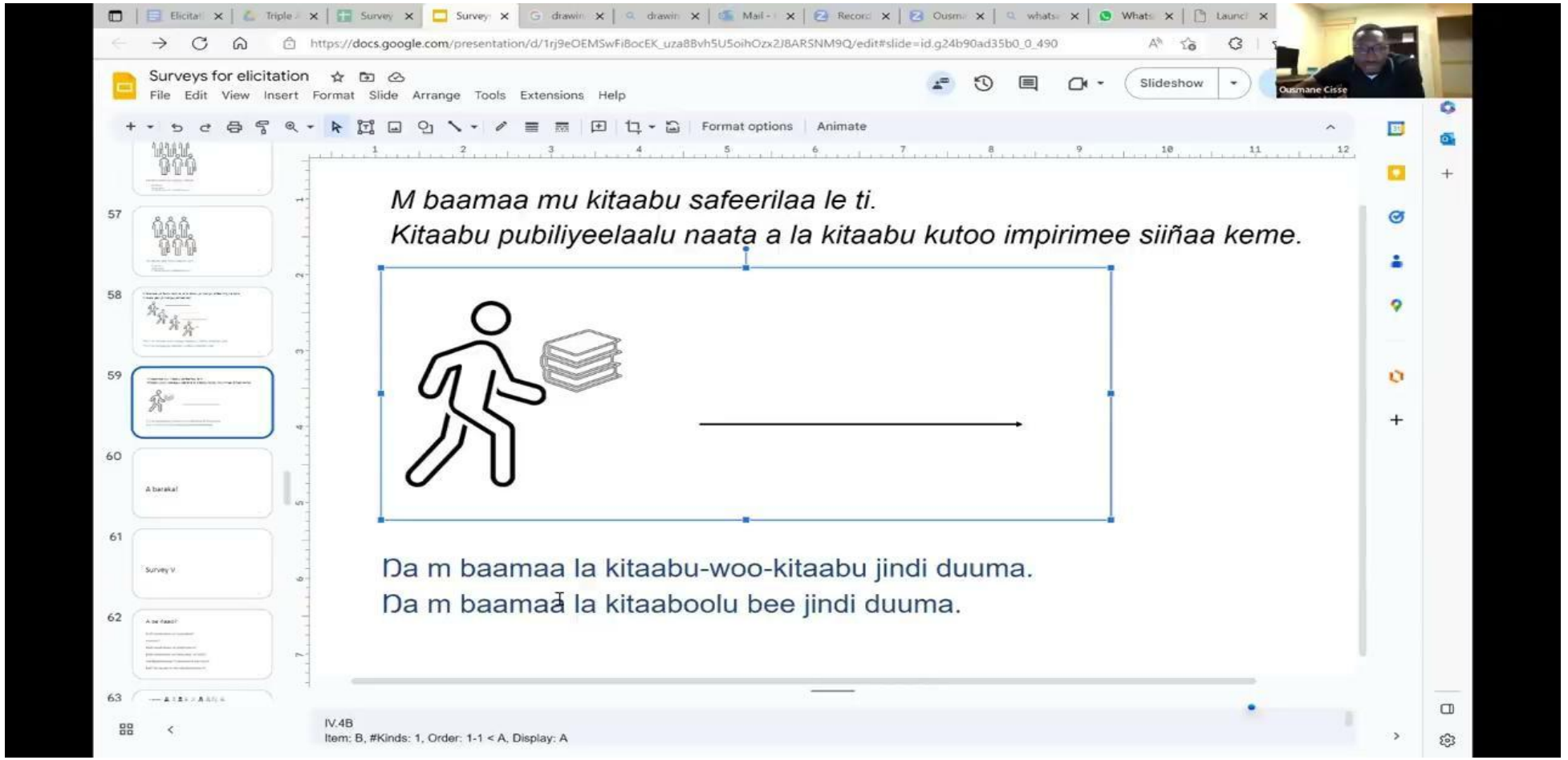
One-by-one effects

More evidence that X-woo-X marks the share in an event-key construction:
Phase II participants were asked about the difference between:

(11) Ɗa m baamaa la **kitaabu-woo-kitaabu** jindi duuma
1.SG my mother GEN book-**DISTR**-book carry down
'I carried down each one of my mother's books.'

(12) Ɗa m baamaa la **kitaabo-o-lu bee** jindi duuma.
1.SG my mother GEN book-**DET-PL** **all** carry down
'I carried down all of my mother's books.'

Several explained the difference in terms of *kiliŋ kiliŋ* 'one one'.



Ñiŋ	fraaz	foloo,	i	ye	i	**kiliŋ**	**kiliŋ**	jindi	le,
this	sentence	first	2P.SG	PRED	3P.PL	**one**	**one**	carry_down	PERF
ñiŋ	do,	i	ye	i	bee	le	jindi	ñoŋ	na.
this	some,	2P.SG	PRED	3P.PL	all	FOC	carry_down	together	OBL

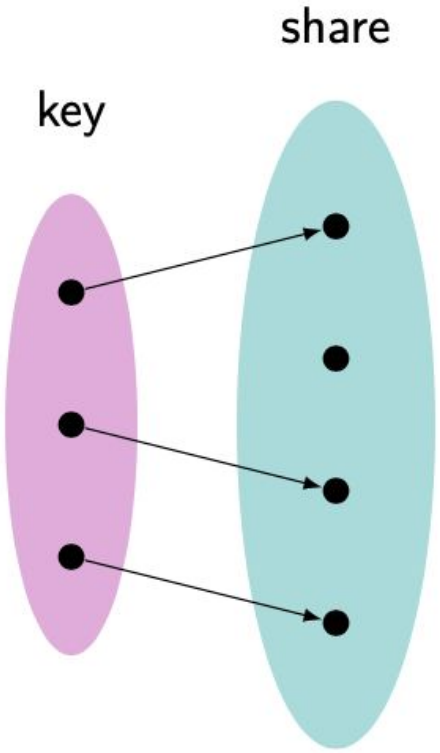
‘This one you carried them down one by one, this other one, you carried them down all together.’

One-by-one effects

Interim conclusion

Gil's Conjecture is right for Mandinka:

X-woo-X reduplication marks the **share**
(that is, X is the share)
in an event-key distributive relation.



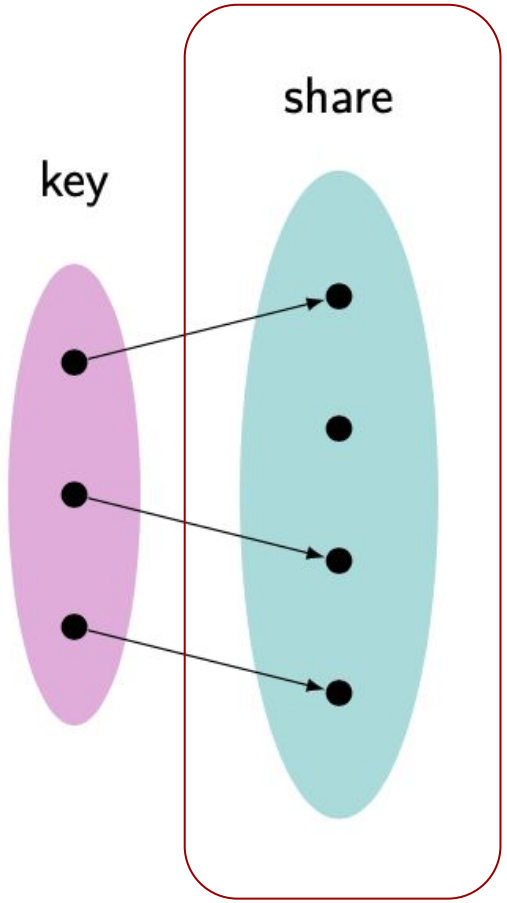
One-by-one effects

Interim conclusion

Gil's Conjecture is right for Mandinka:

X-woo-X reduplication marks the **share**
(that is, X is the share)
in an an event-key distributive relation.

But that alone would not predict exhaustivity wrt X.



Part 3

Exhaustivity effects

Exhaustivity effects

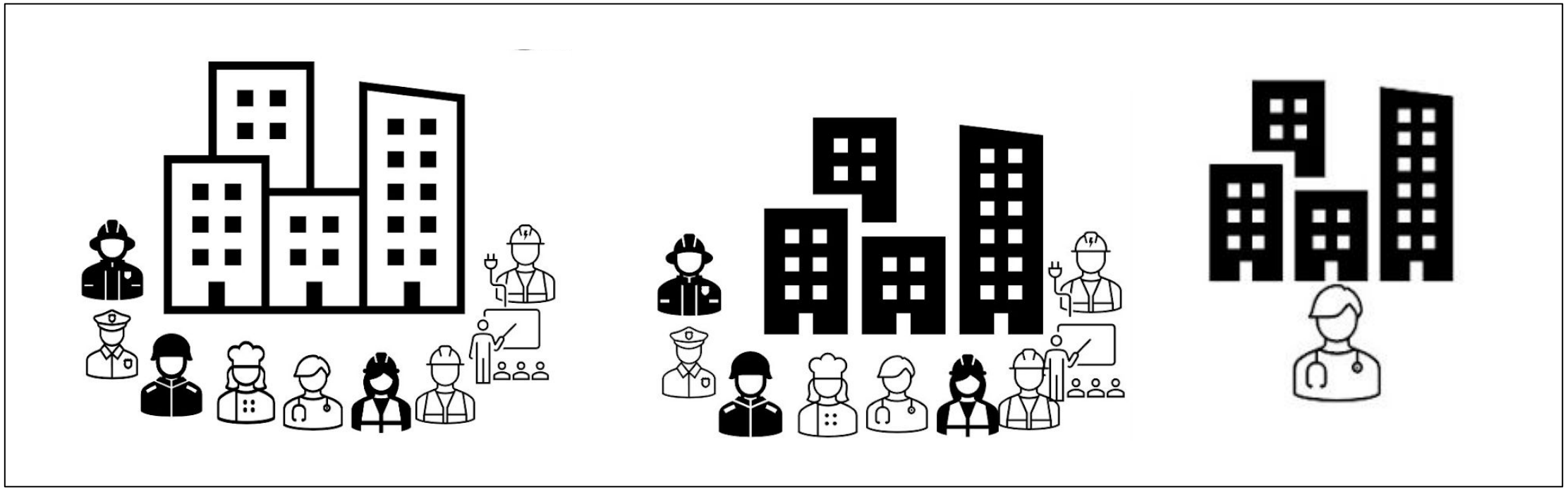
Exhaustivity experiment

Sentence type	**Exhaustive Display**	**Non-Exhaustive Display**
Subject **Town-woo-town** has a doctor/teacher		
Object The town has **worker-woo-worker**		
Both **Town-woo-town** has **worker-woo-worker**		

Phase II participants were asked 2 questions about the same sentence type (subject, object, or both), one for each display type (exhaustive vs. non-exhaustive), at the beginning of the session.

Exhaustivity effects

Example stimulus



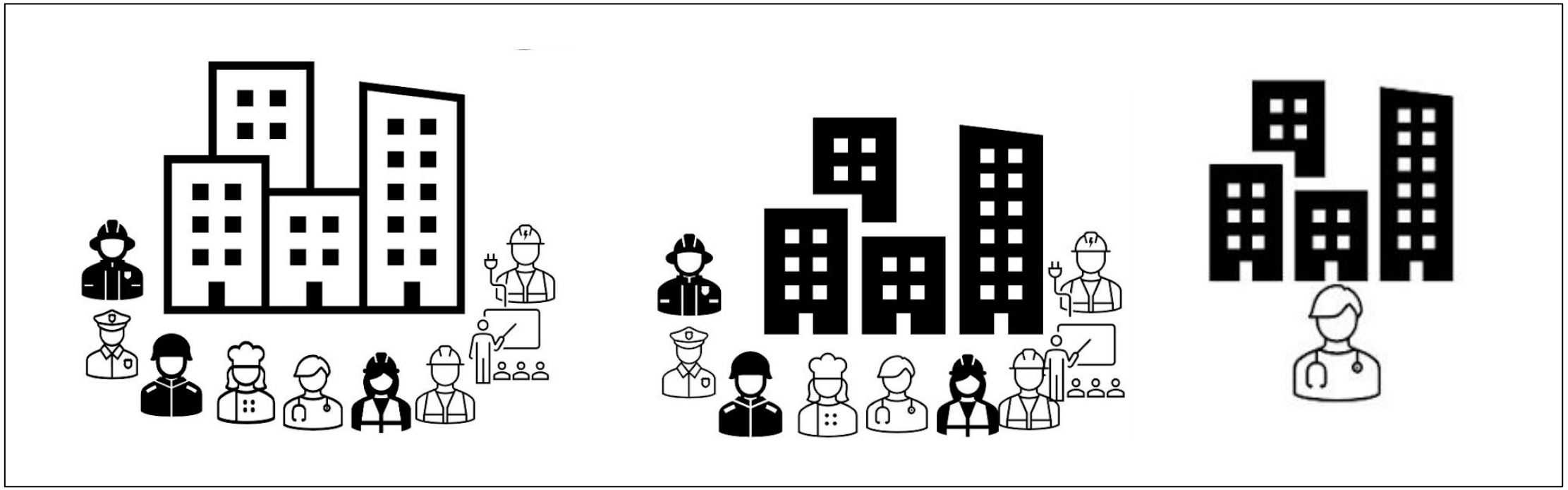
Saatee-woo-saatee ye jararlaa soto le. [Town-woo-town has a doctor]

- Tonya loŋ [true]
- Tonya nteŋ [not true]
- A manke tonya ti, a manke fanya ti [not true, not a lie]

Cf. Bosni'c et al. (2021) on Serbian *po*

Exhaustivity effects

Subject position, exhaustive display

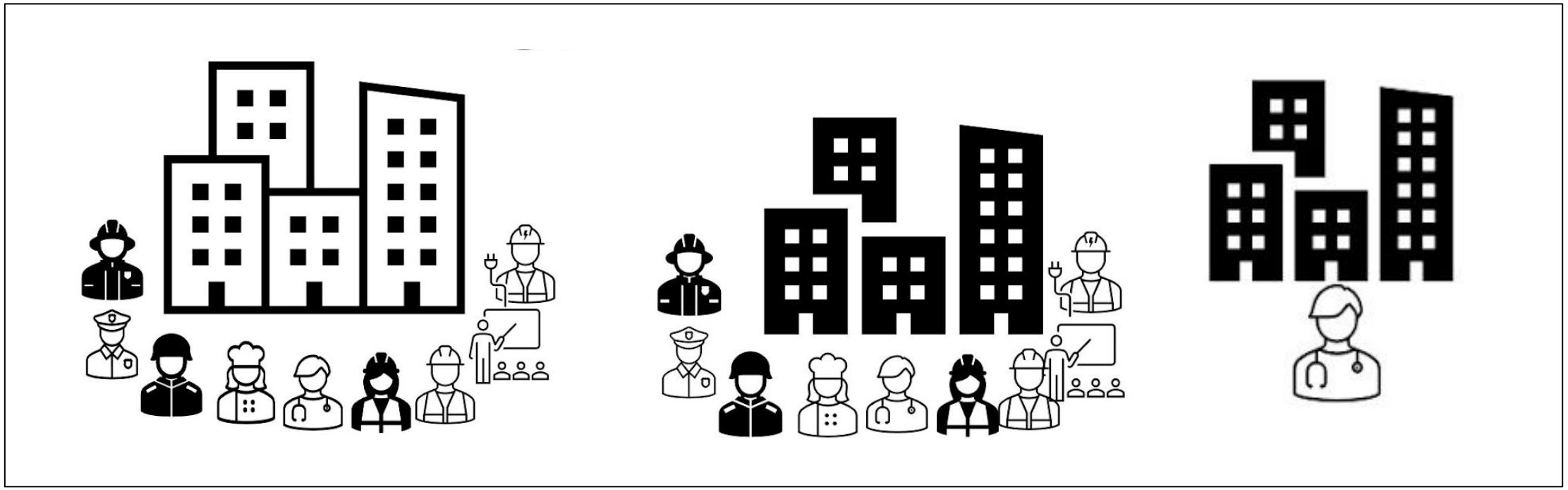


(13) Saatee-**woo**-saatee ye **jararlaa** soto le
town-DIST-town PRED **doctor** have PERF
'Every town has a doctor'

True
4/4

Exhaustivity effects

Subject position, non-exhaustive display



(14) Saatee-**woo**-saatee ye **karandirlaa** soto le
town-DIST-town PRED **teacher** have PERF
'Every town has a teacher'

False
4/4

Exhaustivity effects

Object position, exhaustive display

Dookuulaalu:

(15) Saate-e ye **dookuulaa-woo-dookulaa** soto le
town-DET PRED worker-DIST-worker have PERF
'The town has every (kind of) worker'

True
(4/4)

Exhaustivity effects

Object position, non-exhaustive display

Dookuulaalu:

(15) Saate-e ye **dookuulaa-woo-dookulaa** soto le
town-DET PRED worker-DIST-worker have PERF
'The town has every (kind of) worker'

False
(4/4)

Exhaustivity effects

X-woo-X in both subject and object positions, exhaustive display

(16) **Saatee-woo-saatee** ye **dookuulaa-woo-dookulaa** soto le
town-DIST-town PRED worker-DIST-worker have PERF
'Every town has every (kind of) worker'

True
4/4

Exhaustivity effects

X-woo-X in both subject and object positions, non-exhaustive display

Dookuulaalu:

(16) **Saatee-woo-saatee** ye **dookuulaa-woo-dookulaa** soto le
town-DIST-town PRED worker-DIST-worker have PERF
'Every town has every (kind of) worker'

False
4/4

Exhaustivity effects

Exhaustivity experiment

Sentence type	Exhaustive Display	Non-Exhaustive Display
Subject **Town-woo-town** has a doctor/teacher	**True**	**False**
Object The town has **worker-woo-worker**	**True**	**False**
Both **Town-woo-town** has **worker-woo-worker**	**True**	**False**

Conclusion: X-woo-X is always interpreted exhaustively wrt X.

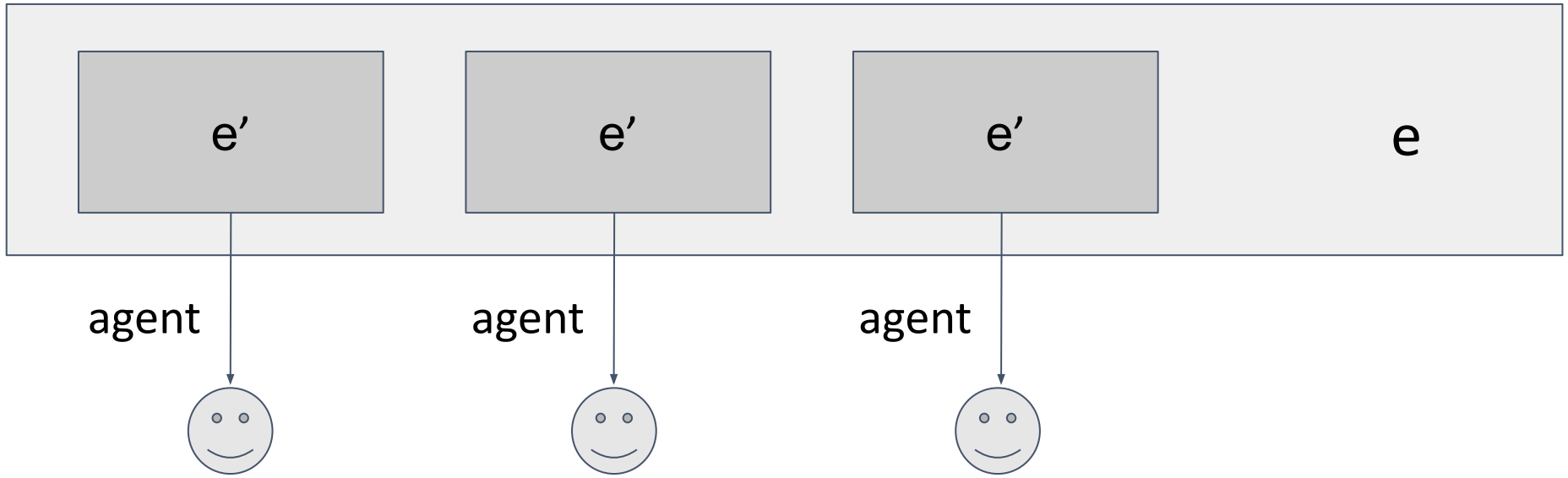
Part 4

Analysis

Analysis

(9) **Moo-woo-moo** naata le.
person-**DIST**-person come PERF
'Everybody came'

Pure share-marker analysis:



(17) $\lambda e \,.\, e \in {}^*\lambda e'[\text{person}(\text{agent}(e')) \wedge \text{come}(e')]$

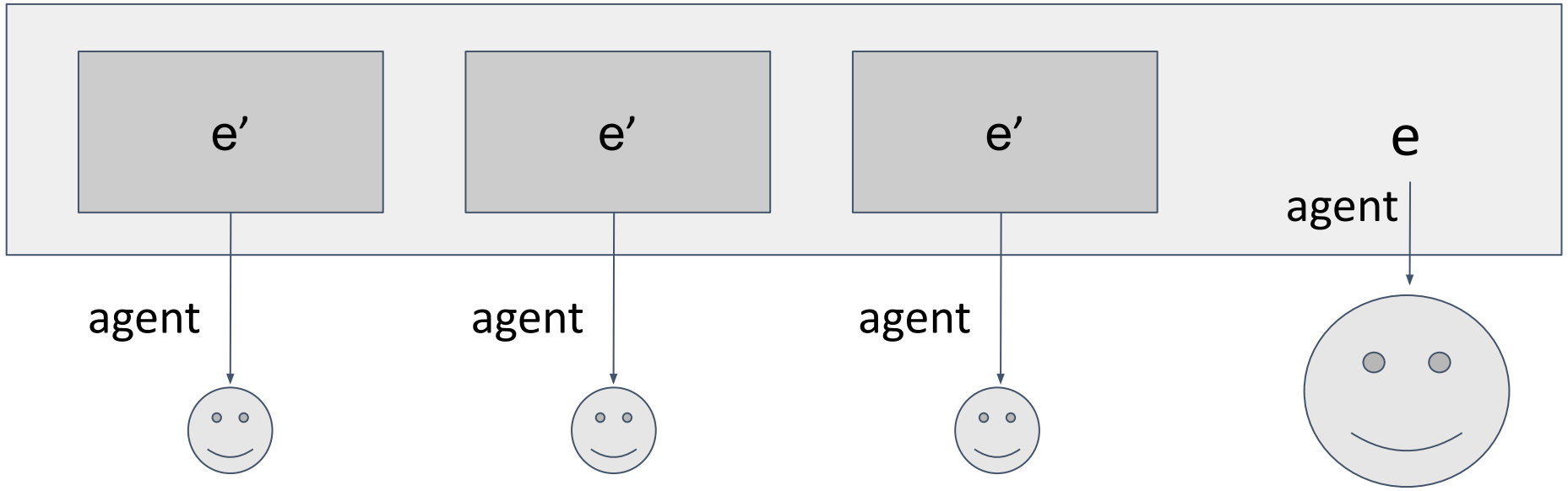
(18) *-woo-* ⇝ $\lambda P \lambda \theta \lambda V \lambda e \,.\, e \in {}^*\lambda e'[P(\theta(e')) \wedge V(e')]$

Cf. Champollion (2016)

Analysis

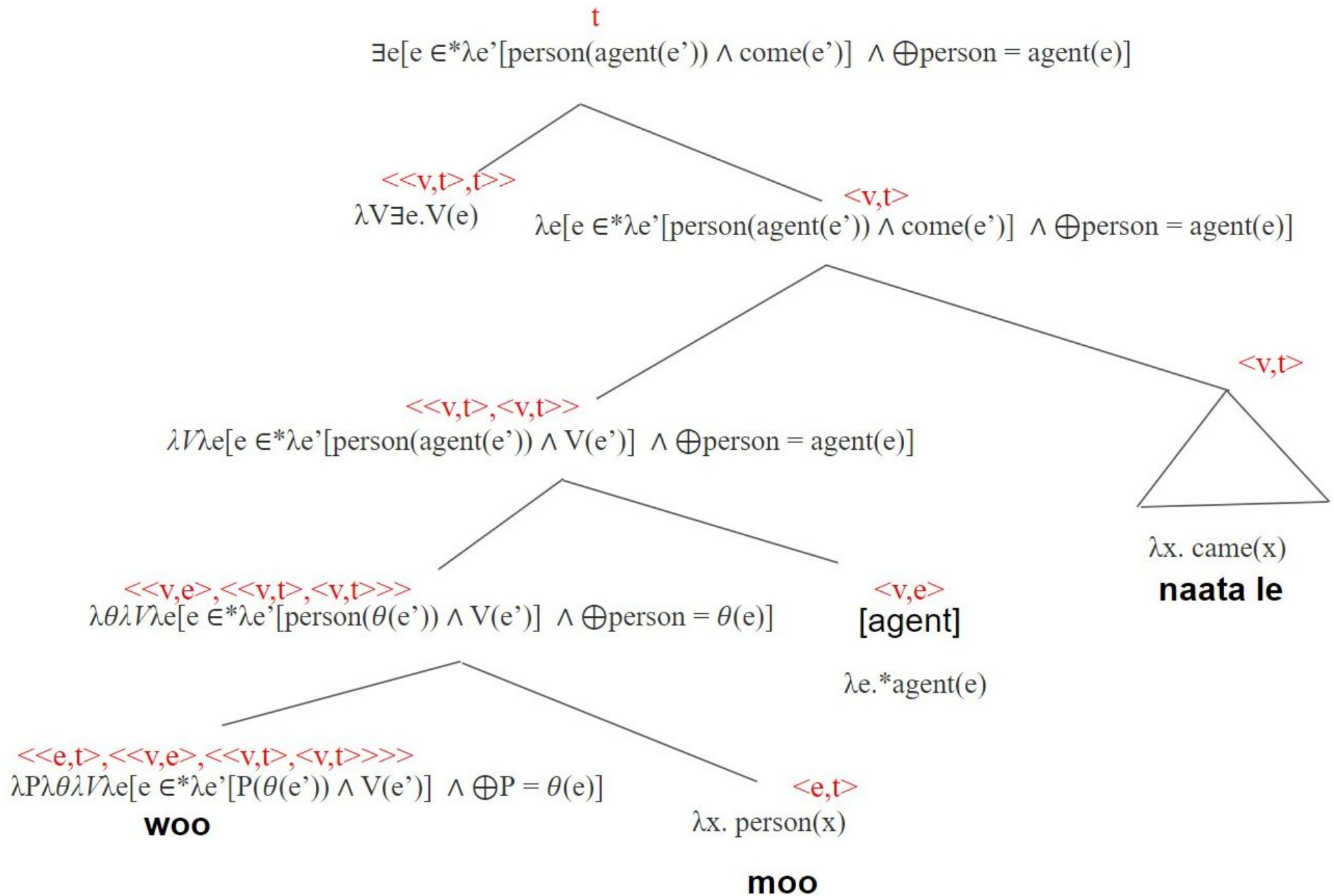
(9) **Moo-woo-moo** naata le.
person-**DIST**-person come PERF
'Everybody came'

Hybrid share/key analysis:



(19) $\lambda e\,[\, e \in {}^{*}\lambda e'[\text{person}(\text{agent}(e')) \wedge \text{come}(e')] \wedge \oplus\text{person} = \text{agent}(e)\,]$

(20) -*woo*- ⇝ $\lambda P \lambda\theta \lambda V \lambda e\,[\, e \in {}^{*}\lambda e'[P(\theta(e')) \wedge V(e')] \wedge \oplus P = \theta(e)\,]$


t
∃e[e ∈*λe'[person(agent(e')) ∧ come(e')] ∧ ⊕person = agent(e)]
<<v,t>,t>>
λV∃e.V(e)
<v,t>
λe[e ∈*λe'[person(agent(e')) ∧ come(e')] ∧ ⊕person = agent(e)]
<v,t>
<<v,t>,<v,t>>
λVλe[e ∈*λe'[person(agent(e')) ∧ V(e')] ∧ ⊕person = agent(e)]
λx. came(x)
naata le
<<v,e>,<<v,t>,<v,t>>>
λθλVλe[e ∈*λe'[person(θ(e')) ∧ V(e')] ∧ ⊕person = θ(e)]
<v,e>
[agent]
λe.*agent(e)
<<e,t>,<<v,e>,<<v,t>,<v,t>>>>
λPλθλVλe[e ∈*λe'[P(θ(e')) ∧ V(e')] ∧ ⊕P = θ(e)]
woo
<e,t>
λx. person(x)
moo

Analysis

-*woo*- ⇝ $\lambda P \lambda\theta \lambda V \lambda e\, [\, e \in {}^*\lambda e'[P(\theta(e')) \wedge V(e')] \wedge {\oplus}P = \theta(e)\,]$

The hybrid share/key analysis captures both:

- the one-by-one effect
- the exhaustivity property

Cf. Champollion's (2016)'s analysis of determiner *each*
and Kuhn & Aristodemo's (2017) of EACH in French Sign Language
and "simultaneous distributivity" as Henderson (2019) calls it
in for example Comox-Sliammon (Mellesmoen 2018)
which "degrades the key-share relationship" (Henderson 2019, 14)

Analysis

Good prediction: Event differentiation

Unlike *every*, *each* requires different subevents (Tunstall 1998, Brasoveanu & Dotlacil 2015, Thomas & Sudo 2016):

(21) Jake photographed { every / #each } student in the class,
but not individually.

Similar effect in Mandinka:

(22) #Jake ye **dindiŋ-oo-dindiŋ** fotoo le, bari a maŋ a ke kiliŋ kiliŋ
Jake PRED kid-DIST-kid photog. PERF, but 3SG NEG 3SG DO one one
'Jake photographed each kid but not one by one.'

Analysis

Another good prediction: Bad with *almost*

English: Unlike *every*, *each* is bad with *almost* (Farkas 1997):

(23) Almost { every / *each } student left the room.

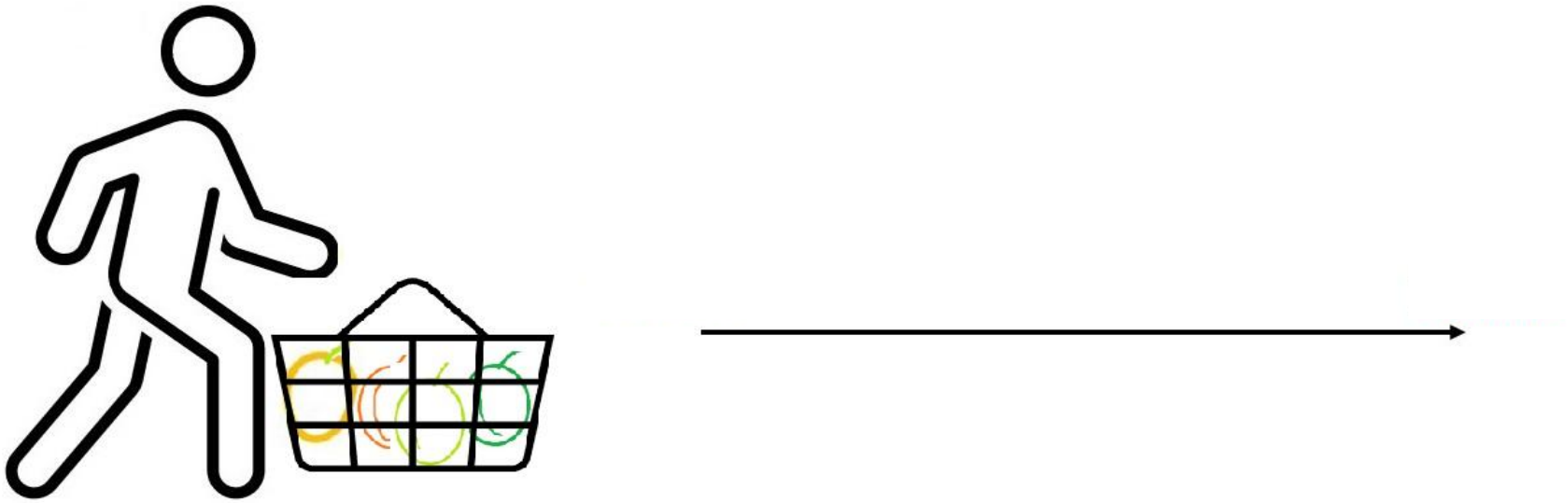
Similar effect with Mandinka X-woo-X:

(24) *Fode ye pereske siise-e **kili-woo-kili** samba le
Fode PRED almost chicken-DET egg-DIST-egg carry PERF
`*Fode carried almost each egg.'

Analysis

Still unexplained: Different-kinds effect

Recall: X-woo-X acceptable in all-at-once scenario with different kinds



Suggestion: X-woo-X depends on an ordering on the set of X's.
Types can be ordered; individual eggs not so easily.
(Cf. Henderson 2013 on "X by X")

Outlook

From *Handbook of Quantifiers in Natural Language*:
(Keenan & Paperno 2017, chapter by V. Vydrin)

Quantifiers in Dan-Gwɛɛtaa (South Mande) 239

(107) *Bɛ̰̄ ŏŏ bɛ̰̄ ɾ́ dṵ̄, ā*
human any human REL.3SG.JNT come\JNT 1SG.EXI
dȫ ǟ bǟ̰-'.
go\NEUT 3SG.NSBJ beat-INF
'Whoever comes, I'll beat him/her'.

X-woo-X exists in Jahanke and Bambara too (personal observation)

Outlook

From *Handbook of Quantifiers in Natural Language*:
(Keenan & Paperno 2012, chapter by K. Tamba, H. Torrence & M. Zimmerman on Wolof)

A third construction for expressing universal quantification is the reduplicative *NP-oo-NP*:

(91) a. **Góór-óó-góór** ma gis-kó
man-OO-man 1SG see-3SG
'I saw every single man'

b. Dem-na-a **kër-óó-kër**
go-FIN-1SG house-OO-house
'I went to every single house'

Outlook

Gil (1995):

"Whether there exist bona fide instances of reduplication with the interpretation of distributive-key universal quantifier must remain open for future investigation."

Nominal reduplication in Mandinka *has* the interpretation of distributive-key universal quantifier, although it is simultaneously a share-marker.

Does reduplication always mark the share (perhaps in addition to the key)?

A baraka!

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Thanks also to our participants, including Amadou Dabo, Lamine Seydi, Bakary Bodjang, Momodou Dabo, Dembo Saama, Mahawa Gassama, Ibrahima Gassama, Mamadou Lamine Bodjang, Kaaraa Seydi, Mamady Camara, Boubacar Dabo, and Soona Dabo.

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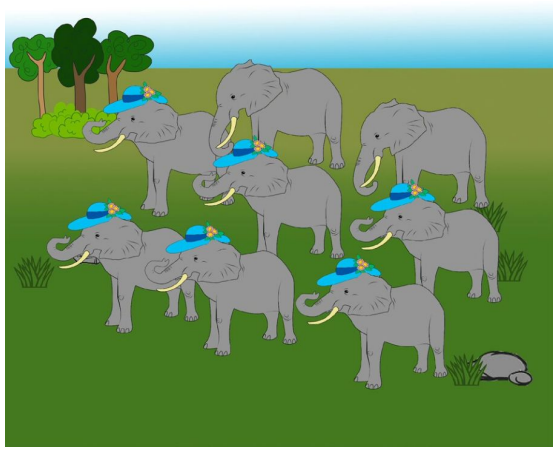
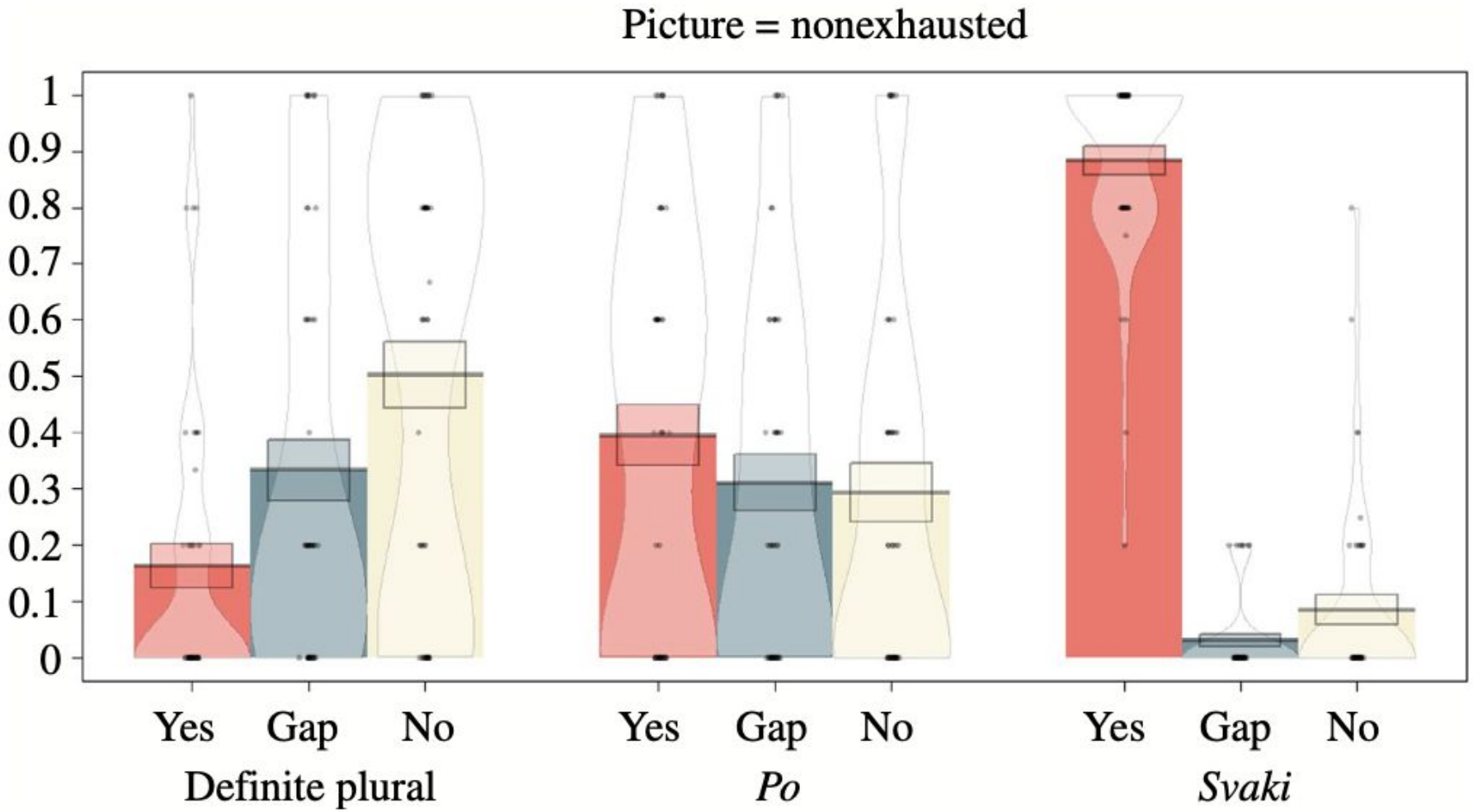
Appendix

Negation experiment

Exhaustivity effects

Bosnic et al (2021) found that exhaustivity wrt key with *po* in Serbian behaves like homogeneity with definite plurals





The elephants are **not** wearing hat

The elephants are **not** wearing **po** hat

Not every elephant is wearing a hat

Exhaustivity effects

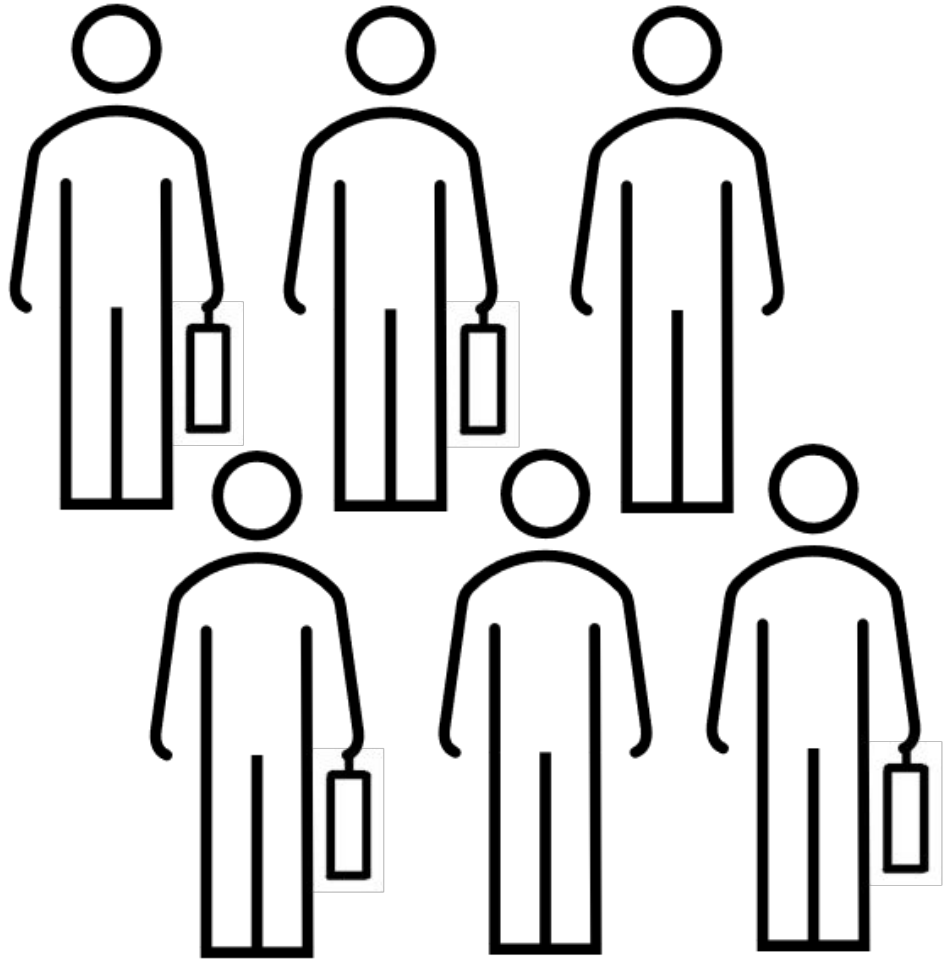
Exhaustivity+negation experiment

Design

- 3 types of determiners (X-woo-X vs. ‘all’ vs. ‘def’)
- 2 polarities (positive vs. negative)
- 2 types of displays (exhaustive, non-exhaustive)
- 2 items (hats and suitcases)

Participants: 12 native speakers (Phase II participants), individually

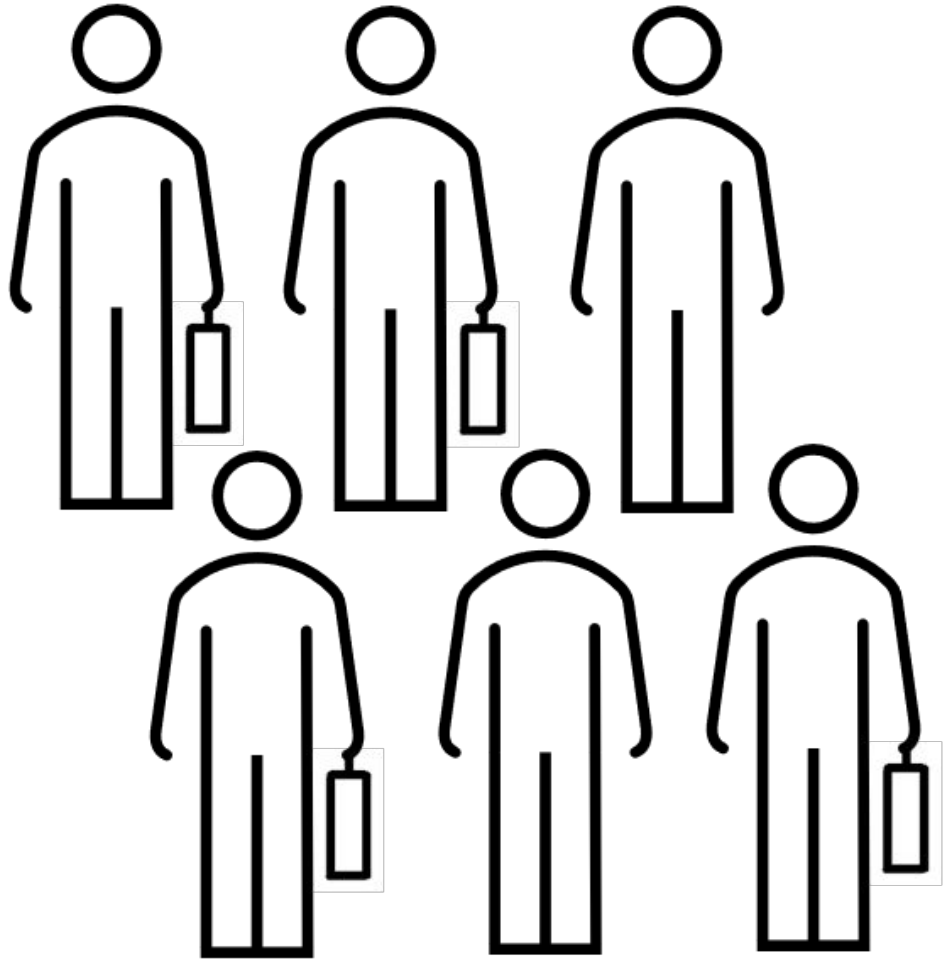
Procedure: Participants were asked two questions (positive and negative), after the exhaustivity experiment.



True
4/4

Dindiŋ-oo-dindiŋ maŋ walisoo cika. [Each kid is not carrying a suitcase]

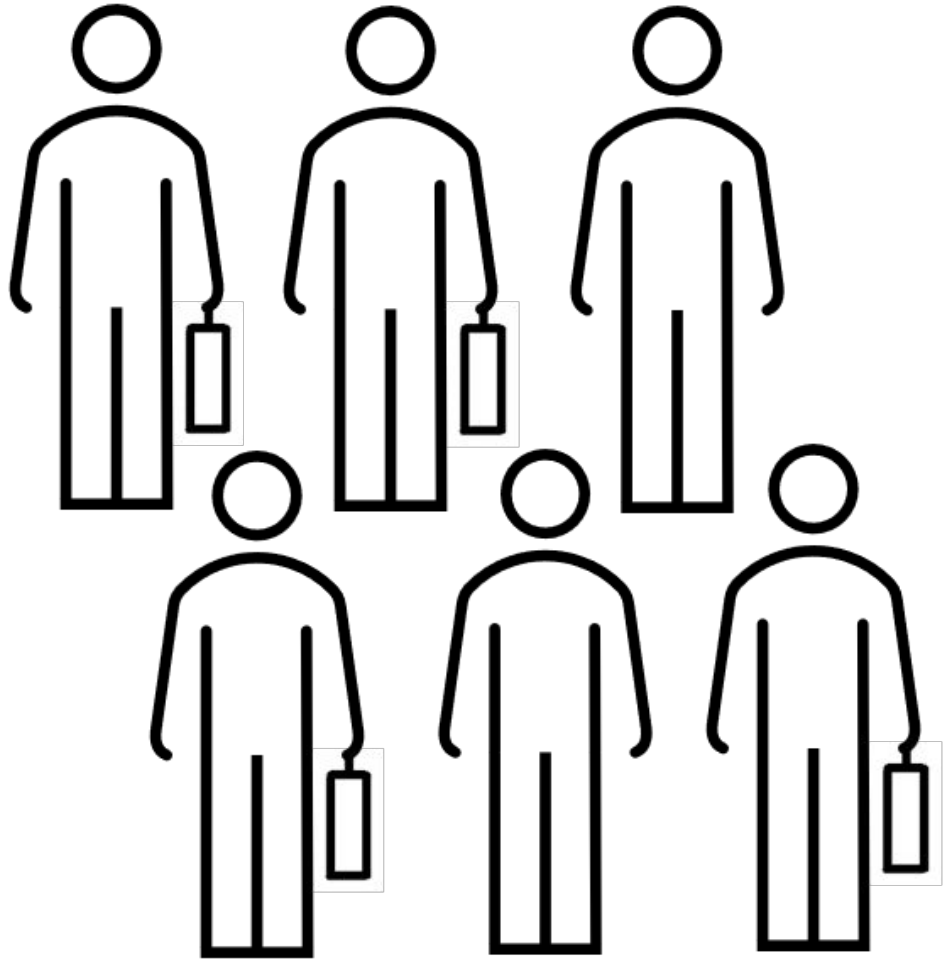
- Tonya loŋ [true]
- Tonya nteŋ [not true]
- A manke tonya ti, a manke fanya ti [not true, not a lie]



True
4/4

Dindiŋolu bee maŋ walisoo cika. [All the kids are not carrying a suitcase]

- Tonya loŋ [true]
- Tonya nteŋ [not true]
- A manke tonya ti, a manke fanya ti [not true, not a lie]



True
4/4

Dindiŋolu maŋ walisoo cika. [All the kids are not carrying a suitcase]

- Tonya loŋ [true]
- Tonya nteŋ [not true]
- A manke tonya ti, a manke fanya ti [not true, not a lie]