

A UNIFIED SEMANTIC ANALYSIS OF
CLASSIFIERS AND REDUPLICATION ACROSS
NOMINAL AND VERBAL DOMAINS
PLA SYMPOSIUM 2014

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OVERVIEW

FUNCTIONS OF CLF AND REDP IN N & V

CENTRAL CLAIM: 2-TIERED QUANTF-INDV

PREDICTIONS

IMPLICATION

CLASSIFIER IN NOMINALS

English does not use Clf: a cup / *an air / a puff of air

Cantonese nominals require Clf:

- (1) jat1 go3 bui1 'a cup'
- (2) jat1 dung6 bui1 'a stack of cups'
- (3) jat1 {dik6 / bui1 / gung1sing1} sei2
'a drop/cup/litre (of) water'

- ▶ Clf denotes the unit of counting / measuring
 $\llbracket Clf(X)_K \rrbracket = Count_K(X_{root} \cap Q)$ (Rothstein, 2010)
- ▶ Nouns in Cantonese typically require Clf
- ▶ Natural plurality expressed solely by Clf,
 no marking on bui1 'cup'

(Rothstein, 2010; Cheng, 2012; Zhang, 2013; Harding & Lin, 2014)

CLASSIFIER IN VERBS

English expresses bounded events with count nouns,
i.e. not with Clf:

- ▶ 'take a look' (as suggested by the use of determiner)
- ▶ 'give it a try'

CLASSIFIER IN VERBS

Cantonese Clf can occur with verbs to give the same bounded reading, among other constructions:

Clf with Nominals

- (4) loeng5 go3 jan4
two Clf person
'two people'

Clf with Verbs

- (5) paau2 go3 bou6
run Clf step
'go for a jog'
- (6) sik6 go3 faan6
eat Clf rice
'have a meal'
not 'eat a grain of rice'

- ▶ Bounded events can cooccur with Asp-marking
(Syntax: below AspP; Semantics: Clf-V does not denote viewpoint aspect)

REDUPLICATION IN N & V

- (7) **zek3 zek3** gau2
 Clf Clf dog
 ‘every dog’

Clf-N → Exhaustive list reading
 N-N reduplication are unacceptable

- (8) **haau1 haau1** ha5 mun4
 knock knock Dur door
 ‘knocking on the door’

Bounded V → Iterative event

- (9) **cung1 cung1** ha5 loeng4
 wash wash Dur cool
 ‘taking shower’

Unbounded V → Durative event

The boundedness of ‘knock’ and ‘wash’ happen to be the same as English, cf. modification by ‘for a long time’.

REDUPLICATION IN N & V

Redp is essentially 'every'.

$$(10) \quad \llbracket \text{EVERY} \rrbracket = \lambda f \in D . \forall x \in D \rightarrow f(x) = 1$$

(Heim & Kratzer, 1998)

(11) bun2 bun2 syu1 dou1 hou2 cung5
 Clf Clf book all very heavy
 'Every book is heavy.' (distributive but not collective
 reading)

- ▶ the function f (being an entire book) is applied to all object x in the domain D in question.

SUMMARY OF INTERPRETATIONS OF REDP

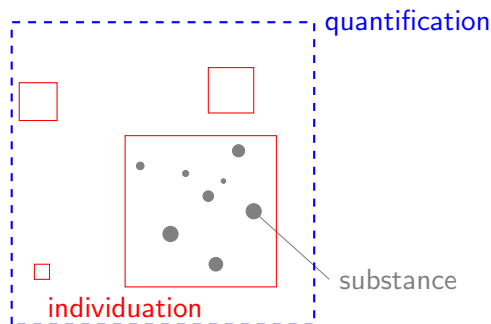
Category	Interpretation
Cl-N	exhaustive list 'every N'
$V_{bounded}$	iterative 'knocking'
$V_{unbounded}$	durative 'running'
Adj	diminutive 'fairly Adj'

Lam (2013) explains the pattern in terms cumulativity and quantization.

CENTRAL CLAIM

2-tiered Quantification-Individuation

- ▶ t0: N / V instantiates the mass, unquantifiable substance
- ▶ t1: Clf individuates substance to **quantifiable units**
- ▶ t2: Redp takes units and returns **quantified set**



FORMALLY

Denotation for Clf:

$$\llbracket \text{Clf}(X)_K \rrbracket = \text{Count}_K(X_{\text{root}} \cap Q)$$

(Rothstein, 2010)

 $\text{Count}_K(\text{Dog}_{\text{root}} \cap Q) = 1$ iff:


... or ...



Otherwise, like
 Then $\text{Count}_K(\text{Dog}_{\text{root}} \cap Q) = 0$

INDIVIDUATED NOUN + REDUPLICATION

$$\llbracket Clf(X)_K \rrbracket = Count_K(X_{root} \cap Q) \quad (\text{Rothstein, 2010})$$

$$\llbracket EVERY \rrbracket = \lambda f \in D . \forall x \in D \rightarrow f(x) = 1 \quad (\text{Heim \& Kratzer, 1998})$$

(12) zek3 zek3 gau2

 Clf Clf dog

 'every dog'

Clf-N \rightarrow Exhaustive list reading

N-N reduplication are unacceptable in adult speech

1. $Dog(X) = 1$, iff X has the property of 'being dog' (not 'a dog'!)
2. $Count_K(Dog_{root} \cap Q) = 1$, iff the object has the property of being dog AND satisfies the quantity of 'a dog', manifested by 'zek3 gau2' in Cantonese
3. $\lambda Dog \in D . \forall Clf(X) \in D \rightarrow f(Clf(X)) = 1$, iff all $Clf(X)$ can be called 'a dog', manifested by 'zek3 zek3 gau2' in Cantonese

INDIVIDUATED VERB + REDUPLICATION

$$\llbracket Clf(X)_K \rrbracket = Count_K(X_{root} \cap Q) \quad (\text{Rothstein, 2010})$$

$$\llbracket \text{EVERY} \rrbracket = \lambda f \in D . \forall x \in D \rightarrow f(x) = 1 \quad (\text{Heim \& Kratzer, 1998})$$

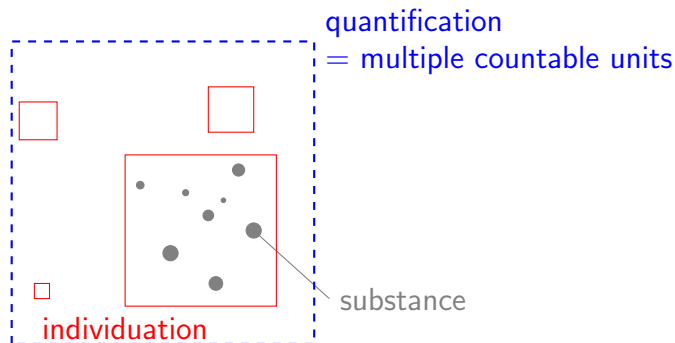
- (13) **haau1 haau1** ha5 mun4
 knock knock Dur door
 ‘knocking on the door’ Bounded V \rightarrow Iterative event

1. $\text{Knock}(X) = 1$, iff X has the property of ‘being knocking’
2. Though there is no Clf , but the lexical knowledge forces us to interpret it as bounded
3. $\lambda \text{Knock} \in D . \forall x \in D \rightarrow \text{Knock}(x) = 1$, iff all X can be called ‘a knock’, manifested in reduplication in Cantonese

INDIVIDUATED ELEMENTS + REDUPLICATION

- (14) zek3 zek3 gau2
 Clf Clf dog
 'every dog'

Graphically:



UNINDIVIDUATED ELEMENT + REDUPLICATION

$$\llbracket Clf(X)_K \rrbracket = Count_K(X_{root} \cap Q) \quad (\text{Rothstein, 2010})$$

$$\llbracket \text{EVERY} \rrbracket = \lambda f \in D . \forall x \in D \rightarrow f(x) = 1 \quad (\text{Heim \& Kratzer, 1998})$$

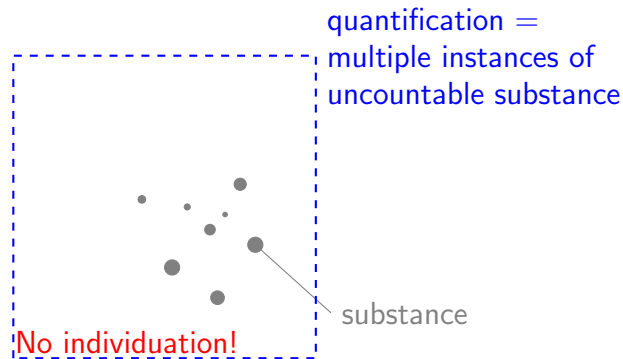
- (15) *cung1 cung1* ha5 loeng4
 wash wash Dur cool
 'taking shower' Unbounded V \rightarrow Durative event

Typically we use variable e for events

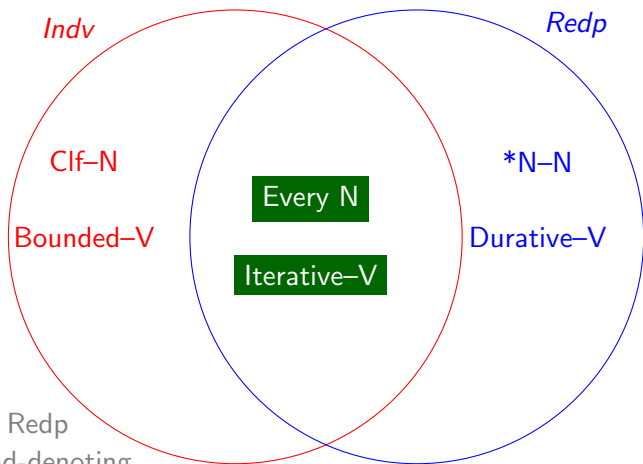
1. $\text{Wash}(e) = 1$, iff the event e can be characterized as Wash
2. In sentences like 'He showered for a long time.', the reading is durative, hence 'shower' is considered unbounded.
3. $\lambda \text{Wash} \in D . \forall e \in D \rightarrow \text{Shower}(e) = 1$, iff all frames in the events can be characterized as Wash

UNINDIVIDUATED ELEMENT + REDUPLICATION

Graphically:



SUMMARY



No Indv or Redp
bare N: kind-denoting
V: Generic

PREDICTION I: BEHAVIORS OF INDIVIDUATED N IN CANTONESE

(16) nin6 nin6
year year
'every year'

(17) sei3 (*go3) nin6
four Clf year
'4 years'

(18) *go3 go3 nin6
Clf Clf year
'*Intended*: every year'

- ▶ These nouns can be considered inherently individuated
- ▶ As long as an object is individuated, they can be counted and undergo reduplication (CL-N and these individuated N)

PREDICTION II: REDUPLICATED ELEMENTS ARE MULTIPLIED

- ▶ Redp + individuated argument = multiple individuals, iterative events
- ▶ Redp + unindividuated argument = durative events

- (19) ngo5 **haau1 haau1** ha5 dou6 mun4 keoi5 zau6 ceot1 lai4
 1sg **knock knock** Asp Clf door 3sg then out come
 'He came out while I was knocking on the door.
(multiple knocking)
- (20) ngo5 haau1 **dou6 dou6** mun4 dou1 mou5 jan4
 1sg knock **Clf Clf** door all Neg person
 'I knock on every door and no one (answered).
(multiple doors)

PREDICTION II: REDUPLICATED ELEMENTS ARE MULTIPLIED (CONT'D)

Bangla/Bengali

(21) **bachar bachar** ek kaj kara

'Do the same **every year**.'

(22) **Kheye Deye** Ami Shute Jaba

'After **eating**, I shall go to sleep.' (partial reduplication)

(Chakraborty & Bandyopadhyay, 2009)

PREDICTION II: REDUPLICATED ELEMENTS ARE MULTIPLIED (CONT'D)

American Sign Language (Wilbur, 2005)

- ▶ LOOK vs. LOOK-AT [durative]
- ▶ The durative reading is achieved by circular motion (hand movement), interpreted as a prolonged event similar to 'keep on looking'
- ▶ ASL shows a wider range of reduplicated forms (different motions, phonologically) that provide different meanings

IMPLICATION: PARALLELISM BETWEEN N & V

1. N & V are interpreted in similar syn-sem structure
 - ▶ N: Counting vs. Measuring
 - ▶ V: Iterative vs. Durative
2. Compatible with current spell-out driven syntactic structure
 - ▶ D-Q-Clf-N
 - ▶ TenseAspMood-InternalAsp-V

CONCLUSION

- ▶ Predicting counting vs. measuring by Individuation in both N & V
- ▶ 2-tiered semantics (Quantification + Individuation) handles the interaction between classifier construction and reduplication
- ▶ Accounts for cross-category behaviours (common syntax in N & V)

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REFERENCES I

- Chakraborty, T., & Bandyopadhyay, S. (2009). Identification of reduplication in Bengali corpus and their semantic analysis: A rule-based approach. In *23rd international conference on computational linguistics* (p. 73).
- Cheng, L. L. S. (2012). Counting and classifiers. In D. Massam (Ed.), *Count and Mass across languages*. Oxford University Press.
- Harding, J., & Lin, C. C.-J. (2014). *Attuning to cohesion: English count-syntax, the Mandarin general classifier ge, and wholeness*. (Poster presented at The 27th Annual CUNY Conference on Human Sentence Processing, March 13–15, The Ohio State University, abstract available on <http://cuny14.osu.edu/>)

REFERENCES II

- Heim, I., & Kratzer, A. (1998). *Semantics in generative grammar*. Wiley-Blackwell.
- Lam, C. (2013). Reduplication across categories. *PACLIC 27*, 277–286. (Taipei)
- Rothstein, S. (2010). The semantics of count nouns. In M. Aloni, H. Bastiaanse, T. Jäger, & K. Schulz (Eds.), *Logic, language and meaning* (Vol. 6042, p. 395-404). Springer Berlin Heidelberg.
- Wilbur, R. B. (2005). A reanalysis of reduplication in American Sign Language. In B. Hurch (Ed.), *Studies in reduplication*. Berlin/New York: de Gruyter.
- Zhang, N. N. (2013). *Classifier structures in Mandarin Chinese*. Berlin: Mouton de Gruyter.