

REDUPLICATION AS SUMMATION  
COUNTABILITY WORKSHOP, DÜSSELDORF

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# OVERVIEW

THE VARIOUS INTERPRETATIONS OF REDUPLICATION

PROPOSAL: REDUPLICATION AS SUMMATION

IMPLICATIONS

## REDUPLICATION ACROSS CATEGORIES

All examples are in Cantonese

- (1) **bun2 bun2** syu1 \*(dou1) hou2 cung5  
 CI CI book Distr very heavy  
 'Every book is heavy.' (*subject only; distributive N*)
- (2) keoi5 **haau1 haau1** ha5 mun4 \*(wan4 zo2)  
 3sg knock knock Dur door pass.out Perf  
 'S/he passed out when knocking on the door.' (*iterative event*)
- (3) keoi5 **gou1 gou1** dei2  
 3sg tall tall Prt  
 'S/he is fairly tall.' (*hedging, diminutive Adjective*)

All 3 lexical categories can undergo reduplication.

## NOMINAL REDUPLICATION

- (4) go2 \*(bun2) syu1  
 D Cl book  
 'that book'
- (5) go2 loeng5 \*(bun2) syu1  
 D two Cl book  
 'those 2 books'
- (6) (\*go2) **bun2 bun2** syu1  
 D Cl Cl book  
 'every book' (*distributive N*)
- ▶ Interpretation of RED-CL: "every x"
  - ▶ RED-CL is in complementary distribution with D-(Num)-CL-N

## NOMINAL REDUPLICATION

(7) **mui5** bun2 syu1  
every CI book (any position)

(8) **bun2 bun2** syu1  
CI CI book (subject only)  
'every book'

- ▶ lexicalized 'every' and CL-RED share the same meaning, but differ in syntactic distribution

## (INHERENTLY) INDIVIDUATED NOUNS

- (9) nin6 nin6  
year year  
'every year'
- (10) sei3 (\*go3) nin6  
four CL year  
'4 years'
- (11) \*go3 go3 nin6  
CL CL year  
'*Intended*: every year' (changing CL cannot save it)
- ▶ Also: *jat6* 'day', *dou6* 'place', *ci3* 'time', *jan4* 'person'
  - ▶ As long as an object is individuated, they can be counted and undergo reduplication (CL-N and these individuated N)

## (INHERENTLY) INDIVIDUATED NOUNS

- (12)    *jan4 jan4*  
          person person  
          'everybody'
- (13)    *sei3 (go3) jan4*  
          four CL person  
          '4 people' **both acceptable!**
- (14)    *go3 go3 jan4*  
          CL CL person  
          'every body' **acceptable!**

It seems that *jan4* 'person' is an exception in that it goes with or without CL.

## NOMINAL REDUPLICATION

- ▶ Only classifiers can be reduplicants, not N or D
- ▶ Reduplication cannot cooccur with D-CL-N construction.
- ▶ **CL individuates objects** (Cheng, 2012; Zhang, 2013)
- ▶ Without CL, none of the above utterances is acceptable – for most of the nouns



## VERBS AND ITS WITHIN-CATEGORY DIFFERENCE

- (15) keoi5 **haau1 haau1** ha5 mun4 \*(wan4 zo2)  
 3sg knock knock Asp door pass.out Perf  
 'S/he passed out when knocking on the door.' (*iterative event*)
- (16) keoi5 **tai2 tai2** ha5 din6si6 \*(wan4 zo2)  
 3sg watch watch Asp television pass.out Perf  
 'S/he passed out when watching TV.'
- ▶ another predicate 'pass out' is required
  - ▶ 'knock' and 'watch' are equivalent of these English counterparts in delimitation/duration property

## VERBS AND ITS WITHIN-CATEGORY DIFFERENCE

(17) ngo5 haau1 mun4 haau1 zo2 saam1-fen1-zong1  
 1sg knock door **knock Perf 3-minute**  
 'I knocked the door for 3 minutes.'  
 →multiple knocking

(18) ngo5 tai2 din6si6 tai2 zo2 saam1-fen1-zong1  
 1sg watch TV **watch Perf 3-minute**  
 'I watched TV for 3 minutes.'  
 →continuous watching, not multiple watching

- ▶ (17) and (18) are distinct from RED: Vs are not contiguous
- ▶ Depending on the types of event, V-RED gives two possible interpretations
- ▶ This rules out syntactic category as an explanation to the observations

## ADJECTIVES AND DEGREE MARKING

(19) keoi5 \*(hou2) gou1  
s/he very tall  
'She is (very) tall.'

(20) keoi5 \*(gei2) gou1  
s/he fairly tall  
'She is fairly tall'

(21) keoi5 gou1 gou1 \*(dei2)  
s/he tall tall Prt  
'She is fairly tall'

- ▶ Adjectives must come with degree marking (e.g. 'very', 'fairly')
- ▶ RED is among the possible ways to mark degree
- ▶ RED must co-occur with a particle *dei2*
- ▶ Only gradable adjectives undergo reduplication

## ADJECTIVES AND DEGREE MARKING

(22) keoi5 \*(hou2) gou1

s/he very tall

'She is (very) tall.'

(23) keoi5 m5 gou1

s/he NEG tall

'She is not tall'

- ▶ Negation does not require degree marking

## SEVERED ‘AP’

- ▶ Like nominals (which consists of at least D, CL, N), AP is internally complex

(24) keoi5 \*(hou2) gou1  
 s/he very tall  
 ‘She is (very) tall.’

(25) keoi5 \*(gei2) gou1  
 s/he fairly tall  
 ‘She is fairly tall’

- ▶ Deg is analogous to CL and Determiner
- ▶ Bare adjectives are dimension-denoting, analogous to kind-denoting and unindividuated N

## SUMMARY OF INTERPRETATIONS OF RED

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

# With a few exceptions of 'year', 'day', 'place' and 'person'

## CHALLENGE OF THE CROSS-CATEGORIAL BEHAVIOUR

- ▶ Various unrelated interpretations across categories
- ▶ Similar in surface order
- ▶ All producing systematic (thus predictable) results

## PROPOSAL: REDUPLICATION AS SUMMATION

- ▶ Reduplication =  $\llbracket \text{SUM} \rrbracket$

$$(26) \quad \llbracket \text{SUM} \rrbracket = \lambda f \in D . \forall x \in D \rightarrow f(x) = 1$$

(Heim & Kratzer, 1998)

- ▶ (26) directly comes from H&K's denotation for  $\llbracket \text{every} \rrbracket$



## CUMULATIVITY

- (27) A predicate  $P$  is cumulative iff
- (i)  $\forall x, y [P(x) \wedge P(y) \rightarrow P(x \oplus y)]$
  - (ii)  $\exists x, y [P(x) \wedge P(y) \wedge \neg x = y]$

(i) shows that  $P$  can predicate the union of  $x$  and  $y$  (and each of them separately)

(ii) ensures that  $x$  is not the same atomic element  $y$

(Krifka, 2001)

## QUANTIZATION

(28) A predicate  $P$  is quantized iff  
$$\forall x, y [P(x) \wedge P(y) \rightarrow \neg y < x]$$

- ▶ If  $P(x)$  and  $P(y)$ , no element  $y$  can be a proper subpart of  $x$
- ▶ e.g. no part of a book can be a book

## RED AT WORK: NOMINALS

- ▶ Only individuated atoms undergo reduplication (CL-N)
- ▶ Quantization:

(29) A predicate  $P$  is quantized iff  
 $\forall x, y [P(x) \wedge P(y) \rightarrow \neg y < x]$

(30)  $\llbracket \text{SUM} \rrbracket = \lambda f \in D . \forall x \in D \rightarrow f(x) = 1$

(31) bun2 bun2 syu1  
 CL CL book  
 'every book'

(Krifka, 2001; Rothstein, 2004)

- ▶ (31) is true iff
  - (i) each of the elements in the set can be called a book (30) &
  - (ii) no proper subset of 'a book' can be called a 'book' (29)

## RED AT WORK: PUNCTUAL VERBS

(32)  $\llbracket \text{SUM} \rrbracket = \lambda f \in D . \forall x \in D \rightarrow f(x) = 1$

(33) keoi5 **haau1 haau1** ha5 mun4 \*(wan4 zo2)  
 3sg knock knock Dur door pass.out Perf  
 'S/he passed out when knocking on the door.' (*iterative event*)

- ▶ (33) is true iff
  - (i) each of the elements in the set can be called 'knock' (33)
  - (ii) no proper subset of 'knock' can be called a 'knock' (29)
- ▶ Because a part of knocking (e.g. extending the arm, bending the fingers) cannot be called 'knock',  $\llbracket \text{SUM} \rrbracket(\text{knock})$  is interpreted as iterative, captured by quantization:
 
$$\forall x, y [P(x) \wedge P(y) \rightarrow \neg y < x]$$

## RED AT WORK: ATELIC VERBS

Atelic verbs are cumulative:

1. watch-TV( $e_1$ ) & watch-TV( $e_2$ )
  2.  $e_1 \neq e_2$
  3. watch-TV( $e_1+e_2$ )
- ▶  $\llbracket \text{SUM} \rrbracket = \lambda f \in D . \forall x \in D \rightarrow f(x) = 1$
  - ▶  $\llbracket \text{SUM} \rrbracket(\text{watch-TV})$  can be interpreted as one durative event because subparts of it can be called 'watch-TV'

## RED AT WORK: ADJECTIVES

- ▶ bare-Adj are not individuated / instantiated because of the required degree-marking
- ▶  $\llbracket \text{SUM} \rrbracket = \lambda f \in D . \forall x \in D \rightarrow f(x) = 1$
- ▶ let d1 and d2 be two distinct degree/points on the same scale
  1. tall(d1) & tall(d2)
  2. tall  $\neq$  tall
  3. tall(d1+d2)
- ▶ More reliable tests needed.

## RED AT WORK: ADJECTIVES

- ▶ in languages where adjectives come degree-marked and quantized, the present theory would predict Adj-RED to be intensifying (e.g. Basque)
- ▶ in languages where reduplicated adjectives denote diminution, the adjectives are not marked with degree and thus unindividuated and cumulative.
- ▶ Cantonese adjectives belong to the latter

## PUZZLE WITH DIMINUTIVE ADJ-RED

- ▶ Summation is by default adding up elements
- ▶ ‘Adding’ in this case yields less
- ▶ ‘white-ish’, ‘reddish’ (Abraham, 2005)
- ▶ (34)  $\llbracket \text{SUM} \rrbracket = \lambda f \in D . \forall x \in D \rightarrow f(x) = 1$   
 $\llbracket \text{SUM} \rrbracket$  as defined here does not require addition in arithmetic sense
- ▶ ‘very’ as a default marking (implicature is cancellable by follow-up clarification)
- ▶ RED is a marked form and prompts a separate interpretation from ‘very’ (the default can denote affirmation and intensification)



## INTERPRETATIONS OF RED AGAIN

Category	Interpretation	Property of Elements
CI-N	exhaustive list 'every N'	Quantized
$V_{punctual}$	iterative 'knocking'	Quantized
$V_{atelic}$	durative 'running'	Cumulative
Adj	diminutive 'fairly Adj'	Cumulative

## IMPLICATION: INDIVIDUATION

- ▶ Only CL-N cluster and a few nouns can reduplicate
  - RED -  $V_{punctual}$ : iterative events
    - quantized / individuated / instantiated objects and events
- ▶ RED -  $V_{atelic}$ : durative events
  - RED - Adj: diminution
    - cumulative / unindividuated events and scale

## TOWARDS A UNIFIED ACCOUNT FOR LEXICAL STRUCTURE

- ▶ Reduplication as a function shared by lexical categories
- ▶ The position of RED is in complementary distribution with D, Asp and Deg  
Semantically, RED and D, Asp and Deg are saturated by the same kind of argument  
It suggests that D, Asp and Deg could share some features
- ▶ Generalized 'functional structure' as opposed to categories-specific nominal-/event-/scale structure (Lohndal, 2011; Parsons, 1990)

## SUMMARY

- ▶ Parallelism between categories  $N$ ,  $V$  &  $A$
- ▶ Parallelism between  $RED$  and functional categories  $D$ ,  $Asp$ , &  $Deg$
- ▶  $RED$  as summation can predict the interpretation as long as we can tell cumulativity / quantization

## SOME MORE REMARKS

- ▶ Reliable test for diminution might give more idea on where it comes from
- ▶ Other verbal predicates are not included in the analysis (?achievement, ?accomplishment)
- ▶ Bisyllabic RED in Mandarin & Cantonese (AABB & ABAB forms)

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