Zero, Measurements, & Null Individuals in Mandarin Nominal Semantics

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Introduction

It has been convincingly argued by Bylinina & Nouwen (2016, 2018) that English zero is not a negative quantifier but a numeral, for it cannot license negative polarity items:

(1) a.   No students cried at all.
    b.   *Zero students cried at all.

Thus, it provides evidence for introducing _null individuals_ —that is, zero-membered pluralities—into the model.

However, Chow & Morzycki (2021) provides evidence that such null individuals is a matter of cross-linguistic variation, observing that Cantonese zero has a more restricted distribution that systematically prevents uses of zero that require null individuals.

(2) #ling4 go3 pang4 jau5
    zero CL.unitfriend
    'zero friends'

They put forth that the hypothesis should be reformulated as _the Null Individual Parameter_, which is on for English, but off for Cantonese. This conclusion is striking as it implies a difference in natural language metaphysics between the languages.

Of particular interest to this paper, Chow & Morzycki (2021) drew out three noun classifications when laying the distribution of Cantonese zero, and with each class, zero behaves differently. The suggestion that there exists different classifications of nouns and their class informs their relationship with zeros is non-trivial but not fully explored.

Objective & Hypothesis

In light of this, and in step with both Chow & Morzycki and Bylinina & Nouwen's numeral-based approach, we hypothesize that the variation in the nouns' treatment of zero is a product of the grammar's sensitivity to features of different measurement scales (in spirit of Sassoon 2010).
Our aim here is two fold: 1) to hunt for null individuals in Mandarin, and 2) to study the distribution of Mandarin zero in hopes to further extend and make sense of Chow & Morzycki's classification of nouns.

Findings

Mandarin Data in a Nutshell:
With _ordinary nouns_ ('students', 'dogs', 'friends'):
  • ordinary numerals require a classifier
  • zero is impossible

With _unit nouns_ ('calories', 'age', 'grade points,'):
  • classifiers are prohibited
  • zero is possible
  • ordinary numerals are possible

With _concept nouns_ ('sense of humor', 'luck', 'probability'):
  • three subcategories: arbitrary, proportional, and unit scale

(3) Table 1: _Concept nouns_ and their relationship with various types of numerals

	Natural Numbers	Zero	Percentage	Degrees with Units
Arbitrary Scale ('Sense of humor')	No	Yes	No	N/A
Proportional Scale ('Probability')	No	Yes	Yes	N/A
Unit Scale ('Height')	No	Yes	No	Yes

Analysis

Mandarin zero systematically does not occur with classifiers, indicating a lack of null individuals, supporting the need for the _Null Individual Parameter_.
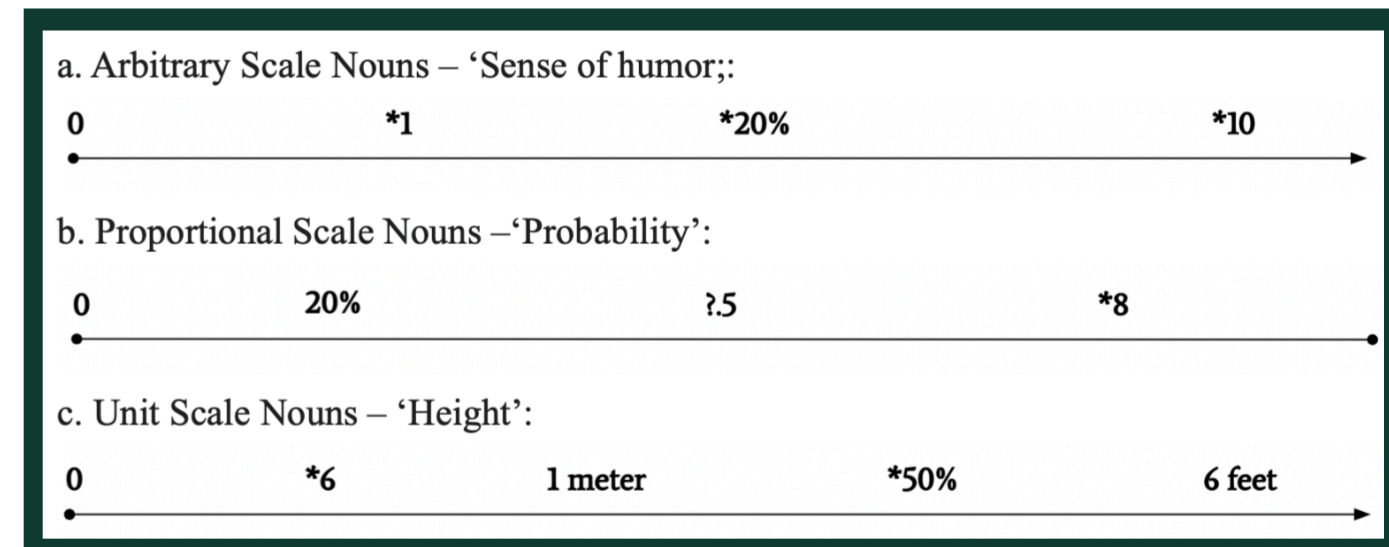
However, we also observed other types of numerals to be subjected to various restrictions in distribution that is not dissimilar to zero. This leads us to argue that the distinction is not between numerals and quantifiers, but between types of degrees and their relationship with different nouns; that zero's incompatibility is result of mechanics similar to why "John's height is 2° celsius" is inappropriate.

Discussion

We offered a numeral based denotation for the three classification of nouns that invoke a specialized measure function, an extension of Scontras's (2014) approach to measure terms:

(4) **CLASSIFIERS:** ⟦ge4 'CL.unit'⟧ = $\lambda k \lambda n \lambda x[\pi(k)(x) \wedge \mu card(x) = n]$
(5) **UNIT NOUNS:** ⟦fen1 'grade'⟧ = $\lambda n \lambda x[\mu grade(x) = n]$
(6) **CONCEPTS NOUNS:** ⟦ke3neng2xing4 'probability'⟧ = $\lambda x[\mu probability(x)]$

Notably, none of the denotations presuppose particular numeral arguments as a lexical stipulation. We argue instead that certain numerals are simply not a member of the image of a measure function invoked. As a result, certain arguments will yield false irregardless of the world, and hence be infelicitous.

a. Arbitrary Scale Nouns – 'Sense of humor;:
0 ——— *1 ——— *20% ——— *10

b. Proportional Scale Nouns –'Probability':
0 ——— 20% ——— ?5 ——— *8

c. Unit Scale Nouns – 'Height':
0 ——— *6 ——— 1 meter ——— *50% ——— 6 feet

Conclusions & Implications:
1) Measure functions are not conceptually basic; are lexically indexed in natural languages
2) They can vary cross-linguistically
3) The Null Individual Parameter is product differences in conceptualization of the cardinality measure function

References

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