Every sentence has how many quantifiers each?  
Binominal each in English

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Background

We used survey and corpus techniques to investigate a mismatch between predictions of semantic theories and native judgments of binominal each constructions in English.

Literature:


- Pre-nominal EACH: *The monkeys wrote 5 plays each*
- Floated EACH: *The monkeys each wrote 5 plays*
- Binominal EACH: *The monkeys wrote 5 plays each*

Sentences with binominal EACH are analyzed as involving a sorting key (the thing being distributed over) and a distributive share (what’s being distributed over the set in the sorting key) (Choe 1987):

*The boys love (the woman/every woman/that woman) each.*

The specific set of facts examined here are interesting as a result of these descriptions of binominal EACH. They are expected to rule out the following:

- a. Every team wrote one section each
- b. Each team wrote one section each

However, this seems to disagree with our own judgments. Many speakers seem to find both at least somewhat acceptable with EVERY...EACH being considerably better than EACH...EACH. Additionally, there are several languages which seem to allow analogous constructions (an example in Telugu from Balusu 2005):

- *pilla-lu renDu renDu koosta-lu-n cuus-ce-ru*
  - these kid-PL two monkey-PL-ACC see-PAST-3PL
  - ‘these kids saw two monkeys’

available readings:

- *pilla-lu renDu renDu koosta-lu-n cuus-ce-ru*
  - a. *These children saw two monkeys each* (participant key)
  - b. *These children saw two monkeys in each time interval* (temporal key)
  - c. *These children saw two monkeys in each location* (spatial key)

Balusu analyzes the distributive quantification in these cases as some partitioning of the event of monkey-seeing by participants, time, or space. This applies fairly well to the English cases as well, although English only allows the participant key. Binominal EACH can be seen as a partition of the event by participants. However, the cases that are supposed to be ungrammatical for English are unproblematic in many other languages.

Methodology:

- We developed an online survey in which native speakers of American English rated sentences on a five-point scale of naturalness.

Survey:

- We devised two versions of an eight-question online survey. These surveys were designed to test samples comparing the quantifier constructions THE...EACH, EVERY, EVERY...EACH, and EACH...EACH.

- The survey items were of the following format: one background sentence without a quantifier, followed by a second sentence containing a quantifier. Each version of the survey contained exactly one example of each target construction and lexical frame.

- Each survey also included four randomly ordered filler sentences containing non-pertinent quantifiers: “most”, “at least”, “both”, and “all”.

- Two surveys were distributed equally to five sections of introductory undergraduate linguistics courses at NYU. We analyzed 63 survey responses (33 from Version 1 and 30 from Version 2).

Results:

- Participants rated sentences containing EACH...EACH as significantly less natural than any other construction. In contrast, the EVERY...EACH sentences were not rated significantly differently from THE...EACH and EVERY sentences.

- Bonferroni-adjusted pairwise comparisons confirm that EACH...EACH is rated as significantly worse than all the other constructions (p < .001), while the other constructions were not significantly different from each other (see Figure 3).

- Further tests confirm that when sentence content is controlled for, EACH...EACH is rated as significantly less natural than EVERY WHILE EVERY...EACH is not significantly different from THE...EACH (see Figure 4).

Discussion

Literature

- The literature predicts that both EVERY...EACH and EACH...EACH constructions are unacceptable.

Corpus

- The corpus results indicate that EVERY...EACH and EACH...EACH are rare in occurrence. However, EVERY...EACH occurred more frequently than EVERY...EACH.

Judgments

- Survey results show that EVERY...EACH is widely accepted by American English speakers. Sentences with EACH...EACH, while not completely rejected, were rated as significantly less natural than sentences with other quantifier constructions.

From our results, it seems that it may be possible to extend Balusu (2005)’s analysis of these constructions in Telugu to their English equivalents. If one views the distributive quantifier as a partition of some event this provides a more coherent explanation of the behavior of the distributive, and of why EVERY...EACH and EACH...EACH are (mostly) grammatical, in contrast to the inaccurate predictions of other models.

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