



A compositional semantic analysis of participant number

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Participant number

Participant number is a robust cross-linguistic pattern where verbal marking reflects the notional number of internal (thematic) arguments (Mel'čuk 1979; Durie 1986; Mithun 1988; Corbett 2000; Veselinova 2006).

- Typically restricted to a subset of verbs, particularly verbs of motion or stance (e.g. lay, walk, dance)
- Can show two-, three-, or four-way contrasts (e.g. dual, paucal), even if the grammatical number system doesn't

(1) Hiaki (Bobaljik & Harley 2017):

- a. Aapo vuite.
3SG run.SG
'S/he is running.' (SG)
- b. Vempo **tenne**.
3PL run.PL
'They are running.' (PL)
- c. Aapo uka koowi-ta me'a-k.
3SG the.SG pig-ACC.SG kill.SG-PRF
'She killed the pig.' (SG>SG)
- d. Aapo ume kowi-m **sua**-k.
3SG the.PL pig-PL kill.PL-PRF
'She killed the pigs.' (SG>PL)

There are **three cross-linguistic generalizations** for participant number:

- It can be marked by suppletion, reduplication, or an affix.
- It is restricted to internal arguments.
- It marks notional (or semantic) number, not grammatical number.

Previous analyses fall into two classes:

- ▷ **Lexical semantic**: Participant number realizes distinct lexical items, one of which is only felicitous with plural entities (Mithun 1988; Corbett 2000).
- ▷ **Local suppletion**: Participant number is verb root suppletion conditioned by number features in the morphosyntax (Bobaljik & Harley 2017; Toosarvandani 2016; Thornton 2018).

These analyses miss two generalizations: 1) that participant number is often affixal, and 2) it reflects notional, not grammatical number.

Proposal

Participant number is **semantic** and **compositional**.

Lexical items introduce a cardinality presupposition for the first argument to compose with the verb.

$$(2) \begin{aligned} \llbracket \text{SG} \rrbracket &= \lambda P_{(e, st)}. \lambda x: |x| = 1. \lambda e. P(x)(e) \\ \llbracket \text{PL} \rrbracket &= \lambda P_{(e, st)}. \lambda x: |x| > 1. \lambda e. P(x)(e) \end{aligned}$$

These denotations realize a verb-internal number node (Thornton 2018), which allows us to maintain strict locality of suppletion within the morphological word (complex X^0).

Three generalizations

▷ Can be affixal

Participant number is canonically suppletive, as in (1), but may be marked with reduplication (3) or a segmental affix (4).

- (3) Niuean (Seiter 1980):
- a. Kua hala e laua e lā akau.
PERF cut ERG 3DU ABS branch tree
'They cut down the branch.' (PL>SG)
- b. Kua **ha**-hala e ia e tau lā akau.
PERF RED.PL-cut ERG 3SG ABS PL branch tree
'He cut down the branches.' (SG>PL)
- (4) Karuk (Ararahih'uripih Corpus):
- a. xás u-p-vôon-ishuk
then 3SG-ITER-crawl-out
'And he crawled back out.' (SG)
- b. xas kun-p-**iru**-vôon-ishuk
then 3PL-ITER-PL-crawl-out
'And they came out.' (PL)

▷ Targets internal arguments

Participant number occurs with verbs that are semantically "unaccusative", plus verbs of motion and stance.

Indirect and applied objects do not trigger participant number (5).

- (5) Huichol (Comrie 1982):
- a. nee waakana ne-mec-umi?ii-ri eeki
I chicken 1SG.S-2SG.O-kill.SG-BEN you
'I killed you (SG) the chicken.'
- b. nee waakana-ari ne-mec-**uqi**?ii-ri eeki
I chicken-PL 1SG.S-2SG.O-kill.SG-BEN you
'I killed you (SG) the chickens.'

▷ Reflects notional number

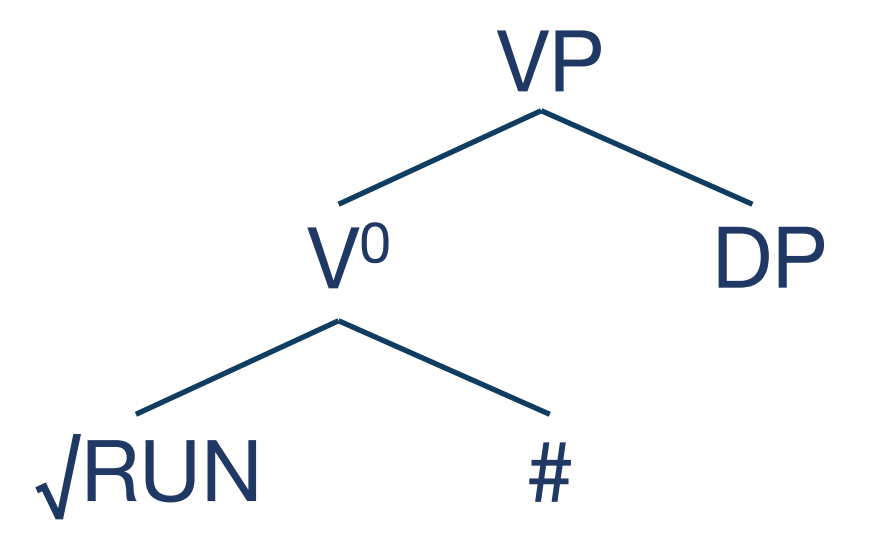
When grammatical and notional number differ, participant number reflects notional number and appears to conflict with agreement/concord.

- (6) Georgian (Aronson 1989):
- a. Čem-i sam-i megobar-i... da-**sxd**-a.
my-AG three-AG friend.SG-NOM PRV-sit.PL-AOR.3SG
'My three friends... sat down.'
- (7) Navajo (Jeanne, Hale & Pranka 1984):
- a. Shí ashkii bi-t yi-**sh**-'ash
1SG boy him-with PROG-1SG-walk.DU
'I am walking with the boy.'
- (8) Hiaki (Harley 2014):
- a. Veho'ori-**m** nas vui-**vuite**.
lizard-PL around RED-run.SG.PRS
'The lizard is running around.'

Analysis

Participant number can be implemented as a cardinality presupposition: the denotations in (2) essentially run a number test on the first argument to compose with the verb.

$$(2) \begin{aligned} \llbracket \text{SG} \rrbracket &= \lambda P_{(e, st)}. \lambda x: |x| = 1. \lambda e. P(x)(e) \\ \llbracket \text{PL} \rrbracket &= \lambda P_{(e, st)}. \lambda x: |x| > 1. \lambda e. P(x)(e) \end{aligned}$$



These elements realize a number node # within the complex V head (following Thornton 2018).

A compositional semantic analysis allows us to straightforwardly capture:

- ▷ Affixal and suppletive realizations
- ▷ The restriction to internal arguments
 - Assuming external arguments are introduced by v (Kratzer 1996), # functions can only compose with verbs with internal arguments.
- ▷ The restriction to notional number
 - # functions check semantic cardinality; presupposition ensures that participant number persists under questions, negation, etc.

Alternative analyses

▷ Lexical semantic

Functional analyses (e.g. Mithun 1988, Corbett 2000) argue that participant number reflects two distinct lexical items (one singular, one plural).

- Plural verb forms would be "essentially plural" like English *gather* or *scatter*, which are infelicitous with singular arguments.

Some issues (as identified by Harley 2014):

- Participant number shows precise, sometimes three-way contrasts; "essentially plural" predicates don't.
- Cannot easily account for affixal participant number—there is no relationship between singular and plural forms of the verb

▷ Local suppletion

Bobaljik & Harley (2017) argue that the verb undergoes root suppletion conditioned by a number feature on the internal argument.

- (21) a. b. sua ↔ √KILL / +PL
mea ↔ √KILL

Two main issues with a morphosyntactic analysis:

- ▷ **Affix problem**: Built for suppletive cases, not for affixation.
 - We must resort to locally-conditioned affix insertion (or node sprouting) to allow for affixal participant number.
- ▷ **Feature problem**: Requires notional number features in the syntax.
 - This incorrectly predicts that both types of features will participate in suppletion/Agree (as far as I'm aware, unattested).

Aronson 1989. *Georgian: A Reading Grammar*. • Bobaljik & Harley 2017. Suppletion is local: Evidence from Hiaki. In *The Structure of Words at the Interfaces*. • Comrie 1982. Grammatical relations in Huichol. In *Studies in Transitivity*. • Corbett 2000. *Number*. • Durie 1986. The grammaticization of number as a verbal category. *BLS 12*. • Harley 2014. Hiaki verbal number suppletion really is suppletion. *Roots IV*, NYU. • Jeanne, Hale & Pranka 1984. Where is suppletion? *GLOW 1984*. • Kratzer 1996. Severing the external argument from the verb. In *Phrase Structure and the Lexicon*. • Mel'čuk 1979. Countability and non-countability. *CLS 15*. • Mithun 1988. Lexical categories and the evolution of number marking. In *Theoretical Morphology*. • Thornton 2018. Plural verbs, participant number, and Agree. *WCCFL 35*. • Seiter 1980. *Studies in Niuean syntax*. PhD diss., UCSD. • Veselinova 2006. *Suppletion in Verb Paradigms*.

Participant number is semantics, not syntax.