What makes a plurality sentient?: grouphood as the structure of number in Ktunaxa

In many languages, there is a correlation between degree of sentience and number-marking, with some or all number-marking restricted to more sentient individuals. While this has been noted since at least the mid-1970s (Smith-Stark 1974), and shown to hold across different dimensions of number in a fairly stable pattern (Corbett 2001), the reason for the correlation is not well theorized, outside of a cognitive connection between individuation and human-ness. The aim of this paper is to provide a more motivated account for this connection, by looking at number through the lens of an understudied language.

This language is Ktunaxa, an isolate of the Columbia River Basin, traditionally spoken in Canada and the US. Accounts of its number-marking system are limited to documentation of the morphology (e.g. Boas 1926, Morgan 1991); this includes three morphemes associated with plurality: *-kistik*, called a dual, *-niṅtik,* a plural, and *-qantik,* a collective, all of which are restricted to sentient entities. Rather than view these as instances of cardinal number, I propose that Ktunaxa is organized under group number: that its number system tracks an un-/grouped contrast rather than a singular/plural one. Besides accounting for irregular features of the system, this analysis provides a new way to motivate sentience restrictions in number-marking, since the truth conditions of grouphood are relativized to a sentient perceiver or judge.

Empirical Problem: Most semantic analyses of number use the theoretical framework of a semilattice, derived from Link (1983) and adopted widely in the number literature (e.g. Landman 1989, Schwarzchild 1996, Chierchia 1999). As a model for grammatical number, the lattice entails that number reference is a function of cardinality: subparts of the lattice are defined according to the cardinality of their members.

From this viewpoint, Ktunaxa number-marking is unusual. It does not track the cardinal number of units comprising an entity—marked and unmarked nominals may both denote plural referents (1a)—and it is restricted to nominals referring to non-sentient beings (1b). Instead, number seems to track the *complexity* of the units comprising an entity. In (2), the suffix *-kistik* indicates that the units of *naʔuti* 'girl(s)' are pairs; hence, the numeral counts pair-units rather than simple atoms. This meaning clearly includes cardinality (two), but additionally entails an organizing principle for each unit. In (3), use of number-marking rather than a numeral predicate indicates that the unit members are organized according to a social relation, rather than being two random individuals.

(1) a. Qałsa-ni naʔuti(-niṅtik)
three-IND girl-NUM
"There are three girls."

b. Qałsa-ni nuʔkiy(*-niṅtik)
three-IND rock-NUM
"There are three rocks."

(2) a. Haqaʔ-ni naʔuti-kistik
exist-IND girl-NUM
"There is a pair of girls."

b. Qałsa-ni naʔuti-kistik
three-IND girl-NUM
"There are three pairs of girls."

(3) a. Hu wu·kat-i ki=ʔas ka·kin
1SBJ see-IND COMP=two wolf
"I see two wolves."

b. Hu wu·kat-i ka·kin-kistik
1SBJ see-IND wolf-NUM
"I see a pair of wolves." *(Wolves are associated in some way… a mating pair, part of the same pack)*

Proposal and Analysis: Rather than claim Ktunaxa number is irregular, I propose that it is structured on a different principle: group number. Cardinal number restricts (or widens) domains of reference relative to the semilattice: its highlights an atom/plurality contrast, and is true relative to a one-place property. In contrast, group number does not track an atom/plurality contrast, and needs not denote any particular layer of a semilattice. Instead, it highlights a un-/grouped contrast—whether an atomic or plural entity is an unassociated set, or a set organized under a group relation—and is true relative to a two-place relation. While a group might be realized as a group noun (e.g. *pair*), it is also a natural model for comitative and associative constructions, where relations hold between a focal entity and some set of individuals. In Ktunaxa, it provides the tools needed to explain the behaviour shown in the number markers above.

To derive the kind of meaning shown in examples (1-3), two tools are required: (i) an underspecified group relation G, whose interpretation is determined by pragmatic context, and (ii), the function MEMBER, from Barker (1992), which takes a group entity and returns the set of entities which are its members. A phrase including *-qantik,* as in (4), might then look like (5). While the atoms of the entity *x* are restricted

by the numeral *qałsa* 'three,' the MEMBER function maps those atoms to more complex sets of individuals, which are in turn organized under a group relation *G*.

(4) qałsa naʔuti-qantik
three girl-NUM
"three groups of girls"

(5) Where D_e contains both atoms and pluralities, and $x \in D_e$:
$\lambda x.\ girl(x) \wedge |x| = 3 \wedge \forall y,z \subseteq MEMBER(x)\ [G(y)(z)]$

This group analysis also provides a more compelling role for sentience restrictions. If cardinal number is determined empirically (by tracking the number of atomic entities), grouphood is not: whether individuals constitute a group is determined by a constellation of social, cultural, and inferential properties. These include sharing a social bond, being spatio-temporally proximal, being used together, performing together, etc. In this context, number is easily, or perhaps necessarily, relativized to a viewpoint. In turn, that viewpoint could belong to group members, or to someone external to the group (e.g. the speaker).

In Ktuanxa, this relativization is explicit. The number-markers shown so far are in fact morphologically complex, consisting of a group morpheme (*-kis, -nin̓, -qan*), a transitivizer *-t* (6)*,* and a valency-altering reflexive *-ik* (7). Significantly, the transitivizer may be used to introduce a variety of semantic roles, including ones restricted to sentient beings and indicating viewpoint (i.e. experiencer or judge in 6b).

(6) a. Sukaxniʔ-ni na ka·pi·
good-taste-IND DEM coffee
"This coffee tastes good."

b. Suk-axniʔ-t-i na-s ka·pi·-s Ȼan
good-taste-TR-IND DEM-OBV coffee-OBV John
"This coffee tastes good to John."

(7) a. Małi his-i Amlu-s
Mary feed-IND Ambrose-OBV
"Mary fed Amlu."

b. Amlu his-ik
Ambrose feed-REFL
"Amlu fed himself."

These two morphemes combine striaghtforwardly to introduce a viewpoint-holder (which I label *judge*), and then to (reflexively) assign that judge role to the group itself. As a result, the group must judge itself to constitute a group, meaning that it must consist of sentient individuals capable of holding a viewpoint.

(8) a. Valency extender *-t :*
$\lambda P \lambda x \lambda y.\ P(x) \wedge judge(x)(y)$

b. Valency reducer *-ik :*
$\lambda P \lambda x.\ P(x) \wedge judge(x)(x)$

(5, revised) $\lambda x.\ girl(x) \wedge |x| = 3 \wedge \forall y,z \subseteq MEMBER(x)\ [G(y)(z)] \wedge judge(x)(x)$

Outcomes: Besides providing a first in depth analysis of Ktunaxa number, this research gives a new theoretical framework for number-systems which fail to conform to expectations under a cardinal number rubric. This has relevance for languages with restricted, irregular number-markers, especially ones with associative or collective meaning, e.g. Japanese (Nakanishi and Tomioka 2004) and Mandarin (Iljic 1994). It also gives a new way to interpret sentience restrictions in number-marking cross-linguistically. Rather than directly link number-marking and sentience, group number allows the perception or judgment to mediate between the two domains. This is particularly promising, given a common association between grouphood and sentience, e.g. via associative, collective, or group expressions (Moravcsik 2003).

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