Distributive Numerals in Tlingit: Pluractionality and Distributivity

Seth Cable; University of Massachusetts Amherst

1. Introduction
This paper describes and analyzes the semantics of distributive numerals in Tlingit, a highly endangered and understudied Na-Dene language of Alaska. Based upon original field data, I argue that — contrary to first appearances — distributive numerals in Tlingit possess a single, univocal, pluractional semantics, one that is able to felicitously describe a multitude of different scenarios.

2. Basic Phenomenon
When a numeral in Tlingit bears the ‘distributive’ suffix –gaa, the resulting expression has all the hallmarks of a ‘distributive numeral’ (Gil 1982, Choe 1987, Farkas 1997, Oh 2005, Henderson 2011). As shown below, unlike unmarked numerals (1), distributive numerals in Tlingit do not permit ‘collective’ or ‘cumulative’ readings. Rather, they require an adjacent NP to function as a ‘distributive share’ (Choe 1987). As indicated below, the understood ‘distributive key’ (Choe 1987) can be either another participant in the sentence (2a) or some plural event (2b).

(1) Ax kaa yatxi' nask xaat has aawashaat.
  my male children three fish they.caught
  My sons caught three fish.
  (Cumulative or Collective Reading OK)

(2) Ax kaa yatxi' nasi'gigaa xaat has aawashaat.
  my male children three.DIST fish they.caught
a. My sons caught three fish each. (key = sons; share = three fish)
b. My sons caught three fish each time. (key = events of fishing, share = three fish)

Although I will later claim that (2a,b) are not separate ‘readings’, I will use the terms ‘entity key scenario’ and ‘event key scenario’ to distinguish these two kinds of verifying scenarios for sentences like (2).

3. Methodology
To ascertain the truth-conditions of Tlingit sentences containing distributive numerals, I interviewed four native speakers (three women, two men) living in Juneau, AK. All four speakers were present at each interview session. I would present various scenarios to the elders, both orally and through the use of an accompanying cartoon. Scenarios were paired with an English sentence describing the scenario. Speakers were asked to supply an equivalent description in Tlingit. Speakers were also asked to judge the ‘truth/correctness’ of constructed Tlingit sentences relative to said scenarios.

4. Syntax of Distributive Numerals
Distributive numerals in Tlingit can function either as adnominal or adverbial modifiers. Their adnominal status is revealed by the possibility of discourses like the following.

(3) a. Question: Daa sawe has aawashaat ya i kaa yatxi'?
  what Q.FOC they.caught these your male children
  What did you sons catch?

b. Answer: Nasi'gigaa xaat three.DIST fish
  Three fish each.

As shown by (3b), the elliptical answer to a wh-question can consist of a distributive numeral followed by an NP. Generally, such elliptical answers in Tlingit can only be constituents; it can be shown that an adverb followed by an NP cannot function as such an answer. Moreover, the complex data set below demonstrates that Tlingit distributive numerals can also function as adverbs.

(4) a. Ax shaa yatxi' daxga keitl has aawashuch.
  my female children two.DIST dog they.bathed
  My daughters bathed two dogs each.

b. * Ax shaa yatxi' daxga we keitl has aawashuch.
  my female children two.DIST those dog they.bathed

c. * Ax shaa yatxi' we daxga keitl has aawashuch.
  my female children those two.DIST dog they.bathed

b. Ax shaa yatxi' daxga has aawashuch we keitl
  my female children two.DIST they.bathed those dog
  My daughters bathed those dogs two at a time.

The contrast between (4a) and (4b,c) shows that NPs modified by distributive numerals cannot also be modified by demonstratives, a common pattern across languages (Zimmermann 2002). Consequently, the
numeral in (4d) could not be a ‘floating’ modifier of the distributive share \textit{wē keitl} ‘those dogs’; rather, it must originate as an adverbial modifier. Furthermore, the contrast between (4a,b) shows that the numeral in (4a) must be adnominal; if it were adverbial, then the ill-formedness of (4b) would not be expected.

5. Semantics of Distributive Numerals

Importantly, whether the distributive numeral is adnominal or adverbial has no effect upon whether the sentence can describe ‘event key scenarios’ or ‘entity key scenarios’ (Gil 1982, Oh 2005). As shown by (5), an adnominal distributive numeral can describe event key scenarios. As shown by (6), adverbial distributive numerals can describe entity key scenarios.

(5) Scenario: My son went fishing every day last week. Each day, he caught three fish. 
\[ \text{my son three.DIST fish caught} \]
My son caught three fish each time.
Judgment: True/felicitous description of scenario above.

(6) Scenario: My neighbors have four dogs. My daughters Hazel and Bea went over to their house to wash their dogs. Hazel washed two dogs, and Bea washed the other two.
\[ \text{my female children two.DIST they.bathed those dog} \]
My daughters bathed two of those dogs each.
Judgment: True/felicitous description of scenario above.

There are, however, a variety of constraints/generalizations governing the possible interpretations of structures containing distributive numerals. Some are listed below; all have been established via the methodology described in Section 3 above.

(7) a. **Sentences of the Form ‘Distributive Numeral > SubjectPlural > ObjectPlural > Verb’**
   (i) Can describe entity key scenario where share = subject and key = object
   (ii) Cannot describe entity key scenario where share = object and key = subject
   (iii) Can describe event key scenario where share = subject

   Can only describe event key scenarios where share = object, subject
   (e.g. Each time, \( \text{num}_1 \text{ subjects V-ed num}_2 \text{ objects} \))

6. Semantic Analysis

I propose that Tlingit distributive numerals are (always) pluractional operators (Beck & von Stechow 2007). The ability of sentences containing distributive numerals to describe both ‘entity key’ and ‘event key’ scenarios is not due to an ambiguity, but instead to their possessing rather general truth-conditions. I propose two different lexical entries for \textit{–gaa}, one creating adnominal distributive numerals, and the other creating adverbial ones. The semantics for ‘adnominal \textit{gaa}’ is given in (8); ‘adverbial \textit{gaa}’ is similar. I assume that sentence (2) has the LF in (9), and thus the T-conditions in (10). Note that in deriving the T-conditions in (10), I assume many of the key ideas of Kratzer (2008).

(8) \[ [ \text{gaa} ] = [ \lambda n : [ \lambda Q_{<e>} : [ \lambda P_{<e>}, : [ \lambda e_c, : \exists x. Q(x) \& P(x)(e) \& <e, x> \in *\{ <e', y> : \text{part}(e,y) \& |y| = n \} \} \] \]

(9) \[ [ [ \text{three gaa} ] \text{ fish } ] [ 1 [ \text{ my sons } [ v [ \text{ caught t}_1 ] ] ] ] \]

(10) \[ \exists e. \exists x. *\text{fish(x)} \& *\text{caught(e,x)} \& *\text{agent(e) = my.sons} \& <e, x> \in *\{ <e', y> : \text{part}(e,y) \& |y| = 3 \} \]

There is a (plural) event \( e \), and a plurality of fish \( x \), and \( e \) is a (cumulative) event of catching \( x \), and my sons are the (cumulative) agent of \( e \), and the fish \( x \) can be formed from all those triples \( \text{that participated in a subevent of } e. \)

As can be seen from the informal paraphrase of the T-conditions above, the analysis correctly predicts that (2) is true both in scenarios where each son caught three fish, and ones where the sons collectively caught three fish on multiple occasions. Thus, the single lexical entry in (8) predicts that (2) is true in both ‘entity key’ (2a) and ‘event key’ (2b) scenarios. The same prediction is shown to hold for sentences containing ‘adverbial \textit{gaa}’. Finally, the analysis correctly predicts all the various generalizations, excerpted in (7), that concern the interpretations of sentences containing distributive numerals. Moreover, I show how the semantics in (8) could be modified to apply to English ‘binominal each’ constructions.