

The distribution of nominal quantifiers in a digitized corpus of St. Lawrence Island Yupik



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Overview

- St. Lawrence Island Yupik. St. Lawrence Island / Central Siberian Yupik / *Akuzipik* (ISO 639-3:ess)
- Endangered, under-resourced language spoken on St. Lawrence Island, AK; Chukotka peninsula of Russia; mainland AK (~1000 speakers) (Schwartz et al. 2019)
- Rapid generational shift since 1990s; youth now largely L1 English speakers (Schwartz et al. 2019)
- Polysynthetic, ergative-absolutive (case), relatively free word order
- Part of a larger project to document Yupik, digitize legacy materials, create computer tools for researchers and speakers, aid in revitalization efforts
- Existing work on agreement, noun incorporation (de Reuse 1994; Jacobson 2001)
- Goals:
 - Arrive at an exhaustive list of nominal quantifiers
 - Is there a preferred order between head N and Q?
 - Are case and number agreement obligatory in N-Q?

Methods

Initial search

- Badten, et al. (2008) Yupik-English dictionary, Jacobson (2001) grammar searched for Q-like elements
- Found possible examples of Generalized Existential, Generalized Universal, Proportional, Comparative, and Partitive Qs (Keenan 2017)
- Examples:
 - GE: *ataasiq* 'one', *maalghuk* 'two'
 - GU: *iingunagh** 'all; whole', *tamaghagh** 'all, every, both (for dual)'
 - Proportional: *uglagh* 'large number or amount; many; much; large quantity', *aveg* "half" (nominal root)
 - Comparative: *ellmaaghaghagh** 'a little bit more'
 - Partitive: *naliit/naliighiit(a)* 'any of, which'

Elicitation

- To gather naturally produced examples of known Qs; potentially elicit others
- Procedure adapted from the Quantifier Questionnaire (Keenan 2017)
- Series of visualizations created with each of the categories in mind (following Kinloch 1971, Gregg 1992, and Woods 1999, Matthewson 2004)
- Elicitation conducted asynchronously via Facebook Messenger due to COVID-19: speaker asked to comment on each visualization
- Known Qs confirmed; several new senses of known roots added to list of Qs

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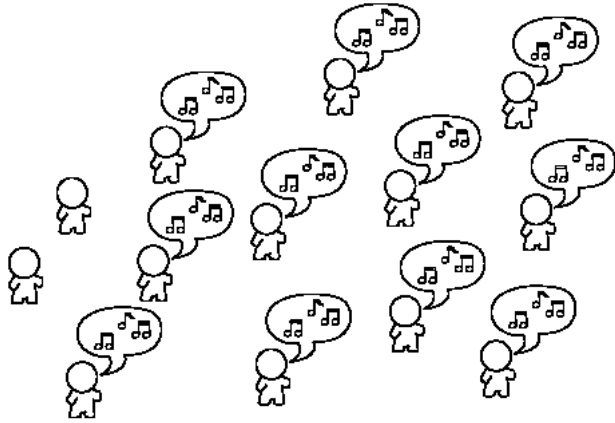


Figure 1: Quantifier visualization 9 –
Pos “most”, “almost all”, “many”
Neg “two”, “few/a few”, “not many”

Kiyang ilaagaghhtenguut.
“Most are singers.”
(Elicitation 09/2020; Speaker 21)

Maalghuk ukughyagneng ilaagan’ghiituk.
“Two out of all these didn’t sing.”
(Elicitation 09/2020; Speaker 21)

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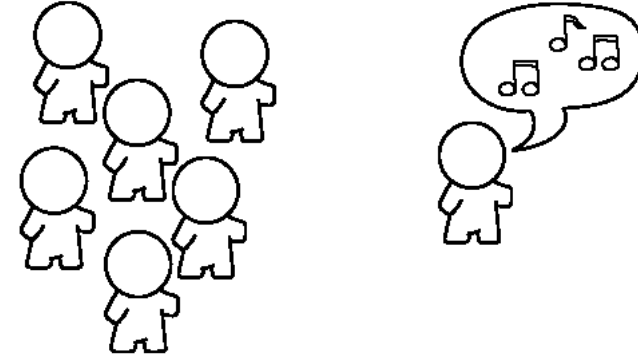


Figure 2: Quantifier visualization 1 –
Pos “one”, “only one”
Neg “most”, “almost all”, “many”, “several”

Taam ilaani ilaagaataqii.
“That one is singing to the others he’s with.”
(Elicitation 09/2020; Speaker 21)

Ataasighhiinaq ilaagaghaaquq.
“Only one is singing.”
(Elicitation 09/2020; Speaker 21)

Corpus Preparation and Search

- Yupik digital corpus (Schwartz, et al. 2021)
- Digitized text files
 - primers, storybooks, and fables (all primarily fiction)
 - Yupik NT Translation and other religious texts were excluded
- ~100,000 tokens, ~40,000 types
- Corpus annotated using finite-state morphological analyzer (Chen & Schwartz 2018)
- Series of regular expressions used to extract targeted quantifier contexts, yielding 17,937 tokens
- Included: Target word forms with unambiguous analyses (4,953 tokens) or two analyses that posited the same root and agreed in part of speech
 - Also any quantifiers that would've been totally excluded by these criteria
- Subcorpus: 1076 sentences, 581 coded, 172 identified as nominal quantification
- Coded manually for
 - Quantifier
 - Pre- or postnominal
 - Case and number of Q & N

Quantifier	Meaning	Identified Root	Root definition (Badten et al. 2008)
<i>ilaani</i>	other	<i>ila</i>	relative; associate; part; one or some (of)
<i>ilaanghini</i>	only some		
<i>avelghhi/avegluku</i>	half	<i>aveg</i>	half
<i>uglan'ghi</i>	more	<i>uglagh</i>	large number or amount; many; much; large quantity
<i>kiyang</i>	most	<i>kiyang</i>	mostly; usually
<i>qerngita</i>	all	<i>qerngagh</i>	together
<i>ingunaghmeng</i>	all	<i>iingunagh</i>	all; whole
<i>natengiighhaq</i>	little bit	<i>natengiighhagh</i>	little bit; slightly; temporarily
<i>nalighneghiini</i>	only part	<i>nalighnegh</i>	some part or the other
<i>nalighhkek</i>	neither	<i>naligh</i>	which one(s)
<i>naliighhiit</i>	any/none of these		
<i>nalighhiiniit/ naliighhiinaq</i>	none		
<i>naliighhiinaat/ naliighhiinaan</i>	only some/little bit of them/it		

Figure 3: Quantifiers identified through elicitation task (novel and new senses of known quantifiers)

Word Order

- Previous work posited relatively free word order in Yupik; determined primarily by discourse considerations (Jacobson 2001; de Reuse 1994).
- De Reuse (1994): possessors tend to precede the noun; demonstratives and nominal modifiers tend to follow the noun

- The corpus sample demonstrated the opposite tendency: quantifiers precede the noun more often, even when non-numeral quantifiers and numerals are considered separately
- Quantifier-noun (head-final) sequences make up ~68% of all sampled word orders, including those with another intervening word.

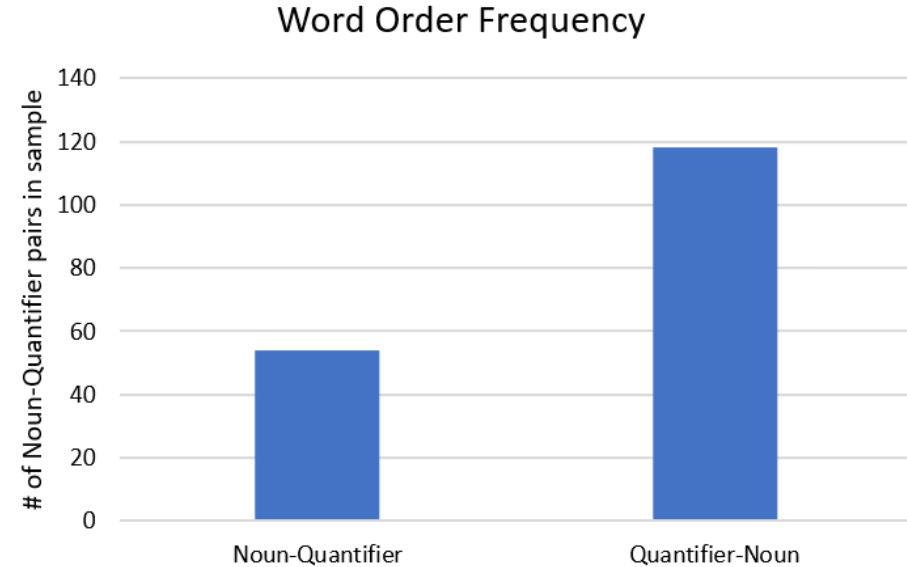


Figure 4: Word order frequency in corpus sample

- Influence from English seems unlikely, given the nature of the texts in the corpus sample (primers, storybooks, fables; published in the 1970s-1990s)
- Preference for one order over the other may be linked to discourse considerations (which may or may not be extractable from the corpus data)
- Next steps: Analysis based on the type of text; analysis of naturally-occurring speech in elders vs. younger speakers

Case Agreement

- Head nouns and quantifiers were predicted to show agreement in case and number
 - Other nominal modifiers in the language (e.g., demonstratives) agree with the modified noun in both dimensions
- 83% of the quantifiers in the sample matched the modified noun in grammatical case
- Of those that did not match:
 - instances of a particular set of roots that can only take ergative case
 - caseless loanwords
 - undocumented morphology or misspellings (requires further investigation)
 - noun incorporation (no overt case marking on incorporated nouns)

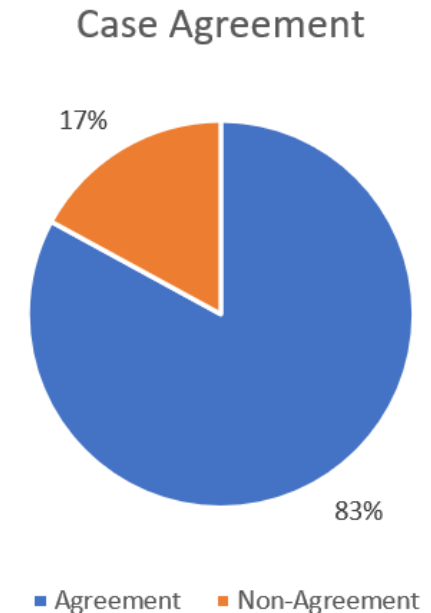


Figure 5: Case agreement between nouns and quantifiers in the sample

Case Agreement

- The sample showed a high incidence (95%) of number agreement between quantifier and head noun.
- The few instances of non-agreement:
 - morphologically singular nouns in a case that can be used to express plural semantics or
 - involve a particular quantifier (*ilangi* 'some') being used substantively along with another quantifier

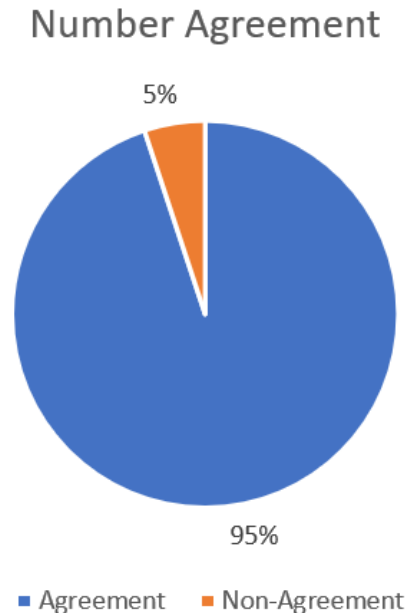


Figure 6: Number agreement between nouns and quantifiers in the sample

Implications and Future Directions

- Purposes:
 - Provide a descriptive picture of nominal quantification in Yupik
 - Contribute to the documentation of the language and further scholarship
- Several gaps identified in the expected quantifiers filled as a result of elicitation sessions
- The literature usually describes Yupik as having “free word order”
 - This analysis found that quantified nominal phrases appear to tend toward a head-final ordering
 - This could lend credibility to arguments for contextually preferred word order in languages which have traditionally been analyzed as having free word order
 - Possible implications for similar tendencies in related languages, particularly others on the Inuit-Yupik branch
- Additionally, our corpus annotation efforts lay the groundwork for the development of pedagogical materials for the Yupik community (e.g. a fully tagged, parsed corpus) to be used in...
 - advanced Yupik language study
 - development of natural language exercises for all learning levels
 - larger data-driven research projects on various aspects of Yupik grammar

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