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The role of vagueness in distributive marking: Evidence from Albanian *nga*

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This squib reports a previously undescribed restriction on the Albanian distributive marker *nga*. While *nga* combines freely with numeral expressions, speakers judge it strongly degraded with the quantifier *shumë* 'many'. An acceptability judgment experiment confirms a selective interaction between distributive marking and quantifier type: the presence of *nga* lowers acceptability with *shumë* 'many', but not with numerals. Additional judgments suggest that related restrictions may extend to other quantity expressions and to distributive markers in other languages. At the same time, some imprecise numeral expressions appear more acceptable. These findings suggest that distributive marking is not uniformly compatible with all quantity expressions, raising broader questions about how such constructions interact with vagueness.

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1 Introduction

Sentences such as (1b) illustrate the use of distributive numerals in Albanian, which are formed by attaching the particle *nga* to the numeral.

(1) a. Fëmijë-t lexuan dy libra.
child.PL-DEF read.PST.3PL two book.PL
'The children read two books.'
b. Fëmijë-t lexuan nga dy libra.
child.PL-DEF read.PST.3PL NGA two book.PL
'The children read two books each.'

In the absence of *nga*, as in (1a), the sentence is ambiguous between a distributive reading — each child read two books — and a collective reading in which the children jointly read the same two books mentioned in the discourse context. The presence of *nga* in (1b) indicates the sentence can only have a distributive reading, whereby each of the children in the discourse context read two (different) books.

The facts just described allow us to situate *nga* within the broader typology of distributive markers found across both related and unrelated languages. Comparable markers include the Korean particle *ssik* (Gil 1982; Choe 1987; Oh 2006), the Tlingit suffix *-gáa* (Cable 2014), and the Romanian form *câte* (Farkas 2002; Panaitescu 2018; 2019). Similar distributive strategies are also attested in numeral reduplication phenomena in Hungarian (Farkas 1997; 2001; 2021), Telugu (Balusu 2005), and Kaqchikel (Henderson 2014). Some representative examples are provided below.

(2) A gyerekek hoztak **két-két** könyvet.
the children brought two-two books
'The children brought two books each.'
Farkas (2021: ex.(2))

(3) Kluci dostali **po kusu** chleba.
boys got po one piece bread
'The boys got a piece of bread each.'
Dotlačil (2015: ex.(15b))

(4) Oi fitites egrapsan **apo tria** arthra.
the students wrote apo three articles
'The students wrote three articles each.'
Rushiti & Dobrovie-Sorin (2024: ex.(10a))

While such markers uniformly enforce distributive readings, their distribution is subject to additional constraints. This paper identifies a previously unnoticed restriction concerning the Albanian distributive marker *nga*. Specifically, it shows that *nga* is strongly degraded with vague quantifiers such as *shumë* 'many' and *pak* '(a) few', as shown in (5). By *vague quantifiers*, we mean expressions such as MANY, FEW, whose interpretation depends on contextual standards rather than specifying a fixed numerical value.

(5) a. Studentët lexuan (*nga) shumë libra.
student.PL.DEF read.PST.3PL (*NGA) many book.PL
'Intended: Each student read many books.'

b. Studentët lexuan (*nga) pak libra.
student.PL.DEF read.PST.3PL (*NGA) few book.PL
'Intended: Each student read a few books.'

This pattern is not limited to the cases illustrated above, but may also be found in interrogative contexts and in comparable distributive markers in other languages (see Section 3.1 for further discussion). At first glance, this pattern is unexpected. Previous work on distributive markers has emphasized their sensitivity to monotonicity on measurement scales (roughly, whether adding entities increases the measured value (see Panaitescu 2018; Law 2022). However, vague quantifiers such as *many* are typically analyzed as monotonic. The Albanian data therefore suggest a previously unrecognized restriction on distributive marking.

To test the robustness of this pattern, this paper reports the results of an acceptability judgment experiment showing that sentences in which *nga* combines with the vague quantifier *shumë* 'many' are systematically degraded relative to those with numerals. The main contribution of this squib is to establish that distributive markers such as Albanian *nga* are strongly degraded with vague quantifiers. This paper does not attempt to provide a full formal analysis of this restriction. Rather, its goal is to document the pattern and to highlight its implications for the study of distributivity and quantification.

The structure of the paper is as follows. Section 2 presents the experimental study. Section 3 discusses the broader empirical pattern. Section 4 concludes the paper.

2 Experimental study

2.1 Participants

A total of 34 native speakers of Albanian (aged 18–62, $M = 33$) participated in the experiment. Data from one participant were excluded because she rated most ungrammatical fillers as fully acceptable. The final sample therefore consisted of 33 participants. They were recruited via email and social media, and all instructions were provided in Albanian. All participants

were raised in Albania or Kosovo and completed their higher education in Albanian-speaking institutions, ensuring consistent exposure to the standard variety of Albanian used in the experimental materials.

2.2 Procedure, materials and design

Participants were asked to judge the acceptability of sentences in Albanian. Each sentence was presented individually and participants rated it on a seven-point scale, where 1 corresponded to *e papranueshme* 'unacceptable' and 7 to *e pranueshme* 'acceptable'. They recorded their responses by clicking on a number or by using the corresponding key on the keyboard. We created a total of 32 experimental items, divided into two subgroups of 16 items each. The two subgroups involved the same factorial manipulation but differed in syntactic configuration.

Type A items involved simple (*nga*) + NP sequences. Type B items involved phrases introduced by the preposition *me* 'with', yielding *me* + (*nga*) + NP sequences. The inclusion of Type B items was motivated by the fact that *me nga* + NP constructions are widespread in Albanian and were often judged more natural in informal consultations with native speakers.

Within each subgroup, two binary factors were manipulated: (i) quantifier type (*shumë* 'many' vs. numeral), and (ii) the presence or absence of the distributive marker *nga*. This yielded four conditions in each subgroup. The Type A conditions were NGA-SHUMË, SHUMË, NGA-NUMERAL, and NUMERAL; the corresponding Type B conditions were ME-NGA-SHUMË, ME-SHUMË, ME-NGA-NUMERAL, and ME-NUMERAL.

These conditions are illustrated in (6) and (7) below.

(6) TYPE A: (nga) + NP

a. Çdo spektator jepte me kënaqësi **një** monedhë të argjendtë.
every spectator gave with pleasure one coin ART silver
'Every spectator voluntarily donated one silver coin.'

b. Çdo spektator jepte me kënaqësi **nga një** monedhë të argjendtë.
every spectator gave with pleasure nga one coin ART silver
'Every spectator voluntarily donated one silver coin.'

c. Çdo spektator jepte me kënaqësi **shumë** monedha të argjendta.
every spectator gave with pleasure many coins ART silver
'Every spectator voluntarily donated many silver coins.'

d. Çdo spektator jepte me kënaqësi **nga shumë** monedha të argjendta.
every spectator gave with pleasure nga many coins ART silver
'Every spectator voluntarily donated many silver coins.'

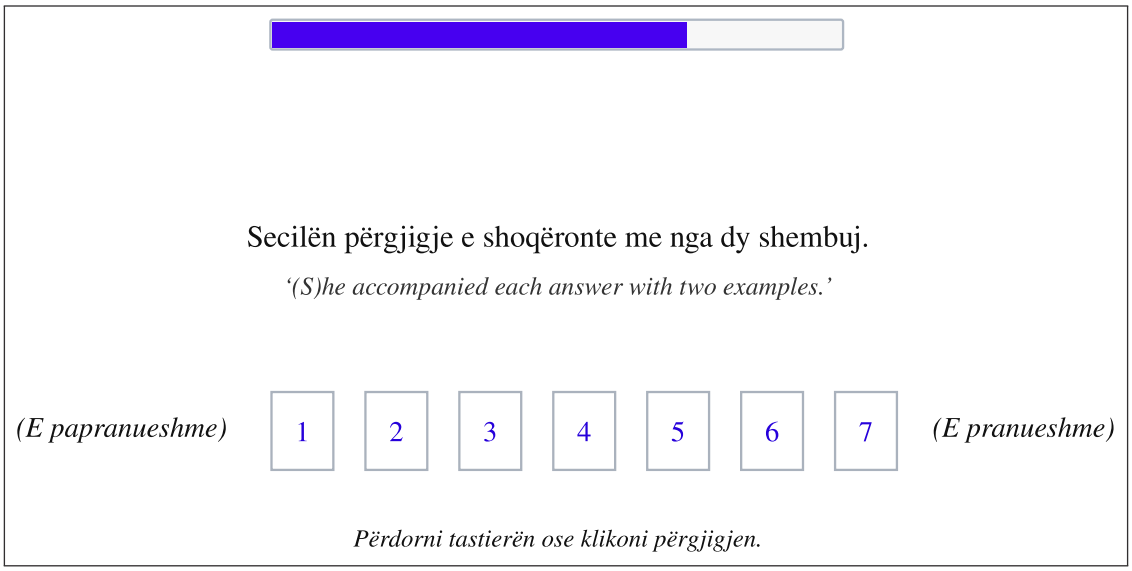

Figure 1: A typical experimental stimulus.

(7) TYPE B: me 'with' + (nga) + NP

a. Në vitin 169, Mark Aureli formoi dy kohorta **me 1000** ushtarë.
in year 169, Marcus Aurelius created two cohorts with 1000 soldiers
'In 169, Marcus Aurelius created two cohorts with 1000 soldiers.'

b. Në vitin 169, Mark Aureli formoi dy kohorta **me nga 1000** ushtarë.
in year 169, Marcus Aurelius created two cohorts with nga 1000 soldiers
'In 169, Marcus Aurelius created two cohorts with 1000 soldiers each.'

c. Në vitin 169, Mark Aureli formoi dy kohorta **me shumë** ushtarë.
in year 169, Marcus Aurelius created two cohorts with many soldiers
'In 169, Marcus Aurelius created two cohorts with many soldiers.'

d. Në vitin 169, Mark Aureli formoi dy kohorta **me nga shumë** ushtarë.
in year 169, Marcus Aurelius created two cohorts with nga many soldiers
'In 169, Marcus Aurelius created two cohorts with many soldiers each.'

The 32 items were distributed across four lists in a Latin Square design, such that each participant saw each lexical item in only one condition while all conditions were equally represented across lists. Consequently, each participant saw four Type A items and four Type B items in each condition. The 32 items were interspersed with 32 fillers, whose purpose was to serve as distractors. These 32 fillers were in turn divided into two groups: 22 grammatical and 10 ungrammatical. The purpose of including ungrammatical fillers was to measure the extent to which subjects were being attentive. An example stimulus[1] is included in **Figure 1**.

[1] *Secilën përgjigje e shoqëronte me nga dy shembuj* "(S)he accompanied each answer with two examples."; *E papranueshme* "Unacceptable"; *E pranueshme* "Acceptable"; *Përdorni tastierën ose klikoni përgjigjen* "Click on the answer or use your keyboard".

The experiment was run on Ibex Farm (Drummond 2013), and it lasted for approximately 20 minutes.

2.3 Predictions

The experiment tests the generalization that sentences containing *shumë* 'many' are selectively degraded when they contain distributive *nga*. Given the contrast coding used in the statistical models, this generalization makes two directional predictions.

First, within the conditions containing *shumë*, sentences without *nga* should receive higher ratings than sentences with *nga*. Since NGA-SHUMË in Type A items and ME-NGA-SHUMË in Type B items serve as the reference conditions, this predicts a positive coefficient for NGA_{NO}.

Second, the effect of omitting *nga* should be greater with *shumë* than with numerals. This predicts a negative QUANTIFIER × NGA interaction. A secondary question is whether both parts of this pattern are replicated across Type A and Type B items.

2.4 Results

Figure 2 presents, for Type A and Type B items, the distribution of acceptability scores across the experimental conditions. Each bar represents the proportion of responses across the seven-point Likert scale (1–7), with blue colours corresponding to higher acceptability ratings. We return to this graph below. For now, notice that NGA-SHUMË in Type A items and ME-NGA-SHUMË in Type B items are strongly dispreferred relative to all the other conditions included in the experiment. By contrast, the numeral conditions—NGA-NUMERAL and NUMERAL in Type A items, and ME-NGA-NUMERAL and ME-NUMERAL in Type B items—display a clear concentration of high ratings, indicating that the strong degradation observed with *shumë* is not found in the numeral conditions.

To evaluate the results statistically, we fitted cumulative link mixed models (CLMMs) to the ordinal Likert-scale responses, using the `clmm()` function from the *ordinal* package in R (Christensen 2018; R Core Team 2019). Cumulative link mixed models are appropriate for Likert-scale data because they treat the response variable as ordinal rather than continuous, preserving the ordering of the response categories without assuming equal spacing between them. As fixed effects, we included two factors: QUANTIFIER and NGA. Since our goal was to examine whether the quantifier *shumë* 'many' can be marked for distributivity, NGA-SHUMË was set as the reference condition for Type A items and ME-NGA-SHUMË as the reference condition for Type B items. Both reference conditions were encoded as the combination $\text{QUANTIFIER}_{\text{MANY}}$ and NGA_{YES} in the models. We included random intercepts for participants and items, as well as by-participant and by-item random slopes. This is the maximal structure allowed by our design (cf. Barr et al. 2013). Because the participants were identical across conditions but the items were not, we fitted separate models for Type A and Type B items. **Table 1** summarizes the significant effects and interactions in the two models.

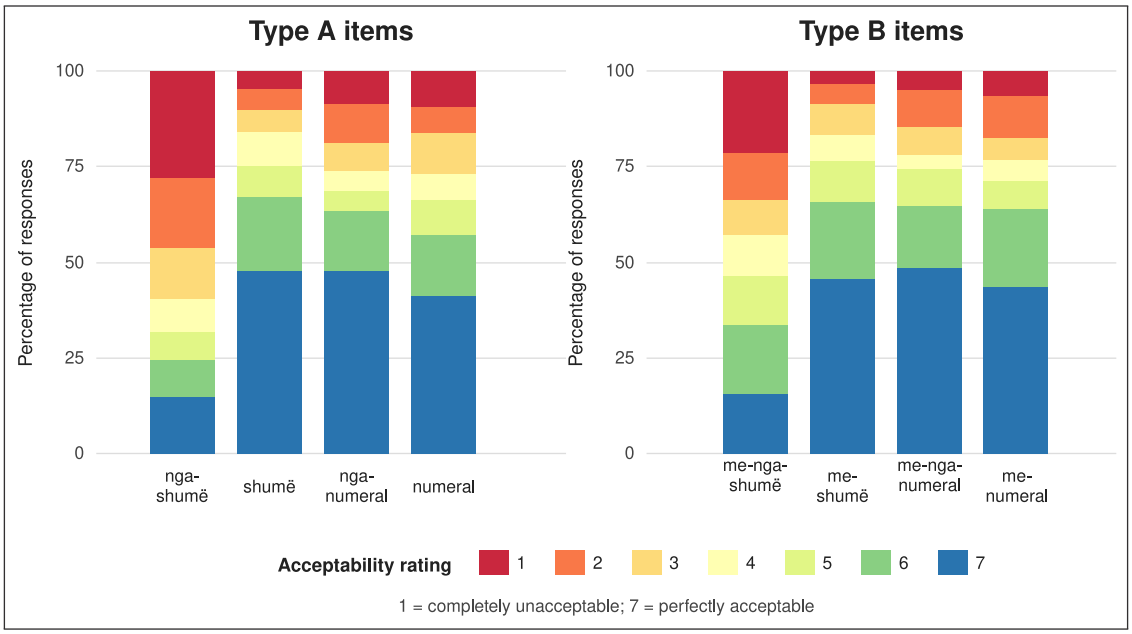

Figure 2: Distribution of Likert-scale responses by condition and item type.

Item type	Predictor	Estimate	SE	*z*	*p*
Type A	$\text{QUANTIFIER}_{\text{NUM}}$	2.513	0.431	5.827	< .001
	NGA_{NO}	2.337	0.489	4.776	< .001
	$\text{QUANTIFIER}_{\text{NUM}} \times \text{NGA}_{\text{NO}}$	–2.943	0.617	–4.769	< .001
Type B	$\text{QUANTIFIER}_{\text{NUM}}$	1.964	0.356	5.520	< .001
	NGA_{NO}	1.876	0.409	4.591	< .001
	$\text{QUANTIFIER}_{\text{NUM}} \times \text{NGA}_{\text{NO}}$	–2.178	0.477	–4.569	< .001

Table 1: Significant effects and interactions in the cumulative link mixed models. The reference combination in both models is $\text{QUANTIFIER}_{\text{MANY}}$ and NGA_{YES}.

Both predictions were supported in Type A and Type B items. First, the coefficient for NGA_{NO} was significantly positive in both models: Type A, $\beta = 2.337$, $SE = 0.489$, $z = 4.776$, $p < .001$; Type B, $\beta = 1.876$, $SE = 0.409$, $z = 4.591$, $p < .001$. Because NGA-SHUMË and ME-NGA-SHUMË served as the reference conditions for Type A and Type B items, respectively, these coefficients show that sentences containing *shumë* received significantly higher ratings without *nga* than with it. This supports the first prediction that *nga* degrades sentences containing *shumë*.

Second, the $\text{QUANTIFIER} \times \text{NGA}$ interaction was significantly negative in both models: Type A, $\beta = -2.943$, $SE = 0.617$, $z = -4.769$, $p < .001$; Type B, $\beta = -2.178$, $SE = 0.477$, $z = -4.569$, $p < .001$. The negative interaction shows that the improvement associated with omitting *nga* was

significantly smaller with numerals than with *shumë*. This supports the second prediction that the degradation associated with *nga* is selective.

Taken together, the positive NGA_{NO} coefficients establish that NGA-SHUMË and ME-NGA-SHUMË are degraded relative to SHUMË and ME-SHUMË, respectively, while the negative interaction coefficients show that this effect differs significantly from the corresponding contrast in the numeral conditions. The same pattern is found in Type A and Type B items.

3 General discussion

This section places the experimental findings in a broader empirical context. Section 3.1 shows that the restriction documented experimentally is not limited to the quantifier *shumë* 'many'. Section 3.2 examines the behavior of *disa* 'several' and modified numerals, showing that the restriction cannot be reduced to a simple contrast between precise and imprecise quantity expressions.

3.1 Beyond *shumë*: a broader empirical pattern

The experiment reported in Section 2 provides the first systematic evidence that the Albanian distributive marker *nga* is strongly degraded when combined with the quantifier *shumë* 'many', relative to numerals. Informal judgments further suggest that similar restrictions extend to other quantity expressions such as *pak* '(a) few'. A related restriction also appears in interrogative contexts: preferred answers involve numerals rather than vague quantifiers, as shown below.

(8) a. Nga sa libra blenë fëmijët?
NGA how.many book.PL buy.PST.3PL child.PL.DEF
'How many books each did the children buy?'

b. Sa libra bleu secili fëmijë?
how.many book.PL buy.PST.3SG each child
'How many books did each child buy?'

Responses containing *dy* 'two' are natural with both questions: (8a) can be answered with *nga dy* 'two each', and (8b) with *dy* 'two'. A contrast emerges, however, with *shumë* 'many' and *pak* 'a few'. The expressions *nga shumë* and *nga pak* are markedly degraded as responses to (8a), whereas *shumë* and *pak* improve substantially as responses to (8b). This contrast shows that the degradation cannot be attributed solely to an independent preference for questions containing *sa* 'how many' to be answered with a specific cardinality. It instead provides preliminary evidence that *nga* contributes to the markedness of the combinations in question.

Comparable restrictions can be observed in distributive markers in other languages[2]. Greek *apo*, Romanian *câte*, Basque *-na*, and English binominal *each* all appear more natural with numerals than with at least some vague quantifiers.

(9) Oi fitites diavasan (*apo) merika / liga / pola vivlia.
the students read (*apo) several / a few / many books
'The students each read several / a few / many books.'

(10) Studenții au citit (*câte) câteva / puține / multe cărți.
student.PL.DEF have.3PL read (*câte) several / a few / many book.PL
'The students each read several / a few / many books.'

(11) Ikasleek zenbaitna / gutxi(*na) / asko(*na) liburu irakurri dituzte.
student.PL.ERG several-NA / a.few-(*NA) / many-(*NA) books read AUX
'The students each read several / a few / many books.'

(12) The students read several / ??a few / ??many books each.

The Greek example in (9) suggests that the distributive marker *apo* is degraded with Q-adjectives such as *merika/liga/pola* 'several/a few/many'. A similar tendency is found with Romanian *câte* in (10). In Basque, *-na* appears acceptable with *zenbait* 'several', but degraded with *gutxi* 'few' and *asko* 'many'. Likewise, binominal *each* in English is more acceptable with *several* than with *a few* or *many*[3].

Taken together, these observations suggest that vague quantifiers are disfavored as share expressions under distributive marking, whereas numerals are systematically preferred. The broader cross-linguistic parallels further suggest that the Albanian pattern may reflect a more general tendency in how distributive markers interact with quantity expressions.

At the same time, the source of this restriction remains open. One possible explanation concerns the difference between numerals and expressions such as *shumë* 'many'. The meaning of *shumë* depends on the context: the number that counts as many books may change from one situation to another. A numeral such as *dy* 'two', by contrast, directly states the number of books associated with each child. This difference may help explain why *nga dy libra* 'two books each' is natural, whereas *nga shumë libra* 'many books each' is degraded. A closely related possibility

[2] The judgments in (9)–(12) are based on judgments reported to the first author by native speakers.

[3] A related observation concerns English *each*. While adverbial and binominal uses of *each* are often treated as semantically equivalent (e.g. Champollion 2012; 2016), preliminary observations suggest that they may differ in their compatibility with vague quantifiers, with binominal *each* appearing more degraded in such contexts than its adverbial counterpart. If this contrast is robust, it may indicate that the two constructions are subject to distinct constraints, a possibility that is not straightforwardly captured by analyses that derive them from a single underlying operator. We leave a detailed investigation of this issue for future work.

concerns how clearly the quantity associated with each individual is expressed. In *Fëmijët lexuan nga dy libra* 'The children read two books each', we know that each child read two books, although the children may have read different books. In *Fëmijët lexuan nga shumë libra*, we understand that every child read many books, but the number associated with each child is left open and may differ across children. This may make the combination with *nga* less natural. This explanation remains tentative, especially because *nga* is acceptable with expressions such as *rreth 100* 'about 100' and *tre a katër* 'three or four', which also leave some variation in the quantity associated with each individual.

3.2 *Several* and modified numerals

As the data above show, the quantifier SEVERAL may constitute a counter-example to the generalization discussed in this paper. As the data (9)–(12) show, SEVERAL is reported to be degraded under distributive marking in Greek and Romanian, but not in Basque and English. This suggests that expressions glossed as 'several' do not uniformly behave like canonical vague quantifiers across languages or contexts. As for Albanian, several native speakers have judged *disa* acceptable under *nga* in both (13) and (14) below:

(13) U dhashë fëmijëve nga disa libra.
3PL.DAT give.PST.1SG child.PL.DAT.DEF NGA several book.PL
'I gave each child several books.'

(14) Ana e këndonte këtë këngë nga disa herë në ditë.
Ana 3SG.ACC sing.IMPF.3SG this song NGA several time.PL per day
'Ana used to sing this song several times a day.'

A possible reason is that *disa* indicates an imprecise small number, two or three in (13) and three or four in (14). These interpretations of *disa* bring it closer to imprecise numeral expressions than to vague quantifiers such as MANY. Work on numerical (im-)precision (cf. Solt 2014) has shown that numerals and numeral-based expressions may be used approximately, especially when they involve round numbers or overt approximators such as *about* and *approximately*.

(15) Të dy barinjtë kishin nga rreth 100 dele.
ART two shepherd.PL.DEF have.IMPF.3PL NGA about 100 sheep
'The two shepherds each had approximately 100 sheep.'

The example in (15) shows that distributive marking is compatible with at least some forms of numerical imprecision. If so, the relevant contrast may not simply be between precise and imprecise quantity expressions. Rather, some quantity expressions may facilitate distributive

readings more than others. What gives rise to these contrasts remains an open question. Distinguishing among these possibilities requires further investigation.

The compatibility of *nga* with imprecise numerical expressions is not restricted to approximative numerals. It also combines naturally with disjunctive numerals:

(16) U formuan dy grupe me nga tre a katër vetë.
NACT form.PST.3PL two group.PL with NGA three or four person.PL
'Two groups of three or four people each were formed.'

Other numeral modifiers produce a less clear pattern. The examples in (17) are possible but slightly degraded:

(17) a. ?Të dy barinjtë kishin nga saktësisht 100 dele.
ART two shepherd.PL.DEF have.IMPF.3PL NGA exactly 100 sheep
'The two shepherds had exactly 100 sheep each.'
b. ?Të dy barinjtë kishin nga të paktën 100 dele.
ART two shepherd.PL.DEF have.IMPF.3PL NGA at.least 100 sheep
'The two shepherds had at least 100 sheep each.'
c. ?Të dy barinjtë kishin nga më shumë se 100 dele.
ART two shepherd.PL.DEF have.IMPF.3PL NGA CMPR much than 100 sheep
'The two shepherds had more than 100 sheep each.'

The examples in (17) contain *saktësisht* 'exactly', *të paktën* 'at least', and *më shumë se* 'more than'. A comparable pattern with the comparative modifier is found in Romanian.[4] This contrasts with the fully acceptable approximative and disjunctive expressions in (15) and (16). We report these preliminary judgments without proposing an analysis of the differences among the modifiers. The fuller paradigm shows that numeral-based expressions do not behave uniformly under distributive marking. In particular, the acceptability of *rreth 100* 'about 100' and *tre a katër* 'three or four' demonstrates that *nga* does not generally exclude numerical imprecision. Why other numeral modifiers are less natural remains a question for future research.

4 Conclusion

The findings presented in this squib refine our understanding of distributive numerals and their cross-linguistic variation. The experimental results show that the Albanian distributive marker *nga* is significantly degraded with the vague quantifier *shumë* 'many', despite the fact that such

[4] Preliminary judgments suggest an ordering contrast with Romanian *câte*. *Mai mult de câte 100 de cărți* 'more than 100 books each' is acceptable, whereas *câte mai mult de 100 de cărți* is degraded. Thus, *câte* is not generally incompatible with modified numerals; the degradation occurs in the order in which the comparative follows *câte*. We leave the source of this contrast for future research.

expressions are generally compatible with monotonicity-based accounts of distributive marking (Law 2022). Additional judgments suggest that related restrictions may extend to other quantity expressions and to comparable distributive constructions in other languages.

The broader discussion also suggests that distributive marking may distinguish between contextual vagueness and at least some forms of numerical imprecision in the sense of Solt (2014). While vague quantifiers are often degraded, approximative and numeral-based expressions may be more acceptable. This indicates that distributive marking interacts with quantity semantics in a more fine-grained way than previously recognized.

Several questions remain open. Future research should determine how widespread these restrictions are cross-linguistically, whether they arise from semantic or pragmatic pressures, and how distributive markers differ in the kinds of quantity expressions they license. Addressing these questions will help clarify how distributive marking constrains not only how quantities are distributed, but also how they may be linguistically expressed.

Abbreviations

ACC = accusative; ART = article; AUX = auxiliary; CMPR = comparative; DAT = dative; DEF = definite; ERG = ergative; IMPF = imperfective; NACT = non-active; NGA = Albanian particle *nga* (form-based gloss); PL = plural; PST = past; SG = singular; 1 = first person; 3 = third person.

Data availability

The experimental materials, anonymized data, and analysis code are available on the Open Science Framework at https://osf.io/sqmr8/.

Ethics and consent

Formal ethics approval was not obtained because institutional ethics review was not readily available for linguistic research of this kind at the time the study was conducted. Participation was voluntary, all participants provided informed consent, and all responses were collected, stored, and analysed anonymously. The study followed the ethical principles applicable to research involving human participants.

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Competing interests

The authors have no competing interests to declare.

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