

Psycholinguistics and under-represented languages: Number in Yucatec Maya sentence production

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Number marking in Yucatec Maya

Classifiers and plural morphology

- Obligatory numeral classifiers

1) ka'a-túul chakmo'ol 2) *ka'a chakmo'ol
two-CL.AN jaguar two jaguar
"two jaguars" "two jaguars"

- Optional plural marking

3) le x-ch'úupal 4) le x-ch'úupal-o'ob
DEF FEM-girl DEF FEM-girl-PL
"the girl" / "the girls" "the girls" / NOT: "the girl"

Head marking

- Set A and Set B pronominal cross-reference markers

5) K-in wil-ik-o'ob le x-ch'úupal-o'ob-o'
IMPF-A1 see-INC-B3PL DEF FEM-girl-PL-DIST
"I see the girls."

Constituent order

- Canonical Verb-Undergoer-Agent: VUA/VOS [3]

6) Ku yil-ik le chakmo'ol le x-ch'úupal-o'
IMPF-A3 see-INC DEF jaguar DEF FEM-girl-DIST
"The girl sees the jaguar."

- Most frequent Agent-Verb-Undergoer: AVU/SVO

7) Le x-ch'úupal-o' k-u yil-ik le chakmo'ol
DEF FEM-girl-DIST IMPF-A3 see-INC DEF jaguar
"The girl sees the jaguar."

Agreement

- Polysynthetic, head-marking, pronominal cross-reference markers
- Animacy, topicality and definiteness trigger left-dislocation of post-verbal arguments, frequently resulting in AVU and UVA orders [3]
- Left-dislocated DPs do not necessarily trigger plural cross-reference marking on the verb (third person plural co-reference marker is also optional)
- What factors contribute to plural marking on DPs and VPs?
 - Syntactic, semantic, both?

Rationale/objectives of this study

Are syntactic or semantic factors influencing the use of optional plural marking in Yucatec?

- If **syntactic** factors are influential on the use of plural morphology, we predict the presence of plural form on DP or VP triggering covariant plural form on the other across conditions
- If **semantic** factors are influential, we predict a difference in plural marking between conditions or plural marking on one constituent, DP or VP, without plural marking on the other
 - Yucatec is an interesting test case because it allows plural marking with a numeral and classifier

Experiment 1

- Timed translation task (15 seconds)
- Speech-synthesized Spanish stimulus, repeated 3x
- 30 items (16 human, 14 animal), 32 fillers

Cond.	Spanish stimulus	English translation
Sg	La muchacha está cantando	The girl is singing
Two	Dos muchachas están cantando	Two girls are singing
Pl	Las muchachas están cantando	The girls are singing

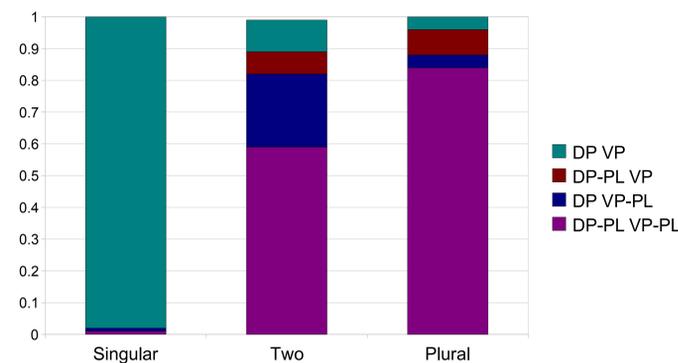


Chart 1: Exp. 1 proportion of covariant plural marking

- Significantly more plural marking on nouns ($X^2(1)=49$, $p<0.001$) but marginal for verbs ($X^2(1)=3$, $p<0.1$) in the plural compared to two condition, and in the two compared to the one condition
- Covariant plural marking was significantly preferred in the responses (Spearman $R^2=0.53$, $p<0.001$)
- The significant preference for covariation of plural form across conditions indicates syntactic influences
- The difference in plural marking in the "two" versus plural conditions indicates semantic influences on the use of plural morphology

Processing "pronominal arguments"

- Pronoun-antecedent agreement takes place at the functional level, while verbal inflectional agreement takes place at the positional level [2], [3]

Conceptual → Functional → Positional [7]

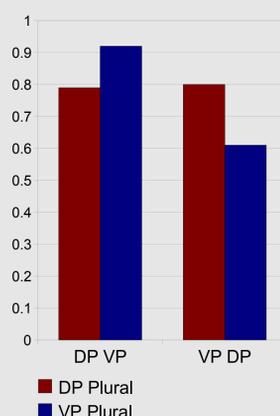


Chart 2: Proportion of plural marking on VP-final and -initial orders

- Results of an experiment manipulating order of constituents revealed significantly less plural marking on verb-initial VPs ($X^2(1)=68$, $p<0.001$)
- More plural marking on verbs when the DP is left-dislocated
- Inflectional agreement is normally controlled by the subject
- More like pronoun-antecedent agreement for pronominal argument-type languages [1], [6]?

Experiment 2

- Picture description task (timed, 15 seconds)
- 24 items (12 human, 12 animal), 48 fillers

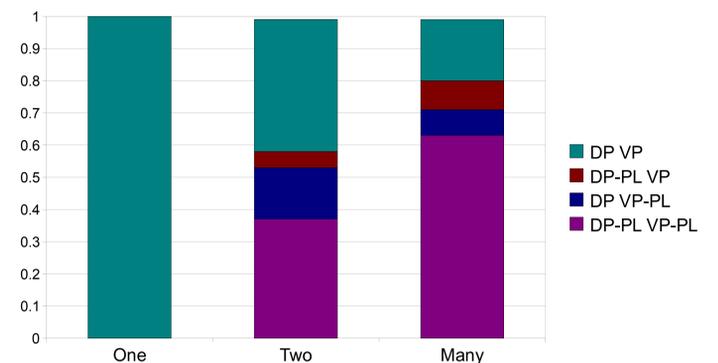
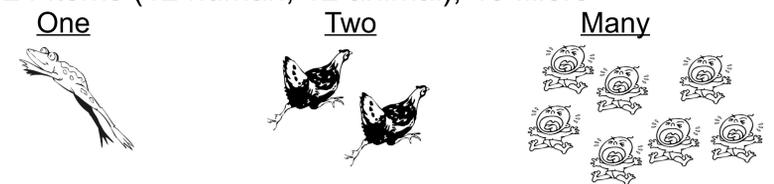


Chart 3: Exp. 2 proportion of covariant plural marking

- Significantly more plural marking on nouns ($X^2(1)=34$, $p<0.001$) AND verbs ($X^2(1)=11$, $p<0.001$) in the plural compared to the one condition, and in the two compared to the one condition
- Covariant plural marking was significantly preferred in the responses (Spearman $R^2=0.61$, $p<0.001$)
- Overall less plural use in Exp. 2 compared to Exp. 1, but the same pattern emerged: a preference for covariation of plural form, greater in the plural/many condition than the two condition

Discussion

Syntactic and semantic effects are influential in plural use in Yucatec Maya

- Preference for covariation in Experiments 1 and 2 (a surprising result because 3rd person number agreement is not obligatory)
- Semantic effect in that the "two" condition in Experiments 1 and 2 resulted in fewer plural marked nouns and verbs as well as plural marking on nouns without covariant plural marking on verbs

Reasons to do psycholinguistics with speakers of under-represented languages

- Expanding the empirical coverage of our theories
- Few psycholinguistic studies of head-marking languages like Yucatec [5]

➤ For references, see handout

References

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