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

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In some languages, like English and Spanish, number is obligatory. In many other languages, like Yucatec Maya, number is optional. Plural morphology is not necessary for a nominal phrase to be interpreted as referring to a plurality. A major debate in literature on number agreement in the cross-linguistic perspective is to what degree number agreement (and agreement mismatch) is more highly conditioned by NOTIONAL (also called conceptual or semantic) factors or SYNTACTIC factors. For example, English speakers are more likely to produce number agreement errors (*the _key_ to the cabinets are on the table*) when the distractor noun is plural and the head noun singular (Bock & Miller 1991). Speakers of Italian and Spanish, among other languages, however, are more likely than English speakers to produce plural number agreement with a singular head noun when the whole noun phrase is more easily likely to be interpreted as distributive (e.g. *the _label_ on the bottles are*...) (i.e. each bottle has a label) (Vigliocco, Butterworth & Smeenza 1995). We investigate the factors involved in number marking from the perspective of a language in which number is non-inflectional and not obligatory. Two experiments carried out in Mexico with speakers of Yucatec Maya tested the effects of notional versus syntactic factors on non-inflectional number marking.

Experiment 1: Participants completed a timed translation task, listening to speech-synthesized Spanish stimuli and producing the translated sentence in Yucatec Maya. The stimuli consisted of intransitive sentences of which the noun phrases were singleton terms, such as "the boy," pair terms, such as "two men" or multitude terms, such as "the women." Both the pair term condition and the multitude condition can be considered to be notionally plural. In Yucatec Maya, the pair term, with the numeral "two" requires the presence of a classifier but noes not necessarily preclude plural marking (see example stimuli and responses (1)). We found significantly more plural marking of multitude terms (e.g. "the boys") compared to pair terms (e.g. "two boys") (p<0.0001) and significantly more marking of pair terms compared to singleton terms (e.g."the boy). The same effect held for marking on verbs (ps<0.0001). While the effect of plural marking on the verb was largely driven by the occurrence of plural marking on the noun phrase (p<0.009), it is partially independent, suggesting additional notional effects beyond purely syntactic effects.

Experiment 2: In this experiment, we used the same timed translation task. The stimuli differed in that the noun phrases of the intransitive sentences involved conjoined nouns, either two singleton terms (e.g. "the boy and the girl"), a singleton term and a multitude term (e.g. "the man and the women"), or two multitude terms (e.g. the doctors and the nurses). We found plural marking more likely to occur on a verb when preceded by a plural-marked noun than by a non-plural-marked noun. Interestingly, the majority of the Yucatec responses contained left-dislocated noun phrases resulting in preverbal noun phrases, rather than the canonical post-verbal position. Thus, our finding suggests an effect of locality on plural marking. When the linearly adjacent noun is marked with the plural morpheme, the verb is more likely to be marked for plural as well, which is reminiscent of the well-known agreement attraction effect (Bock & Miller 1991) or closest conjunct agreement.

This research has broadened the cross-linguistic view of number marking in sentence production by testing a language with optional number marking. Apart from the expected notional effects on plural marking, the syntactic effects of plural marking in a language that does not have obligatory inflectional number are surprising. We could attribute these effects to priming from the Spanish stimuli. We also discuss the differences between subject-verb agreement and subject-anaphor agreement, the later in

which notional effects play a stronger role in determining the form of the pronominal anaphor for languages like English (Bock et al. 1999). We may predict different results if the Yucatec sentences were verb-initial and reflective of true agreement as opposed to anaphora. Finally, his work demonstrates the feasibility of field-based psycholinguistics, and we offer a discussion of the importance of and methods involved in this emerging sub-discipline.

Example stimuli and responses
(1) a. Spanish stimulus: Dos mujeres están cocinando.
     b. Yucatec response: Ka'-túul   ko'lel-o'   tun   meyahanal-**o'b**.
                              two-CL.AN   woman-D2   PRFV.A3   cook.food-**PL**
                              "Two women are cooking."

(2) a. Spanish stimulus: Los muchachos están jugando.
     b. Yucatec response: Le   xi'pal-**o'b**-o'   tun   baxal-**o'b**.
                              DEF   male.child-**PL**-D2   PRFV.A3   play-**PL**
                              "The boys are playing."

Word count: 741

Works cited
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