

Probing the Influence of Heavy-NP Shift on Tagalog Word Order Preferences

Heavy-NP shift, a cognitive tendency to place longer noun phrases (NP) at the end of a clause, has been documented in the literature [1, 2]. Most experimental research on heavy-NP shift, or the short-before-long preference, focuses on ordering effects in few verb-medial and verb-final languages; much remains unknown regarding length-influenced ordering effects in verb-initial languages with strong grammatical constraints on argument placement. It is unclear what interaction would be expected between grammatical constraints and heavy-NP shift, and how these dynamics expand our understanding of memory pressures in sentence production and the cross-linguistic applicability of heavy-NP shift. This study examines Tagalog, a verb-initial language characterized by a voice system where verbal affixes cross-reference the syntactically prominent argument (called the *pivot*) with the nominal marker *ang*. In agent voice (AV), the agent argument is the pivot (sentences 1-2, Table 1); in patient voice (PV), the patient argument is the pivot (sentences 3-4, Table 1). Despite word order flexibility in Tagalog, previous studies showed two grammatical constraints driving word order preferences: a preference to place the agent in the first argument position (agent-first), and the pivot in the second position (pivot-second). The interaction between these two constraints produces a strong preference for Verb-Agent-Patient (V-Ag-Pat) over Verb-Patient-Agent (V-Pat-Ag) in PV, and two equally preferred patterns (V-Ag-Pat/V-Pat-Ag) in AV (Table 1) [3,4,5].

We hypothesized an interaction between the grammatical constraints and heavy-NP shift, such that the latter would dominate the former. Thus, a Tagalog speaker might produce sentences where the longer NP follows the shorter NP in each voice.

We conducted a sentence completion task involving 48 native Tagalog-speaking adults aged 17-52 ($M = 29.33$). A visual scene containing 2 pictures (agent/patient), with descriptive labels (either a short/long NP) below each argument were included, but without the nominal markers (Figure 1). Participants were asked to complete a sentence fragment containing a verb in AV or PV using these labels using Google Forms (Figure 1). Critical items comprised of 32 verbs crossed with 2 voice patterns (AV/PV), 2 length conditions (Ag_{short}, Pat_{long} / Ag_{long}, Pat_{short}) and 2 scene arrangements in a counterbalanced design, distributed to 8 lists. An additional 32 filler items were interspersed with these critical items for each list.

After the exclusion of ungrammatical responses (8%), we coded the data in terms of argument order and computed for the proportion of heavy-NP shift observed for each voice. Results showed that heavy-NP shift influence in the two voices differed. In PV, heavy-NP shift is not always observed, showing a preference for patterns to adhere to agent-first and pivot-second (i.e., PV – Ag_{long} – Pat_{short}; PV – Ag_{short} – Pat_{long}). In AV, there was a greater tendency for patterns to do heavy-NP shift (i.e. AV – Pat_{short} – Ag_{long}; AV – Ag_{short} – Pat_{long}). Maximal logistic mixed-effects models with heavy-NP shift (shift/no shift) as the outcome variable, deviation-coded Voice and Length as predictors, and participants and items as random effects confirmed a significant interaction effect ($t = 13.12$), suggesting that heavy-NP shift did differ by voice.

This difference in heavy-NP shift between voices can be attributed to the relative strength of multiple constraints. In the PV, both agent-first and pivot-second jointly work to dominate heavy NP shift, whereas in AV, each pattern (Pat-Ag or Ag-Pat) only satisfies either one of agent-first or pivot-second, therefore, heavy-NP shift has a greater potential to influence ordering patterns. These findings challenge the notion of a universal cognitive preference for heavy-NP shift, as was also observed in previous work [e.g., 6]. A follow-up study is planned to investigate whether these findings hold in sentences with more than two arguments of varying lengths, and with an online sentence construction task [e.g., 2,6], to determine whether speakers only forego the short-before-long preference based on the number of arguments held in memory (e.g., two versus three argument) in online sentence production.

Table 1. Four word order permutations in Tagalog for the sentence ‘The man carried the vegetables’, and how the word order preferences in the two voices are explained by the satisfaction of two grammatical constraints agent-first and pivot-second.

	Verb	NP1	NP2	Agent-1st?	Pivot-2nd?	Preference
(1)	Nagbitbit carry.AV	ang lalaki PVT man	ng gulay NPVT vegetables	✓		equally preferred with (2)
(2)	Nagbitbit carry.AV	ng gulay NPVT vegetables	ang lalaki PVT man		✓	equally preferred with (1)
(3)	Binitbit carry.PV	ng lalaki NPVT man	ang gulay PVT vegetables	✓	✓	strongly preferred
(4)	Binitbit carry.PV	ang gulay PVT vegetables	ng lalaki NPVT man			strongly dispreferred



Figure 1. Example visual stimuli showing the length manipulations for the agent and patient for the item *nagbitbit* (carry.AV) or *binitbit* (carry.PV). The English translations are not provided in the visual stimuli.

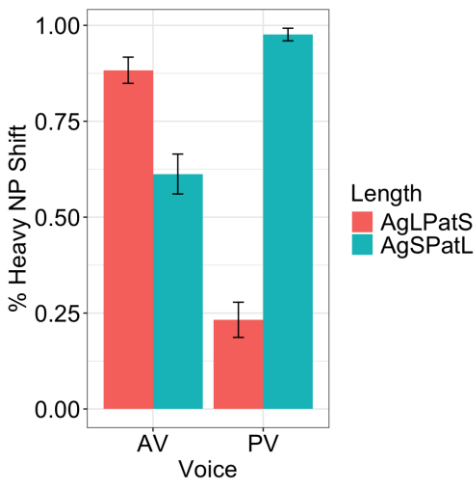


Figure 2. Proportion of completions consistent with heavy-NP shift in the two voices.

References: [1] Stallings & MacDonald (2011). *JPR*. [2] Stallings et al. (1998). *JML*. [3] Bondoc & Schafer (2022). *CJEP*. [4] Kroeger (1993). *Phrase Structure and Grammatical Relations in Tagalog*. [5] Garcia et al. (2018). *First Language*. [6] Yamashita & Chang (2001). *Cognition*.