The Effects of Lexical vs. Perceptual Primes on Sentence Production in Korean: An on-line investigation of event apprehension and sentence formulation

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INTRODUCTION: Previous studies on English have found that production of actives vs. passives is influenced by linguistic (e.g., [1]) and non-linguistic factors (2]) such that if an entity (e.g., agent or patient) is made more accessible by a linguistic (lexical) or a perceptual (non-linguistic) prime, that entity is likely to be mentioned first and become the subject of the sentence. This finding, however, raises several questions. First, when a patient entity is made accessible in a flexible word-order language such as Korean, will it be realized as a grammatical subject of a passive construction (1b), or as a sentence-initial object of an active with non-canonical word order (1c)? Second, do linguistic and perceptual primes have the same effects on utterances? Finally, how are event apprehension and sentence formulation related? Although [3] found that initial looking patterns did not predict which structure was produced, [2] argue that they are closely related to each other. To investigate these questions, we conducted two visual-world eye-tracking experiments on Korean.

(1) a. John-i Mary-lul kkocipessta. [canonical SOV]
   John-NOM Mary-ACC pinched
   ‘John pinched Mary.’

b. Mary-ka John-hantey kkociphiessta. [passive]
   Mary-NOM John-by was pinched
   ‘Mary was pinched by John.’

c. Mary-lul John-i kkocipessta. [OSV non-canonical order/scrambled]
   Mary-ACC John-NOM pinched

EXPERIMENTS: 16 participants were presented with scenes involving an agent and a patient (e.g., dog biting policeman’s leg) and asked to describe them. The agent or patient was primed with a semantically related word (e.g., cat/cuff) in Exp1, and with an attention-capturing flash (similar to [2]) in Exp2.

PRODUCTION: Unlike in English, priming patients in Korean did not result in increased use of passives (Exp1: lexical prime- agent-prime: 10% passives, patient-prime: 8%; Exp2: perceptual prime- agent-prime: 7% passives, patient-prime: 6% passives). Patient primes also failed to increase production of scrambled sentences. This suggests that Korean has a strong bias towards actives with canonical word-order (SOV), and that passives in Korean are more marked than in English.

Eye-movements: Unlike lexical primes (LPs), perceptual primes (PPs) resulted in significantly more looks to primed characters within the first 600ms after picture-onset. Crucially, our results provide support for [2]’s claim, contra [3], that there is an early relationship between production and eye-movements. Looks to the first-mentioned character (N1) are significantly greater during the first 200ms after picture-onset in both lexical (p<.01) and perceptual (p<.01) experiments. As expected, there are also more fixations to N1 than N2 right before utterance-onset.

Eye-movements also reveal differences in the time-course of lexical and perceptual priming effects. In both experiments, there are more looks to N1 than N2 right after picture-onset, but the N1 preference is stronger with PPs (p<.05, N1 preference until 1000ms) than LPs (p<.05, N1 preference until 400ms). However, before utterance-onset, the preference for N1 is stronger with LPs (p<.05, N1 preference until 400ms before utterance-onset) than PPs (p<.05, N1 preference during 1000-800ms before utterance-onset). This suggests that PPs affect early eye-movements more than LPs, but that LPs are more influential before utterance-onset.

CONCLUSION: Our results indicate (i) priming patients does not result in significantly more use of passives or non-canonical/scrambled sentences in Korean, and (ii) event apprehension and sentence formulation are closely related. Moreover, (iii) eye-movement patterns suggest that LPs and PPs may influence sentence processing in difference ways at different points.

REFERENCES