

Meaning, but not grammatical features, is cross-linguistically mask-primed in sentential contexts

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**Background:** One of the topics much debated in bilingual studies is how multiple languages are represented in bi/multilinguals' minds. Much of the key evidence comes from cross-linguistic priming effects on lexical and syntactic levels, although a consensus view has yet to emerge. At the lexical level, Chen and Ng (1989) and others report faster reading times in a lexical decision task when a prime in the L1 has the same meaning as the L2 target word. Cross-linguistic priming effects were observed for syntactic structure (Hartsuiker et al., 2004; Shin and Christianson, 2009; Kantola and van Gompel, 2011), which showed that an exposure to a certain construction in one language significantly increases the probability of using the same structure in another language. However, non-masked results do not rule out effects of conscious perception and controlled processes. Hence, the current study aims to broaden the understanding of cross-linguistic priming effects by investigating the priming effect of L1 case feature on L2 using a masked priming paradigm. In specific, Korean words that are marked for case are used as prime words for English accusative words presented in a sentential context.

**Methods:** 60 Korean-English bilinguals (19 males, age: 28.58 (18-46)) living in the United States (49 participants) or United Kingdom (11 participants) performed an online masked priming experiment. Participants self-reported their first language as Korean, and had lived in the United States or United Kingdom for at least one year at the time of participating in the study. A total of 104 experimental sentence sets and 104 filler sentences were used. All sentences were presented in English, comprised of a person's name, a past transitive verb, and a target word in accusative case (e.g. *Mary bought bread*). The target word was preceded by a prime word presented in Korean that either matched or mismatched in meaning and case (accusative vs genitive), resulting in four conditions (Table 1). The experimental sentences and prime words were distributed across four lists in a Latin-square design. Target words in filler sentences were chosen not to match the meaning of the rest of the sentence (e.g. *Gianna drank clocks*), and were preceded by random Korean prime words with either accusative or genitive case markers. In each trial of the experiment, a subject and a verb were presented in the center of the monitor for 30 frames at 60 Hz (approx. 480 ms), respectively. Then a forward mask was presented for 30 frames (approx. 480 ms), followed by a prime word for two frames (approx. 34 ms) and a target (Figure 1). After seeing the target word, participants judged whether the sentence they just read is semantically correct or not.

**Results:** Mean raw reaction times (RTs) for each condition are presented in Figure 2. For statistical analysis, log-transformed RTs were analyzed with generalized linear regression model with lexical identity, case feature identity and their interaction, and target word length as fixed effects. We found main effects of lexical identity ( $t = -6.3, p < .001$ ) and target word length ( $t = 3.0, p < .001$ ), such that primes that were translations (with any kind of case marker) had faster RTs than non-translations and longer words were read more slowly. On the other hand, the main effect of case feature identity ( $t = 1.1, p = .27$ ) and the interaction of lexical identity and case identity ( $t = -1.0, p = .31$ ) did not reach significance.

**Discussion:** The results show that lexical items show cross-linguistic masked priming for semantic repetition, especially when primes are in L1. This replicates previous findings (e.g. Chen and Ng, 1989; de Groot and Nas, 1991; Jiang, 1999; Hoshino et al., 2010). However, grammatical case features do not demonstrate cross-linguistic masked priming effects. We interpret this as indicating that grammatical features between languages may not form an integrated representation as lexical items do, at least as regards case features.

Table 1. Examples of experimental sentences

Condition	Prime	Target
(a) LexId, CaseId	빵을 <i>ppang-ul</i> bread-ACC	
(b) LexId, CaseDiff	빵의 <i>ppang-uy</i> bread-GEN	bread-ACC
(c) LexDiff, CaseId	빳을 <i>bis-ul</i> comb-ACC	
(d) LexDiff, CaseDiff	빳의 <i>bis-uy</i> comb-GEN	

LexId: lexical identity, LexDiff: lexical difference, CaseId: case feature identity, CaseDiff: case feature difference

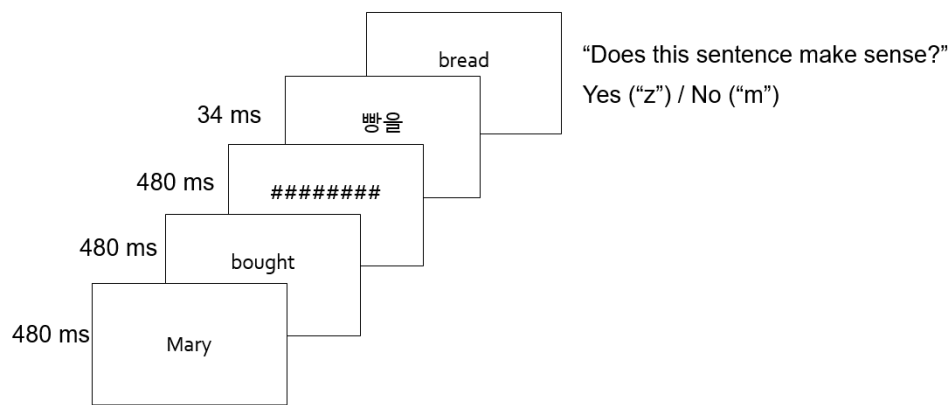


Figure 1. Experiment procedure

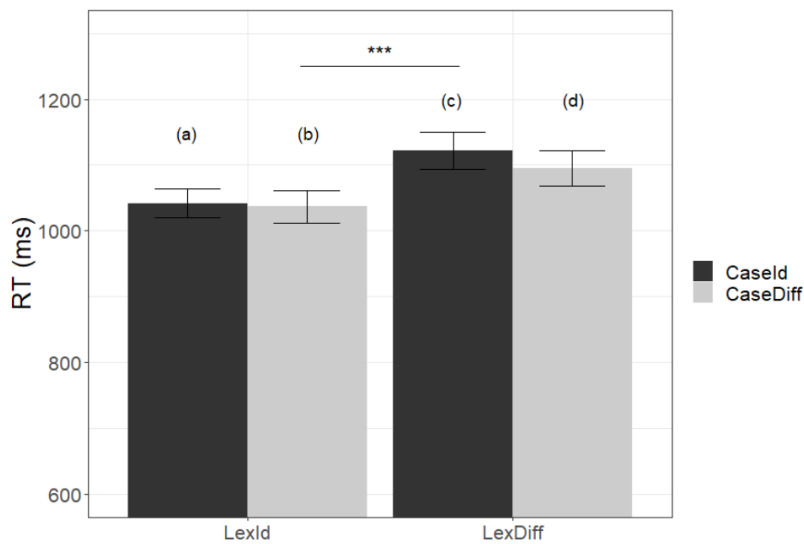


Figure 2. Mean RTs for lexically identical vs different conditions and case identical vs different conditions. Error bars indicate standard errors.