

Active dependency formation, agreement, and interference in L1 and L2 processing

Nayoun Kim (nayoun@skku.edu)¹, Hiroki Fujita², Younseo Ha¹, Subin Oh¹, Ian Cummings³

¹Sungkyunkwan University, ² University of Potsdam, ²University of Reading

Two central issues in psycholinguistics concern (i) how linguistic dependencies are resolved and (ii) similarities and differences between first-language (L1) and second-language (L2) processing. We address these issues by examining how wh-dependency formation influences number agreement in L1 and L2 processing using the stimuli (1a–f) (see page 2).

In (1a/d), the wh-phrase and auxiliary verb match in number (“*Which actors...were*”), whereas, in (1b/c) and (1e/f), they mismatch (“*Which actor...were*”). Previous studies have shown that number mismatches cause processing difficulty, but this mismatch effect is reduced when there is a distractor matching the verb in number as in (1b/e) (“*Which actor in the films...were*”), indicating interference.[1,2]

So-called active dependency formation may influence this interference effect.[3] In (1a–c), the wh-phrase including the distractor may be actively maintained in memory until “were” appears because the phrase requires a verb to form a subject–verb dependency (“*Which actor(s) in the film(s) who decided to work really hard were*”). Memory maintenance may increase the accessibility of the distractor and thus strengthen interference.[3] By contrast, in (1d–f), the wh-phrase is released from maintenance at “decided”, which allows the subject–verb dependency to be formed (“*Which actor(s) in the film(s) decided to work really hard and were*”). This release from maintenance may reduce distractor accessibility and weaken interference.[3] On the basis of previous work, L2ers may show a smaller mismatch effect or greater interference, and interference may be modulated by memory maintenance.[4–6]

We conducted an eye-tracking experiment with 36 item sets. Participants were 108 native speakers of English and 95 native speakers of Korean who spoke English as an L2 (CEFR levels: A2–C2). Eye-tracking data were analysed using linear mixed-effects models. The results showed mismatch effects at “were” ($p < .002$): regression-path and total viewing times were longer in the ungrammatical than grammatical conditions (see Figure 1). Interference was observed at the spillover region ($p = .040$), with shorter regression-path times in the distractor-match than distractor-mismatch conditions. In contrast to previous findings [6], we found no differences in interference effects between the active and non-active conditions or find any differences between the L1 and L2 groups. Our findings suggest similar dependency-formation and memory-retrieval processes in L1 and L2 processing.

Table 1. *Sample of experimental stimuli.*

(1a) Grammatical, Active, Distractor Mismatch

Which actors in the film who decided to work really hard were respected by the director?

(1b) Ungrammatical, Active, Distractor Match

Which actor in the films who decided to work really hard were respected by the director?

(1c) Ungrammatical, Active, Distractor Mismatch

Which actor in the film who decided to work really hard were respected by the director?

(1d) Grammatical, Non-active, Distractor Mismatch

Which actors in the film decided to work really hard and were respected by the director?

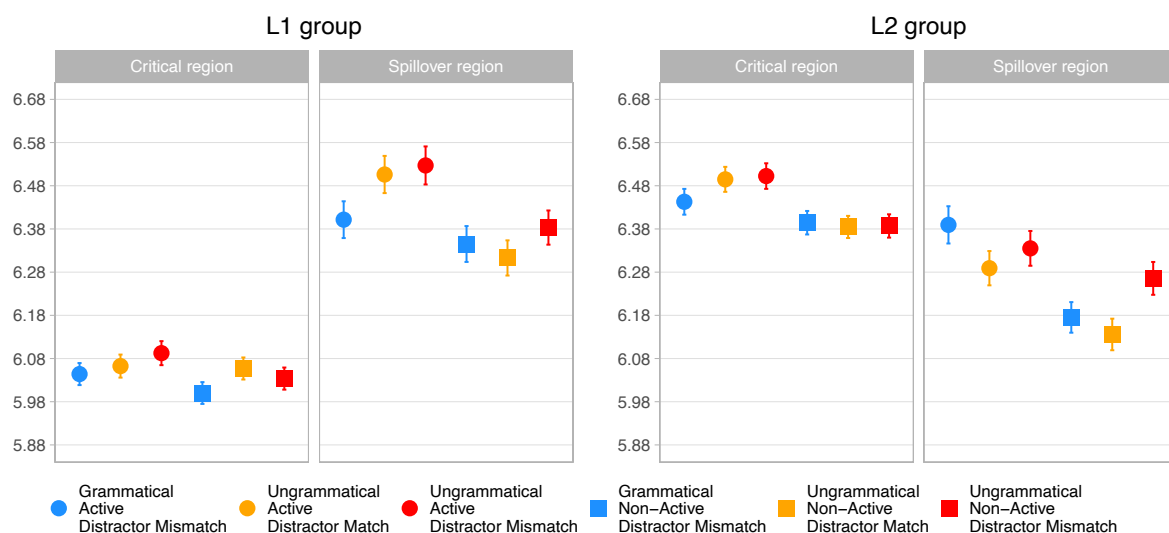
(1e) Ungrammatical, Non-active, Distractor Match

Which actor in the films decided to work really hard and were respected by the director?

(1f) Ungrammatical, Non-Active, Distractor Mismatch

Which actor in the film decided to work really hard and were respected by the director?

Figure 1. *Log-transformed regression-path times at the critical (“were”) and spillover (“respected by”) regions.*



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