

Subject-object asymmetries are not specific to dependencies: Evidence from Korean

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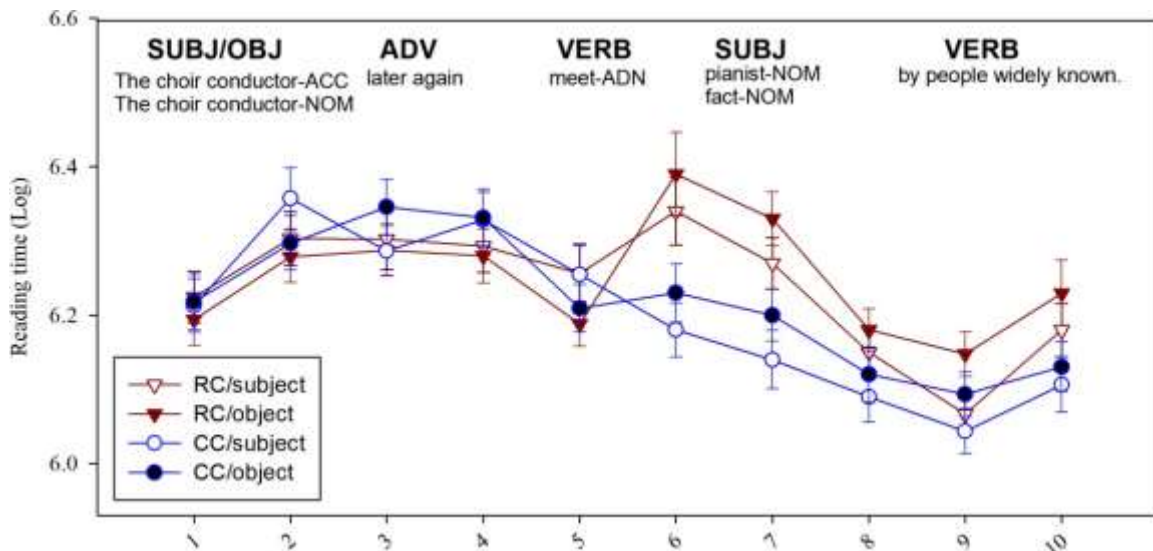
The processing advantage of dependencies that involve a subject compared to an object gap has been well-documented for both *wh*-questions [1,2] and relative clauses [3,4,5,6]. The subject advantage is seen as a property of *dependencies* which link an overt element with a null element: this has been argued to be easier with a subject gap compared to an object gap for a variety of reasons (e.g., structural complexity, syntactic prominence, frequency [7,8,9,10,11]). Here we consider a different view of this phenomenon: while we demonstrate that there is processing difficulty associated with dependency formation, namely with the linking of the head noun to the null element, we also demonstrate that the subject-object asymmetry is an independent effect that is not tied to dependency formation, but is instead a special case of a more general subject-object asymmetry shared by null elements.

Our study capitalizes on several grammatical properties of Korean: (i) it has been shown to exhibit a subject advantage in Relative Clauses [6]; (ii) it allows for both null subject and null object pronouns, and (iii) it is a head final language, which allows creating a temporary ambiguity between relative clauses (RCs) (e.g., *the pianist who met the choir director*, as in 1a-b) and Complement Clauses (CCs) (e.g., *the fact that [someone] met the choir director*, as in 1c-d). The design was 2x2. The first manipulation was **clause type**: the head noun, which crucially *follows* the embedded clause, disambiguates the clause as a RC ('pianist' in a-b) or as a CC ('fact' in c-d; a fact cannot meet or be met by a conductor). In the RC continuation, the null element must be analyzed as a gap, whereas in the CC continuation the null element must be an (exophorically-referring) null pronoun. The second manipulation was **position**: whether the null element is a subject (a,c), in which case the initial NP ('conductor') is an Accusative object, or an object (b,d), in which case that same NP is a Nominative subject. We make three predictions. First, we expect a subject advantage in RCs (cf. [6]). Second, we expect RCs to be processed slower than CCs [12,13], demonstrating the cost of dependency formation. Crucially, if the subject advantage in RCs reflects an advantage for dependencies with subject gaps over object gaps, we expect an asymmetry between RCs and CCs. If, however, this asymmetry arises from a more general asymmetry in the status of null elements, it should be observed across the board with both gaps (in RCs) and null pronouns (in CCs).

Self-paced reading results (n=56). During the processing of the head noun (pianist/fact), there was a main effect of Clause Type ($\beta = 0.15$, $SE = 0.02$, $t = 6.35$), whereby RCs were read significantly slower than CCs: this follows prior findings, demonstrating the cost of dependency formation. In the same region, there was a main effect of Position: reading times were significantly slower when the null element was in object position compared to subject position ($\beta = -0.05$, $SE = 0.02$, $t = -2.11$). However, there was no interaction ($\beta = -0.01$, $SE = 0.04$, $t = -0.22$). The same pattern continued in the spillover region: both main effects were again observed (Clause Type: $\beta = 0.13$, $SE = 0.02$, $t = 6.10$; Position: $\beta = -0.16$, $SE = 0.02$, $t = -2.77$), and but there was no interaction ($\beta = 0.03$, $SE = 0.04$, $t = 0.01$). In the region after the spillover region, there was again a main of Clause Type ($\beta = 0.06$, $SE = 0.02$, $t = 3.12$) and a marginal main effect of Position ($\beta = -0.4$, $SE = 0.02$, $t = -1.9$).

These results are inline with previous findings that RCs are harder to process than CCs (cf. [12,13]). For both clause types, encountering the head noun reveals the need to identify a silent element, and so any differences between them cannot arise from the null element alone. One possibility is that RCs are read slower because of the need to link the head noun to the silent element (there is no such relationship in CCs, where the null element is a pronoun). Another possibility is that RCs are read slower because they involve the integration of a new referent – *the pianist* (no new referent is introduced at *fact* because the content of the fact has already been processed). Importantly, the subject advantage is observed equally in both clause types, revealing that the subject-object asymmetry is not specific to dependency formation, but it more generally characterizes null elements. Importantly, such asymmetry has been observed with null arguments in other domains: for instance, null subjects admit wider referential options than null objects [14,15,16] and they show an advantage over null objects in first and second language acquisition [17,18].

Region: 1-2 [[SUBJ/OBJ	3-4	5 VERB]	6 SUBJ]	7	8-10 VERB
(A) Relative Clause (RC) / Subject					
성가대	지휘자를	후에 다시	재회한	피아니스트가	많이 알려져 있다.
The choir	conductor-ACC	later again	meet-ADN	pianist-NOM	by people widely was-known
The pianist who later met the choir conductor again was widely known by people.					
(B) Relative Clause (RC) / Object					
성가대	지휘자가	후에 다시	재회한	피아니스트가	많이 알려져 있다.
The choir	conductor-NOM	later again	meet-ADN	pianist-NOM	by people widely was-known
The pianist who the choir conductor later met again was widely known by people.					
(C) Complement Clause (CC) / Subject					
성가대	지휘자를	후에 다시	재회한	사실이	많이 알려져 있다.
The choir	conductor-ACC	later again	meet-ADN	fact-NOM	by people widely was-known
The fact that someone later met the choir conductor again was widely known by people.					
(D) Complement Clause (CC) / Object					
성가대	지휘자가	후에 다시	재회한	사실이	많이 알려져 있다.
The choir	conductor-NOM	later again	meet-ADN	fact-NOM	by people widely was-known
The fact that the choir conductor later met someone again was widely known by people.					



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