Processing arguments in Korean nominal predicates

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Background. Agentivity plays a predictive role in online processing: comprehenders are faster when agents appear as the first argument in a sentence [1-2]. When the first argument is animate, participants more often commit to an agent interpretation early, and are more likely to be inhibited if reanalysis to a non-agent is necessary [3-6]. Prominence alignment theories interpret these findings as pressures (agent first, animate first) that, when aligned, facilitate faster comprehension [7-12]. While previous studies have focused on full clauses, this study investigates animacy effects in the online processing of Korean NPs, asking whether the effects of prominence alignment extends to nominals. Korean event nominal constructions aren't clausal, but do have clause-like properties, so we might expect prominence alignment effects. Korean is predicate-final, and internal/external arguments in the nominal have the same case marking (genitive), and are otherwise not distinct from each other on the surface. Korean is a *pro*-drop language, in which any argument can be dropped readily given context. These qualities make Korean ideal for investigating alignment effects in nominals, as a single initial nominal argument will be temporarily ambiguous as external or internal prior to the predicate. By manipulating the animacy of this initial argument, we can explore whether animacy gives rise to similar kinds of facilitatory alignment effects observed previously for clauses.

Methods. In a moving window SPR study (n=40), participants were asked to accept or reject sentences according to their plausibility. A plausibility rating study (n=28) was also conducted, in which participants rated items on a scale of 1-7. All sentences included event nominal constructions in topic position, consisting of a single initial argument, then an adjective, followed by the predicate. 32 itemsets were created in a 2x2 design (1), crossing the animacy of the initial argument (ANIM, INANIM) with the predicate's ability to combine with an NP complement (NP-allowed, CP-only). See itemset in (2). The two predicate types have different argument entailments: CP-predicates *require* an Agent, but NP-predicates permit both an Agent and a Theme. An initial animate argument will bias toward positing an Agent, which is compatible with the entailments of both predicate types, so we expect no processing inhibitions. Having an initial inanimate will bias against an Agent: for NP-predicates, this should again cause no issues, but for CP-predicates, which *must* have an agent, we expect a slow down at the predicate, where it becomes clear that the inanimate argument must be re-analyzed as an implausible agent.

Results (SPR). At the critical predicate region, there were no significant effects of Animacy or Predicate Type. At the first and second spillover region, animates were read slower, and CP predicates were read faster (Fig 1), resulting in NP-animates being read the slowest of all conditions. Spillover region 1: ANIMACY, $\beta = -0.006$, $SE = 0.003$, $t = -2.37$, $p < 0.02$; PREDICATE TYPE, $\beta = -0.108$, $SE = 0.003$, $t = -40.93$, $p < 0.001$; ANIMACY*PREDICATE TYPE, $\beta = 0.149$, $SE = 0.003$, $t = -56.85$, $p < 0.001$. Spillover region 2: ANIMACY, $\beta = -0.061$, $SE = 0.031$, $t = -1.91$, $p < 0.06$; PREDICATE TYPE, $\beta = -0.053$, $SE = 0.032$, $t = -1.67$, $p < 0.1$; no significant interactions.

Results (Ratings). We found an interaction between Predicate Type and Animacy (Fig 2; PREDICATE TYPE*ANIMACY, $\beta = 1.70$, $SE = 0.15$, $z = 11.26$, $p < 0.001$), such that CP-ANIM conditions were rated more plausible than CP-INANIM conditions, consistent with our predictions. However, there was no significant difference between NP-ANIM and NP-INANIM conditions.

Discussion. The absence of any reading time advantages for initial animate arguments at the predicate suggests a weaker commitment to an early aligned thematic role assignment in nominals. In NP conditions, initial animate arguments led to prolonged reading times after the predicate. At first blush, this presents a contrast with argument processing in clauses. One possibility is that only NP-ANIM conditions require the identification of an implicit Theme. In inanimate conditions, by contrast, an implicit agent may be identified before the predicate, a process which is less costly by hypothesis.

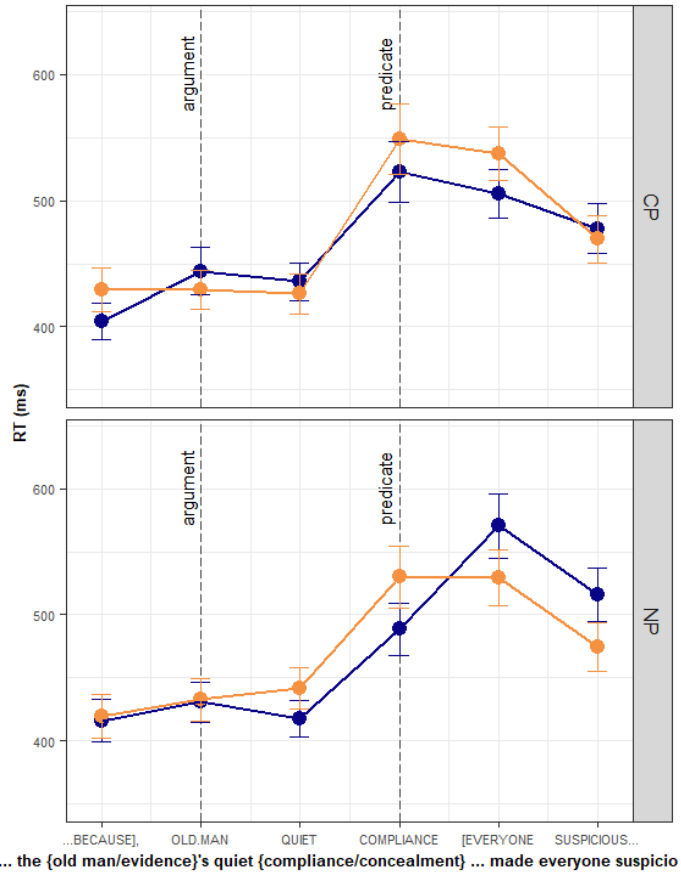
(1) Experiment design: Animacy x Predicate Type

$$\left\{\frac{ANIMATE \quad NP}{INANIMATE \quad NP}\right\} \times \left\{\frac{"CP"\ Predicate\ (subcategorizes\ for\ only\ a\ non{-}NP\ complement}{"NP"\ Predicate\ (subcategorizes\ for\ only\ an\ NP\ complement}\right\}$$

(2) *Swusa-ka cinhayng cwung-ietki ttaymwuney* {***acessi/cungke***}*-uy coyonghan* {***hyepco/unphyey***}*-nun motwu-lul uysimhakey hayssumnita*
Investigation-NOM progress.in.was because, {**old.man/evidence**}-GEN quiet **compliance/concealment**}-TOP everyone-ACC suspicious caused.
"Because the investigation was on-going, the {**old man/evidence**}'s quiet {**compliance**$_{\text{("CP"-predicate)}}$/**concealment**$_{\text{("NP"-predicate)}}$} made everyone suspicious."

CP x Anim:
old.man-GEN quiet **compliance**-TOP
CP x Inanim (implausible!):
evidence-GEN quiet **compliance**-TOP

NP x Anim:
old.man-GEN quiet **concealment**-TOP
NP x Inanim:
evidence-GEN quiet **concealment**-TOP



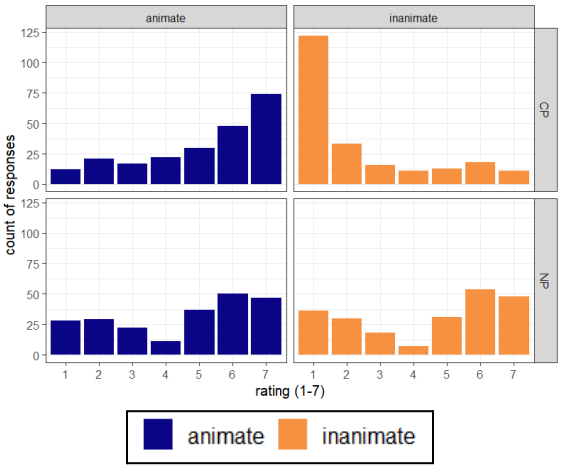


Fig. 1. (left).Time course of average reading time (by word) for all SPR trials.

Fig. 2. (above). Plausibility ratings by condition. (1 = least plausible, 7 = most plausible).

Selected references. [1] Cohn & Paczynski 2013. *Cog. Psych. 67(3).* **[2]** Ferreira 2003. *Cog. Psych. 47(2).* **[3]** Branigan et al. 2008. *Lingua, 118(2).* **[4]** Clifton et al. 2003. *JML 49(3).* **[5]** Kuperberg et al. 2007. *B&L 100(3).* **[6]** Nairne et al. 2013. *Psych. Sci. 24(10).* **[7]** Wilson & Dillon 2022. **[8]** Bornkessel-Schlesewsky & Schlesewsky 2009. *Lang. & Ling. Compass 3(1).* **[9]** Do & Kaiser 2022. *LC&N 37(5).* **[10]** Ferreira 1994. *JML 33.* **[11]** Hammerly et al. 2022. *Cognition 225.* **[12]** Wagers et al. 2018. *Cognition 178.*