

## Illusory NPI licensing of both ‘ever’ and ‘any’ when linear position is controlled

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Linguistic illusions can provide insights into the mechanisms of language comprehension, particularly how memory representations are managed. One type of illusion involves negative polarity items (NPIs), which require a downward-entailing operator (licensor) in a higher structural position [1]. Illusory licensing effects have been observed with adverbial NPIs like English *ever* and German *jemals* [2-4]: unlicensed *ever* is judged more acceptable and causes less processing difficulty in the presence of an irrelevant licensor (*no critics* in 1) than in sentences where a licensor is absent. Parker and Phillips (2016) [4] examined whether susceptibility to illusory licensing is a general property of NPIs in English comparing *ever* and *any*. In speeded judgment and self-paced reading (SPR) studies, they found clear illusory licensing effects with *ever*, but not with *any*. The authors speculated that the divergent effects arose due to the different positions that *ever* and *any* occupied in their test sentences: *ever* was linearly closer to the constituent containing the intrusive licensor than *any* was. [5] also observed differences between *ever* and *any*, which they similarly attributed to a distance effect. To our knowledge, neither [4] nor [5] directly tested the linear distance hypothesis as an explanation for the lack of effect with *any*. Doing so is important, however, because alternative explanations for the absence of illusions with *any* are possible: inherent *lexical* differences in susceptibility to illusions between the NPIs or low statistical power (only 18-24 participants were tested in [4]) could account for the discrepancy. We followed up on [4,5] with a higher-powered SPR experiment that tested whether the illusory licensing effect observed for *ever* can be replicated for *any* when the linear position of the two NPIs is held constant. If similar effects are found for both *ever* and *any*, it is possible to preserve a general theory of the (faulty) licensing mechanisms that give rise to illusory effects. If we only find effects with *ever*, it would suggest that position differences alone cannot account for the disparity, prompting revision of existing theories.

**Design.** 36 items were adapted from [4], Exp 1. Items followed a 2 x 3 design varying *licensor position* (grammatical | irrelevant | no licensor) and *NPI type* (*ever* | *any*). Table 1 contains an example. Sentences started with a subject NP modified by a relative clause (RC) and followed by a main clause predicate containing the NPI. In [4,5], linear distance between the end of the RC and the NPI differed between *any* and *ever* sentences. *Ever* was preceded by an auxiliary. *Any* was preceded by the auxiliary and main verb. To remedy this discrepancy, we omitted the auxiliary before *any* in our items. Furthermore, to prevent difficulty associated with adjacency of the RC verb and main verb, we inserted a prepositional adjunct at the end of the RC.

**Analysis.** Log-transformed RTs were analyzed using linear mixed effects regression. Models included main effects for *NPI* (*ever* v. *any*) and *Licensing* and their interaction. *Licensing* was Helmert coded to test for two separate contrasts: *Grammaticality* (*Grammatical* v. {*No Licensor*, *Irrelevant Licensor*}) and *Illusion* (*No Licensor* v. *Irrelevant Licensor*). We used the maximal random effect structure that converged:  $\text{LogRT} \sim \text{npi} * \text{lic} + (1 + \text{lic} | \text{subj}) + (1 + \text{lic} | \text{item})$ . If *ever* and *any* differ in their susceptibility illusory licensing, we expected an *NPI* × *Illusion* interaction. If both are susceptible, we expected a main effect of *Illusion*.

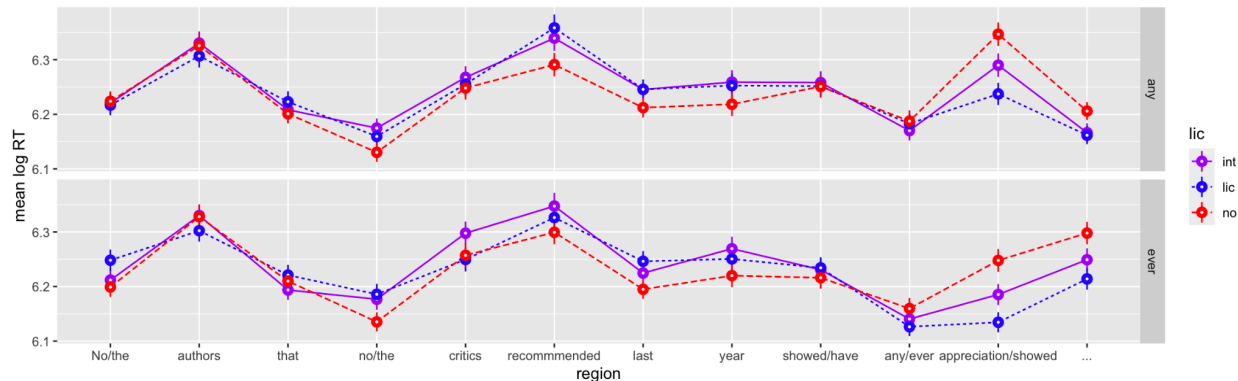
**Results (SPR, N=101 after exclusion).** Average region-by-region Log RTs can be seen in Figure 1. No theoretically relevant effects were observed in the critical NPI region. In the spillover region, there was a main effect of *Grammaticality*: RTs were shorter on average in *Grammatical* conditions than in *Ungrammatical* conditions ( $t = 4.88$ ). There was also a main effect of *Illusion*: RTs were shorter in *Irrelevant Licensor* conditions than in *No Licensor* conditions ( $t = 3.02$ ). *Illusion* did not interact with *NPI* ( $t < 1$ ). Planned comparisons show that the illusory licensing effect was significant with both *ever* ( $t = -2.52$ ) and *any* ( $t = -2.13$ ). Our results suggest that *any* is also susceptible to illusory licensing and support the distance-based explanation of their absence in previous work.

- (1) \*The authors that [no critics recommended] have **ever** received a prize.  
 (2) \*The authors that [the critics recommended] have **ever** received a prize.

**Table 1.** Sample set of experimental items

ever	Grammatical Licensor (lic)	No authors [that the critics recommended that year] have <b>ever</b> received acknowledgment for a best-selling novel.
	Irrelevant Licensor (int)	The authors [that no critics recommended that year] have <b>ever</b> received acknowledgment for a best-selling novel.
	No Licensor (no)	The authors [that the critics recommended that year] have <b>ever</b> received acknowledgment for a best-selling novel.
any	Grammatical Licensor (lic)	No authors [that the critics recommended that year] received <b>any</b> acknowledgement for a best-selling novel.
	Irrelevant Licensor (int)	The authors [that no critics recommended that year] received <b>any</b> acknowledgement for a best-selling novel.
	No Licensor (no)	The authors [that the critics recommended that year] received <b>any</b> acknowledgement for a best-selling novel.

**Figure 1.** Reading times for sentences with NPIs *any* (top) and *ever* (bottom)



## References

- [1] Ladusaw, W. 1979. UT Austin PhD Dissertation; [2] Vasishth, S., Brüssow, S., Lewis, R. L., & Drenhaus, H. 2008. *Cognitive Science*; [3] Xiang, M., Dillon, B., Phillips, C. 2009. *Brain & Language*; [4] Parker, D. & Phillips, C. 2016. *Cognition*. [5] Muller, H., Joly, C., de Dios Flores, I., Resnik, P., & Phillips, C. 2020. *Poster at 33rd CUNY Conference*