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### **The processing of Negative Polarity Items in Turkish-German bilingual speakers**

We investigated the processing of Turkish negative polarity items (NPIs) during reading comprehension in a group of Turkish-German speakers. Previous monolingual processing research has shown that NPI licensing is susceptible to intrusion effects in English and German (Drenhaus, Saddy, & Frisch, 2005; Vasishth, Brüssow, Lewis, & Drenhaus, 2008). In Turkish, a previous study found intrusion effects in the processing of NPIs such as *kimse* ('no one'), which require licensing from a matrix verb marked by the negative suffix *-mE* (1a) (Yanilmaz & Drury, 2016). In this study, Turkish speakers showed processing facilitation in sentences where the negative suffix appeared erroneously on an embedded verb (1b). Our study addressed whether Turkish speakers with varying levels of proficiency in German, a language with a different NPI surface configuration, showed preserved knowledge of NPI licensing constraints in their L1, and whether their Turkish and/or German proficiencies modulated their sensitivity to intrusion.

Fifty-three adult Turkish-German bilinguals performed a self-paced reading acceptability judgement task. Sentence stimuli included 30 item sets distributed across six conditions (1a-f). Our analyses included as predictors (i) Turkish and German self-rated proficiencies, (ii) Negation (*main/embedded/none*) and (iii) NPI (*absent/present*). The acceptability judgements results showed a significant intrusion effect: participants made a disproportionate number of errors in sentences with a negated embedded verb, being more likely to judge these ungrammatical sentences as acceptable. Further, the intrusion effect was modulated by participants' proficiency in German: early bilinguals, who were more proficient in German, showed stronger intrusion effects than late bilinguals. These results suggest that early bilinguals might have less accurate representations of the structural constraints or configurations required to license Turkish NPIs and thus were more sensitive to intrusion from grammatically unlicensed (embedded) verbs.

The reading-time results showed a significant main effect of negation in the embedded verb region (R3): the conditions with a negated embedded verb were read more slowly than the conditions without negation. The main verb region (R4) showed main effects of NPI and negation, with no interaction with proficiency. Crucially, the NPI effect shows that bilinguals took longer to read the +NPI conditions that were ungrammatical (1b-c), as compared to the grammatical conditions that lacked an NPI (1e-f). The lack of interactions with proficiency suggests that both early and late bilinguals were similarly able to detect ungrammaticality from very early on. Finally, the final sentence region (R6) showed a significant interaction effect: the intrusion condition (1b) patterned together with the grammatical conditions in eliciting longer reading times, in contrast with the fully ungrammatical condition (1c), where reaction times were faster. This pattern suggests that bilinguals were able to easily detect the ungrammaticality in (1c) and use it to inform their end-of-sentence acceptability judgments.

Overall, our findings indicate clear intrusion effects in the processing of NPIs in bilingual Turkish-German speakers. The acceptability judgments showed stronger intrusion effects in early than in late bilinguals, consistent with the claim that the structural conditions for NPI licensing in Turkish might be degraded or less stable in speakers who are highly proficient in German, which was often also the dominant society language for our participants. In contrast, the online reading patterns showed an initial sensitivity to grammatical constraints, with intrusion effects arising later and without being influenced by participants' language proficiency.

## References

- Drenhaus, H., Saddy, D., & Frisch, S. (2005). Processing negative polarity items: When negation comes through the backdoor. *Linguistic evidence: Empirical, theoretical, and computational perspectives*. De Gruyter, Berlin.
- Vasishth, S., Brüssow, S., Lewis, R. L., & Drenhaus, H. (2008). Processing polarity: How the ungrammatical intrudes on the grammatical. *Cognitive Science*, 32(4), 685-712.
- Yanilmaz, A., & Drury, J., E. (2016). *Intrusion effects on NPI licensing in Turkish: Does the parser ignore the grammar?* Paper presented at the 27th Annual CUNY Conference on Human Sentence Processing. Ohio State University.

## Sample item set

### (1a/d) MAIN VERB NEGATION +NPI /-NPI

R1	R2	R3	R4	R5	R6
Kimse/ Kemal	[ <sub>RC</sub> Ali'nin	çalıştığını ]	söylemedi	bana	bugün.
No one/Kemal	Ali.GEN	WORK.OBJPART	say.NEG.PST	me.DAT	today.

*Lit. 'No one / Kemal did not tell me that Ali worked today'*

### (1b/e) EMBEDDED VERB NEGATION +NPI/-NPI (intrusion conditions)

R1	R2	R3	R4	R5	R6
Kimse / Kemal	[ <sub>RC</sub> Ali'nin	<u>çalışmadığını</u> ]	söyledi	bana	bugün.
No one/Kemal	Ali.GEN	WORK.NEG.OBJPART	say.PST	me.DAT	today.

*Lit. 'No one told me that Ali did not work today'*

### (1c/d) NO NEGATION +NPI/-NPI

R1	R2	R3	R4	R5	R6
Kimse / Kemal	[ <sub>RC</sub> Ali'nin	çalıştığını ]	söyledi	bana	bugün.
No one / Kemal	Ali.GEN	WORK.OBJPART	say.PST	me.DAT	today.

*Lit. 'No one / Kemal told me that Ali worked today'*

**Figure 1.** Proportion of correct responses in the end-of-sentence acceptability judgments. Participants made a disproportionate number of errors in sentences with a negated embedded verb (1b), being more likely to judge these ungrammatical sentences as acceptable, as compared with the other experimental conditions.

