The costs and benefits of processing negation in NPI licensing contexts in Turkish

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Negative polarity items (NPIs) in English include words like any/every, collocations like at all, and idioms like lift a finger. Being an NPI means being a member of a set of word/phrase-level expressions whose distributions are regulated by a mix of syntactic and logical-semantic/pragmatic?) licensing constraints. Specifically, NPIs must be within-the-scope-of/controlled by a licensor (LIC). What counts as a LIC varies across languages, but negation can serve as a prototypical case, compare: "He hasn't ever been to Paris" to "He has ever been to Paris". Note that the mere presence of a LIC is not enough, consider: "No man [who has a beard] was ever happy" versus "A man [who has no beard] was ever happy". In the first case, negation in the subject NP has scope (commands) the NPI "ever". In the second case, negation linearly precedes the NPI, but it is in a position in which it is a structurally ineligible licensor. Interestingly, in this second case there is evidence that online processing (error detection) may be derailed (Drenhaus et al. 2005) due to either (i) a partial cue match (e.g., {+neg}) in retrieval mechanisms supporting the establishment/checking of these dependencies (Vasishth et al. 2008), or (ii) an erroneous negative implicature which can arise when negation occurs inside a relative clause which may serve to pragmatically license the NPI (Xiang et al. 2009). Whatever the account, the facts indicate that linearly preceding but structural ineligible licensors result in the attenuation of ERP violation responses at the target NPIs and an increase in acceptance rates. More recent work (Parker et al. 2014) has isolated some relevant factors responsible for "turning-on" and "turning-off" behavioral effects of illusory licensing, proposing that the degree to which an intrusive licensor can interfere with error detection switches with whether or not the structure that contains it has been rendered atomic by compositional mechanisms.

We conducted an ERP reading study (N=22) in Turkish, where, unlike English/German, NPIs typically precede licensors (a prospective dependency). We tested sentences with complement clauses and NPI-subjects (e.g., [NPI […embedded-Verb] main-Verb]) and manipulated the presence/absence of negation as in (1A-C). Only main-verb negation licenses matrix subject-NPIs (1A) and complete absence of negation (1C) results in clear deviance/incorrectness. In contrast, the presence of the embedded negation (1B) – a structurally inaccessible licensor – was predicted to result in an intrusion effect on the memory/retrieval account. In contrast, on the erroneous negative implicature view, such effects should not arise here given that we have a complement (not a relative) clause. Additional control stimuli were included involving NPIs in the embedded clauses and sentences with no NPIs (both crossed with the negation manipulation as in (1A-C)). These allowed us to tease apart true NPI-licensing responses from effects connected with negation or presence/absence of NPIs independently and to compare licensing versus intrusion at the embedded verbs. Here we focus only on (1A-C).

In addition to a range of other findings, our results showed that, like German, unlicensed NPIs in Turkish (1C) yield a biphasic N400/P600 pattern at the main verb (after the 700 ms mark in Fig. 1, blue trace relative to black). Further, although behavioral violation effects (correctability judgments) were attenuated by the presence of the intrusive licensor, N400/P600 effects at the main verb did not show the smaller violation effects as in previous studies. Instead, a P600-like positivity following embedded verb was elicited for (1B) (red in Fig.1). However, though this effect resembles part of the downstream main verb violation pattern for 1C (blue), it turns out that (1B) did not differ from cases where there was licit local licensing of an embedded NPI by the embedded negation (not shown here). Thus, the embedded verb P600 effect for (1B) is arguably best understood to reflect (grammatically/structurally illicit) licensing at this point (i.e., online dependency formation that violates the grammar of Turkish NPIs). In addition, presence of negation in the absence of an NPI (Fig.2) yields an N400 for embedded verbs, and P600 for matrix verbs; embedded verb N400 effects flip in the presence of either a matrix subject or embedded NPI which indicates the disappearance of the processing costs for negation in NPI licensing contexts.

We argue that these results cannot be accounted for by the erroneous implicature view, and will also discuss how they may relate to the memory/retrieval account and how to view these patterns under different conceptions of the etiology of N400 (e.g., access/retrieval vs. integration) and P600 effects.
**Figure 1** ERPs time-locked to the embedded verbs in (1). Main verb onset was at 700 ms.

**Figure 2** ERPs time-locked to the embedded verbs in (3). Main verb onset was at 700 ms.

**References:**


