

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/ever*, 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/c-commanded-by a licenser (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 (c-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 licenser. 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 licensers 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 licenser can interfere with error detection swings 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 licensers (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/unacceptability. In contrast, the presence of the embedded negation (1B) – a structurally inaccessible licenser – 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 (acceptability judgments) were attenuated by the presence of the intrusive licenser, 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.

□1A **Kimse Ali'nin çalıştığını söylemedi bana**
NPI [E.Subj. E.Verb] M.Verb-NEG

*1B **Kimse Ali'nin çalışmadığını söyledi bana**
NPI [E.Subj. E.Verb-NEG] M.Verb

*1C **Kimse Ali'nin çalıştığını söyledi bana**
NPI [E.Subj. E.Verb] M.Verb

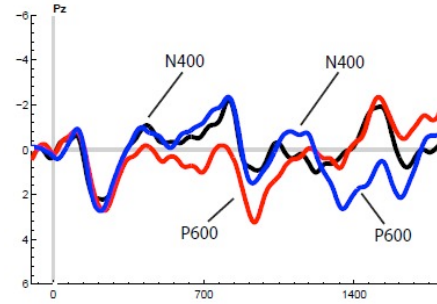


Figure 1 ERPs time-locked to the embedded verbs in (1). Main verb onset was at 700 ms.

3A **Arda Ali'nin çalıştığını söylemedi bana**
no-NPI [E.Subj. E.Verb] M.Verb-NEG

3B **Arda Ali'nin çalışmadığını söyledi bana**
no-NPI [E.Subj. E.Verb-NEG] M.Ver

3C **Arda Ali'nin çalıştığını söyledi bana**
no-NPI [E.Subj. E.Verb] M.Verb

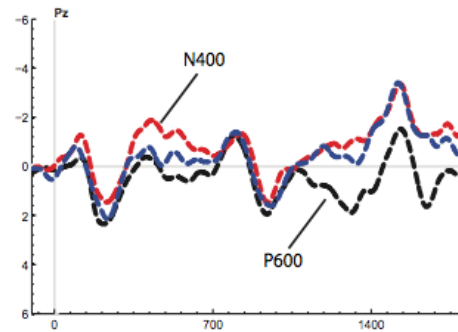


Figure 2 ERPs time-locked to the embedded verbs in (3). Main verb onset was at 700 ms.

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