Priming acceptability judgments of NPI *any*

Summary   We report on a priming experiment whose results indicate that (i) acceptability judgments of the Negative Polarity Item (NPI) *any* can be primed, but (ii) only unacceptable sentences of the same type, i.e., those that contain unlincensed *any*, trigger priming effects. While these findings from a single experiment on their own admittedly have only indirect implications on theories of NPI licensing, we argue that our paradigm has far-reaching methodological importance for theoretical linguistics, offering a novel way of directly testing theoretical predictions. We will illustrate this with the so-called bagel problem for certain Russian NPIs and the source of island effects.

NPI *any* in non-monotonic environments   Weak NPIs like *any* are canonically licensed in Downward Entailing (DE) environments (Fauconnier 1975, 1979, Ladusaw 1979, 1980), but it is also known that they are licensed in certain non-monotonic (NM) environments (Linebarger 1980, 1987). For NM environments with DE at-issue meaning and non-DE presupposition, von Fintel (1999) proposes that weak NPIs are insensitive to presuppositions. However, there are instances of weak NPIs in certain NM environments that this account does not explain. Among those, we focus on NPI *any* under *exactly* n (Heim 1984, Rothschild 2006, Crnič 2011).

(1)   Exactly two restaurants served any vegan dishes.

Previous experimental research found that the acceptability judgments of such sentences are not as crisp as those of NPI *any* in plainly DE environments (Alexandropoulou, Bylinina & Nouwen 2020). Using the experimental method of *priming*, our experiment investigates how these acceptability judgements are affected by preceding sentences. To the best of our knowledge such priming effects on acceptability judgments have not been systematically investigated before.

Priming   Priming has been extensively used to investigate mental representations in various domains of psycholinguistics, most relevant of which in the context of our research is the so-called *structural priming* (Bock 1986; see Pickering and Ferreira 2008 for an overview). To illustrate, participants in Bock's (1986) study repeated prime sentences, appearing either in active or in passive form, and then described a picture. When doing so, they were more inclined to utter a sentence in passive when they had repeated a passive sentence (a 'prime'), than when they had repeated an active prime. This is taken as evidence for the psychological reality of some mental representation that encodes the voice information, but is abstract enough to not include the specific lexical items of the primes. This experimental technique has more recently been used to argue for mental representations of quantifier scope (Raffray & Pickering 2010, Chemla & Bott 2015, a.o.) and scalar implicatures (Bott & Chemla 2016, Meyer & Feiman 2021, a.o.). In the present study, we employed the structural priming paradigm to address our investigation into how the acceptability of *any* in NM environments is affected by the (un)acceptability of different types of primes.

Material, method, and procedure   We collected acceptability judgments of 16 sentences that contain *exactly* n as subject and NPI *any* as object, as in (1). As weak NPIs are considered to be judged as more acceptable for smaller n's (Heim 1984, Rothschild 2006, Crnič 2011), we used numerals between *two* and *eight* (each in two target items). Each target item was preceded by two primes (as in most previous structural priming experiments). There were six types of primes altogether. They contained *no* or *some* as the subject quantifier and one of the following as the object quantifier: (a) NPI *any*, (b) a bare plural, or (c) *many* + singular NP. Regardless of the subject quantifier, (b) is expected to be grammatical, and (c) is expected to be ungrammatical, while (a) should be sensitive to the subject quantifier. Therefore, there were six types of primes, as exemplified in (2) and (3). The experiment also contained 72 filler items with varying acceptability.

(2)   a.   No artists sold any paintings.   (3)   a.   Some artists sold any paintings.
     b.   No artists sold paintings.   b.   Some artists sold paintings.
     c.   No artists sold many painting.   c.   Some artists sold many painting.

90 participants were recruited on Prolific. They were randomly assigned to one of the six priming conditions. Each of them provided acceptability ratings of 120 sentences (16 target items, each preceded by 2 primes, plus 72 filler items) on a 7-point Likert scale (labelled 'Completely ungrammatical' on the left and 'Completely grammatical' on the right), after reading instructions that were

modelled after those used by Sprouse, Schütze & Almeida 2013 and completing one practice item. Two participants were excluded from the analysis for low accuracy on filler items ($< 75\%$).

Results The ratings of primes and target items are summarized in Figure 1. The acceptability judgments of primes (left column, Figure 1) are overall as expected. We fitted an ordinal mixed effect regression model to the target data using the `ordinal` package (Christensen 2022) for R.

Two fixed effect variables, Subject and Object, were each treatment-coded with *Some* and *Any* as reference levels. The model also had by-item variance on the intercept as the sole random effect (including any other random effect resulted in estimation error). The model reveals that target items following Some+Any primes were judged as more acceptable than those following No+Any primes ($\beta = -1.14, p < 0.001$). We also observe that target items following Some+Any primes were judged as more acceptable than those following the other two kinds of
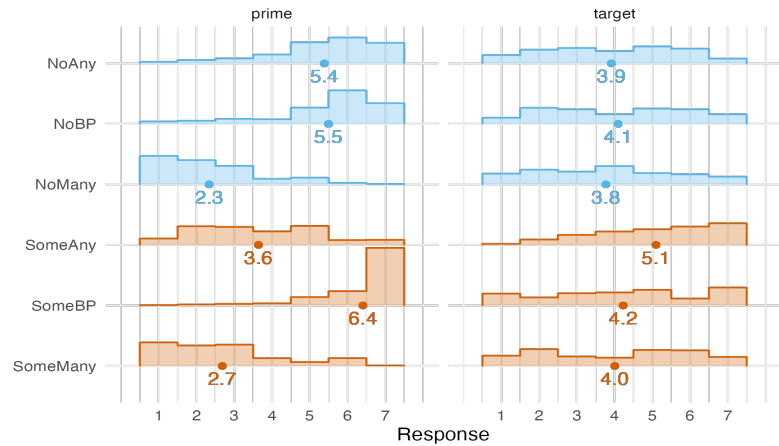

Figure 1: Ratings of primes and target items by condition. The numbers are mean ratings and the histograms represent distributions of by-subject mean ratings.

primes containing *some* as subject (BarePlural: $\beta = -0.83, p < 0.001$; Many: $\beta = -1.04, p < 0.001$). Moreover, the significant positive interaction effects (BarePlural: $\beta = 0.99, p < 0.001$; Many: $\beta = 0.88, p < 0.001$), which counteract the negative effect of Subject, suggest that there is not much difference among target items following the three types of primes containing *no* as subject.

Discussion The experimental results indicate that acceptability judgments of NPI *any* under *exactly* n can be primed, but only by unacceptable primes containing unlicensed NPI *any* (i.e. Some+Any). It is especially notable that the kind of unacceptability triggered by the number mismatch between *many* and a singular NP exhibited no comparable priming effects. This selective nature of NPI priming gives credence to the existence of a mental representation dedicated to NPI licensing. We illustrate here two potential ways of making use of this finding to directly investigate theoretical issues in future research. The first one is the so-called 'bagel problem' for Russian NPIs. Russian has two series of NPIs, wh+*libo* and wh+*nibud'*, which are licensed in all environments where NPI *any* is licensed, except under negation (Haspelmath 1997, Pereltsvaig 2004). One way to understand this pattern is by assuming that these Russian NPIs are weak NPIs on a par with NPI *any*, but have further licensing conditions. In that case, we expect unlicensed instances of uncontroversially weak NPIs (in Russian or English) to trigger priming effects on wh+*libo*/wh+*nibud'*. The second theoretical issue we discuss here is how island effects are to be explained. It has long been suggested that at least some island effects—especially the so-called weak islands (see, e.g., Szabolcsi 2006)—are to be explained non-syntactically (see Newmeyer 2016 for an overview). Testing what has priming effects on the acceptability of which islands may provide direct evidence for some of these theoretical explanations.

Lastly, we also note that unlike unlicensed NPI *any* (i.e. Some+Any), licensed NPI *any* (i.e. No+Any) had no noticeable priming effects. We claim that this is part of a general property of priming that only 'unexpected events'—in our case unlicensed *any*—trigger priming effects. This is explained by the hypothesis that the mechanism behind priming is an adaptation mechanism (Fine, Jaeger, Farmer & Ting 2013, Jaeger & Snider 2013, Waldon & Degen 2020, Marty, Romoli, Sudo & Breheny to appear). Applying this hypothesis to our case, we claim that the adaptation mechanism lowered the standard for the overall acceptability/grammaticality of NPI *any*, upon exposure to unlicensed instances (cf. 'syntactic satiation effect'; Snyder 2000).