How do readers adapt to unfamiliar syntax?: Evidence from *needs*+past participle

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A fundamental challenge for comprehension is that language varies across contexts, disrupting the use of prior linguistic experience. One solution may be for the comprehension system to adapt to the current environment. Indeed, comprehenders rapidly adapt to novel or unfamiliar syntactic constructions [1,2]. Here, we investigate if the mechanism underlying this adaptation is (a) probabilistic prediction of the specific novel structure [3], (b) broadened acceptance of anomalous input [4], or (c) *preparation* for certain input types without specific predictions [5].

Method. We examine this question in the context of the *needs*+past participle construction (*Dialectal Need*, example 1a) in some English dialects [6]. For people unfamiliar with Dialectal Need, it receives a garden-path interpretation (modifier, 1b) that initially makes the structure slow to read [1], but speed quickly improves with repeated exposure [1]. Here, we use moving-window self-paced reading to test the *consequences* of that adaptation for other constructions. In an initial *exposure phase*, participants encountered either Dialectal Need or a conventional control (1c) embedded within 4- or 5-sentence texts and intermixed with 50% filler texts. (A post-experiment questionnaire confirmed participants' prior unfamiliarity with Dialectal Need.) Then, participants transitioned invisibly to a *test phase* in which we tested the effects of that exposure on other syntactic constructions, as measured in length- and position-corrected reading times.

In **Experiment 1** (N=119), the test phase contained either Dialectal or Conventional Need (Fig. 1). Replicating [1], participants read Dialectal Need in the test phase more quickly with previous exposure to it (as compared to Conventional Need exposure). This effect was specific to the spillover word following the disambiguation of the critical construction, t = -2.16, *lmerTest* p = .03, and did not affect filler items, suggesting it reflected processing of Dialectal Need. By contrast, participants did *not* read Conventional Need more slowly after Dialectal Need exposure, p = .60. Given that Dialectal Need also does not impair processing the garden-path modifier structure [1], these results indicate a lack of support for probabilistic prediction, in which adaptation to Dialectal Need should impair processing of other, competing structures.

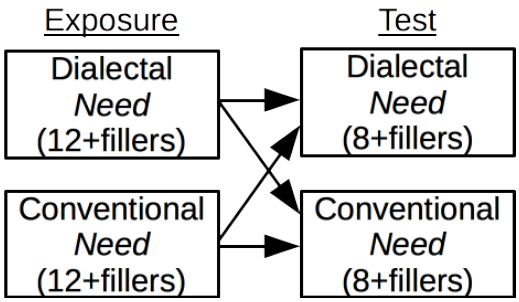
If comprehenders were not predicting particular structures, why did exposure to Dialectal Need facilitate its subsequent processing? One possibility is that comprehenders simply relaxed their standards for unfamiliar or "erroneous" input rather than adapting to Dialectal Need per se. If so, exposure to Dialectal Need should facilitate processing of *any* unfamiliar construction. In **Experiment 2** (N= 64, Fig. 2), the test phase contained a dissimilar dialectal construction: Positive Anymore (example 2); Dialectal Need can be interpreted as the *absence* of "to be" (e.g., "needs to be washed" → "needs washed"), but Positive Anymore involves the *presence* of the unexpected word "anymore" [7]. Relative to Conventional Need, exposure to Dialectal Need significantly *slowed* reading of the spillover word after the disambiguation of Positive Anymore, t = 2.57, p = .01. The negative effects of Dialectal Need on Positive Anymore show that adapting to one unfamiliar construction does *not* facilitate processing of all unfamiliar constructions.

Discussion. Replicating [1], reading times displayed rapid adaptation to an unfamiliar syntactic construction. This adaptation did *not* impair processing of conventional structures with the same meaning, suggesting it was not probabilistic prediction (since increasing the probability assigned to one construction must decrease that assigned to others). Nor did adaptation generalize to dissimilar dialectal constructions, suggesting that it did not reflect general accommodation to unfamiliar or "erroneous" input. Rather, we hypothesize the comprehension system adjusts to processing certain structures (or classes of structures) without generating advance predictions. This concords with the proposal [5] that the comprehension system *prepares* to receive kinds of certain syntactic (or other linguistic) features without always making specific predictions.

REFERENCES
[1] Kaschak & Glenberg (2004), *JEP:General*. [2] Luka & Choi (2012), *JML*. [3] Levy (2008), *Cognition*. [4] Boland, de los Santos, Carranza, & Kaschak (2015), CUNY2015. [5] Ferreira & Chantavarin (2018), *Curr. Dir. in Psych Science*. [6] Murray, Frazer, & Simon (1996), *American Speech*. [7] Youmans (1986), *American Speech*.

EXAMPLE SENTENCES (underline = disambiguation; double underline = spillover)
(1a) The science book needs edited because there are still typos. **[Dialectal Need]**
(1b) The science book needs edited chapters… **[Modifier Garden-Path]**
(1c) The science book needs editing because there are still typos. **[Conventional Need]**
(2) Everyone drives a car anymore instead of walking. **[Positive Anymore]**
(gloss: 'Everyone drives a car nowadays instead of walking.')

FIGURES



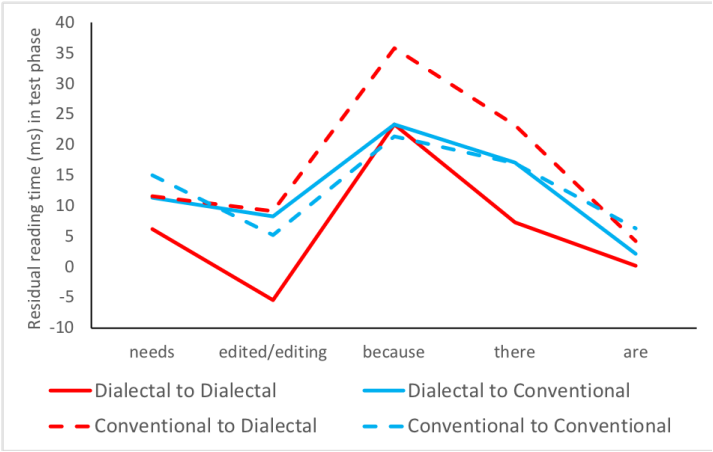
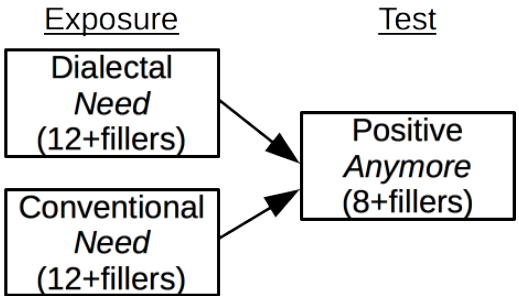


Figure 1. Experiment 1 design (left panel) and results (right panel).



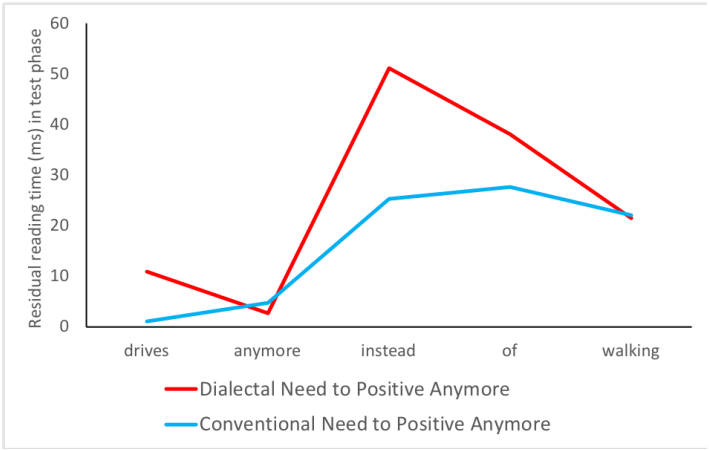


Figure 2. Experiment 2 design (left panel) and results (right panel).