Considering experimental and observational evidence of priming together, syntax doesn't look so autonomous

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Abstract: We agree with Branigan & Pickering (B&P) that structural priming experiments should supplant grammaticality judgments for testing linguistic representation. However, B&P overlook a vast (corpus-)linguistic literature that converges with – but extends – the experimental findings. B&P conclude that syntax is functionally independent of the lexicon. We argue that a broader approach to priming reveals cracks in the façade of syntactic autonomy.

Branigan & Pickering (B&P) make a compelling case for the utility of experimental methods – in particular, priming – for understanding linguistic representation. We whole-heartedly support this position. As linguists, however, we must note that B&P have misrepresented the state of affairs within linguistics. The claim that linguists rely solely (i.e., "on a single method," "dominantly," "almost exclusively") on acceptability judgments is an exaggeration. Said judgments have indeed been prevalent in the work of some linguists, but – especially in the last two decades – this is far from the sole method used. A glance at the papers forthcoming in *Language* finds just one paper using acceptability judgments, but four using analyses of observational data or corpora and two using advanced statistical techniques. Furthermore, several major schools of linguistic thought have flatly rejected the validity of acceptability judgments for more than three decades (e.g., Bybee 2006; Chafe 1994; Givón 1983; Thompson & Mulac 1991).

Much of what we discuss below relies on corpus data. Pickering and Branigan (1999) argue that such data cannot speak to the nature of priming, given their relatively low level of control compared to well-controlled experimental designs. This assumption reflects a common prejudice among experimental psychologists: That the "found data" nature of corpora makes them unsuitable for disentangling target effects from confounds. Modern statistical techniques now enable distinguishing the influences of many confounding variables. In fact, many variables important to priming are more difficult to control for in experimental paradigms than in corpus studies (e.g., distance effects between prime and target, beta-persistence [Szmrecsanyi 2006]; effects of non-variable structures on variable contexts, cumulative priming effects [Jaeger & Snider 2013]).

B&P argue that syntactic representations are independent of semantics and lexicon. This assertion is ambiguous (Croft 1995). We all agree that syntactic aspects are (explicitly or implicitly) represented in the mind. However, saying that syntax is

functionally and/or representationally encapsulated apart from lexicon and semantics is more contentious. B&P support this claim by showing that abstract clausal templates (e.g., prepositional-object [PO] or double-object [DO]) are primed even without lexical overlap between the prime and target. Further, semantically dissimilar but syntactically similar structures prime each other. For example, intransitive + locative-PP constructions prime passives. However, these intransitives and passives have more in common than acknowledged by the authors. For instance, ergative languages align such structures along both syntactic and semantic dimensions (Keenan 1984). Moreover, semantic similarity beyond lexical overlap has been found to drive syntactic choice of PO/DO, even in the absence of syntactic similarity (Hare & Goldberg 1999).

Another strong indicator of the semantic properties of clausal constructions is the statistical association between verbs and constructions (Goldberg 2006; Ellis & Ferreira-Junior 2009; Stefanowitsch & Gries 2003). These associations co-determine the magnitude of priming (e.g., Gries 2005). Importantly, they do not merely boost priming but may actually resist priming (and these relationships may change depending on context [Jaeger & Snider 2013]). Lexical choices also often dictate syntactic choices, both in production and in comprehension (e.g., Jaeger 2010; Novick et al. 2003). Importantly, such choices may be influenced by syntactic information that prima facie should be irrelevant to the syntactic alternation under consideration (Wasow et al. 2011). Furthermore, words – even syntactically impoverished bare nouns – are never processed in isolation from the entirety of their syntactic distributional information, and may prime each other via such distributions (Lester & Moscoso del Prado Martín 2016; Lester et al.,2017).

B&P survey clear evidence of priming among words, syntactic structures, and semantic structures. They also explain how simultaneous overlap between any two of these levels results in increased priming (the so-called boosts). One can account for these findings in two ways: (1) relationships among syntax, semantics, and lexicon are captured by additional interfaces whose only job is to combine information from separate modules (e.g., Jackendoff 2013); or (2) the relationships constitute connection weights between words and structures, which are directly related in memory (Diessel 2015). B&P appear to prefer the first option. However, short of undisputed neuropsychological evidence for the separation between these representational levels (which is not known to us), there is no way of distinguishing among three separated levels with connections between them, and a single level of representation with different degrees of overlap. Considering that priming effects are very similar in the three levels, and that overlap among them interacts, it seems more parsimonious to assume a single layer of representation, rather than positing three such encapsulated layers plus interconnections.

B&P's arguments rely on binary choices (such as PO/DO). However, it is unlikely that these choices could benefit from structural overlap in phrasal constituents; the critical variable depends only on where those phrases are placed. If there is no additional reason to adjust structures to accommodate the accessibility of subclausal units, then why would one? Whether there may be a task-driven confound remains a question for further study. However, notice that chronometric studies show that the locus of priming may not always be the clause, even when clause-structural overlap is present (Smith & Wheeldon 2001). Further, more comprehensive models of linguistic reproduction exist, which make distinctions beyond simple identity priming. Consider Dialogic Syntax (Du Bois 2014;

Du Bois et al. 2014), which distinguishes among framing resonance, the locus of syntactic priming, and focal resonance, the aligning of meanings within syntactic alignment.

We emphasize that we are not advocating the position that syntactic priming is reducible to lexical, semantic, or pragmatic effects. To truly understand linguistic representation on the basis of processing, we must consider all possible sources of information from processing across all levels that are brought to bear on language use, including data from both experimental and observed contexts. This trend is already well underway in several major branches of linguistics. B&P's bold proposal to establish "a new basis for understanding the nature of language" stands to benefit from a full partnership with researchers drawing on a broad range of evidence to account for a system that dynamically responds to linguistic, cognitive, and interactional contexts.

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