MIT Open Access Articles

*Structural priming is most useful when
the conclusions are statistically robust*

The MIT Faculty has made this article openly available. **Please share**
how this access benefits you. Your story matters.

Citation: Mahowald, Kyle et al. "Structural priming is most useful when the conclusions are statistically robust." Behavioral and Brain Sciences, 40 (2017): e302 © 2017 Cambridge University Press

As Published: <http://dx.doi.org/10.1017/s0140525x17000504>

Publisher: Cambridge University Press (CUP)

Persistent URL: <https://hdl.handle.net/1721.1/122804>

Version: Author's final manuscript: final author's manuscript post peer review, without publisher's formatting or copy editing

Terms of use: Creative Commons Attribution-Noncommercial-Share Alike

Title: Structural priming is most useful when the conclusions are statistically robust

Kyle Mahowald, MIT Brain & Cognitive Sciences
Richard Futrell, MIT Brain & Cognitive Sciences
Edward Gibson, MIT Brain & Cognitive Sciences

The relevant expertise we bring to bear on the target article or book: sentence processing; syntax; semantics. One relevant paper of ours:

Mahowald, K., James, A., Futrell, R., & Gibson, E. (2016). A meta-analysis of syntactic priming in language production. *Journal of Memory and Language*. doi: 10.1016/j.jml.2016.03.009.

Our paper provides a meta-analysis of syntactic priming, showing that although it is a real phenomenon, studies using it are often under-powered, especially when the studies attempt to test claims about how syntactic priming is moderated by other variables. This is highly relevant to Branigan & Pickering's claim that syntactic priming can be used to adjudicate details of syntactic theory.

Commentary response:

Branigan & Pickering (2016; henceforth BP) claim that the success of structural priming as a method should “end the current reliance on acceptability judgments.” The basis of such a claim rests on the premise that, not only is structural priming a robust psychological phenomenon, but also it can be used to adjudicate between finer points of syntactic theory. While we agree that structural priming is an interesting and useful phenomenon, we have reservations whether there is sufficient statistical evidence to support all the detailed claims made about specific points of syntactic theory.

For instance, as a case study of what they call the “clearest example,” BP discuss what priming studies tell us about passive constructions and specifically how priming studies push back against the standard generative grammar accounts of passives. The details of this argument rely on priming studies that go beyond asking whether Structure X in a prime sentence leads to an increased likelihood of a participant producing Structure X in a target sentence. Rather, it relies on evidence that locatives prime passives (Bock and Lobell, 1990), that unergatives prime unaccusatives (Flett 2006), and that POs and DOs prime light verbs (Wittenberg 2014). Often, there is only one paper that investigates a particular research question, and BP typically accept the results of that paper as delivering a statistically valid conclusion about the phenomenon in question.

In a meta-analysis in Mahowald et al. (2016), we give evidence that structural priming is a robust and well-replicated phenomenon, but caution that studies of the type that BP rely on for some of their conclusions (specifically, studies that ask whether some priming effects are greater than others or whether certain factors, such as age or L2 status, moderate priming effects) are statistically underpowered (with an average power of 53%-as determined by a p-curve analysis) and often do not use enough participants to warrant the conclusions drawn. Indeed, in studies of this sort, we recommend using several

hundred participants—which almost no existing priming studies do.

While this is not evidence that the conclusions drawn in any one study that BP referenced are misleading, we should be cautious not to assume that every individual study can be used as a building block in a larger syntactic theory. Rather, we should expect some studies to reach statistically significant conclusions (or fail to reach statistically significant conclusions) based on chance alone—and not just because of the experimental manipulation. This is of particular concern when there is only one unreplicated study on a particular phenomenon.

Of course, none of this is to say that structural priming should not be used alongside and sometimes instead of acceptability judgments (which have their own host of pitfalls). In the often messy world of empirical science, the availability of diverse, orthogonal methods that explore the same research question using different techniques is a feature, not a bug. So, insofar as BP argue against the hegemony of one particular technique (acceptability judgments) in linguistics research, we agree. Insofar as they argue for the hegemony of a different technique (priming), we urge a healthy skepticism.