No pseudo-morphological decomposition during lexical access, but actual morphological analysis in the lexicon: Meta-analytical evidence from seven new replicated masked priming experiments.

Introduction. Cross-linguistic masked priming evidence shows that [a] bimorphemic (***bone****less*) and [b] pseudo-affixed, monomorphemic words (***corne****r*) often trigger similar masked priming effects on their stems (*BONE* and *CORN,* respectively). In contrast, [c] monomorphemic words (e.g., ***cash****ew*) trigger negligible effects on the embedded stem (*CASH*). The dissociation between [a, b] and [c] has been taken as evidence that lexical access goes through an obligatory decomposition procedure based on morpho-orthographic "islands of regularity", i.e. the statistically-regular letter sequences corresponding to the orthographic realizations of morphemes (cf. Rastle & Davis 2008). This procedure arguably occurs *before* accessing any lexical (morpho-syntactic, or semantic) information so that, at early stages, [b], but not [c], can be provisionally visually decomposed similarly to [a]. Thus, this decomposition process is not an actual *morphological* or even *linguistic* process *per se* (despite often being described as *morphological decomposition*), but a *visual* process informed by morpho-orthographic statistical regularities. Recent findings, however, have challenged such a view, showing *differential* effects for [a] and [b] (e.g., Feldman et al. 2009), and *similar* effects for [a] and [c] or [b] and [c] (e.g., Morris et al. 2011).

Methods. We conducted seven different replications of an English masked priming experiment both in-lab and online, to ensure replicable results (N_{total}=1,235). Five conditions were tested across all experiments: An *identity* condition (*fuss-FUSS*), a transparent *morphological* condition (*sharper-SHARP*), a *pseudo-morphological* condition (*belly-BELL*), and two orthographic control conditions: a *nonsyllabic orthographic* control (*bark-BAR*), and a *syllabic orthographic* control (*cashew-CASH*). Items were controlled for orthographic length and word frequency. Trials consisted of a 33ms-long prime preceded by a 500ms-long forward mask, and followed by a target, on which participants performed a lexical decision task. After excluding subjects and items with high error rates, and trials with outlying prime durations or extreme RTs, we performed a varying-coefficient meta-analysis (Bonett 2009) on the raw-data estimates across all seven replications.

Results. Identity and *morphological* priming effects were indistinguishable, and almost as large as the prime duration, suggesting ceiling effects ($M_{identity}$=26 ms, 95% CI [22 30]; $M_{transparent}$=26 ms, 95% CI [22 29]). *Pseudo-morphological* priming was significantly smaller than both (M_{opaque}=17 ms, 95% CI [13 21]), and closely matched the *nonsyllabic orthographic* priming condition ($M_{nsyll\text{-}ortho}$=16 ms, 95% CI [11 20]), which was somewhat larger than the *syllabic orthographic* priming condition ($M_{syll\text{-}ortho}$=9 ms, 95% CI [5 13]).

Conclusions. These results are incompatible with the proposal that lexical access includes a *pre-lexical morpho-orthographic decomposition* of the input, as *pseudo-morphological* priming patterned with purely *orthographic* priming, not with actual *morphological* priming. In contrast, real *morphological* priming effects were indistinguishable from *identity* priming effects, possibly indicating that these priming effects obtain at the *lexical*, not *prelexical* level, suggesting that even very brief visual presentations (here, 33ms) are sufficient to lead to access to lexical information, contrary to the assumption that only pre-lexical processes can occur during that time window.

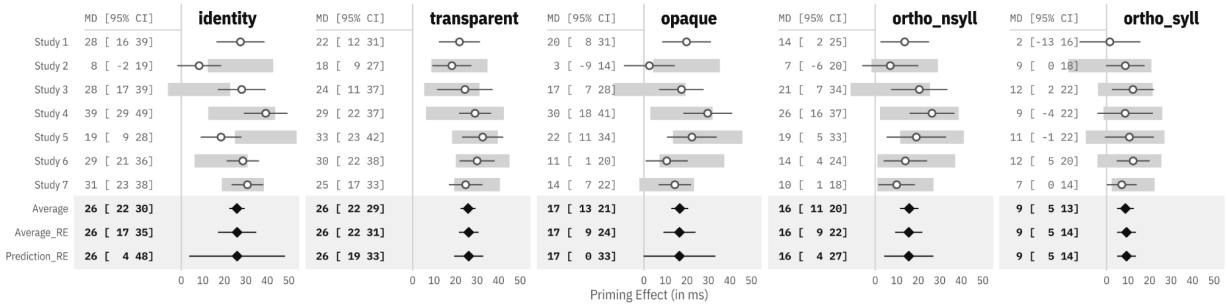

Figure 1: Mean and 95% CI of each condition in each experiment in our sample. The gray bands indicate the 95% Prediction Interval (PI) of one study to the next. The last three lines include the following estimates: the mean and 95% CI of the Varying Coefficient Meta-Analysis and Random-Effects Meta-Analysis, as well as the 95% Prediction Interval (PI) of the Random-Effects Meta-Analysis.