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Corrigendum

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Neural predictors and effects of cognitive behavioral therapy for depression: the role of emotional reactivity and regulation – CORRIGENDUM

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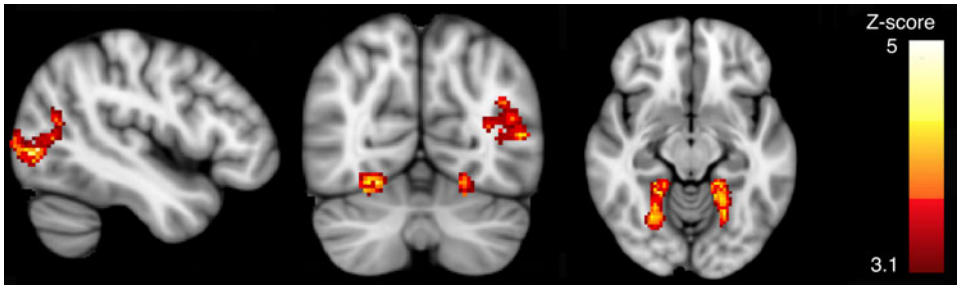
This article was published in Psychological Medicine with an error in our analysis code that affected the longitudinal (pre-post treatment) whole-brain voxelwise analyses reported in the manuscript. The authors have written below in order to correct this error:

We discovered an error in our previous publication, *Neural predictors and effects of cognitive behavioral therapy for depression: the role of emotional reactivity and regulation* (Rubin-Falcone H et al, Psychol Med 2020;50(1):146–160). We identified an error in our analysis code that affected the longitudinal (pre-post treatment) whole-brain voxelwise analyses reported in the manuscript. The error caused the order of the files in the analysis to be shuffled.

We had previously reported that better treatment outcome with cognitive behavioral therapy for depression was associated with increased down-regulation of BOLD activity during emotion regulation from pre- to post-treatment in precuneus, occipital cortex, and middle frontal gyrus. However, in our corrected analysis, this was a null contrast, with no significant findings at our *a priori* statistical threshold. This result was reported in the abstract, results section 3.3.3, in the conclusions paragraph 4, and Figure 3 (b) and a portion of table 2. All discussion of it in the manuscript should be ignored.

We had previously reported no significant association between longitudinal changes in emotional reactivity BOLD signal and treatment outcome (results section 3.2.3). In our corrected analyses, we found that increased emotional reactivity BOLD signal from time 1 to time 2 was associated with lower BDI post treatment (better treatment outcome) in bilateral lingual gyrus (right: peak $Z = 4.54$ at 22,-70,-16 with 334 voxels, corrected $p = 0.024$; left: peak $Z = 4.62$ at -22,-50,-14 with 290 voxels, corrected $p = 0.039$; does not survive correction for multiple analyses) and left lateral occipital cortex (peak $Z < 0.001$ at -52,-70,10 with 1117 voxels corrected $p < 0.001$) (See figure below).



No other analyses were impacted by this error, including main effects of tasks (Figures 2(a) and 3(a), table 2), prediction of treatment outcome for each task (table 2, figure 2(b)), all reported region-of-interest-based analyses (results section), and sample descriptions (figure 1, table 1).

Discussion of new findings:

We found that greater BOLD-fMRI responses to emotionally aversive images from pre- to post-treatment in lingual gyrus and occipital cortex correlated with better treatment outcome. In an earlier analysis of this same cohort, we found that increased emotion-regulation BOLD signal within lingual gyrus during an aversive-memories based task was also associated with improved treatment outcome. These two findings taken together suggest that CBT targets the lingual gyrus during both emotion regulation and emotional reactivity. Given

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that this region is associated with the verbalization of high-emotion words, these results support the hypothesis that CBT's efficacy is correlated with increased verbalization during both deliberate and subconscious emotional processing.

We did not find any associations between treatment outcome and emotion regulation BOLD signal using the task discussed here, although we found that emotion regulation BOLD signal increases correlated with better treatment outcome in this same cohort using a different aversive memories-based task. This may have been because the distancing strategy used in the pictures task discussed here is less cognitively taxing than some other reappraisal strategies, and after learning it participants have reported decreased stress without deliberately applying the strategy. The aversive memories task used in our earlier analysis involved a more taxing and deliberate regulation strategy, which might explain why there were longitudinal treatment outcome associations using that task but not the one discussed here.

The authors apologise for this error.

Reference

Rubin-Falcone, H., Weber, J., Kishon, R., Ochsner, K., Delaparte, L., Doré, B., … Miller, J. (2020). Neural predictors and effects of cognitive behavioral therapy for depression: The role of emotional reactivity and regulation. *Psychological Medicine*, *50*(1), 146–160. doi:10.1017/S0033291718004154

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