Reviewer's report

Title: Cross-modal deactivations during modality-specific selective attention

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Reviewer: Notger G Mueller

Reviewer's report:

In their study the authors address the interesting topic of crossmodal sensory interaction. However, this topic has been studied by many others before and - I must say - using a more convincing approach. This is my critique in more detail:

1. The authors state their study to be the first to assess crossmodal interactions in the absence of target stimuli. This is not true: Baier et al (J. Neuroscience, 2006) have studied cue induced activity in primary auditory and visual cortex by extracting signal change before target onset.

2. If the authors are interested in target absent effects, why omit targets only in 1/3 of trials? Why create a range of stimuli varying in difficulty when this is never analyzed further? And why are subjects not told that there are no-target trials? If they are supposed to give yes/no answers, how would a no answer make sense if subjects are left to believe that a target is presented in every trial?

3. There was no behavioral effect of visual attention. Later in the discussion the authors admit that visual and auditory tasks differed in task difficulty because there was auditory but no visual noise. So why wasn't visual noise added to make the tasks equally difficult and allow for behavioral attention effects in the visual task as well? Why are the d' values of the visual task not presented?

4. The authors did not subdivide auditory and visual cortex further. This is not state-of-the-art anymore. One would certainly love to see how the effects differ from V1 to V4.

5. In the discussion the authors state that attention drives sensory activity only when highly salient stimuli are presented. This is not true: Ress et al (Nat Neurosci, 2000), amongst others, found attention effects in V1 to be strongest with low-contrast as opposed to salient stimuli.

To conclude: one gets the impression the authors had different aims in mind when they designed their study (why for example the complicated modulation of stimulus salience?) but failed to observe the expected effects. In their discussion they themselves suggest how future studies could address their questions more adequately. They should do that.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable
Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests.