

rsa report 9-16 (ROI approach)

First off, I have a shorthand for describing the various encoding phases, conditions, and source memory responses. For example:

`CS+B_B` = CS+ items that were encoded during Baseline, that then were sourced to Baseline

`CS+B_A` = CS+ items that were encoded during Baseline, that then were sourced to Acquisition.

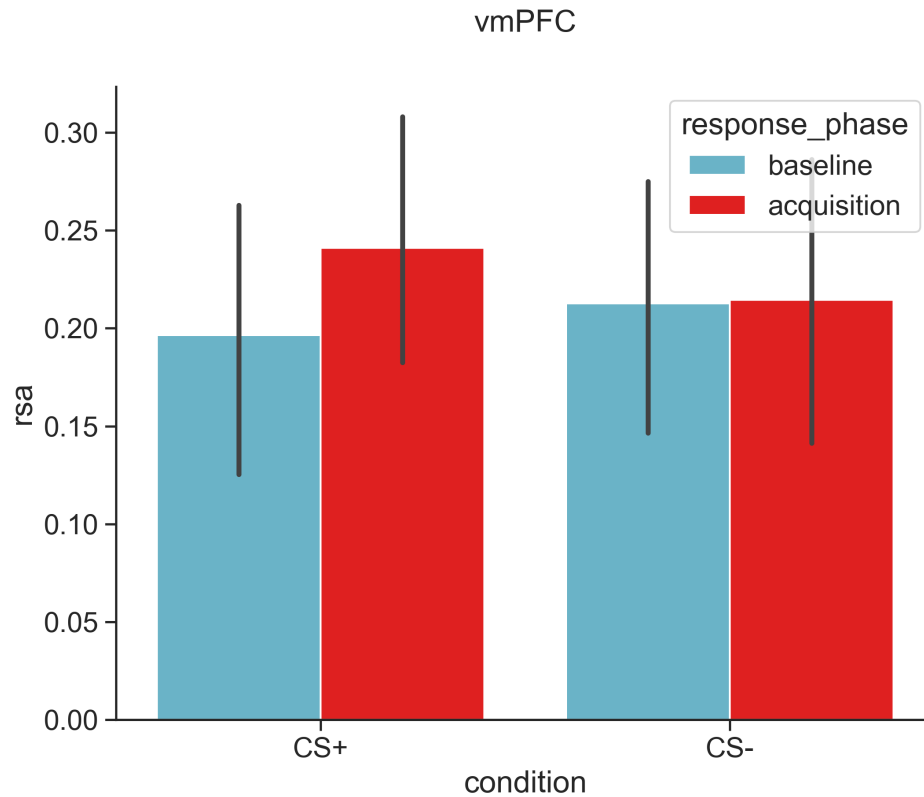
My ROI based approach includes the following bilateral ROIs:

`[amyg_cem, amyg_bla, hc_head, hc_body, hc_tail, dACC, vmPFC]`

The first analysis was a comparison of items encoded during baseline to items encoded during acquisition that were sourced correctly.

Specifically, we hypothesized that some areas might show increased based on matching source memory responses (`CS+B_A` to `CS+A_A` similarity), compared to "correct" responses (`CS+B_B` to `CS+A_A` similarity).

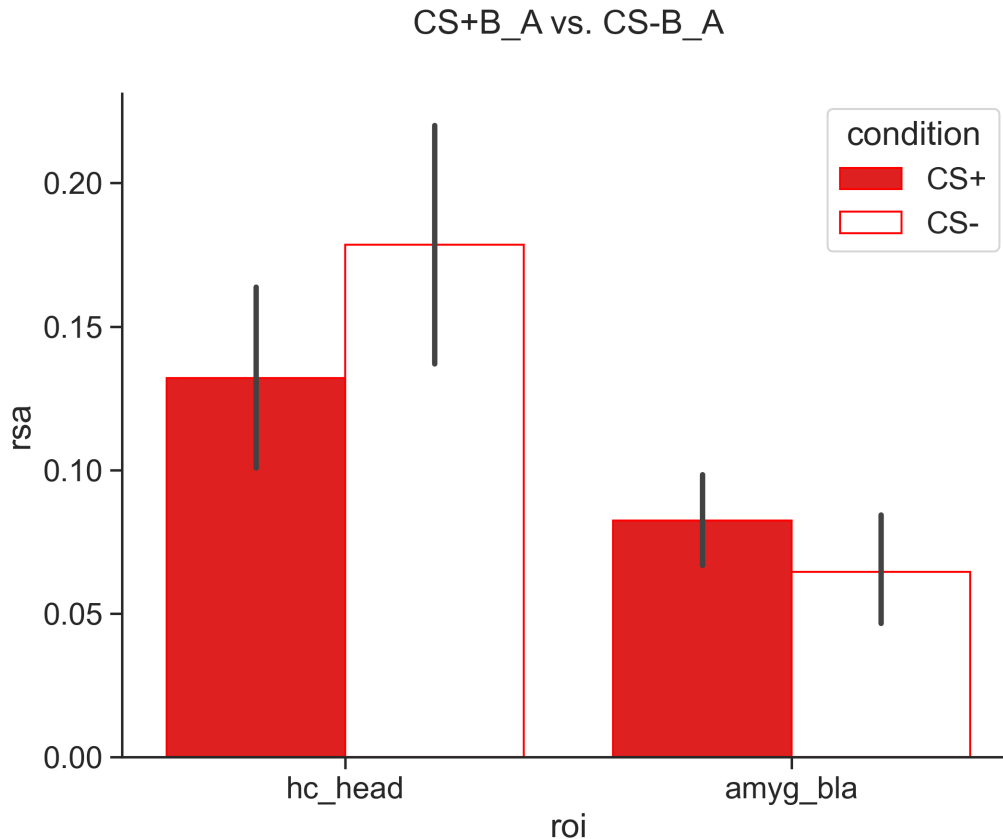
The only ROI where this was true was the vmPFC, and again its unclear how to interpret this.



	W-val	tail	p-val	
vmPFC	156.0	two-sided	0.044417	*

Using the same data, we can also look for regions showing learning specific effects, i.e. areas where **CS+B_A** similarity is higher than **CS-B_A** similarity (comparing the two red bars in the above graph)

Again, an almost completely null result, except for the two **trending** results in the hippocampus head and amygdala BLA. They're just trending, and in opposite directions, so not much to interpret here. I mainly just include them here as possible places to check again in a searchlight analysis of this same comparison.



	w-val	tail	p-val	
hc_head	177.0	two-sided	0.065712	~
amyg_bla	185.0	two-sided	0.089613	~

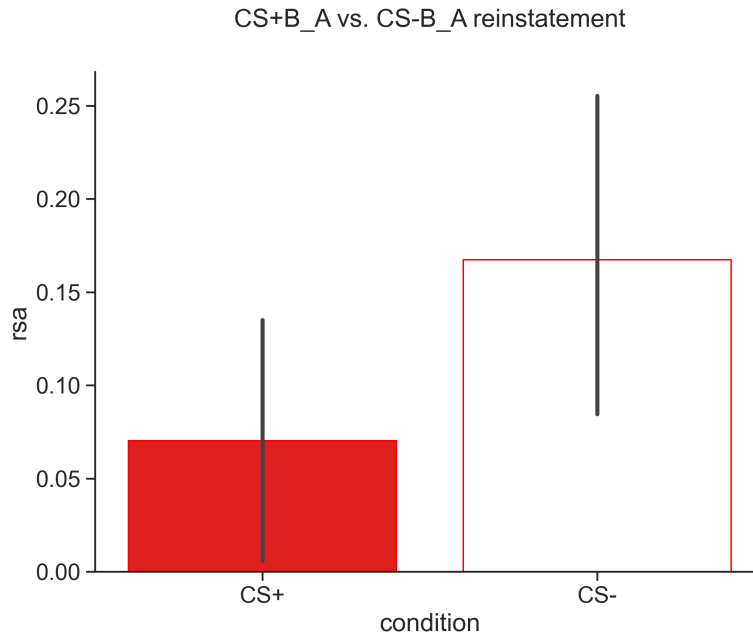
Encoding-retrieval similarity

As Alison suggested in LewPea lab meeting, I also compared ERS between `CS+B_B` and `CS+B_A`. The hypothesis here is that `CS+B_B` will be more strongly reinstated than the `CS+B_A`, since they were sourced to the correct temporal context, and possibly underwent less representational change.

Good idea, but was a null effect across all ROIs.

Next, I looked for effects of CS+ on reinstatement. `CS+B_A` vs. `CS-B_A` ERS.

Again null effect in most ROIs, however, again we see an effect in our vmPFC ROI.



	W-val	tail	p-val
vmPFC	150.0	two-sided	0.020189 *

In combination with the 1st analysis above, this data is telling us that in the vmPFC:

1. During retrieval, there is an effect of CS type on the similarity of items encoded during baseline that are sourced to acquisition, compared to items encoded during acquisition that are correctly sourced. (**B_A** items to **A_A** items). there is more similarity of the CS+ items than the the CS- items. Initially, we thought that this comparison indicate some representational shift related to the emotional learning specific bias in source memory misattribution to the emotional context.
2. During retrieval, there is *less* reinstatement of the **CS+B_A** items compared to **CS-B_A** items. This is interesting as if you remember from FearGram data, the overall CS+ - CS- difference in ERS in the vmPFC is 0. But, if we look at this slice of the data (items sourced to the emotional context), we see less reinstatement for the CS+ than CS-. An interpretation here is that the CS+

items underwent more representational change during consolidation, and thus there is less of an encoding-retrieval match.

I think it's worth considering how we find these two results in the same ROI. On one hand, we are showing CS+ specific *increased* similarity to items encoded in a different temporal/emotional context, and on the other hand we are showing a CS+ specific *decrease* in ERS. Thus we have evidence that suggests a representational change has occurred, and direct evidence of a representational change. That being said, I need to read up more about how the vmPFC is thought to operate to help bind contexts, items, and emotions.