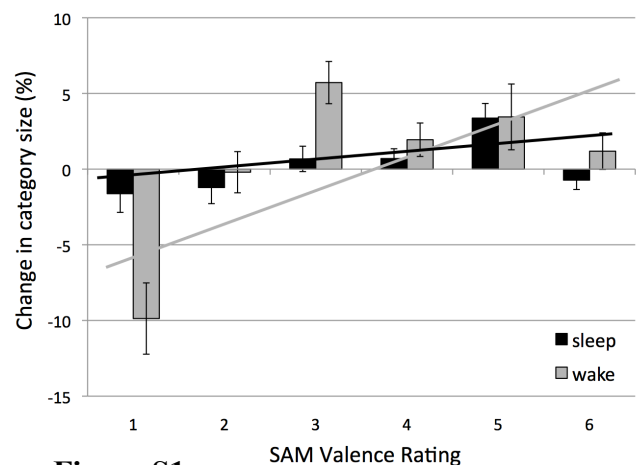


## Supplementary Results for Baran et al., Journal of Neuroscience, in press

Recently van der Helm et al (2011) published a study on the relationship between emotional reactivity and sleep. Similar to our design, the authors asked participants to rate images from the International Affective Picture System (IAPS) over two sessions separated by 12 hrs. Unlike the traditional valence and arousal ratings, they used a 5-point emotional intensity rating scale (1=not at all; 5=extremely). They suggested that emotional intensity ratings decrease overnight. We adapted the same analysis to assess whether differences may be attributable to our analytical strategy.

Rather than an item-by-item based analysis, van der Helm et al defined change in emotional reactivity as the change in the percentage of pictures rated at each level of emotional intensity. In other words, the authors found the percent of items rated as '1' in session 2 and subtracted the percent of items rated as a '1' in session 1, and so on for each emotional rating value (1-5). Note that correlations with REM physiology measures were based only on changes in percentage of items rated as a '5' (most intense).

In our study, we used the 9-point SAM rating scale and analyses were based on ratings of 1-3 (negative) and 4-6 (neutral) as our study did not include positive pictures resulting in few items being categorized as 7-9. Thus, here we calculated the change in category size for 1-6 ratings. A repeated measures ANOVA on this measure with two within-subjects factors of Session and SAM rating (1 through 6) and a between subjects factor of Group (Sleep vs Wake) revealed a significant 3-way interaction suggesting that the slope of the change is different in the Sleep and Wake groups,  $F(8, 72) = 2.69, p = .012$  (**Fig S1**).



**Figure S1**

Our picture set consisted of negative to neutrally valenced pictures whereas the van der Helm intermingled positive, negative and neutral pictures. In their supplemental materials, the authors separated the data by valence. Comparing the change in category size for only the negatively valenced pictures, the authors report a trend level interaction for Group (Sleep v. Wake) and session for the most intense ratings ( $p = .067$ ) with a decrease in the Sleep group and an increase in the Wake group. When we similarly restrict our analysis to the most negative rating in our data ('1'), we also find a significant Session X Group interaction,  $F(1,79) = 8.26, p = .005$ . However, contrary to van der Helm, the Wake group rated significantly less items as most negative in their second session and this percentage remained relatively constant in the Sleep group.

Thus, we maintain that the differences in outcomes of these studies reflects methodological differences. Most significantly, intermingled presentation of positive, negative, and neutral items, and/or measures based on 'intensity' (rather than valence or arousal) may yield alternative results.

### Supplementary Reference

van der Helm, E., Yao, J., Dutt, S., Rao, V., Saletin, J., & Walker M. P. (in press) REM sleep depotentiates amygdala activity to previous emotional experience. *Current Biology*.