# ***Supplementary material***

# **Emotional salience enhances the forward flow of memory**

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## **Contingency analyses on overall recall**

To better investigate the retrograde amnesic effect and the pattern of recall of the items presented right before the oddballs at encoding (oddball-1) we conducted a contingency analysis to calculate the proportion of recalled/forgotten oddball-1 items upon recall of the oddballs. Both emotional and perceptual lists showed a significant item co-dependency (emotional lists 2 (1)=65.72, p<0.0001; perceptual lists 2(1)=11.76, p=0.0006 ) which show that memory for the oddball does not come at cost of memory for its preceding item but rather it enhances it (Fig. 1A, B).

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| Chart, treemap chart  Description automatically generated  A | Chart  Description automatically generated  B |
| **Figure 1.** B and C) Contingency analyses tables showing the proportion of words recalled in each condition for emotional and perceptual lists, respectively. Recalling an oddball did not come at cost of recalling its surrounding items (oddball-1 items). | |

## **Contingency analyses on overall recall by SOA**

We conducted contingency analyses to evaluate whether enhanced memory for oddballs came at the expense of its preceding items i.e to investigate if the proportion of words recalled/forgotten depending on whether the oddballs were recalled/forgotten changed across SOAs and oddball types. Contingency analyses showed a co-dependency in emotional lists across all SOAs: SOA 1(2(1)=7.36, p=0.007), SOA 2 (2(1)=38.72, p<0.0001), SOA 3 (2(1)=4.55, p=0.03), SOA 4 (2(1)=7.15, p=0.008) and SOA 6 (2(1)=7.15, p=0.008). While at short SOAs there was a higher amount of forgotten E-1 items, this effect changed as SOA increased where there was a higher amount of recalled emotional oddballs. However, this co-dependency was not present in perceptual lists: SOA 1(2(1)=0.50, p=0.48), SOA 2 (2(1)=3.71, p=0.05), SOA 3 (2(1)=0.46, p=0.50), SOA 4 (2(1)=2.99 p=0.08), SOA 6 (2(1)=2.99 , p=0.08).

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| **Emotional Lists**  A   |  |  | | --- | --- | | Chart, treemap chart  Description automatically generated | Chart, treemap chart  Description automatically generated | | Chart, treemap chart  Description automatically generated | Chart, treemap chart  Description automatically generated | | Chart, bar chart  Description automatically generated | | |
| **Perceptual Lists**  B   |  |  | | --- | --- | | **A picture containing chart  Description automatically generated** | **Chart, treemap chart  Description automatically generated** | | **Chart  Description automatically generated** | **Chart, treemap chart  Description automatically generated** | | **Chart  Description automatically generated** | | |
| **Figure 2.**  Contingency tables as a function of SOA for oddball and oddball-1 items. A) emotional lists and B) perceptual lists. |

### **Are conditional response probability curves modulated upon oddball recall?**

We next investigated whether CRP curves were modulated depending on whether oddballs were remembered or forgotten. A 4-way RM ANOVA (oddball type [emotional, perceptual] x lag [1-5] x direction [backwards, forwards] x recall [oddball recalled, oddball forgotten]) showed a significant main effect of lag (F(3.24, 220.23)=96.75, p<0.0001) as well as lag x direction (F(3.24, 220.34)=10.20, p<0.0001). Post-hoc uncorrected t-tests showed that contiguity effect was preserved (specially at lags 1 and 2) as well as a forward effect at lags 1 (t(279)=-4.70, p<0.0001) and 5 (t(278)=3.64, p<0.001). Furthermore, we found a significant main effect of recall (F(1,68)=43.33, p<0.0001) which showed overall enhanced CRP curves for lists where oddballs were recalled (Fig. 7). We found no significant main effects of oddball types (F(1, 68)=0.91, p=0.35), direction (F(1, 68)=0.34, p=0.56), oddball x lag (F(4, 272)=1.51, p=0.20), oddball x direction (F(1, 68)=0.55, p=0.46), oddball x recall (F(1, 68)=0.77, p=0.38), lag x recall (F(4,272)=1.09, p=0.36) nor a significant direction x recall (F(1, 68)=1.19, p=0.28).

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| **Figure 3.** CRP curves showed a preserved forward-contiguity effect both when items were recalled as well as forgotten. Lists in which emotional oddballs were recalled showed overall enhanced CRP curves compared to those that were not. |

### **Is there a relationship between E-1 normalized recall and transitions from emotional oddballs?**

We correlated E-1 normalized recall values with lag +1 transitions from emotional oddballs to evaluate whether enhanced transitions from emotional oddballs explained reduced memory for E-1 items, however this did not seem to be the case (Spearman’s rho=-0.04, p=0.76).

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| **Figure 4.** Spearman’s correlation between normalized recall values of E-1 items and CRP values at lag +1 in transitions from emotional oddballs. |

### **The influence of valence and arousal on recall for E and E-1 items.**

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| **Figure 5.** Plot of the effects of the logistic regression general linear model on recall of emotional items influenced by valence and arousal. Valence and arousal values for the items were obtained from (Stadthagen-Gonzalez et al., 2017) where valence (1=unhappy, 9=happy) and arousal (1=quiet, 9=excited). Logistic regression Chi-squared values showed both a main effect of valence X2(1)=15.21, p<0.0001 and arousal X2(1)=4.07, p=0.04. |