

Familiarity does not inhibit image-specific encoding of faces*Supplementary Analysis: Median split by Participant Familiarity*

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In all experiments, participants included in the final analysis were familiar with at least 10 of the celebrities that were used as stimuli. However, there was considerable variability in the number of celebrities each participant was familiar with, which may have affected the strength of our familiarity manipulation. To investigate this, we performed a post-hoc ‘median split’ analysis that tested the effect of familiarity on image memory, separately for ‘high familiarity’ participants (who were familiar with more celebrities than average) and ‘low familiarity participants’ (familiar with less than average).

Full details of this analysis are reported below. For each experiment, data were reanalysed separately for high and low familiarity subsamples, using a 2x3 repeated measures ANOVA with Familiarity (familiar, unfamiliar) and Array Size (4 images, 9 images, 16 images) as the within participant factors. For brevity, only the critical comparisons of this analysis that involve familiarity are reported.

To summarise, across 5 experiments we did not observe a cost of familiarity in any of the image memory tasks, for either low or high familiarity participants. In Experiment 1, we did find a main effect of familiarity for high familiarity group but this was in the opposite direction to predicted. Based on this analysis, we conclude that differences in participants’ familiarity with the celebrities cannot account for the lack of differences found between unfamiliar and familiar faces.

Experiment 1

Median familiarity with the ‘familiar’ celebrities was 75%. We reanalysed d-prime

scores separately for the high familiarity group ($n = 25$, Mean familiarity = 90.1%, $SD = 7.1$, $min = 77.5\%$, $max = 100\%$) and the low familiarity group ($n = 31$, $M = 58.9\%$, $SD = 14.2$, $min = 28\%$, $max = 75\%$). Six participants with the median familiarity score were assigned to low familiarity group.

For the high familiarity group, there was a significant main effect of Familiarity, $F(1, 24) = 5.172$, $p = .032$, $\eta_p^2 = .177$, but in to the opposite direction to predicted, with sensitivity being higher for familiar faces on this task than for unfamiliar faces. The interaction between Familiarity and Array Size was not significant, $F(1, 24) = 0.711$, $p = .496$, $\eta_p^2 = .029$. For the low familiarity group the main effect of Familiarity, $F(1, 30) = 0.089$, $p = .767$, $\eta_p^2 = .003$, and interaction between factors, $F(1, 30) = 2.634$, $p = .080$, $\eta_p^2 = .081$, were not significant.

Experiment 2

Median familiarity with ‘familiar’ celebrities was 53.8%. Average familiarity for the high familiarity group was 72.9% ($n = 28$; $SD = 12.8$, $min = 55\%$, $max = 100\%$) and average familiarity for the low familiarity group was 41.5% ($n = 28$; $SD = 6.4$, $min = 32.5\%$, $max = 52.5\%$).

For the high familiarity group, both the main effect of Familiarity, $F(1, 27) = 0.184$, $p = .671$, $\eta_p^2 = .007$, and interaction between factors, $F(1, 27) = 1.636$, $p = .204$, $\eta_p^2 = .057$, were not significant. For the low familiarity group, the main effect of Familiarity, $F(1, 27) = 0.918$, $p = .346$, $\eta_p^2 = .033$, and interaction between factors, $F(1, 27) = 0.313$, $p = .732$, $\eta_p^2 = .011$, were not significant.

Experiment 3

Median familiarity with ‘familiar’ celebrities was 68.8%. Average familiarity for the high familiarity group was 81.4% ($n = 25$, $SD = 8.1$, $min = 70\%$, $max = 100\%$) and average familiarity for the low familiarity group was 53.2% ($n = 26$, $SD = 9.7$, $min = 35\%$, $max =$

67.5%).

For the high familiarity group, both the main effect of Familiarity, $F(1, 24) = 2.232$, $p = .148$, $\eta_p^2 = .085$, and interaction between factors, $F(1, 24) = 0.589$, $p = .624$, $\eta_p^2 = .024$, were not significant. For the low familiarity group, the main effect of Familiarity, $F(1, 25) = 0.417$, $p = .524$, $\eta_p^2 = .016$, and interaction between factors, $F(1, 25) = 0.625$, $p = .601$, $\eta_p^2 = .024$, were not significant.

Experiment 4

Median familiarity with ‘familiar’ celebrities was 67.5%. Average familiarity for the high familiarity group was 82% ($n = 26$, $SD = 7.8$, $min = 70\%$, $max = 95\%$) and average familiarity for the low familiarity group was 50.8% ($n = 30$, $SD = 10.8$, $min = 27.5\%$, $max = 67.5\%$).

For the high familiarity group, both the main effect of Familiarity, $F(1, 25) = 0.003$, $p = .956$, $\eta_p^2 = .000$, and interaction between factors, $F(1, 25) = 0.833$, $p = .370$, $\eta_p^2 = .032$, were not significant. For the low familiarity group, the main effect of Familiarity, $F(1, 29) = 0.836$, $p = .368$, $\eta_p^2 = .028$, and interaction between factors, $F(1, 29) = 2.594$, $p = .118$, $\eta_p^2 = .082$, were not significant.

Experiment 5

Unlike the previous experiments, familiarity with the image set used in this experiment was much higher, with a median familiarity of 100%. Consequently, the median split analysis instead compared the results of participants with 100% familiarity ($n = 27$) against participants with lower familiarity ($n = 24$). Average familiarity for the low familiarity group was 93.8% ($SD = 4.3$, $min = 81.3\%$, $max = 96.9\%$).

For the high familiarity group, the main effect of Familiarity was significant, $F(1, 26) = 68.977$, $p < .001$, $\eta_p^2 = .726$, with higher sensitivity for familiar faces than unfamiliar faces.

However, there was also a significant interaction between Familiarity and Task Type, $F(1, 26) = 82.364, p < .001, \eta_p^2 = .760$. Follow up comparisons show significantly higher sensitivity for familiar faces than unfamiliar faces on the identity task, $t(26) = 10.84, p < .001$, Cohen's $d = 4.254$, but no significant differences between the familiar and unfamiliar faces on the image task, $t(26) = 1.195, p = .178$, Cohen's $d = 0.468$. The two-way interaction between Familiarity and Instruction Timing, $F(1, 26) = 0.199, p = .659, \eta_p^2 = .008$, and the three way interaction, $F(1, 26) = 1.061, p = .313, \eta_p^2 = .039$, were both not significant.

For the low familiarity group, we found the same pattern of results. There was a significant main effect of Familiarity, $F(1, 23) = 36.883, p < .001, \eta_p^2 = .616$, with higher sensitivity for familiar than unfamiliar faces. Moreover, the interaction between Familiarity and Task Type was also significant, $F(1, 23) = 26.177, p < .001, \eta_p^2 = .532$. Follow up comparisons again show significantly higher sensitivity for familiar faces than unfamiliar faces on the identity task, $t(23) = 7.592, p < .001$, Cohen's $d = 3.168$, but no significant differences between the familiar and unfamiliar faces on the image task, $t(23) < 1$. The two-way interaction between Familiarity and Instruction Timing, $F(1, 23) = 0.025, p = .877, \eta_p^2 = .001$, and the three way interaction, $F(1, 23) = 0.003, p = .954, \eta_p^2 = .000$, were both not significant.