Stimulus Set

The scenes as the same as those used in Rimmele et al. (2012). All scenes were selected from the International Affective Picture Set based on the normative ratings provided for emotional arousal and valence assessed with the Self-Assessment Manikin (SAM) scale (1 = unhappy, 9 = happy; 1 = calm, 9 = excited) (Lang, 1999). Based on their normative ratings, the scenes were divided into an emotional set (arousal: M = 5.62, SD = 0.63, valence: M = 2.88, SD = 0.74) and a neutral set (arousal: M = 3.87, SD = 0.94, valence: M = 5.58, SD = 0.60). Negative and neutral scenes were matched on visual complexity. Visual complexity was rated by a separate group of participants (N = 5) on a 9-point scale (1 = not at all complex to 9 = highly complex). Neutral (M = 4.77, SD = 1.53) and negative (M = 5.24, SD = 1.40) scenes did not differ in their visual complexity, p > .26. For both the negative and neutral scene sets, approximately two-thirds depicted humans and the remaining one-third depicted animals and inanimate objects to an equal degree.

Supplementary Methods

**MCMC Sampling Parameters**

*Bayesian Hierarchical Cognitive Models ~ HMeta-d’ (Meta-d’/d’)*

Nchains = 3

Nburnin = 4,000

Nsamples = 10,000

Nthin = 2

*Bayesian Hierarchical Linear Models ~ d’/c*

Nchains = 4

Nsamples = 10,000

family = gaussian()

adapt\_delta = 0.99

**Prior Specification**

*Bayesian Hierarchical Cognitive Models ~ HMeta-d’ (Meta-d’/d’)*

μM  ∼  N(0,  1)

σM = |ξM| × δs

𝜉𝑀 ∼ Beta(1,1)

δs  ∼  N(0,  σδ)

σδ  ∼  ℋ𝒩(1)

Note: These are the default parameters settings outlined in Fleming (2017)

*Bayesian Hierarchical Linear Models ~ d’/c*

|  |  |  |
| --- | --- | --- |
|  | Memory Type | |
| Item | Associative Detail |
| d’ | μM  ∼  N(1.5,  .5)  σM ~ N(0,  .5) | μM  ∼  N(1,  .5)  σM ~ N(0,  .5) |
| c | μM  ∼  N(0,  .5)  σM ~ N(0,  .5) | |
| Vividness of Visual Imagery (VVIQ) | μM  ∼  N(0,  .5)  σM ~ N(0,  .5) | |
| Body Awareness (BA) | μM  ∼  N(0,  .5)  σM ~ N(0,  .5) | |

Supplementary Table S1: Prior Specifications for parameters in linear model

Supplementary Findings

*Full Sample (N=62) Item Memory Results*

Below we report the results for our full sample of eligible participants with item memory data. Specifically, these supplemental analyses include the 22 participants who were either excluded due to below chance (50%) memory accuracy for associated details (n=2) or below chance discrimination sensitivity – d’>0.5 (n=20).

*Recognition judgements for items were liberal (c), but demonstrated high discrimination sensitivity (d’)*

Our sample performed well on the old/new recognition task – effectively discriminating between previously seen and novel items (*M* = 2.19, *SD =* 0.33). This performance is particularly noteworthy given liberal response biases demonstrated by an increased tendency to claim recognition compared to an unbiased observer (*M* = -0.34, *SD* = 0.19). Alignment between effective discrimination and liberal responding suggests participants were metacognitively aware of their performance. However, we must evaluate confidence judgements and metacognitive efficiency to confirm this association.

*Metamemory confidence judgements for items were metacognitively inefficient*

Average confidence in our sample was 2.38 (*SD* = 0.32). Compared to the median of our confidence scale (2), this indicates participants in our sample were overconfident. To evaluate how well metamemory confidence ratings align with performance, we hierarchically estimated metacognitive efficiency at the group level while taking into consideration uncertainty at the individual level. Metacognitively ideal observers align confidence ratings with performance and possess an M-ratio of 1. In our sample, metamemory confidence judgements were metacognitively inefficient (*Median* = 0.67, *SD* = 0.32). Considering participant’s high discrimination sensitivity, this suggests metacognitive inefficiency stemmed from overconfidence in performance.

*Visual imagery and body awareness are not associated with recognition or metacognitive judgements*

Our participants possessed a wide range of individual differences with respect to body awareness (*M* = 61.81, *SD* = 21.76, Range=28-110), and visual imagery capabilities (*M* = 57.48, *SD* = 9.75, Range=35-80). We investigated potential associations between SDT parameters (c/d’) and these trait-level features for item memory to determine if individuals with greater awareness of their physical and mental processes leverage these capabilities in service of recognition. Specifically, we leveraged Bayesian linear models with visual imagery and body awareness as independent variables, and SDT parameters d’ and c as our dependent variables. There was a lack of evidence to support meaningful associations across all four associations (Supplementary Tables S26-S29). We additionally investigated whether visual imagery or body awareness is associated with metacognitive efficiency. Specifically, we follow a procedure from previous research (Harrison, Garfinkel, et al. 2021) to conduct a hierarchical regression estimate of metacognitive efficiency where participant’s standardized visual imagery and body awareness subscale scores serve as our covariates of interest. This analysis concluded there is insufficient evidence to support an association between visual imagery and metacognitive efficiency with 89% confidence (*Median* = -0.031, HDI89%[-0.11 0.06]), and insufficient evidence to support an association between body awareness and metacognitive efficiency with 89% confidence (*Median* = -0.059, HDI89%[-0.15, 0.029]). Therefore, the evidence indicates that neither visual imagery nor body awareness is positively associated withrecognition or metacognitive judgementsfor items.

*Recognition judgements for negatively valenced items are more conservative, and sensitive, than for neutral*

Recognition judgments were more sensitive (d’: *M*=2.43, *SD*=0.81), and conservative (c: *M*=-0.2, *SD*=0.29) for negatively valenced items compared to neutral (d’: *M*=2.04*, SD*=0.46*;* c: *M*=-0.44, *SD*=0.31). We can be at least 89% certain that discrimination performance meaningfully differs across valence (*M* = 0.38, *HDI89%* = [0.22, 0.54]) with a 100% probability of being higher for negatively valenced items, and response bias meaningfully differs across valence (*M* = -0.23 *HDI89%* = [-0.31, -0.15]) with a 100% probability of being more conservative for negatively valenced items. Differences in behavior across valence conditions suggest that individuals increased discrimination performance and conservative response behavior was due to the arousing, negatively valenced nature of emotional stimuli.

*Metacognitive efficiency was 2.31x greater for neutral valenced items*

Average confidence was high in our sample, but qualitative differences across valence conditions were still apparent; metamemory confidence judgments for negatively valenced items were higher (*M*=2.43, *SD*=0.32) than neutral (*M*=2.34, *SD*=0.34). We can be at least 89% certain that confidence ratings meaningfully differ across valence (*M* = 0.09, *HDI89%* = [0.04, 0.14]) with a 99.98% probability of being higher for negatively valenced items. This conclusion is additionally supported by 64.5% (40/62) of participants being more confident when recognizing negatively valenced items.

The metacognitive efficiency of metamemory confidence judgements was lower for negatively valenced items (*M*=0.078, *SD*=0.017) compared to neutral (*M*=0.18, *SD*=0.022). Comparing metacognitive efficiency across valence conditions in item memory provides evidence that we can be more than 89% certain there is an effect of valence on metacognitive efficiency (*Median* = -0.1, HDI89%[-0.17, -0.029]). The evidence therefore suggests that arousing, negatively valenced information is associated with decreased metacognitive efficiency for item memory. However, this finding conflicts with the result presented in the main text of the manuscript. Given this unanticipated conflict, we decided to further investigate the metacognitive efficiency of our held-out sample (N=22). This investigation revealed that metacognitive efficiency in this subset of participants was poor (*M*=0.15, *SD*=0.06), and lower for arousing, negatively valenced information (*M*=0.1, *SD*=0.01) than neutral (*M*=0.19, *SD*=0.03). Moreover, examining the correlation between participant’s behavior and confidence judgments for item memory indicates these constructs were completely dissociated (ρ = 0.06); this is in stark contrast to the good metacognitive performance (*Median* = 0.55, *SD* = 0.097) and strong correlation (ρ = 0.61) observed for the subset of participants with reasonable discrimination performance for associative detail recognition judgments (d’ > 0.5). This dissociation between recognition and confidence judgments provides additional justification and evidence to support our pre-defined exclusion criteria. Considering this limitation in addition to the floor effect evident in these estimates helps explain why the observed trends in metacognitive efficiency across valence conditions differed across sample sizes. Specifically, the excluded participants who were unable to adequately recognize associated details (d’ > 0.5) had extremely poor metacognitive efficiency for item memory. Since the held-out sample effectively discriminated between old and new items (*M*=2.16, *SD*=0.6), this suggests these participants relied on familiarity for recognition, but lacked the metacognitive awareness necessary to accurately integrate this information into their confidence judgments.

Supplementary Sampling Information

**Response Behavior x Memory Type (2)**

***brm(d ~ Memory + (1|ID), family = gaussian, iter = 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 2.2 | 2.1 | 2.3 | 100% | 1.00 | 33,149 | 0.00035 |
| Associated Detail (β1) | -0.89 | -1.03 | -0.75 | 100% | 1.00 | 33,865 | 0.00047 |

Supplementary Table S2: MCMC sampling summary for d’ and Memory Type

***brm(c ~ Memory + (1|ID), family = gaussian, iter = 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.36 | -0.38 | -0.33 | 100% | 1.00 | 22,049 | 0.00012 |
| Associated Detail (β1) | 0.71 | 0.67 | 0.74 | 100% | 1.00 | 24,890 | 0.00015 |

Supplementary Table S3: MCMC sampling summary for c and Memory Type

**Response Behavior x Emotional Valence (4)**

*Item Memory*

***brm(d ~ Valence + (1|ID), family = gaussian, iter = 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 2.41 | 2.27 | 2.55 | 100% | 1.00 | 12,635 | 0.00079 |
| Neutral (β1) | -0.37 | -0.51 | -0.23 | 99.99% | 1.00 | 37,269 | 0.00046 |

Supplementary Table S4: MCMC sampling summary for d’ and Valence in Item memory

***brm(c ~ Valence + (1|ID), family = gaussian, iter = 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.25 | -0.32 | -0.18 | 100% | 1.00 | 18,519 | 0.00032 |
| Neutral (β1) | -0.18 | -0.26 | -0.09 | 99.94% | 1.00 | 25,957 | 0.00034 |

Supplementary Table S5: MCMC sampling summary for c and Valence in Item memory

*Associative Detail Memory*

***brm(d ~ Valence + (1|ID), family = gaussian, iter = 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 1.35 | 1.16 | 1.53 | 100% | 1.00 | 10,775 | 0.0012 |
| Neutral (β1) | -0.18 | -0.36 | -0.01 | 93.75% | 1.00 | 32,714 | 0.00063 |

Supplementary Table S6: MCMC sampling summary for d’ and Valence in Associative Detail memory

***brm(c ~ Valence + (1|ID), family = gaussian, iter = 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.24 | 0.16 | 0.32 | 100% | 1.00 | 20,264 | 0.00035 |
| Neutral (β1) | 0.18 | 0.08 | 0.28 | 99.67% | 1.00 | 32,711 | 0.00035 |

Supplementary Table S7: MCMC sampling summary for c and Valence in Associative Detail memory

**Response behavior (item) x Subjective Measures (4)**

*Vividness of Visual Imagery (VVIQ)*

***brm(d ~ VVIQ + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 1.79 | 1.32 | 2.27 | 100% | 1.00 | 14,466 | 0.0025 |
| VVIQ (β1) | 0.01 | -0.00096 | 0.015 | 92.81% | 1.00 | 14,521 | 0.000042 |

Supplementary Table S8: MCMC sampling summary for d and VVIQ in Item memory

***brm(c ~ VVIQ + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.48 | -0.69 | -0.26 | 99.97% | 1.00 | 14,644 | 0.0011 |
| VVIQ (β1) | 0.00 | -0.0015 | 0.0058 | 82.33% | 1.00 | 14,817 | 0.000019 |

Supplementary Table S9: MCMC sampling summary for c and VVIQ in Item memory

*Body Awareness (BA)*

***brm(d ~ BA + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 2.3 | 2.03 | 2.57 | 100% | 1.0001 | 17,401 | 0.0013 |
| BA (β1) | -0.0012 | -0.0053 | 0.0026 | 69.33% | 1.0002 | 18,211 | 0.000018 |

Supplementary Table S10: MCMC sampling summary for d’ and BA in Item memory

***brm(c ~ BA + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.4 | -0.52 | -0.28 | 100% | 1.0004 | 15,977 | 0.00059 |
| BA (β1) | 0.0006 | -0.0011 | 0.0023 | 72.75% | 1.0005 | 16,711 | 0.000008 |

Supplementary Table S11: MCMC sampling summary for c and BA in Item memory

**Response behavior (Associated Detail) x Subjective Measures (4)**

*Vividness of Visual Imagery (VVIQ)*

***brm(d ~ VVIQ + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.78 | 0.1 | 1.44 | 96.84% | 1.00 | 18,768 | 0.0031 |
| VVIQ (β1) | 0.01 | -0.0023 | 0.021 | 89.55% | 1.00 | 18,937 | 0.000052 |

Supplementary Table S12: MCMC sampling summary for d’ and VVIQ in Associative Detail memory

***brm(c ~ VVIQ + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.31 | 0.21 | 0.4 | 100% | 1.00 | 17,224 | 0.00047 |
| VVIQ (β1) | 0.00 | -0.00093 | 0.0024 | 77.19% | 1.00 | 17,404 | 0.000008 |

Supplementary Table S13: MCMC sampling summary for c and VVIQ in Associative Detail memory

*Body Awareness (BA)*

***brm(d ~ BA + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 1.34 | 0.95 | 1.72 | 100% | 1.00 | 19,964 | 0.0017 |
| BA (β1) | -0.00 | -0.0059 | 0.0052 | 56.47% | 1.00 | 19,763 | 0.000025 |

Supplementary Table S14: MCMC sampling summary for d’ and BA in Associative Detail memory

***brm(c ~ BA + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.37 | 0.32 | 0.43 | 100% | 1.00 | 18,153 | 0.00025 |
| BA (β1) | -0.00 | 0.0011 | 0.00045 | 76.83% | 1.00 | 20,679 | 0.0000034 |

Supplementary Table S15: MCMC sampling summary for c and BA in Associative Detail memory

**Metacognitive Efficiency (1)**

***Fit\_meta\_d\_mcmc\_group(nR\_S1, nR\_S2, mcmc\_params)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.55 | 0.35 | 0.66 | 100% | 1.0001 | 29,998 | 0.001 |

Supplementary Table S16: MCMC sampling summary for Metacognitive Efficiency in Item Memory

**Metacognitive Efficiency x Memory (1)**

***Fit\_meta\_d\_mcmc\_groupCorr(nR\_S1\_1, nR\_S2\_1, mcmc\_params)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.52 | 0.37 | 0.74 | 100% | 1.0004 | 29,988 | 0.0000066 |
| Associated Detail (β1) | -0.37 | -0.49 | -0.24 | 100% | 1.0005 | 29,985 | 0.0000014 |

Supplementary Table S17: MCMC sampling summary for Metacognitive Efficiency by Memory Type

**Metacognitive Efficiency x Valence (2)**

*Item*

***Fit\_meta\_d\_mcmc\_groupCorr (nR\_S1\_1, nR\_S2\_1, mcmc\_params)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.74 | 0.63 | 0.87 | 100% | 1.0019 | 29,943 | 0.000054 |
| Neutral (β1) | -0.13 | -0.26 | 0.00 | 93.44% | 1.0007 | 29,979 | 0.0000088 |

Supplementary Table S18: MCMC sampling summary for Metacognitive Efficiency by Valence in Item memory

*Associated Detail*

***Fit\_meta\_d\_mcmc\_groupCorr(nR\_S1\_1, nR\_S2\_1, mcmc\_params)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.61 | 0.53 | 0.71 | 100% | 1.017 | 29,501 | 0.0000086 |
| Negative (β1) | 0.17 | -0.15 | 0.46 | 80.4% | 1.0018 | 29,946 | 0.000014 |

Supplementary Table S19: MCMC sampling summary for Metacognitive Efficiency by Valence in Associative Detail memory

**Metacognitive Efficiency (item) x Subjective Measures (2)**

*Vividness of Visual Imagery (VVIQ)*

***Fit\_meta\_d\_mcmc\_regression(nR\_S1, nR\_S2, cov, mcmc\_params)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.54 | 0.34 | 0.75 | 100% | 1.0001 | 29,997 | 0.0012 |
| BA (β1) | -0.14 | -0.31 | 0.018 | 92.3% | 1.0000 | 30,000 | 0.0006 |

Supplementary Table S20: MCMC sampling summary for Metacognitive Efficiency by VVIQ in Item memory

*Body Awareness (BA)*

***Fit\_meta\_d\_mcmc\_regression(nR\_S1, nR\_S2, cov, mcmc\_params)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.54 | 0.42 | 0.62 | 100% | 1.0002 | 29,994 | 0.0012 |
| VVIQ (β1) | 0.11 | -0.051 | 0.27 | 87.1% | 1.0001 | 29,996 | 0.00057 |

Supplementary Table S21: MCMC sampling summary for Metacognitive Efficiency by BA in Item memory

MCMC Sampling Information (*N=62*)

**Metacognitive Efficiency (1)**

***Fit\_meta\_d\_mcmc\_group(nR\_S1, nR\_S2, mcmc\_params)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.67 | 0.62 | 0.71 | 100% | 1.0039 | 29,883 | 0.0000033 |

Supplementary Table S22: MCMC sampling summary for Metacognitive Efficiency in Item Memory

**Response Behavior (item) x Emotional Valence (2)**

***brm(d ~ Valence + (1|ID), family = gaussian, iter = 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 2.43 | 2.29 | 2.57 | 100% | 1.00 | 9,103 | 0.0009 |
| Neutral (β1) | -0.38 | -0.51 | -0.25 | 100% | 1.00 | 29,943 | 0.00047 |

Supplementary Table S23: MCMC sampling summary for d’ and Valence in Item memory

***brm(c ~ Valence + (1|ID), family = gaussian, iter = 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.2 | -0.27 | -0.14 | 100% | 1.00 | 23,027 | 0.00026 |
| Neutral (β1) | -0.23 | -0.31 | -0.15 | 100% | 1.00 | 33,010 | 0.00028 |

Supplementary Table S24: MCMC sampling summary for c and Valence in Item memory

**Metacognitive Efficiency (item) x Valence (1)**

***Fit\_meta\_d\_mcmc\_groupCorr (nR\_S1\_1, nR\_S2\_1, mcmc\_params)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.078 | 0.06 | 0.1 | 100% | 1.006 | 29,922 | 0.0000024 |
| Neutral (β1) | -0.1 | -0.17 | -0.029 | 97.9% | 1.0054 | 29,813 | 0.0000031 |

Supplementary Table S25: MCMC sampling summary for Metacognitive Efficiency by Valence in Item memory

**Response behavior (item) x Subjective Measures (4)**

*Vividness of Visual Imagery (VVIQ)*

***brm(d ~ VVIQ + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 1.87 | 1.45 | 2.28 | 100% | 1.00 | 14,574 | 0.022 |
| VVIQ (β1) | 0.01 | -0.0016 | 0.012 | 89.32% | 1.00 | 14,409 | 0.000037 |

Supplementary Table S26: MCMC sampling summary for d and VVIQ in Item memory

***brm(c ~ VVIQ + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.33 | -0.55 | -0.08 | 98.45% | 1.00022 | 14,781 | 0.0012 |
| VVIQ (β1) | -0.0001 | -0.0041 | 0.004 | 51.31% | 1.0003 | 15,018 | 0.000021 |

Supplementary Table S27: MCMC sampling summary for c and VVIQ in Item memory

*Body Awareness (BA)*

***brm(d ~ BA + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 2.24 | 2.02 | 2.44 | 100% | 1.0003 | 20,241 | 0.00093 |
| BA (β1) | -0.0007 | -0.004 | 0.0025 | 64.45% | 1.0005 | 21,422 | 0.000014 |

Supplementary Table S28: MCMC sampling summary for d’ and BA in Item memory

***brm(c ~ BA + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.37 | -0.49 | -0.25 | 100% | 1.0006 | 16,361 | 0.00058 |
| BA (β1) | 0.0005 | -0.0013 | 0.0023 | 68.41% | 1.0005 | 17,629 | 0.0000085 |

Supplementary Table S29: MCMC sampling summary for c and BA in Item memory

**Metacognitive Efficiency (item) x Subjective Measures (2)**

*Vividness of Visual Imagery (VVIQ)*

***Fit\_meta\_d\_mcmc\_regression(nR\_S1, nR\_S2, cov, mcmc\_params)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.65 | 0.49 | 0.77 | 100% | 1.00 | 29,999 | 0.0000058 |
| BA (β1) | -0.031 | -0.11 | 0.06 | 69.91% | 1.0001 | 29,996 | 0.0000018 |

Supplementary Table S30: MCMC sampling summary for Metacognitive Efficiency by VVIQ in Item memory

*Body Awareness (BA)*

***Fit\_meta\_d\_mcmc\_regression(nR\_S1, nR\_S2, cov, mcmc\_params)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.65 | 0.53 | 0.8 | 100% | 1.001 | 29,998 | 0.0000059 |
| VVIQ (β1) | -0.059 | -0.15 | 0.029 | 86.1% | 1.00 | 30,000 | 0.0000018 |

Supplementary Table S31: MCMC sampling summary for Metacognitive Efficiency by BA in Item memory

MCMC Sampling Information for gender analyses (*N=40*)

**Response Behavior x Gender (4)**

*Item Memory*

***brm(d ~ Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 2.07 | 1.77 | 2.37 | 100% | 1.00 | 1,859 | 0.0044 |
| Female (β1) | 0.18 | -0.16 | 0.50 | 80.38% | 1.00 | 1,919 | 0.0048 |

Supplementary Table S32: MCMC sampling summary for d’ by Gender in Item memory

***brm(c ~ Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.30 | -0.42 | -0.17 | 99.95% | 1.00 | 1,763 | 0.0019 |
| Female (β1) | 0.05 | -0.08 | 0.19 | 70.01% | 1.00 | 2,217 | 0.0018 |

Supplementary Table S33: MCMC sampling summary for c by Gender in Item memory

*Associative Detail Memory*

***brm(d ~ Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 1.21 | 0.85 | 1.64 | 100% | 1.06 | 40 | 0.0341 |
| Female (β1) | 0.10 | -0.28 | 0.51 | 59.89% | 1.04 | 69 | 0.0327 |

Supplementary Table S34: MCMC sampling summary for d’ by Gender in Associative Detail memory

***brm(c ~ Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.12 | -0.19 | 0.44 | 73.87% | 1.00 | 5,167 | 0.0027 |
| Female (β1) | -0.04 | -0.38 | 0.28 | 58.43% | 1.00 | 5,560 | 0.0028 |

Supplementary Table S35: MCMC sampling summary for c by Gender in Associative Detail memory

**Subjective Measures x Gender (2)**

*Vividness of Visual Imagery (VVIQ)*

***brm(VVIQ ~ Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 53.66 | 46.82 | 60.11 | 100% | 1.00 | 13,725 | 0.0358 |
| Female (β1) | 4.96 | -2.41 | 12.13 | 86.36% | 1.00 | 13,837 | 0.0390 |

Supplementary Table S36: MCMC sampling summary for VVIQ by Gender memory

*Body Awareness (BA)*

***brm(BA ~ Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 67.89 | 53.10 | 82.66 | 100% | 1.00 | 14,670 | 0.0770 |
| Female (β1) | -2.36 | -18.74 | 13.19 | 59.45% | 1.00 | 14,848 | 0.0832 |

Supplementary Table S37: MCMC sampling summary for BA by Gender

**Response behavior (Item) x Subjective Measures + Gender (4)**

*Vividness of Visual Imagery (VVIQ)*

***brm(d ~ VVIQ + Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 1.52 | 0.79 | 2.24 | 99.90% | 1.00 | 6,189 | 0.00584 |
| VVIQ (β1) | 0.01 | 0.00 | 0.02 | 90.88% | 1.00 | 6,097 | 0.000098 |
| Female (β2) | 0.14 | -0.18 | 0.46 | 75.38% | 1.00 | 7,144 | 0.00238 |

Supplementary Table S38: MCMC sampling summary for d’, VVIQ, and Gender in Item memory

***brm(c ~ VVIQ + Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.54 | -0.82 | -0.27 | 99.89% | 1.00 | 5,701 | 0.0023 |
| VVIQ (β1) | 0.00 | 0.00 | 0.01 | 94.09% | 1.00 | 5,525 | 0.000039 |
| Female (β2) | 0.02 | -0.10 | 0.16 | 61.97% | 1.00 | 5,899 | 0.0011 |

Supplementary Table S39: MCMC sampling summary for c, VVIQ, and Gender in Item memory

*Body Awareness (BA)*

***brm(d ~ BA + Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 2.22 | 1.72 | 2.72 | 100% | 1.00 | 5,164 | 0.0042 |
| BA (β1) | -0.00 | -0.01 | 0.00 | 72.34% | 1.00 | 5,635 | 0.000050 |
| Female (β2) | 0.17 | -0.16 | 0.47 | 81.13% | 1.00 | 7,131 | 0.0024 |

Supplementary Table S40: MCMC sampling summary for d’, BA, and Gender in Item memory

***brm(c ~ BA + Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.25 | -0.45 | -0.06 | 97.72% | 1.00 | 7,532 | 0.0014 |
| BA (β1) | -0.00 | 0.00 | 0.00 | 67.96% | 1.00 | 9,174 | 0.000015 |
| Female (β2) | 0.04 | -0.09 | 0.17 | 70.36% | 1.00 | 6,043 | 0.0011 |

Supplementary Table S41: MCMC sampling summary for c, BA, and Gender in Item memory

**Response behavior (Associative Detail) x Subjective Measures + Gender (4)**

*Vividness of Visual Imagery (VVIQ)*

***brm(d ~ VVIQ + Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.51 | -0.58 | 1.57 | 77.84% | 1.00 | 3,333 | 0.0118 |
| VVIQ (β1) | 0.01 | -0.01 | 0.03 | 85.46% | 1.00 | 3,324 | 0.00020 |
| Female (β2) | 0.11 | -0.31 | 0.54 | 66.88% | 1.00 | 5,303 | 0.0037 |

Supplementary Table S42: MCMC sampling summary for d’, VVIQ, and Gender in Associative Detail memory

***brm(c ~ VVIQ + Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.39 | -1.19 | 0.39 | 78.23% | 1.00 | 6,490 | 0.0062 |
| VVIQ (β1) | 0.01 | 0.00 | 0.02 | 87.38% | 1.00 | 6,315 | 0.00011 |
| Female (β2) | -0.09 | -0.44 | 0.25 | 65.77% | 1.00 | 6,492 | 0.0027 |

Supplementary Table S43: MCMC sampling summary for c, VVIQ, and Gender in Associative Detail memory

*Body Awareness (BA)*

***brm(d ~ BA + Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 1.25 | 0.53 | 1.93 | 99.64% | 1.00 | 6,435 | 0.0055 |
| BA (β1) | -0.00 | -0.01 | 0.01 | 59.99% | 1.00 | 7,771 | 0.000061 |
| Female (β2) | 0.15 | -0.28 | 0.58 | 71.84% | 1.00 | 7,607 | 0.0031 |

Supplementary Table S44: MCMC sampling summary for d’, BA, and Gender in Associative Detail memory

***brm(c ~ BA + Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.19 | -0.71 | 0.34 | 71.60% | 1.00 | 7,204 | 0.0039 |
| BA (β1) | 0.00 | 0.00 | 0.01 | 88.70% | 1.00 | 6,237 | 0.000050 |
| Female (β2) | -0.03 | -0.38 | 0.30 | 56.70% | 1.00 | 7,431 | 0.0025 |

Supplementary Table S45: MCMC sampling summary for c, BA, and Gender in Associative Detail memory

**Response Behavior (Item) x Valence x Gender (2)**

***brm(d ~ Valence + Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 2.20 | 1.93 | 2.49 | 100% | 1.00 | 10,806 | 0.0017 |
| Neutral (β1) | -0.34 | -0.46 | -0.22 | 100% | 1.00 | 27,660 | 0.00047 |
| Female (β2) | 0.16 | -0.13 | 0.45 | 81.35% | 1.00 | 11,036 | 0.0018 |

Supplementary Table 46: MCMC sampling summary for d’, Valence, and Gender in Item memory

***brm(c ~ Valence + Gender (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | -0.25 | -0.36 | -0.13 | 99.96% | 1.00 | 13,025 | 0.00062 |
| Neutral (β1) | -0.08 | -0.14 | -0.02 | 98.48% | 1.00 | 28,702 | 0.00022 |
| Female (β2) | 0.09 | -0.02 | 0.22 | 89.92% | 1.00 | 12,153 | 0.00067 |

Supplementary Table 47: MCMC sampling summary for c, Valence, and Gender in Item memory

**Response behavior (Associative Detail) x Valence x Gender (2)**

***brm(d ~ Valence + Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.72 | 0.29 | 1.16 | 99.57% | 1.00 | 9,361 | 0.0028 |
| Neutral (β1) | -0.07 | -0.26 | 0.11 | 74.02% | 1.00 | 26,427 | 0.00070 |
| Female (β2) | 0.07 | -0.38 | 0.52 | 60.66% | 1.00 | 9,292 | 0.0029 |

Supplementary Table 48: MCMC sampling summary for d’, Valence and Gender in Associative Detail memory

***brm(c ~ Valence + Gender + (1|ID), family = gaussian, iter= 10,000)***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameter | Median | 5.5% | 94.5% | pd |  | ESS | MCSE |
| Intercept (β0) | 0.40 | -0.22 | 1.00 | 85.22% | 1.00 | 27,105 | 0.0023 |
| Neutral (β1) | -0.14 | -0.58 | 0.32 | 69.27% | 1.00 | 31,320 | 0.0016 |
| Female (β2) | -0.27 | -0.83 | 0.31 | 77.66% | 1.00 | 28,063 | 0.0021 |

Supplementary Table 49: MCMC sampling summary for c, Valence and Gender in Associative Detail memory