Rich autobiographical memory recall benefits from both novelty and similarity to other daily experiences

Erin Welch, Victoria Schelkun, Camille Gasser, Kathryn Lockwood, Lila Davachi

Supplementary Materials

Table 1

Meaningful effects based on subsequent Bayesian models with full random effects structure

Model	*Estimate*	*95% CrI*	*% pd*	*Effect Type*
event regularity ~ memory stability (new vs routine)	-0.08	[-0.13, -0.03]	0.15%	new>routine
event regularity ~ memory stability (periodic vs routine)	-0.06	[-0.11, -0.01]	0.78%	periodic>routine
memory stability ~ memory vividness	2.87	[2.12, 3.61]	100%	positive
memory stability ~ memory vividness (new)	2.48	[0.84, 4.07]	99.83%	positive
memory stability ~ memory vividness (periodic)	2.43	[1.43, 3.41]	100%	positive
memory stability ~ memory vividness (routine)	2.75	[1.04, 4.46]	99.88%	positive
memory stability ~ episodic detail	4.04	[2.59, 5.38]	100%	positive
memory stability ~ episodic detail (new)	3.98	[1.02, 6.78]	99.53%	positive
memory stability ~ episodic detail (periodic)	3.7	[1.88, 5.48]	99.95%	positive
memory stability ~ episodic detail (routine)	2.96	[-0.81, 6.79]	94.03%	positive
event regularity ~ RSS (new vs periodic)	0.018	[0.007, 0.029]	99.83%	periodic>new
event regularity ~ RSS (new vs routine)	0.032	[0.019, 0.045]	100%	routine>new
event regularity ~ RSS (periodic vs routine)	0.014	[0.002, 0.27]	98.80%	routine>periodic
RSS ~ memory vividness (new)	2.16	[0.20, 4.08]	98.38%	positive
RSS ~ memory vividness (routine)	-2.88	[-5.47, -0.41]	1.05%	negative
RSS ~ memory stability (routine)	-0.56	[-1.18, 0.015]	2.85%	negative
event regularity ~ excited rating (new vs periodic)	-0.22	[-0.36, -0.07]	0.30%	new>periodic
event regularity ~ excited rating (new vs routine)	-0.41	[-0.60, -0.21]	0%	new>routine
event regularity ~ excited rating (periodic vs routine)	-0.19	[-0.37, -0.14]	1.80%	periodic>routine
event regularity ~ calm rating (new vs periodic)	0.2	[0.07, 0.33]	99.90%	periodic>new
event regularity ~ calm rating (new vs routine)	0.38	[0.18, 0.58]	99.98%	routine>new
event regularity ~ calm rating (periodic vs routine)	0.18	[0.004, 0.36]	97.73%	routine>periodic
event regularity ~ afraid (new vs periodic)	-0.12	[-0.25, 0.003]	2.80%	new>periodic
event regularity ~ afraid (new vs routine)	-0.24	[-0.38, -0.11]	0%	new>routine
event regularity ~ afraid (periodic vs routine)	-0.12	[-0.25, 0.008]	3.35%	periodic>routine
RSS ~ afraid rating	-1.34	[-1.90, -0.80]	0%	negative
event regularity ~ RES (new vs periodic)	0.016	[0.008, 0.024]	99.98%	periodic>new
event regularity ~ RES (new vs routine)	0.023	[0.008, 0.039]	99.88%	routine>new
RES ~ memory vividness	-1.77	[-2.81, -0.77]	0%	negative
RES ~ memory vividness (periodic)	-1.61	[-1.86, -1.37]	0%	negative
RES ~ episodic details	-4.42	[-7.63, -1.23]	0.30%	negative
RES ~ episodic details (new)	-7.16	[-13.76, -0.62]	1.73%	negative

RES ~ episodic details (periodic)	-4.85	[-9.02, -0.72]	1.10%	negative
event regularity ~ memorability (new vs periodic)	-0.822	[-0.97, -0.67]	0%	new>periodic
event regularity ~ memorability (new vs routine)	-1.27	[-1.53, -1.01]	0%	new>routine
event regularity ~ memorability (periodic vs routine)	-0.45	[-0.66, -0.23]	0%	periodic>routine
RES ~ memorability	-2.87	[-3.92, -1.91]	0%	negative
RES ~ memorability (new)	-0.82	[-0.97, -0.67]	0%	negative
RES ~ memorability (periodic)	-1.26	[-1.51, -1.03]	0%	negative
RES ~ memorability (routine)	-0.44	[-0.66, -0.23]	0%	negative
day-level novelty ~ current positive rating	0.22	[0.10, 0.34]	99.98%	positive

Results from the full-random-effects Bayesian models corresponding with random-intercept-only Frequentist models with significant effects (see *Methods*). '*95% CrI*' represents the credibility interval. '*% pd'* represents the percent of posterior slopes that were greater than zero. Bayesian effects were deemed meaningful when the percentage of posterior slopes was either greater than 95% (meaning a majority of posterior slopes were positive) or less than 5% (meaning a majority of posterior slopes were negative). '*Effect type*' details the nature of the effect (i.e., whether the effect is positive, negative, or which level in a categorical variable is greater when a pairwise comparison was made).

Table 2

Post-hoc ANOVA tests comparing 'original' to 'reduced' models of novelty predicting memory outcomes

Original model	*Reduced model*	*Chi-squared*	*P-value*
event regularity*RSS + RES ~ vividness	event regularity*RSS ~ vividness	$\chi2(1) = 12.41$	$p < 0.001$
event regularity*RSS + RES ~ vividness	RES ~ vividness	$\chi2(5) = 219.59$	$p < 0.001$
event regularity*RSS + RES ~ episodic detail	event regularity*RSS ~ episodic detail	$\chi2(1) = 8.72$	$p = 0.003$
event regularity*RSS + RES ~ episodic detail	RES ~ episodic detail	$\chi2(5) = 26.80$	$p < 0.001$
event regularity*RSS + RES ~ mem. stability	event regularity*RSS ~ mem. stability	$\chi2(1) = 1.71$	$p = 0.191$
event regularity*RSS + RES ~ mem. stability	RES ~ mem. stability	$\chi2(5) = 18.43$	$p = 0.002$

Post-hoc ANOVAs were run to verify that the multilevel Frequentist models used for our statistical analyses better explained the variance in the dependent variables (i.e., vividness ratings, total number of episodic details at recall, and memory stability) compared to reduced models. The 'original model' structure was a significantly better fit in all cases except one. Therefore, reported results predicting memory vividness, episodic detail at recall, and memory stability are based on the original multilevel models that include the interaction between RSS and event regularity, and RES as predictors in the model.

Table 3

Effects of relative semantic similarity on emotion ratings at each event regularity level

Model	*Estimate*	*SE*	*95% CI*	*P-value*
RSS ~ happy rating (new)	3.85	0.88	[2.11, 5.58]	$p < .001$
RSS ~ happy rating (periodic)	3.59	0.51	[2.59, 4.60]	$p < .001$
RSS ~ happy rating (routine)	3.21	1.06	[1.13, 5.30]	$p = 0.003$
RSS ~ excited rating (new)	2.04	0.81	[0.46, 3.63]	$p = 0.012$
RSS ~ excited rating (periodic)	1.07	0.47	[0.15, 1.98]	$p = 0.022$

RSS ~ excited rating (routine)	1.11	0.97	[-0.80, 3.02]	$p = 0.254$
RSS ~ calm rating (new)	1.76	0.79	[0.20, 3.32]	$p = 0.027$
RSS ~ calm rating (periodic)	2.81	0.46	[1.90, 3.72]	$p < .001$
RSS ~ calm rating (routine)	2.79	0.95	[0.91, 4.66]	$p = 0.004$
RSS ~ sad rating (new)	-0.94	0.59	[-2.09, 0.21]	$p = 0.109$
RSS ~ sad rating (periodic)	-1.39	0.34	[-2.06, -0.71]	$p < .001$
RSS ~ sad rating (routine)	-1.43	0.70	[-2.81, -0.05]	$p = 0.043$
RSS ~ afraid rating (new)	-1.65	0.57	[-2.78, -0.53]	$p = 0.004$
RSS ~ afraid rating (periodic)	-1.29	0.33	[-1.93, -0.65]	$p < .001$
RSS ~ afraid rating (routine)	-0.59	0.69	[-1.95, 0.76]	$p = 0.389$

The within-event regularity multilevel Frequentist models that produced significant effects are bolded.