

## **Preliminary Experiment**

### **Counterbalancing Analysis**

Whether GJFC or KLZN was assigned as the rehearsed or non-rehearsed set did not affect results for implicit liking,  $F(1,40) = 0.64$ ,  $p = .43$ , or implicit identification,  $F(1,40) = 2.50$ ,  $p = .12$ .

### **Experiment 1 Pilot: Replicating the Preliminary Experiment with Added Procedural Control**

The Experiment 1 Pilot, which was not included in the main text of the manuscript, piloted instructions for the go/no-go task comparison condition that only required a spacebar response on non-rehearsed trials. The procedure was similar to that of the Preliminary Experiment but added self-report measures (see Experiment 1) and used the following instructions: “When you see a letter you should rapidly press the SPACEBAR, except when you see any of the four letters G, J, F, or C. When you see G, J, F, or C, DO NOT PRESS ANY KEY — pressing a key will be scored as an error. Instead, just wait for the next letter.”

The rehearsed letter set was more identified with than the non-rehearsed set on explicit ( $M = 3.39$ ,  $SD = 9.01$ ),  $t(58) = 2.89$ ,  $p = .005$ ,  $d = .38$ , and implicit measures ( $M = .11$ ,  $SD = .47$ ),  $t(58) = 1.85$ ,  $p = .07$ ,  $d = .23$ . The rehearsed letter set was not more liked on explicit ( $M = -1.11$ ,  $SD = 9.30$ ),  $t(60) = -.94$ ,  $p = .35$ ,  $d = .12$ , or implicit measures ( $M = .02$ ,  $SD = .49$ ),  $t(60) = .38$ ,  $p = .71$ ,  $d = .04$ .

Because the instructions’ focus on rapidly pressing the spacebar for non-rehearsed letters might have discouraged close attention to the rehearsed letters, Experiment 1 (reported in the main text) utilized a different set of instructions.

### **Experiment 1: Replicating the Preliminary Experiment with Added Procedural Control**

#### **Counterbalancing Analysis**

The benefits of rehearsal were greater when GJFC appeared as the rehearsed set than when KLZN appeared as the rehearsed set on explicit,  $t(179) = 2.89, p = .004$ , and implicit liking,  $t(179) = 2.38, p = .02$ , but not on explicit,  $t(169) = -1.05, p = .30$ , and implicit identification,  $t(169) = 1.41, p = .16$ .

### **Experiment 2: Extension to Visual Image Stimuli**

#### **Counterbalancing Analysis**

The benefits of rehearsal were greater when image set 2 (see stimuli below) appeared as the rehearsed set than when image set 1 appeared as the rehearsed set on explicit identification,  $t(46) = 2.40, p = .02$ , and implicit liking,  $t(43) = 2.73, p = .01$ , but not on explicit liking,  $t(43) = 1.34, p = .19$ , and implicit identification,  $t(46) = .17, p = .86$ .

### **Experiment 3: Separating Mental Rehearsal from Stimulus Grouping**

#### **Counterbalancing Analysis**

The benefits of rehearsal were greater when image sets 2 and 3 appeared as the rehearsed set than when image set 1 appeared as the rehearsed set for explicit liking,  $F(2,150) = 9.06, p < .001$ . Which string set was assigned as the rehearsed or non-rehearsed set did not significantly affect the results,  $F(2,150) = 1.67, p = .19$ .

### **Experiment 4a & 4b: Rehearsal Compared to No Rehearsal for both Grouped and**

#### **Individual Stimuli**

#### **Additional Methodological Details**

**Details of experiment variations.** Experiment 4a was run in three variations because a programming error in its first implementation ( $n = 150$ ) compromised control over exposure

frequencies. Data for those subjects are not included in the main text but are reported here in the online supplement and in the main text as part of the meta-analytic summary preceding the General Discussion; their results were similar to those reported in this article.

**Brief IAT details.** As mentioned in the main manuscript text, a practice categorization task preceded the BIAT measure. Because this task could itself be construed as a rehearsal procedure, the BIAT was contaminated as a test of repeated presentation effects. In addition to this problem, the extra 5-6 stimulus presentations resulted in a total of 14 presentations for previously rehearsed and non-rehearsed stimuli before the BIAT. Bornstein’s (1989) meta-analysis indicates that presentation boredom effects can start at presentation frequencies as low as 10.

**Details of rehearsal task trial order.** The stimulus trial order was random with two exceptions. First, the stimulus type (abstract image or letter string) alternated on each trial. Second, to sustain subjects’ engagement in the task, 9 trial pairs that required a “same” response were inserted at set points throughout the task, ensuring that at least 24% of the odd (rehearsal) trials required a “same” response.

**Explanation for rehearsal task filler stimuli.** The first two trials of the rehearsal task contained singleton filler stimuli that were not used in dependent variables. These fillers were needed because the first trial differed from subsequent trials – it did not require both rehearsal and a keyboard response, as was the case for odd trials starting with trial 3.

To construct a series meeting needs of the overall design, 8 other trials (4 odd-numbered and 4 even-numbered) used trio filler stimuli. If only one set of trio stimuli had been used throughout the task, subjects might have discovered that they could respond with “same”

anytime a trio appeared on adjacent odd trials, without needing to attend to the specific stimuli in the trio.

### **Additional Analysis Details**

**Counterbalancing analyses.** The effects of three (theoretically unimportant) counterbalancing factors are presented here for the primary comparisons of interest: (1) Rehearsal compared to no rehearsal of *images* on explicit liking measures, (2) Rehearsal compared to no rehearsal of *strings* on explicit liking measures, (3) Rehearsal compared to no rehearsal of images on explicit *identification* measures, (4) Rehearsal compared to no rehearsal of strings on explicit *identification* measures. These analyses will be referred to by their respective numbers and are based on the full data set, as opposed to the limited data presented in the main text of the manuscript.

#### **Dependent variable order**

**Experiment 4a.** The order of dependent variables (explicit or implicit) marginally affected the results of analysis 2 (rehearsal compared to no rehearsal of strings on explicit liking),  $F(1,553) = 3.55, p = .06$ . Rehearsal benefits for strings were stronger when the explicit measure appeared first,  $F(1,553) = 19.34, p = 10^{-5}$ , than when it appeared second  $F(1,553) = 2.91, p = .09$ .

Analyses 1, 3, and 4 were not significantly affected by dependent variable order, respectively,  $F(1,409) = .85, p = .36$ ;  $F(1,409) = 1.47, p = .23$ ;  $F(1,493) = 2.71, p = .10$ .

**Experiment 4b.** Analyses 1, 2, 3, and 4 were not significantly affected by dependent variable order, respectively,  $F(1,188) = .004, p = .95$ ;  $F(1,188) = 1.89, p = .17$ ;  $F(1,188) = .006, p = .94$ ;  $F(1,188) = 2.74, p = .10$ .

#### **Stimulus role assignment**

**Experiment 4a.** Which stimulus sets were assigned as the singleton, trio, and novel stimuli only affected the results of analysis 4 (rehearsal compared to no rehearsal of strings on explicit identification measures),  $F(2,491) = 3.65, p = .03$ . Rehearsal benefits for strings were strongest when string set 3 appeared as singletons (see stimuli in appendix),  $F(1,491) = 21.54, p = 10^{-6}$ . However, the same pattern of results held when string sets 1 and 2 appeared as singletons, respectively,  $F(1,491) = 1.33, p = .25$ ;  $F(1,491) = 5.16, p = .02$ .

Analyses 1, 2, and 3 were not significantly affected by stimulus role assignment, respectively,  $F(2,407) = .40, p = .67$ ;  $F(2,551) = 1.09, p = .34$ ;  $F(2,407) = .10, p = .91$ .

**Experiment 4b.** Analyses 1, 2, 3, and 4 were not significantly affected by stimulus role assignment, respectively,  $F(2,186) = .96, p = .39$ ;  $F(2,186) = .20, p = .82$ ;  $F(2,186) = .47, p = .62$ ;  $F(2,186) = .18, p = .84$ .

#### **BIAT block order**

Whether previously presented singletons or novel stimuli appeared as focal stimuli first in the BIAT was counterbalanced. This counterbalancing factor was not relevant for the comparisons examined here because in the BIAT always compared rehearsed or non-rehearsed stimuli to novel stimuli.

Supplementary Materials: “Mental Rehearsal Increases Liking for Repeatedly Exposed Stimuli”

<b>Table S1.</b> Statistical analyses of comparisons between rehearsed, non-rehearsed, and novel stimuli on self-report measures of liking and identification for Experiments 4a and 4b including only those completing explicit measures first.								
					Statistical tests			
Row	Measure(s)	Stimulus	Grouping	Experiment	<i>t</i>	df	<i>p</i>	<i>d</i>
Stronger liking and/or identification for rehearsed than for non-rehearsed presented stimuli								
1	Self-report liking	Images	Singletons	4a	1.66	206	.10	.230
2				4b	.69	96	.49	.139
3			Trios	4a	1.45	206	.15	.201
4				4b	1.16	96	.25	.234
5		Strings	Singletons	4a	4.26	206	10 <sup>-5</sup>	.591
6				4b	3.44	96	.001	.695
7			Trios	4a	3.78	206	10 <sup>-4</sup>	.525
8				4b	2.78	96	.006	.563
9	Self-report identification	Images	Singletons	4a	1.24	206	.22	.172
10				4b	.18	96	.86	.037
11			Trios	4a	1.26	206	.21	.174
12				4b	1.23	96	.22	.249
13		Strings	Singletons	4a	3.70	206	10 <sup>-4</sup>	.514
14				4b	2.57	96	.01	.519
15			Trios	4a	3.97	206	10 <sup>-4</sup>	.550
16				4b	2.38	96	.02	.480
17	Implicit liking	Images	Singletons	4a	-.07	99	.95	-.013
18				4b	.41	43	.68	.122
19		Strings	Singletons	4a	-1.96	102	.05	-.384
20				4b	.56	47	.58	-.048
21	Stimulus familiarity	Images	Singletons	4a	4.65	206	10 <sup>-5</sup>	.645
22				4b	3.37	96	.001	.682
23			Trios	4a	2.93	206	.004	.406
24				4b	2.66	96	.009	.539
25		Strings	Singletons	4a	2.47	206	.02	.342
26				4b	2.83	96	.006	.572
27			Trios	4a	2.87	206	.005	.398
28				4b	1.77	96	.08	.357
Stronger liking and/or identification for rehearsed stimuli than for novel stimuli								
29	Self-report liking	Images	Singletons	4a	5.84	106	10 <sup>-7</sup>	.564
30				4b	3.16	46	.003	.461
31			Trios	4a	4.24	106	10 <sup>-5</sup>	.410
32				4b	2.37	46	.02	.346
33		Strings	Singletons	4a	8.17	100	10 <sup>-12</sup>	.813
34				4b	5.89	50	10 <sup>-7</sup>	.825
35			Trios	4a	5.16	100	10 <sup>-6</sup>	.513
36				4b	4.42	50	10 <sup>-4</sup>	.618

Supplementary Materials: “Mental Rehearsal Increases Liking for Repeatedly Exposed Stimuli”

37	Self-report identification	Images	Singletons	4a	5.93	106	$10^{-8}$	.573
38				4b	3.92	46	$10^{-4}$	.572
39			Trios	4a	5.58	106	$10^{-7}$	.539
40				4b	3.73	46	.001	.545
41		Strings	Singletons	4a	8.42	100	$10^{-13}$	.838
42				4b	5.70	50	$10^{-6}$	.798
43			Trios	4a	5.84	100	$10^{-7}$	.581
44				4b	4.26	50	$10^{-4}$	.597
45	Implicit liking	Images	Singletons	4a	1.38	50	.17	.194
46				4b	1.67	21	.11	.357
47		Strings	Singletons	4a	.70	51	.49	.097
48				4b	-.95	23	.35	-.194
49	Stimulus familiarity	Images	Singletons	4a	14.17	106	$10^{-26}$	1.404
50				4b	7.96	46	$10^{-10}$	1.225
51			Trios	4a	10.59	106	$10^{-18}$	1.045
52				4b	6.83	46	$10^{-8}$	1.048
53		Strings	Singletons	4a	12.20	100	$10^{-21}$	1.237
54				4b	7.99	50	$10^{-10}$	1.159
55			Trios	4a	10.65	100	$10^{-18}$	1.073
56				4b	7.00	50	$10^{-8}$	1.007
Stronger liking and/or identification for non-rehearsed presented stimuli than for novel stimuli								
57	Self-report liking	Images	Singletons	4a	3.61	100	$10^{-4}$	.359
58				4b	3.19	50	.002	.447
59			Trios	4a	2.10	100	.04	.209
60				4b	.88	50	.39	.122
61		Strings	Singletons	4a	3.25	106	.002	.314
62				4b	1.77	46	.08	.258
63			Trios	4a	1.15	106	.26	.111
64				4b	1.02	46	.32	.148
65	Self-report identification	Images	Singletons	4a	4.86	100	$10^{-6}$	.483
66				4b	6.21	50	$10^{-7}$	.869
67			Trios	4a	4.57	100	$10^{-5}$	.455
68				4b	3.23	50	.002	.453
69		Strings	Singletons	4a	4.01	106	$10^{-4}$	.388
70				4b	3.12	46	.003	.455
71			Trios	4a	1.89	106	.06	.182
72				4b	2.85	46	.007	.415
73	Implicit liking	Images	Singletons	4a	1.56	49	.13	.220
74				4b	1.18	22	.25	.245
75		Strings	Singletons	4a	3.59	51	.001	.497
76				4b	-.67	24	.51	-.135

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77	Stimulus familiarity	Images	Singletons	4a	6.54	100	$10^{-9}$	.654
78				4b	5.87	50	$10^{-7}$	.823
79			Trios	4a	5.99	100	$10^{-8}$	.600
80				4b	3.96	50	$10^{-4}$	.556
81		Strings	Singletons	4a	8.06	106	$10^{-12}$	.826
82				4b	3.80	46	$10^{-4}$	.557
83			Trios	4a	3.87	106	$10^{-4}$	.376
84				4b	2.39	46	.02	.349
Effects of single stimulus presentations stronger than effects of grouped presentations								
Row	Measure(s)	Stimulus	Rehearsal assignment	Experiment	<i>t</i>	df	<i>p</i>	<i>d</i>
85	Self-report liking	Images	Rehearsed	4a	2.36	106	.02	.229
86				4b	1.16	46	.25	.170
87			Non-rehearsed	4a	1.70	100	.09	.170
88				4b	2.12	50	.04	.300
89		Strings	Rehearsed	4a	3.87	100	$10^{-4}$	.385
90				4b	2.72	50	.009	.386
91			Non-rehearsed	4a	2.92	106	.004	.259
92				4b	1.01	46	.32	.149
93	Self-report identification	Images	Rehearsed	4a	2.19	106	.03	.220
94				4b	1.47	46	.15	.224
95			Non-rehearsed	4a	1.53	100	.13	.157
96				4b	3.27	50	.002	.459
97		Strings	Rehearsed	4a	5.29	100	$10^{-6}$	.531
98				4b	4.38	50	$10^{-4}$	.643
99			Non-rehearsed	4a	4.09	106	$10^{-4}$	.447
100				4b	1.81	46	.08	.300

Supplementary Materials: “Mental Rehearsal Increases Liking for Repeatedly Exposed Stimuli”

<b>Table S2.</b> Statistical analyses of comparisons between rehearsed, non-rehearsed, and novel stimuli on self-report and implicit measures of liking and identification for Experiments 4a and 4b including both the first and second set of dependent variables completed.					Statistical tests			
Row	Measure(s)	Stimulus	Grouping	Experiment	<i>t</i>	df	<i>p</i>	<i>d</i>
Stronger liking and/or identification for rehearsed than for non-rehearsed presented stimuli								
1	Self-report liking	Images	Singletons	4a	4.43	463	10-5	.411
2				4b	1.97	190	.05	.285
3			Trios	4a	3.55	458	10-4	.331
4				4b	.42	190	.68	.060
5		Strings	Singletons	4a	4.61	555	10-6	.391
6				4b	3.09	190	.002	.446
7			Trios	4a	3.12	555	.002	.265
8				4b	2.44	190	.02	.352
9	Self-report identification	Images	Singletons	4a	3.45	441	.001	.328
10				4b	1.25	190	.21	.181
11			Trios	4a	2.87	436	.004	.274
12				4b	.18	190	.86	.025
13		Strings	Singletons	4a	4.35	495	10-5	.390
14				4b	2.15	190	.03	.310
15			Trios	4a	3.77	495	10-4	.338
16				4b	1.83	190	.07	.265
17	Implicit liking	Images	Singletons	4a	-1.69	272	.09	-.204
18				4b	.32	92	.75	.065
19		Strings	Singletons	4a	-.65	281	.52	-.078
20				4b	.36	96	.72	.072
21	Stimulus familiarity	Images	Singletons	4a	4.63	507	10-6	.410
22				4b	4.55	190	10-5	.657
23			Trios	4a	5.50	502	10-7	.490
24				4b	4.21	190	10-5	.608
25		Strings	Singletons	4a	3.44	554	.001	.292
26				4b	1.60	190	.11	.231
27			Trios	4a	4.97	554	10-6	.422
28				4b	1.40	190	.16	.203

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Stronger liking and/or identification for rehearsed stimuli than for novel stimuli								
29	Self-report liking	Images	Singletons	4a	9.29	235	$10^{-17}$	.604
30				4b	4.47	93	10-5	.461
31			Trios	4a	4.02	231	10-4	.264
32				4b	.88	93	.38	.091
33		Strings	Singletons	4a	8.38	275	10-15	.505
34				4b	5.70	97	10-7	.576
35			Trios	4a	1.41	275	.16	.085
36				4b	2.14	97	.04	.216
37	Self-report identification	Images	Singletons	4a	8.89	223	10-16	.594
38				4b	5.15	93	10-6	.531
39			Trios	4a	5.15	220	10-6	.346
40				4b	1.79	93	.08	.184
41		Strings	Singletons	4a	9.69	246	10-18	.616
42				4b	5.76	97	10-7	.581
43			Trios	4a	3.18	246	.002	.202
44				4b	2.05	97	.04	.207
45	Implicit liking	Images	Singletons	4a	.04	138	.97	.003
46				4b	3.21	45	.002	.473
47		Strings	Singletons	4a	2.73	139	.007	.230
48				4b	-.36	49	.72	-.052
49	Stimulus familiarity	Images	Singletons	4a	16.89	235	10-42	1.125
50				4b	8.67	93	10-13	.901
51			Trios	4a	4.98	231	10-7	.318
52				4b	1.33	93	.19	.140
53		Strings	Singletons	4a	15.69	274	10-40	.946
54				4b	9.08	97	10-14	.917
55			Trios	4a	2.20	274	.03	.136
56				4b	1.50	97	.14	.156
Stronger liking and/or identification for non-rehearsed presented stimuli than for novel stimuli								
57	Self-report liking	Images	Singletons	4a	3.11	228	.002	.205
58				4b	2.51	97	.01	.253
59			Trios	4a	-.92	227	.36	-.061
60				4b	.41	97	.68	.042
61		Strings	Singletons	4a	3.62	280	10-4	.216
62				4b	2.32	93	.02	.240
63			Trios	4a	-3.17	280	.002	-.189
64				4b	-1.27	93	.21	-.132

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65	Self-report identification	Images	Singletons	4a	5.20	218	10-7	.352
66				4b	4.82	97	10-5	.487
67			Trios	4a	1.26	216	.21	.085
68				4b	1.99	97	.05	.201
69		Strings	Singletons	4a	4.88	249	10-6	.308
70				4b	3.95	93	10-4	.408
71			Trios	4a	-2.06	249	.04	-.132
72				4b	-.42	93	.67	-.04
73	Implicit liking	Images	Singletons	4a	2.63	134	.01	.226
74				4b	2.22	47	.03	.320
75		Strings	Singletons	4a	3.59	142	10-4	.300
76				4b	-.81	47	.42	-.116
77	Stimulus familiarity	Images	Singletons	4a	7.59	227	10-12	.504
78				4b	5.12	97	10-6	.517
79			Trios	4a	-2.24	226	.03	-.159
80				4b	-1.84	97	.07	-.187
81		Strings	Singletons	4a	10.08	280	10-20	.602
82				4b	4.61	93	10-5	.476
83			Trios	4a	-4.80	280	10-6	-.293
84				4b	-3.02	93	.003	-.319
Effects of single stimulus presentations stronger than effects of grouped presentations								
Row	Measure(s)	Stimulus	Rehearsal assignment	Experiment	<i>t</i>	df	<i>p</i>	<i>D</i>
85	Self-report liking	Images	Rehearsed	4a	4.92	208	10-6	.382
86				4b	4.01	93	10-4	.413
87			Non-rehearsed	4a	2.26	203	.03	.277
88				4b	2.11	97	.04	.214
89		Strings	Rehearsed	4a	7.84	275	10-13	.472
90				4b	4.27	97	10-5	.432
91			Non-rehearsed	4a	6.49	280	10-10	.389
92				4b	3.18	93	.002	.328
93	Self-report identification	Images	Rehearsed	4a	5.24	208	10-7	.363
94				4b	4.65	93	10-5	.480
95			Non-rehearsed	4a	3.44	203	.001	.270
96				4b	2.91	97	.005	.294
97		Strings	Rehearsed	4a	8.58	247	10-15	.546
98				4b	5.71	97	10-7	.577
99			Non-rehearsed	4a	6.95	249	10-11	.439
100				4b	4.10	93	10-4	.423

### Meta-Analysis

The macro used to complete the meta-analysis, MetaES.sps, can be found on David Wilson’s website at <http://mason.gmu.edu/~dwilsonb/ma.html>.

### Stimuli

Image set 1 (used in Experiments 2,3,4)



Image set 2 (used in Experiments 2,3,4)



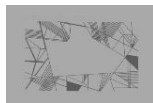
Image set 3 (used in Experiments 3,4)



Image set 4 (used in Experiment 4)



Filler image (used in Experiment 4)



String set 1 (used in Experiments 3,4)

tazon  
cemef  
polov

Supplementary Materials: “Mental Rehearsal Increases Liking for Repeatedly Exposed Stimuli”

String set 2 (used in Experiments 3,4)

lirak  
kigep  
jacud

String set 3 (used in Experiments 3,4)

holum  
sutiz  
nedag

String set 4 (used in Experiment 4)

bunat  
rowib  
dimoc

Filler stimulus (used in Experiment 4)

vupic