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Supplementary Materials for

Forgetting the presidents

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Supplementary Materials:

Materials and Methods

Study 1: The archival data from 1974 were collected from 159 Yale and Purdue University students and were reported in (*6*); the Yale data were collected in 1973 and the Purdue data in 1974. The 1991 data were from 106 Rice and Yale University students and reported in (*7*). The details of methods and scoring for these studies can be found in the respective papers, but especially (*6*). We had access to the original dataset from (*6*) with which we constructed the 1974 curves for Figs. 1A and 2A. The original dataset was not available for 1991, however, so we constructed the 1991 curves in Figs. 1A and 2A using Fig. 1 from (*7*).

The Washington University in St. Louis institutional review board approved the 2009 portion of Study 1. These data were collected from 150 Washington University in St. Louis undergraduate students completing an unrelated recognition memory procedure on a laboratory computer. Midway through this procedure, subjects were instructed that they would have five minutes to remember as many U.S. presidents as possible and to write them down on a sheet of paper in front of them that was numbered from 1 to 44 (corresponding to the total number of presidents who had served in office at time of testing). Subjects were instructed to write a president's name in the correct ordinal position if they could recall the position, and if they could not, to either guess an ordinal position or put the president's name in the margin of the page. Subjects were also told to provide first names or initials when they were able to assist with scoring. See Fig. S2 for an example of recall data. After five minutes, subjects were instructed to proceed with the recognition memory procedure.

The president recall protocols were transcribed and scored by two research assistants who ignored obvious spelling errors. They used the criteria described in (*6*). Credit for ordinal position recall was awarded if a subject wrote a president's last name in the appropriate ordinal position (e.g., Lincoln in position 16). Subjects were excluded from analysis if they did not name Obama as the current president, as we assumed they had misunderstood the instructions. This left 125 subjects remaining out of 150. Free recall credit was awarded for a president if the president's last name was written anywhere on the recall sheet. For the five pairs of presidents who share a last name (Adams, Harrison, Johnson, Roosevelt, and Bush), we used the following criteria if first names or initials were not provided: If the surrounding context of recall allowed the research assistant to infer the intended president (e.g., a Harrison surrounded by two Clevelands implied B. Harrison), credit for that president was awarded. In cases where context did not permit a determination, half credit was given to each president of the pair, following the procedure used in (*6*) and (*7*). In the case of Cleveland, who held two nonconsecutive terms, half credit was assigned for each correct ordinal position recall and each correct free recall. Recall of Cleveland is relatively rare, so other criteria for scoring would not appreciably change the results.

Each forgetting curve in Fig. 3 was computed by using four data points: an assumption of 1.00 free recall in the year that president left office, and the data from Fig. 2 in the years 1974, 1991, and 2009. Only three points were used to estimate forgetting of Nixon, who left office in the same year the 1974 data were collected. The 1974 data were collected while Ford was still in office, so the 1974 data preceded the 1.00 free recall point (1977, when Ford left office) in this specific case. SPSS was used to fit a power function to each set of four points, and we used this function to estimate presidential forgetting through the year 2100. The .26 baseline recall function was obtained by averaging the three generational free recall scores from both college student and MTurk samples for Van Buren to Buchanan and Hayes through Coolidge (the pre-recency portion of the serial position curve, omitting the outliers of Lincoln and his two successors), then averaging across those 20 presidents.

Study 2: The Washington University in St. Louis institutional review board approved Study 2, which was programmed in Adobe Flash (*27*) and posted online to MTurk. Five hundred ninety-nine subjects participated. Prior to the task, we collected age, gender, amount of education, handedness, and whether English was the subject's first language. Following this, subjects completed the vocabulary subtask of the Shipley test (*28*) as a measure of vocabulary. We did not examine these additional measures for the present study. Subjects then read instructions similar to the ones provided for Study 1. The experiment can be accessed online (*29*) and the main data collection screen used is shown in Fig. S3. Following completion of the task, subjects were asked whether they had used any external resources on the task and were told that their answer to that question would not affect their payment. We excluded the data from the 29 subjects who responded in the positive; a subtotal of 570 subjects remained. Out of these, 58 subjects who were unable to name Obama as the current president and 15 over the age of 69 were excluded, leaving a total of 497.

Subjects were assigned to the Millennial group if they were between ages 18-29 at the time of testing (n = 116), Generation X group if 30-49 (n = 207), and Baby Boomer group if 50-69 (n = 174).

Due to the amount of data, unlike in Study 1, data from Study 2 were not hand scored but were rather scored electronically using a strict spelling criterion (but ignoring case). Specifically, subjects were awarded credit for ordinal position recall of a given president if they typed that president's last name in the correct position. Subjects were awarded credit for free recall of a given president if they typed that president's last name in any location on the screen. For the five pairs of presidents with the same last name, half credit was assigned to each president of the pair if the last name was recalled once, and full credit was assigned to each president of the pair if the last name was recalled two or more times. Free recall of Cleveland was scored the same way. Despite the differences in scoring between Study 1 and Study 2, results were extremely consistent (see Tables S1 and S2).

Tables S1 and S2 contain the correlations between groups in Study 1 and Study 2 for ordinal position recall and free recall, respectively. The correlations shown are for

Washington to Ford for each group, limited by the 1973 group because Ford was the most recent president at the time of testing. If the correlations are calculated excluding cases pairwise instead of listwise (e.g., comparing across more presidents when the option was available), no changes in significance or level of significance occur (i.e., all $p < .001$).

Although these correlations are quite high, forgetting was greater in Figs. 1B and 2B than in Figs. 1A and 2A; in other words, overall recall performance was higher when subjects were tested as undergraduate college students compared to when (different) individuals of corresponding ages were tested in 2014. This was true only of more recent presidents and may reflect the effects of aging on memory for events occurring during one's lifetime (*30*). Of course, the difference might reflect the fact that these were different groups of subjects.

To calculate the correlation between president ranking and recallability in Study 2, we correlated the rankings provided by (*18*) with the average free recall probability scores of the Baby Boomer, Generation X, and Millennial groups for presidents Washington through Coolidge (the pre-recency presidents).

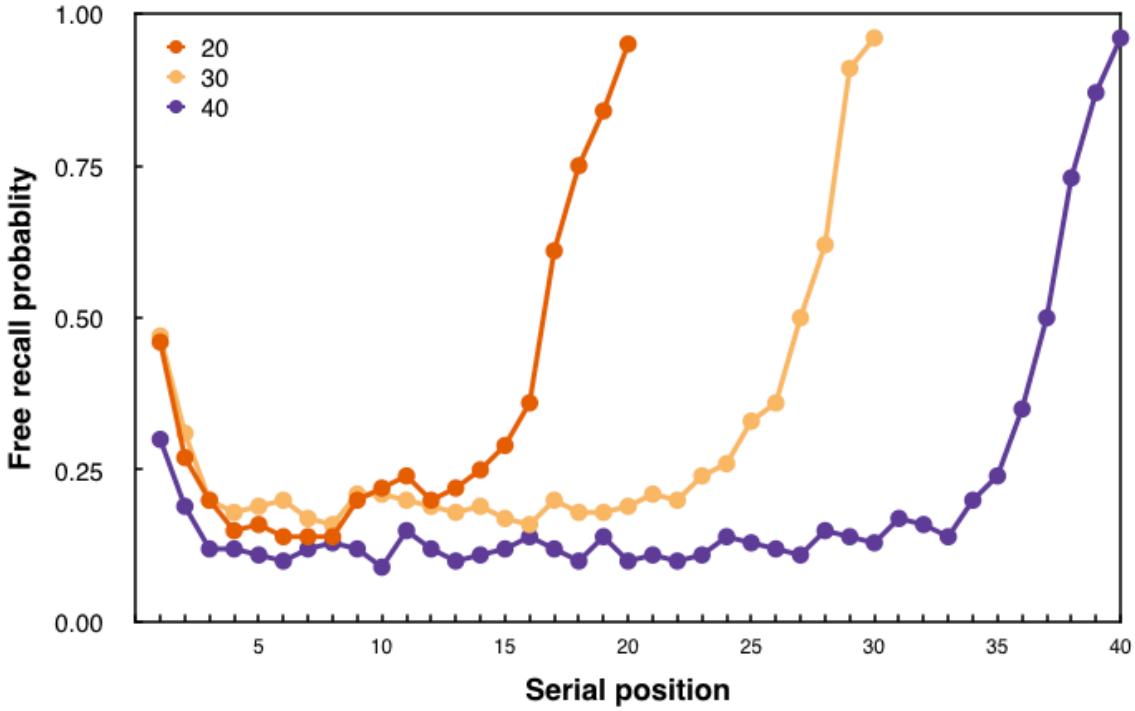

Fig S1: Example serial position curves. Serial position curves from (*31*) depicting free recall of items from lists of 20, 30, or 40 items presented to subjects one second at a time. These data are provided to demonstrate the general similarity between recency effects in free recall of lists and in recall of the presidents in Figs. 1 and 2. Content from the public domain.

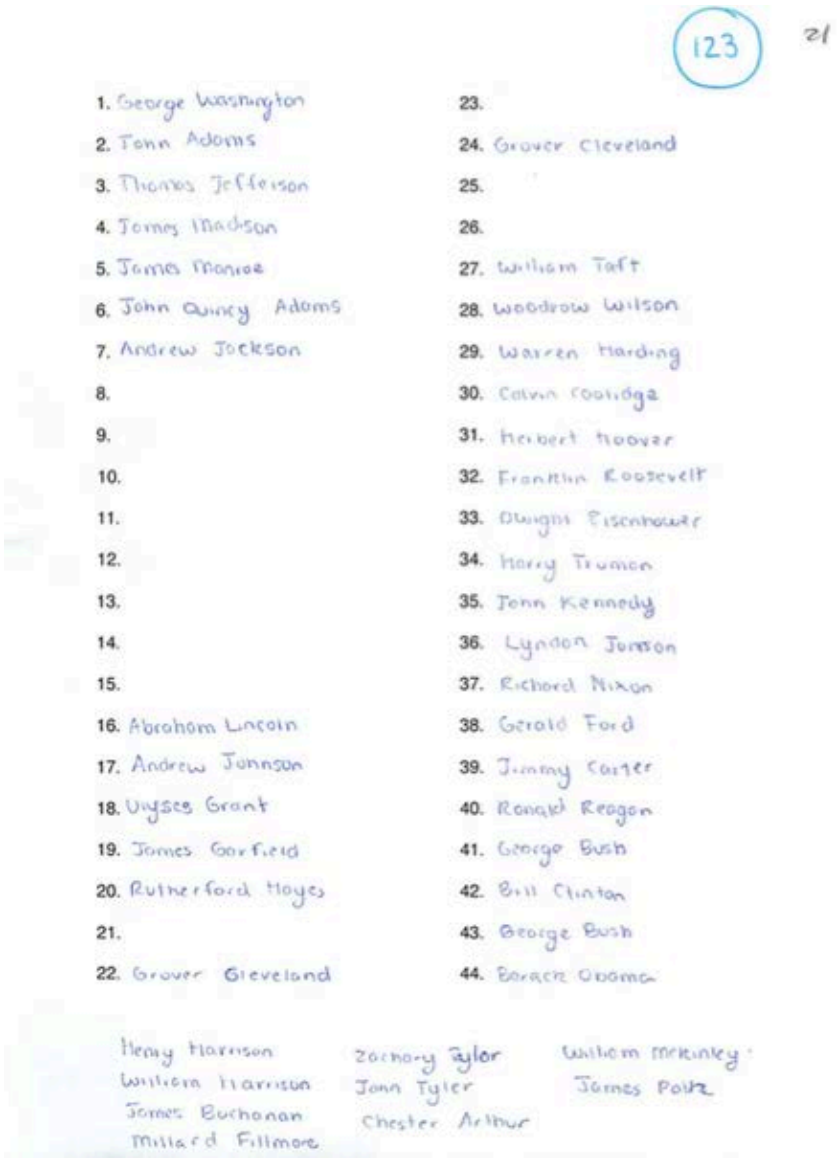

Fig. S2: An example completed recall sheet completed in 2009.

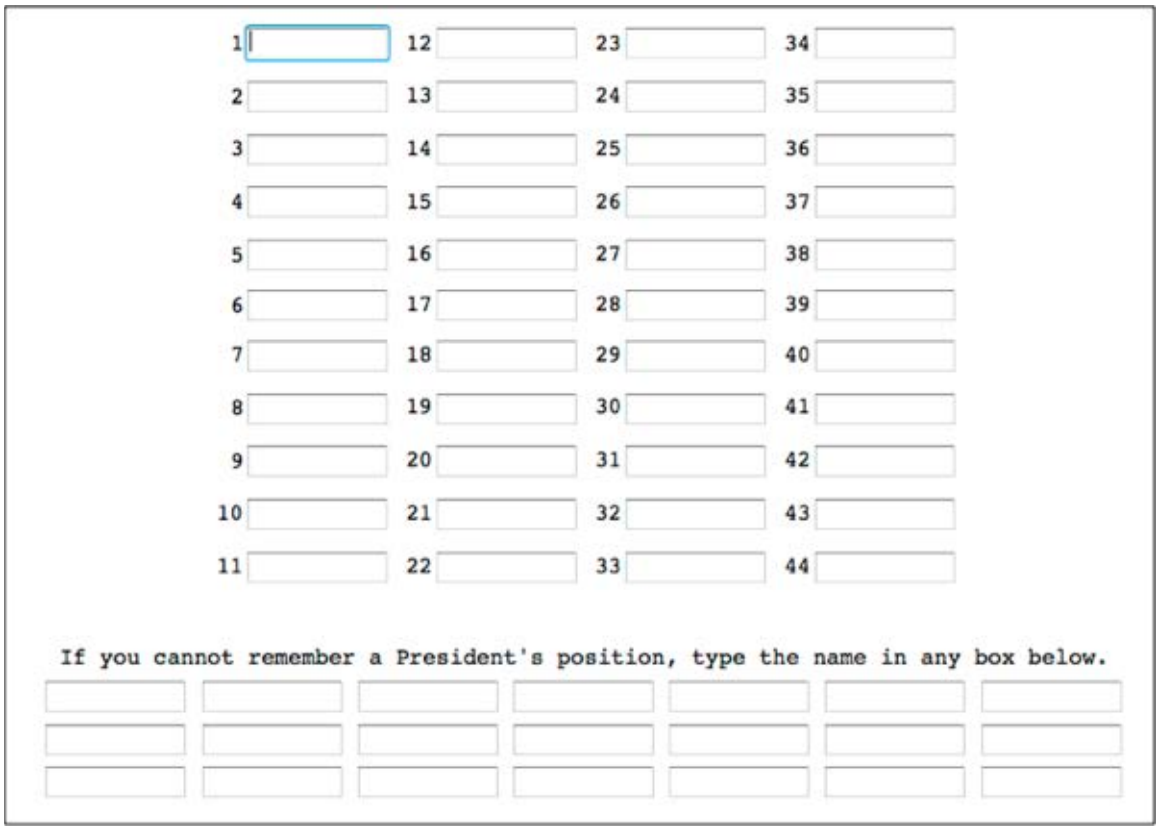

Fig. S3: The data collection screen for the MTurk study.

	Group	1	2	3	4	5	6
1	1974	1.00					
2	1991	.92	1.00				
3	2009	.67	.82	1.00			
4	Baby Boomer	.91	.95	.89	1.00		
5	Generation X	.82	.95	.94	.96	1.00	
6	Millennial	.71	.86	.98	.92	.96	1.00

Table S1: Ordinal position recall correlation matrix. Matrix showing the ordinal position recall correlations between groups in the two studies. All correlations are statistically significant, $r(36)$, $p < .001$.

	Group	1	2	3	4	5	6
1	1974	1.00					
2	1991	.95	1.00				
3	2009	.87	.92	1.00			
4	Baby Boomer	.93	.95	.93	1.00		
5	Generation X	.89	.94	.95	.97	1.00	
6	Millennial	.86	.94	.97	.95	.98	1.00

Table S2: Free recall correlation matrix. Matrix showing the free recall correlations between groups in the two studies. All correlations are statistically significant, $r(36)$, $p < .001$.

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29. Feel free to complete the task yourself at http://presidents.technimentis.com.

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