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Remembering President Barack Obama's inauguration and the landing of US Airways Flight 1549: A comparison of the predictors of autobiographical and event memory

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We examined and compared the predictors of autobiographical memory (AM) consistency and event memory accuracy across two publicly documented yet disparate public events: the inauguration of Barack Obama as the 44th president of the United States on January 20th 2009, and the emergency landing of US Airways Flight 1549, off the coast of Manhattan, on January 15th 2009. We tracked autobiographical and event memories for both events, with assessments taking place within 2½ weeks of both events (Survey 1), and again between 3½ and 4 months after both events (Survey 2). In a series of stepwise regressions we found that the psychological variables of recalled emotional intensity and personal importance/centrality predicted AM consistency and event memory accuracy for the inauguration. Conversely, the rehearsal variables of covert rehearsal and media attention predicted, respectively, AM consistency and event memory accuracy for the plane landing. We conclude from these findings that different factors may underlie autobiographical and event memory for personally and culturally significant events (e.g., the inauguration), relative to noteworthy, yet less culturally significant, events (e.g., the plane landing).

Keywords: Event memory; Autobiographical memory; Memory practices; Barack Obama; US Airways Flight 1549.

People often form lasting memories of public events, such as the terrorist attack on 11 September 2001 (9/11). These memories in turn often become incorporated into a community's collective memory, and subsequently contribute to that community's collective identity (Hirst & Manier, 2008). The national identity of Americans, for

instance, is no doubt shaped in part by their collective memories of 9/11. People also form memories of the circumstances in which they first learned about a consequential public event, as opposed to their memory for the public event per se, so-called *flashbulb memories* (FBMs; Brown & Kulik, 1977). Researchers have most often oper-

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ationalised FBMs in terms of the consistency between a baseline FBM report, culled shortly after the event, and a later report, culled after a given retention interval (e.g., 1 year; see for example, Conway et al., 1994; Curci & Luminet, 2006; Hirst et al., 2009; Neisser & Harsch, 1992; Talarico & Rubin, 2003).

Researchers have explored a number of factors that could account for the level of consistency of FBMs for a given event, focusing particularly on five factors: (1) objective consequentiality, (2) personal significance, (3) surprise, (4) emotional intensity, and the degree of (5) rehearsal. Significantly, researchers have failed to find a consistent relation between four of these variables and FBM consistency (for a review, see Talarico & Rubin, 2009). The one exception is personal significance (Bohn & Berntsen, 2007; Conway et al., 1994; Curci, Luminet, Finkenauer, & Gisle, 2001; Er, 2003; Neisser et al., 1996; Niedźwieńska, 2003; Otani et al., 2005), and the related constructs of importance to social identity (see Berntsen, 2009) and to personal identity (as, for instance, measured by the *Centrality of Event Scale*; CES, Berntsen & Rubin, 2006).

As for memory for the public events that elicit FBMs (i.e., *event memory*), although the literature is much smaller the results have been more consistent (for studies on event memory, see for example, Bohannon, 1988; Coluccia, Bianco, & Brandimonte, 2010; Curci & Luminet, 2006; Hirst et al., 2009; Shapiro, 2006; Smith, Bibi, & Sheard, 2003; Tekcan, Ece, Gülgöz, & Er, 2003). In addition to personal significance or importance to one's identity (Coluccia et al., 2010; Curci & Luminet, 2006; Tekcan et al., 2003), emotional intensity (Bohannon, 1988; Coluccia et al., 2010; Smith et al., 2003) and rehearsal (Hirst et al., 2009; Shapiro, 2006) have also been found to be positively related to event memory accuracy.

Researchers interested in both FBMs and event memories have generally examined one public event at a time, and have often employed quite different methodologies. For instance, the questions probing for FBM consistency often differ across studies, as do the length of the retention interval and the type of event details being probed. These methodological difficulties might be adjusted for if the "stimulus material" remained consistent across studies. But there is no reason to assume that FBM-evoking events are all the same. For instance, the factors influencing mnemonic retention of a consequential and tragic event (e.g., 9/11) may not be the same as the factors influencing

retention of a less-consequential but positive event (e.g., one's favourite baseball team winning a playoff series; Breslin & Safer, 2011; Kensinger & Schacter, 2006). Both are treated as FBM-evoking events, but they clearly differ in fundamental ways.

With these concerns in mind we undertook a comparative study of two different public events, devising the study to ensure that the assessments were the same for both events. Specifically, we seized upon the occurrence of two public events within 1 week of each other in January, 2009: the inauguration of Barack Obama as the 44th president of the United States on January 20th, and the emergency landing of US Airways Flight 1549, off the coast of Manhattan, on January 15th.¹ We selected these two events because (1) they were both the subject of considerable, overlapping media attention, particularly in the New York area from which we drew our sample; and (2) they nonetheless varied from one another along multiple dimensions. Although the plane landing might not have been a national news event on the scale of the inauguration, we were nonetheless confident our New York sample would have been aware of it. In terms of how the two events differed, we expected specifically that they would vary along at least four dimensions: (1) personal significance to the sample; (2) broader significance; (3) emotional valence, as we expected the inauguration of a Democratic president to be considered unequivocally positive by our politically left-leaning sample, whereas the valence of the plane landing would likely be less straightforward; and (4) the level of surprise attached to each event, as the plane landing was highly surprising, whereas the inauguration was expected.

The inauguration and plane landing were therefore ideal for a comparative study of two richly documented yet very different public events. Thus, in the current study, we probed for how the predictors of autobiographical and event memories varied across these two events. As to specific hypotheses we expected that, given their contrasting nature, results would differ across

¹We recognise that the autobiographical memory one forms of the inauguration might not be considered a flashbulb memory, in that most people watched the inauguration on television rather than having learned of it from someone else. Thus we will use the terms *autobiographical memories* (AMs) and *event memories* to reflect in the former either memory for one's reception context upon hearing of an event, or for one's circumstances *during* the event (depending on which measure is appropriate to the event), and for the latter term, memory for the details of the event itself.

each event. However, given the exploratory nature of the study, we were agnostic as to what form those differences would take.

METHOD

Participants, recruitment, and procedure

Within 2½ weeks of both events, between January 22nd 2009, and February 2nd 2009, participants were recruited from psychology courses at The New School in New York, NY, and Sarah Lawrence College in Bronxville, NY. Students completed the questionnaire in class. A total of 47 students completed the survey in this first wave.

Approximately 3½ months later the same students were approached again in class, and asked to complete the same survey as at the first wave. These second solicitations occurred between May 6th 2009 and May 15th 2009 and 36 students completed this second survey. For the present analyses we drew upon the data from these 36 participants who completed both surveys. Of these respondents, two failed to answer the questions about the plane landing. Therefore our final sample consisted of 36 participants for the questions relating to the inauguration, and 34 participants for the questions relating to the plane landing.

Of the 34 participants who indicated their gender, 27 were female (79.4%) and 7 were male (20.6%). As of Survey 1, participants reported a mean age of 21.2 years old ($SD = 4.7$), with a range from 18 to 37. As expected the sample was predominantly composed of Barack Obama supporters: of the 33 participants who reported voting in the 2008 general presidential election (91.7% of the sample), all of them reported voting for Obama.

Surveys

The surveys used at both waves were identical. Other than the questions relating to event memory, the same questions were asked of both events. Table 1 summarises the probes that figured in the present analyses. Items 1–3 queried pertinent demographic information. Items 4–9 were used to establish the consistency of AMs. For the inauguration these questions referred to participants' memory for their circumstances

during the inauguration, whereas for the plane landing they referred to participants' memory for their circumstances upon being informed of the plane landing. Items 10–17 concerned the accuracy of event memories for the inauguration, and items 18–28 concerned the accuracy of event memories for the plane landing.

Items 29–37 probed the putative predictors of autobiographical and event memories. These predictors were chosen to reflect the most salient psychological and rehearsal variables that, as reviewed above, researchers have investigated as bearing on FBM consistency and/or event memory accuracy. For personal importance, broader importance, surprise, and the questions from the 20-item CES, participants were instructed to base their appraisal of each event on how they felt at the time of the questionnaire. For emotional valence and intensity, on the other hand, participants rated these appraisals based on their recollections for their emotional reaction at the time the event occurred. For the rehearsal variables of media attention, conversation, and covert rehearsal, participants rated the extent to which they had engaged in each since the event occurred. Lastly we constructed a composite variable, *personal importance/centrality*, comprising the overall mean from (1) the question probing personal importance, and (2) the mean score across each item of the CES, as queried in reference to each event. We combined these items because they were both conceptually similar and highly intercorrelated (with intercorrelations ranging, across each event at each survey, from .62 to .92; in all cases, $p < .01$).

Coding of the memory variables

For the AM items the responses to the six questions at Survey 1 were used as a baseline measure. At Survey 2, responses to each question were judged as either consistent or inconsistent with the corresponding response at Survey 1. Consistent responses were given a score of 1; inconsistent or blank responses, a score of 0. Responses at Survey 2 were judged as consistent with those at Survey 1 if they matched on a gist level. When a question at Survey 1 was left blank we took this as indicating that the participant did not remember the answer, even at that minimal retention interval. Consequently responses at Survey 2 were scored as inconsistent given that, for our purposes, a failure to form a memory at all

TABLE 1
Relevant questions in Survey 1

Demographics	Autobiographical memory	Event memory		Predictors
		Inauguration	Flight 1549	
1. Are you male or female?	4. Where were you during the inauguration/when you heard about Flight 1549?	10. What time was President Obama sworn into office?	18. On what date did the plane landing occur?	29. What was the intensity of your emotional reaction to the inauguration/Flight 1549? [Rate on a 1–7 scale.]
2. What is your age?	5. Who were you with during the inauguration/when you heard about Flight 1549?	11. What was the weather like during the inauguration?	19. At what time of day did the plane landing occur?	30. Was your reaction to the inauguration/Flight 1549 positive or negative? [Rate on a 1–7 scale.]
3. Who did you vote for in the 2008 election?	6. What were you wearing during the inauguration/when you heard about Flight 1549?	12. What colour was President Obama's tie during the inauguration?	20. What was the weather like when the plane landing occurred?	31. What was the personal importance of the inauguration/Flight 1549? [Rate on a 1–7 scale.]
	7. What were you eating/drinking during the inauguration/when you heard about Flight 1549?	13. How many people were estimated to be in attendance?	21. What airline was it?	32. What was the broader importance of the inauguration/Flight 1549? [Rate on a 1–7 scale.]
	8. What did you do after the inauguration/after you heard about Flight 1549?	14. What colour jacket was Michelle Obama wearing?	22. How many people were on board the flight?	33. How surprising was the outcome of the inauguration/Flight 1549?
	9. Do you remember any other information about what you were doing (or your surroundings) during the inauguration/after you learned about 29Flight 1549	15. What was former Vice President Dick Cheney sitting in?	23. What river did the plane land in?	34. How frequently have you thought about the inauguration/Flight 1549 since it occurred? [Rate on a 1–7 scale.]
		16. Which musicians performed before the swearing-in?	24. Where was the plane travelling to?	35. How frequently have you watched/read/listened to media coverage about the inauguration/Flight 1549 since it occurred? [Rate on a 1–7 scale.]
		17. Who administered the oath of office to President Obama?	25. What did Governor Paterson call the event?	36. How frequently have you spoken about the inauguration/Flight 1549 since it occurred? [Rate on a 1–7 scale.]
			26. How many people died?	37. [Centrality of Event Scale, in reference to both the inauguration and Flight 1549, respectively (All items on a 1–5 scale; Berntsen & Rubin, 2006) ^a]
			27. What was the name of the pilot?	
			28. What Manhattan street did the plane land close to?	

^aEach participant's mean score across each item on the Centrality of Event scale, in reference to each event, was averaged with their response to question #32 in reference to the same event, to create a composite variable called *personal importance/centrality*.

was functionally equivalent to an inconsistent memory. There was one item for which a non-response might be considered ambiguous: the item asking what participants were eating or

drinking at the time of each event, where a non-response might be taken as indicating that the participant was not eating or drinking anything. However, many participants explicitly stated that

they were not eating or drinking anything at the time (47.2% for the inauguration and 52.9% for the plane landing), while few respondents left the question blank (11.1% for the inauguration and 8.8% for the plane landing). From the six individual questions on AM consistency we calculated a mean score of AM consistency, by summing the scores for each question and dividing by the number of questions (6).

For the event memory questions, responses to each question, at both Surveys 1 and 2, were coded as either accurate or inaccurate. Similar to the coding for the AM questions, accurate responses were given a score of 1; inaccurate or blank responses, a score of 0. As with AM consistency, accuracy was also judged at a gist level. Also following from our treatment of the AM items we computed a mean score of event memory accuracy at both Survey 1 and Survey 2 by summing the scores for each individual question and dividing by the number of questions (8 for the inauguration, and 11 for the plane landing).

We randomly selected 10 questionnaires (27.8% of the total questionnaires) to be dual coded. We found good reliability, with kappas exceeding .90 for AM consistency at Survey 2, as well as for event memory accuracy at each survey.

RESULTS

We divide the results into three sections: (1) a preliminary section examining whether the inauguration and plane landing differed across the four dimensions posited in the Introduction: personal significance, broader significance, emotional valence, and surprise; (2) a section on AM consistency and event memory accuracy; and (3) a section on the predictors of AM consistency and event memory accuracy.

Differences across both events along the four posited dimensions

The inauguration and plane landing differed along the four expected dimensions. Using the mean ratings from Survey 1 as the point of comparison, participants rated the inauguration as more personally important/central than the plane landing, $M = 3.76$ ($SD = 1.17$) to 2.00 ($SD = 1.16$), $t(32) = 6.58$, $p < .001$, $d = 1.15$, and containing greater broader importance as well,

$M = 6.33$ ($SD = 1.24$) to 3.65 , ($SD = 1.89$), $t(33) = 9.18$, $p < .001$, $d = 1.57$. Likewise participants rated the inauguration as more positive than the plane landing, $M = 6.38$ ($SD = 0.78$) to 3.91 ($SD = 2.02$), $t(32) = 6.84$, $p < .001$, $d = 1.19$. Lastly, participants rated the plane landing as more surprising than the inauguration, $M = 5.62$ ($SD = 1.88$) to 3.57 ($SD = 1.72$), $t(33) = 5.47$, $p < .001$, $d = .94$.

Autobiographical memory consistency and event memory accuracy

The consistency of AMs was significantly higher for the inauguration ($M = .69$, $SD = .27$) than the plane landing ($M = .53$, $SD = .29$), $t(33) = 4.84$, $p < .001$, $d = .83$. Moreover, event memories of the inauguration were significantly more accurate than event memories of the plane landing at Survey 1, and trended towards being significantly more accurate at Survey 2—Survey 1: $M_{inauguration} = .65$ ($SD = .22$) to $M_{plane\ landing} = .51$ ($SD = .22$), $t(33) = 3.02$, $p = .01$, $d = .52$; Survey 2: $M_{inauguration} = .56$ ($SD = .26$) to $M_{plane\ landing} = .48$ ($SD = .22$), $t(33) = 1.81$, $p = .08$, $d = .31$. At Survey 1 all participants correctly answered at least two of the 11 event memory items for the plane landing (18.2%), confirming our presumption that they were all well aware of this event.

Predictors of autobiographical memory consistency and event memory accuracy

We ran a series of stepwise regressions to determine the predictors of AM consistency, and event memory accuracy for each event. The regressions were computed using forward regression with a statistical significance of .05 for entry. As predictor variables we included those predictors from Table 1 which, in prior Pearson's correlations, were significantly correlated with the relevant memory variable at an alpha level of .05. For AM consistency and event memory accuracy at Survey 2 we considered, for inclusion in the regressions, each predictor variable at both Survey 1 and Survey 2. However, for event memory accuracy at Survey 1 we only considered participants' scores on the predictor variables at Survey 1 for inclusion in the regressions.

At the same time we were mindful of not overloading the regressions with an inappropriately large number of predictors for our modest sample size. Therefore we maintained a ratio of no more than one predictor in the regression for every five participants in the sample (Brace, Kemp, & Snelgar, 2003). In one case (the regression for event memory accuracy for the plane landing at Survey 2) we would have exceeded this ratio had we entered all the significant correlates as predictors in the regressions. Here, in keeping with this ratio, we included only the six most strongly correlated variables in the regression.

The coefficients from the regressions are presented in Table 2. The table includes those predictor variables which emerged as significant predictors of performance on each memory variable. It also includes the putative predictors which had been included in the regressions, again based on prior correlational analyses, but which did not ultimately predict memory performance. As the table illustrates, the factors predicting AM consistency and event memory accuracy differed across the two events. For the inauguration, first, recalled emotional intensity at Survey 2 (which was the only significant correlate of AM consistency) predicted AM consistency, $F(1, 34) = 14.93$, $MSE = .05$, $p < .001$, $R^2 = .31$. Second, recalled emotional intensity at Survey 1 predicted event memory accuracy at Survey 1, $F(1, 33) = 4.72$, $MSE = .04$, $p = .04$, $R^2 = .13$. Lastly, personal importance/centrality at Survey 2 predicted event memory accuracy at Survey 2, $F(1, 33) = 4.63$, $MSE = .06$, $p = .04$, $R^2 = .12$.

For the plane landing, first, covert rehearsal at Survey 1 predicted AM consistency, $F(1, 31) = 8.52$, $MSE = .07$, $p = .01$, $R^2 = .22$. Second, media attention at Survey 1 predicted event memory accuracy at Survey 1, $F(1, 32) = 6.90$, $MSE = .04$, $p = .01$, $R^2 = .18$, and media attention at Survey 2 predicted event memory accuracy at Survey 2, $F(1, 32) = 13.08$, $MSE = .04$, $p = .001$, $R^2 = .30$.²

DISCUSSION

The goal of the present study was to compare the predictors of AM consistency and event memory accuracy across two proximally occurring and publicly documented events: the inauguration of Barack Obama and the emergency landing of US Airways Flight 1549. For the inauguration our results indicated that the psychological factors of recalled emotional intensity and personal

importance/centrality of the event predicted AM consistency and event memory accuracy. Alternatively, for the plane landing the rehearsal variables of covert rehearsal and media attention predicted, respectively, AM consistency and event memory accuracy.

These findings support our claim that the mechanisms underlying AM consistency and event memory accuracy may vary across different types of events. Although the probed events differed across at least four dimensions, two critical dimensions might be the levels of personal and broader importance attached to each event. It seems likely that, for events of great personal and broader importance such as Barack Obama's inauguration, the personal importance/centrality and/or emotional intensity of the event might drive both AM consistency and event memory accuracy. Other factors—such as rehearsal—might take a lesser, and perhaps undetectable, role. As for less culturally important events, such as the plane landing, it might be that, often, neither personal importance/centrality nor emotional intensity plays a significant role. In such instances, failing a significant psychological impact of the event, other factors—for example,

²Bohannon and colleagues (Bohannon, Gratz, & Cross, 2007; Julian, Bohannon, & Aue, 2009) have introduced two additional measures when assessing FBMs. Both examine the quantity of information contained in the memory. The first looks at the elaborateness of the narrative people provide when describing their memory. The second focuses on the specific memory probes contained in FBM questionnaires; for instance, who first informed the participant of the event. Julian et al. (2009) argue that the first of these measures may be more sensitive in detecting the contribution of different predictors of the formation and retention of FBMs than the standard consistency measures. We did not collect discovery narratives in this study, and hence cannot explore Julian et al.'s claim further in this study. On the other hand, both Julian et al. (2009) and Bohannon et al. (2007) also found that responses to the memory probes were sensitive to at least one predictor—source of discovery—with individuals who learned of the relevant event from another person, rather than through the media, subsequently reporting greater memory quantity on the probes. Julian et al. suggest that this measure of memory quantity may, likewise, be preferable to consistency measures. Here the measure was all-or-none. That is, Bohannon and colleagues scored the response to a probe as 1 if a memory was reported at all, and as 0 if there was no reported recollection. Following Julian et al. we recoded our responses to the six AM probes in our questionnaires and undertook analyses identical to the ones we undertook with the consistency measure. We did not find any significant predictors of this measure of memory quantity. However, our sample size was substantially smaller than that of Julian et al. It remains an open question as to which measure—consistency or quantity—is preferable in FBM studies.

TABLE 2

Summary of stepwise regressions predicting flashbulb and event memory for the inauguration and plane landing

<i>Obama inauguration autobiographical memory consistency, S1 – S2</i>	<i>Obama inauguration event memory accuracy, S1</i>	<i>Obama inauguration event memory accuracy, S2</i>	<i>US Airways Flight 1549 autobiographical memory consistency, S1-S2</i>	<i>US Airways Flight 1549 event memory accuracy, S1</i>	<i>US Airways Flight 1549 event memory accuracy, S2</i>
Standardised betas	Standardised betas	Standardised betas	Standardised betas	Standardised betas	Standardised betas
Recalled emotional intensity, S2: .55***	Recalled emotional intensity, S1: .35* Broader importance, S1: .24	Personal importance/centrality, S2: .35* Media attention, S1: .25 Recalled emotional intensity, S2: .22	Covert rehearsal, S1: .46** Recalled emotional intensity, S2: .21 Personal importance/centrality, S1: .21 Personal importance/centrality, S2: .20 Conversation, S1: -.02 Covert rehearsal, S2: -.10	Media attention, S1: .42* Covert rehearsal, S1: .23 Conversation, S1: .04	Media attention, S2: .55** Covert rehearsal, S1: .31 Recalled emotional intensity, S2: .29 Personal importance/centrality, S1: .24 Conversation, S1: .18 Covert rehearsal, S2: -.003

* $p < .05$; ** $p < .01$; *** $p < .001$.

rehearsal—might drive AM consistency and event memory accuracy.

The present findings might, at first glance, appear to be at odds with those of Bohannon et al. (2007). Bohannon et al. found, across four FBM-evoking events, that FBM quantity (the proportion of FBM probes to which a participant offered a response, independent of issues of consistency) was greater for events that individuals learned of from another person, while event memory quantity (likewise, the proportion of event memory probes to which a participant offered a response, independent of its accuracy) was greater for events that individuals learned of through the media (for similar findings, see also Julian et al., 2009). Bohannon et al. consequently conclude that the source of discovery bears strongly on the development of FBMs and event memories. Given that, in the current study, the inauguration could be considered a media-sourced event, while the plane landing was likely more person-sourced, Bohannon et al.'s findings suggest that we should have found greater AM consistency for the plane landing and greater event memory accuracy for the inauguration. However, this was not the case; both AM consistency and event memory accuracy were greater for the inauguration. These divergent results might simply reflect, though, the complex nature of autobiographical and event memory. Although the sourcing of an event may influence the development and maintenance of AMs and

event memories, so do the psychological and rehearsal variables we found most predictive in the current study. In some cases one set of factors might have the strongest effect, while in other cases another set of factors might do so.

Our findings, additionally, underscore the importance of a community's *memory practices* in sustaining event memory for a public event, especially when events are of less-personal and broader importance (Hirst et al., 2009). Hirst et al. (2009) found that the degree to which participants followed media coverage about 9/11, as well as the extent to which they engaged in conversation about it, were correlated with event memory accuracy, but not with FBM consistency. The effect they found for rehearsal, even for an event of great personal and broader importance, might have reflected the extensive level of coverage of the 9/11 tragedy. Although there was considerable media coverage of Barack Obama's inauguration, it did not reach the levels of coverage devoted to 9/11. Again, each case differs. Personal importance might mask the role of media and conversation when the resulting rehearsal is not excessive. It might itself be trumped when rehearsal is both extensive and long lasting. There are multiple routes to accurate event memory and consistent FBMs or AMs. One needs to consider both the characteristics of the event and the memory practices surrounding it.

Taken in that light, our findings extend Hirst et al.'s (2009) results in two ways: (1) They suggest

that the importance of a community's memory practices might vary according to the event, with such practices perhaps especially important for noteworthy, though less culturally significant, events, and (2) more specifically, the relation between covert rehearsal and AM consistency for the plane landing suggests that *private* memory practices might be a critical factor in sustaining consistent AMs for certain public events.

To be sure, there are several limitations to our study. Foremost among these are both the small sample size and the limited number of examined events; any conclusions derived from this study should therefore be considered tentative. Our assessment, at Survey 2, of levels of surprise at the time of the survey rather than at the time of the event is also a limitation, inasmuch as it precludes the more typical assessment of the effect of levels of surprise concurrent with the event.

Nevertheless our findings hold important implications for advancing our understanding of the factors that influence whether a given event will come to figure prominently in a community's collective memory—and, by extension, its collective identity. That is, they suggest that there are multiple routes for the formation of AMs and event memories for public events across a community. The great advantage of the comparative methodology explored here, relative to the more prevalent single-case studies, is its potential to illuminate these varying processes behind AM consistency and event memory accuracy for disparate public events.

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