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Flashbulb Memories

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Abstract

We review and analyze the key theories, debates, findings, and omissions of the existing literature on flashbulb memories (FBMs), including what factors affect their formation, retention, and degree of confidence. We argue that FBMs do not require special memory mechanisms and are best characterized as involving both forgetting and mnemonic distortions, despite a high level of confidence. Factual memories for FBM-inducing events generally follow a similar pattern. Although no necessary and sufficient factors straightforwardly account for FBM retention, media attention particularly shapes memory for the events themselves. FBMs are best characterized in term of repetitions, even of mnemonic distortions, whereas event memories evidence corrections. The bearing of this literature on social identity and traumatic memories is also discussed.

Where were you when you first learned about the assassination of John F. Kennedy, the Challenger explosion, or the attack of September 11, 2001? Variants of this question are often asked, and, usually with great enthusiasm, people reply with vivid, elaborate, and confidently held memories, memories that they claim they will never forget. Brown and Kulik (1977) called such autobiographical memories *flashbulb memories* (FBMs) in order to capture their impression that people had taken a photograph of themselves while learning of a public, emotionally charged event such as the Kennedy assassination. The avalanche of research on FBMs that followed their now classic paper occurred, in part, because the “flashbulb nature” of FBMs seemed distinctly different from the character of other autobiographical memories (see Curci & Luminet, 2009, for a collection of papers on FBMs).

We should be clear about our terminology, which builds on Brown and Kulik’s (1977). The term *flashbulb memories* refers only to those autobiographical memories that involve the circumstances in which one learned of a public event. They differ from *first-hand memories*, that is, memories one might form if one actually experienced the event itself, rather than simply learned about it from someone else (Pillemer, 2009). They also differ from memories of the facts concerning the FBM-eliciting event, e.g., with respect to the attack of 9/11, that four planes were involved. Although the term may be misleading, inasmuch as all three

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types of memories involve events, memories for the relevant facts are often referred to as *event memories*.

The events eliciting a FBM are, by definition, public, inasmuch as for people to form a memory of the circumstances of learning of an event, an external source must have communicated the news to them. FBM-eliciting events studied to date include assassinations and other politically charged proceedings, major public occasions, such as the World Cup, and national disasters, such as earthquakes (see Luminet & Curci, 2009, for reviews). Although most studies investigate negative events, positive events can also elicit FBMs, e.g., the fall of the Berlin Wall (Bohn & Berntsen, 2007). The public does not need to be as large as a nation. People can have FBMs of an event experienced within a family setting, such as learning of the death of a parent (Rubin & Kozin, 1984).

Unique memory system?

The seemingly distinctive character of FBMs led Brown and Kulik (1977) to posit that a separate memory mechanism might be involved in their formation and retention, by which we mean a set of encapsulated mental processes that govern the encoding, retention, and retrieval of FBMs and not other autobiographical memories – or any other type of memory. Brown and Kulik labeled the mechanism *Print Now!*, thereby underscoring the putatively indelible, vivid, and elaborated nature of FBMs.

A substantial body of research has assessed Brown and Kulik's (1977) claim, contrasting it with the possibility that the same processes involved in the encoding, retention, and retrieval of "everyday" autobiographical memories could also account, somewhat paradoxically, for the distinctive characteristics of FBMs, what we might call the "*ordinary*" *memory mechanism hypothesis*. Although Brown and Kulik wrote that FBMs were as "unchanging as the slumbering Rhinegold" (p. 86), they could not assess this claim, in that they simply asked individuals for a FBM. Specifically, they confined their queries to possible FBMs formed several years prior to their study. In their study, they asked for an open narrative of the reception event, followed by questions about canonical features, e.g., when did you hear the news, where were you, what were you doing, how did you find out? They also solicited phenomenological characteristics, e.g., vividness, confidence, and/or elaborateness. Other researchers followed up Brown and Kulik's claim that FBMs were unchanged, and hence, presumably accurate by employing a test-retest methodology. They obtained recollections as soon after a major, emotionally charged public event occurred as they could, and then after a substantial delay, usually a few months (e.g., Bohannon & Symons, 1992; Neisser & Harsh, 1992). They then compared the latter recollection with the initial one, often focusing on the canonical features assessed by the probes proposed by Brown and Kulik (Kızıllöz & Tekcan, 2013). If the memory collected a few days after the event is fairly accurate, then the comparison between the initial and latter recollections could serve as a measure of accuracy. However, inasmuch as the accuracy of the initial recollection usually declines as the interval between the reception event itself and the initial testing increases (Winningham, Hyman, & Dinnel, 2000, but see Kvavilashvili, Mirani, Schlagman, Foley, & Kornbrot, 2009), most researchers acknowledge that the test-retest comparison measures *consistency*, not accuracy.

Although there are some reports of marked consistency after substantial delays (Conway et al., 1994; Kvavilashvili et al., 2009), studies using this test-retest methodology have generally found substantial declines in consistency over time, thereby contradicting Brown and Kulik's claim (1977). In line with the bulk of the research reporting inconsistencies, Talarico and Rubin (2003) even showed that, although people may initially remember FBMs better than "everyday" autobiographical memories, the rate of decline was the same for both. Interestingly, once an inconsistency emerges, usually within the first year, it tends to be repeated thereafter (Hirst et al., 2009, 2015). These memory errors often involve time slice confusions (Kvavilashvili, et al., 2009), that is, the tendency to confuse the second or third time one heard news about the FBM-eliciting event with the first time. Time slice confusions apparently become incorporated into the memory and emerge with each memory report.

On the basis of such results, researchers have concluded that "ordinary" memory processes should be sufficient to account for the distinctive characteristics of FBMs (McCloskey, Wible, & Cohen, 1988; Talarico & Rubin, 2009). A caveat is in order, however. Brown and Kulik and researchers employing the test-retest method are discussing two different claims about *forgetting*. Brown and Kulik treated *forgetting* as a failure to have a memory, whereas those employing a test-retest methodology treat *forgetting* as a failure to remember the past consistently. When Brown and Kulik stated that there is no forgetting, they are right, in the sense that most members of the public report having a memory, even after 10 years (Hirst et al., 2015). As the test-retest work indicates, the memory may not be consistent, but it is long lasting.

Factors affecting flashbulb memories

Formation and retention

Necessary and sufficient factors—If ordinary memory mechanisms are enough to account for the distinctive nature of FBMs, are there necessary and/or sufficient factors that could elicit them in such a way that FBMs are formed and retained? Putative factors can be divided into two groups: (1) those focusing on the characteristics of either the FBM-inducing event or the circumstance in which one learned of the event, e.g. the emotions felt upon hearing the news, the degree of surprise when hearing the news, the consequentiality and significance of the event, and the event's distinctiveness; (2) those focusing on how one processes the event over time, e.g., the extent of rehearsal.

Finkenauer et al. (1998) highlighted three structural-equation models that captured in different ways putative factors bearing on the formation of FBMs: Brown and Kulik (1977), Conway et al. (1994), and their own emotional-integrative model (see also Er, 2003). The models probably differ, in part, because they involved different public events. Moreover, the models employed different senses of forgetting, with Conway et al.'s focusing on consistency scores and Brown and Kulik and Finkenauer investigating simply the report of a FBM. Critically, the emotional-integrative model posits that the effect of emotional feeling state is two-fold: (1) As in the other models, it directly impacts on the presence of FBMs, and (2) unlike other models, it can trigger rehearsal of the memory of the FBM-eliciting event, which, in turn, reinforces the FBM.

Although these models specify which factors might have a greater impact on the formation and retention of a FBM over other factors, they do not tackle the difficult problem of specifying necessary and sufficient ones. At a minimum, for a necessary and/or sufficient feature to occur, test-retest studies should consistently find significant correlations between FBM formation and a candidate factor such as emotional state, distinctiveness or surprise. As yet, such consistent findings have proven elusive. For instance, Talarico and Rubin (2003) and Hirst et al. (2009, 2015) failed to find any correspondence between emotional state and consistency in their studies of FBMs of 9/11. Mahmood, Manier, and Hirst (2004) raised questions about distinctiveness by showing that the phenomenological quality of FBMs of the deaths of friends and lovers from AIDS remained the same whether one experienced multiple deaths or a single death. Surprise also does not seem to be a necessary feature (Colucca, Bianco, & Brandimonte, 2010).

The possible absence of necessary and sufficient factors should not be surprising. There may be a wide range of individual differences in how ordinary mechanisms are brought to bear either when hearing of a public event or in the time that follows. Some people may rehearse the event extensively; others may be taken by its distinctiveness. Emotional reactions to the event may also differ. The reaction could linger over the long-term, be short lived, or only appear after the event's impact is fully appreciated. In most laboratory settings, experimenters carefully control how participants respond to stimuli, thereby allowing them to study the effects of a particular process on memory. The complex, real-world nature of learning of a public event does not allow for such control (but see, for example, Lacianno, Curci, & Semin, 2010, for attempts to create FBMs in the laboratory).

Consequentiality and Social Identity—Some researchers have suggested that consequentiality may be a necessary feature of a FBM-inducing event (e.g., Talarico & Rubin, 2009). However, if, as Brown and Kulik (1977) defined the term, consequentiality refers to the consequences for the personal life of a member of the public, it is unlikely to be a necessary feature. British citizens formed FBMs of the death of Princess Diana (Kvavilashvili et al., 2003), but this death clearly had few consequences for their personal lives. On the other hand, consequentiality could refer to consequences for the community touched by the FBM-elicited event. Several studies suggest that this sense of consequentiality may be critical to the formation of a FBM. For instance, French participants possessed FBMs for the death of French President Mitterrand, whereas French-speaking Belgian participants did not (Curci, Luminet, Finkenauer, & Gisle, 2001), reflecting the consequentiality of Mitterrand's death for French citizens, but not French-speaking Belgians. But even here, there is some possibility for debate. People throughout the world formed FBMs of the 9/11 attack (Curci & Luminet, 2006), though the consequences for their respective communities surely differed. The one seemingly unassailable point is that consequentiality, no matter what its definition, is not a sufficient factor. A correlation between measures of consequentiality and consistency is not always found (e.g., Hirst et al., 2015). Moreover, most public, consequential events do not elicit FBMs. It is probably the case that few American women remember the circumstances in which they learned of the confirmation of the first female Supreme Court Justice of the United States, Sandra Day

O'Connor, but that event is surely consequential, especially for American women. FBMs are the exception rather than the rule, even for consequential public events.

Nevertheless, on those rare occasions when FBMs are formed, because of their social consequentiality, they can play a substantial role in shaping social identity (Berntsen, 2009; Neisser, 1982). They play this role, in part, because they mark those instances during which people feel that they are part of the history of their social group. As Neisser (1982) wrote, one “recalls an occasion where two narratives that we ordinarily keep separate – the course of history and the course of our lives – were momentarily put into alignment. . . . Details are linked between our own history and History. . . . [FBMs] are the places we line up our lives with the source of history itself and say ‘I was there’” (p. 48). In this regard, it is interesting that FBMs formed by members of a social group often reflect the attitudes of this group. Elderly Danes, for instance, are likely to remember the weather as worse than it was for the day of the German invasion in WWII, and better than it was for the day of the German withdrawal (Berntsen & Thomsen, 2005).

Widespread presence—FBMs can influence social identity in part because they are held not just by a few members of the public, but by most members. Why is it that few Americans have trouble recollecting where they were when they learned about the attack of 9/11 (Hirst et al., 2015)? The specifics of the FBMs' content may differ, but everyone has a memory. A partial answer might again focus on the role of consequentiality, at least in its “public” sense. One social group forms a FBM because the associated public event is consequential for the group, whereas another social group does not because the event is inconsequential for them (e.g., Conway et al., 1994; Curci et al., 2001). From this perspective, even if consequentiality is not a necessary condition for forming FBMs, it may still explain, at least in part, why they are widespread in one social group but not another.

Confidence

One agreed-upon difference between FBMs and “everyday” autobiographical memories, even those that are rated “important,” is that confidence in FBMs remains high, even as consistency declines, whereas confidence in “everyday” autobiographical memories declines along with consistency (e.g., Talarico & Rubin, 2003). What explains this difference? Vividness, elaborateness, and ease of retrieval are thought to influence the judgment that an event occurred (Johnson, Foley, Suengas, & Raye, 1988). They no doubt also account, in part, for the confidence assigned to a FBM, in that these memories tend to be both vivid and elaborate. Metamemory judgments may also play a role. For instance, although both Americans and Germans did not use ease of retrieval when judging their confidence in their FBMs of 9/11 the first six months after the attack, Germans began to use it after a year (Echterhoff & Hirst, 2006) while Americans did not. Just as a son may feel that any inaccuracies in his memory of learning of the death of his mother would reflect negatively on the quality of his relationship with her, so also might Americans, but not Germans, believe that any inaccuracies in their FBMs would reflect poorly on their relationship to their country. As a result, they judge the memory as accurate, regardless of its phenomenological characteristics. Along similar lines, people are more confident in their FBMs if they feel a social bond to the central figure in the FBM-eliciting event (Day &

Ross, 2013). Both of these findings underscore the close connection between FBMs and social identity.

Event Memory

Although not as thoroughly studied as FBMs, researchers are beginning to appreciate how event memories, that is, memory for facts about the FBM-inducing event, may be similar or different from FBMs. For instance, event memories are similar to FBMs, in that they also decline over time (Bohannon & Symons, 1992; Hirst et al., 2015). But how they are retained — or forgotten — seems to differ (Tinti, Schmidt, Testa, & Levine, 2014). In particular, at least one common factor shaping the accuracy of the event memory may play less of a role for FBMs: the extent of rehearsal attributed to media attention. This factor impacts the public as a group because the media ensures extensive, widespread exposure and, in doing so, may overwhelm any individual differences in the way the event is processed. Not surprisingly, then, we find strong correlations over time between the extent of media coverage and the decline in the accuracies of event memory. Moreover, unlike the repetition of inconsistencies in FBMs over time, corrections of inaccuracies characterize event memories (Hirst et al, 2009, 2015). These corrections can be attributed to the effect of media. For instance, the public's memory for President Bush's location at the time of the attack was quite poor after a year, but suddenly improved after three years. This improvement probably occurred because of the release of Michael Moore's film *Fahrenheit 9/11*. It showed President Bush hearing the news as he sat in a Florida elementary school classroom, thereby refreshing the public's memory, especially those members of the public who saw the film (Hirst et al., 2009, 2015).

FBMs and Trauma

One reason for an interest in FBMs is that their study may help psychologists understand traumatic memories. Their relevance can be seen in two different lines of research. First, epidemiological studies after the attack of 9/11 established that many people in the New York City area who did not directly experience the events at Ground Zero nevertheless experienced symptoms of post-traumatic stress disorder (Galea et al., 2002). Second, brain-imaging studies showed enhanced activity levels of the amygdala after three years for those close to, but not at, Ground Zero (Sharot, Martorella, Delgado, & Phelps, 2007). The amygdala is a brain structure involved in emotional processing and memory. The linkage between FBMs and trauma suggested by this research needs to be approached cautiously, however. The horror of directly experiencing a traumatic event may impact the observer in ways that could not be anticipated by examining those who only learned of the traumatic event.

With this caveat in mind, we would still underscore that, according to the work on FBMs, the confidence that people often have in their traumatic memories may not be fully justified. Moreover, like other autobiographical memories, traumatic memories may be replete with errors of omission and commission, even after a relatively short delay. Finally, persistence of and confidence in a memory is no guarantee of its accuracy. Errors may begin to emerge within weeks and certainly within a year, and once these errors are incorporated into the

memory, they can persist and be confidently held for many years, perhaps a lifetime. Of course, these possible inaccurate memories can be changed, either by introducing misleading information or by correcting the erroneous information. But, in many cases, inasmuch as a traumatic event is something experienced by an individual, with few, if any other people privy to it, the memory may remain fairly stable, if inaccurate, for the long-term.

Concluding Remark: A Look into the Future

FBMs are those rare instances in which personal history and History writ large come into alignment. Consequently, they can influence the social identity of a community. The 40 years of research on FBMs and their associated event memories has allowed psychologists to begin to understand the similarity and differences in how people form both FBMs and event memories. The research, however, is skewed heavily towards investigating negative public events, a leaning that links FBMs to traumatic memories. Future research might investigate positive eliciting events. Positive public events, such as, for many, the election of Barack Obama to the US Presidency, also impact both personal history and History writ large (Koppel et al, 2013). An understanding of their formation and retention, as well as how they in turn shape social identity may be as critical as a similar understanding of negative flashbulb memories.

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