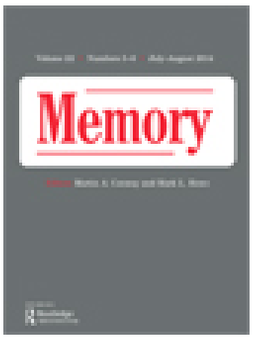

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A day that America will remember: flashbulb memory, collective memory, and future thinking for the capitol riots

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ABSTRACT

This study explores the topics of flashbulb memory, collective identity, future thinking, and shared representations for a public event. We assessed the memories of the Capitol Riots, which happened in Washington DC, on 6 January 2021. Seventy Belgian and seventy-nine American citizens participated in an online study, in which they freely recalled the unfolding of Capitol Riots and answered questions regarding their memory. Inter-subjects similarity of recalled details was analysed using a schematic narrative template (i.e., the event, the causes and the consequences). Results revealed that representations of the event, and its causes were more similar among Belgians compared to Americans, whereas Americans' representations of the consequences showed more similarity than Belgians'. Also, as expected, Americans reported more flashbulb memories (FBMs) than Belgians. The analysis underlined the importance of rehearsal through media and communication in FBM formation. This research revealed a novel relation between FBM and future representations. Regardless of national identity, participants who formed an FBM were more likely to think that the event would be remembered in the future, that the government should memorialise the event, and that a similar attack on the Capitol could happen in the future compared to participants who did not form FBM.

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Collective memory; flashbulb memories; inter-subjects similarity; social identity; future thinking; cultural memory

On 6 January 2021, an angry mob of rioters entered the Capitol building in Washington, DC. They were objecting the results of the 2020 presidential elections and demanded a reassessment in favour of Donald Trump. The rioters quickly spread across the building, trying to find Vice President Mike Pence and House Speaker Nancy Pelosi. Rioters assaulted officers, occupied the complex, and destroyed property. Lawmakers and the staff were immediately evacuated. Five people died and over a hundred people were injured during the riots.

The news of the Capitol riots spread around the world, so that not just Americans, but many others started to form collective representations of the event. The Capitol riots constituted a historical event that possesses many characteristics favouring the formation of a flashbulb memory. Moreover, details concerning the event itself are likely to be remembered in the future, given its uniqueness and consequentiality. In the present research, we explore the formation of flashbulb memories and collective memories around the Capitol Riots among American and Belgian citizens. We also examine how such memory formation influences future thinking associated with the events with a focus on the following questions: How do these personal and collective representations relate? Will they be associated in some way or remain distinctive representations that do not bear on each other?

From individual to collective memory

Memories of the Capitol Riots, as memories for other important public events, allow us to investigate an individual to collective memory continuum (Figure 1). First, these public event memories could be studied through an individual lens since people individually learn and encode the news about the Capitol Riots. As a result, they can form event memories, which encompass the details and factual information about the event (Finkenauer et al., 1998; Merck, 2020). Moreover,

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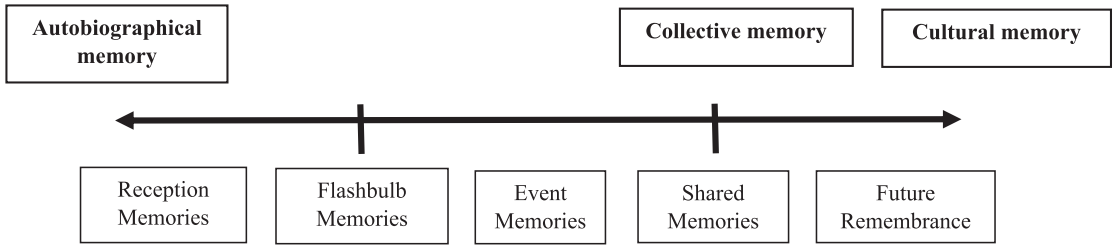

Figure 1. Memory continuum: from individual to collective memory.

the distinct characteristics of the event could lead to the formation of flashbulb memories (FBMs), that is, memories for the context of reception event (Merck et al., 2020). Thus, people could remember not only the event itself but also the personal circumstances in which they learned about the event (Brown & Kulik, 1977). The reception memories for the Capitol Riots correspond to the most detailed level in Conway's model of autobiographical memories (i.e., where one was, what one was doing at that time, with whom one was …) (Conway, 2005; Tinti et al., 2014).

Additionally, by rehearsing event memories through various means such as media and conversations, people can form shared representations around the event (shared memories). If these shared representations bear on the identity of the community in question, in this case Americans, they can be considered collective memories (Burnell et al., 2022; Hirst & Manier, 2008). Thus, the experience of a public event such as the Capitol riots could initiate the creation of memories at different levels of the continuum between individual and collective memory (Berntsen, 2018; Neisser, 1982) (see Table 1). Memories on this continuum can share common psychological principles (Hirst et al., 2018). For instance, both autobiographical and collective memories are important to build a sense of, respectively, a personal and collective identity (Conway, 2009; Hirst & Stone, 2016; Öner & Gülgöz, 2020). Furthermore, people can form future representations around whether the event should be individually or collectively imagined in the future. These future representations could bear on the more long-term cultural memory of the event (Assmann, 1995).

We will now turn to a more detailed discussion of these different realms of memory and how they might interact with each other.

Flashbulb memory

Flashbulb memories (FBMs) are vivid and long-lasting memories of the personal circumstances in which one heard the news about an event, such as when, where and what one was doing when one heard the news, what might be referred to as the *reception event* (Brown & Kulik, 1977).

In earlier work, Brown and Kulik (1977) suggested that FBMs rely on a separate memory system distinct from autobiographical memory. According to subsequent research, however, FBMs exhibit similar characteristics as everyday autobiographical memories, especially in terms of their consistency and the rate of forgetting (Hirst & Phelps, 2016, for a review). What differentiates FBMs is probably not the memory system involved but characteristics of the FBM other than accuracy and rate of forgetting. Several are worth emphasising. First, as indicated, they are more confidently held and more vivid over the long term than most autobiographical memories (Talarico & Rubin, 2003, 2007). In addition, they are more likely to be associated with members of the affected community, e.g., French citizens are more likely to form memories of learning of the death of French President Mitterrand than are French-speaking Belgians (Curci et al., 2001). In this regard, the degree of identification with that community is also important. Memories of the reception event that team-specific baseball fans formed were more likely to have the characteristics associated with FBMs, that is, vividness and confidence, than were the reception memories of generic baseball fans (Merck et al., 2020). Whether one can refer to a reception memory without these characteristics as a FBM is a matter of definition.

Table 1. Definitions of concepts related to memory representations.

Concept	Definitions
Autobiographical memory	*"Memories for the events of one's life"* (Conway & Rubin, 1993)
Reception memories	*Memories for the context of encoding* (Merck, 2020)
Flashbulb memories	*Vivid and long-lasting memories of the personal circumstances in which one heard the news about an event* (Brown & Kulik, 1977)
Event memories	*The facts about the event* (Merck, 2020)
Shared memories	*Memories shared across a community that does not necessarily inform community identity*
Collective memories	*"Widely held memories of community members that bear on the collective identity of the community"* (Hirst & Manier, 2008, *p. 184*)
Future remembrance	*The degree to which people think the event would and should be remembered and memorialised in the future*
Communicative memory	*Memories that are based on and transmitted through everyday communications* (Assmann & Czaplicka, 1995; Muller et al., 2018)
Cultural memory	*Long-term and stable memories that are maintained through cultural formations and that inform cultural identity* (Assmann, 1995)

What is clear, however, is that one can have a reception memory with the characteristics of FBM without being a member of an affected community (Cheriet et al., 2021), but community membership and social identification makes these characteristics more likely to emerge.

Finally, FBMs are widely held within the affected community. It is not simply that FBMs of the death of Mitterrand are more likely to be formed by French citizens than French-speaking Belgians, but it is also the case that most French citizens form such an FBM. Because FBMs are associated with the affected community and are widely held within the affected community, they can serve as a marker of membership within the community (Hirst et al., 2020). A French citizen who does not have a FBM of Mitterrand's death would be considered to only weakly identify with France (Cyr et al., in prep; Merck & Hirst, 2022).

Several factors are often viewed as initiating conditions or maintenance factors for the formation and retention of FBMs. At the time of encoding, emotions such as surprise, consequentiality and, as noted, social identity seem to influence the creation of FBMs (Curci & Conway, 2013; Finkenauer et al., 1998; Hirst & Phelps, 2016; Kopp et al., 2020; Stone et al., 2019; Tinti et al., 2009; Wolters & Goudsmit, 2005). Rehearsal, on the other hand, fosters FBMs after encoding (Curci & Conway, 2013; Hirst & Phelps, 2016).

Emotion has been extensively studied in the FBM literature. It enhances the memory for the context of shocking events (Finkenauer et al., 1998). Most studied FBMs involve negative events associated with strong emotional content, such as assassination of presidents (Pillemer, 1984) or natural disasters (Luminet & Curci, 2017). However, positive events can also trigger FBMs (Bohn & Berntsen, 2007; see Stone & Jay, 2017). One specific emotion often associated with the occurrence of FBMs is the surprise felt when hearing the news.

Brown and Kulik (1977) had, early on, described consequentiality as a critical component in FBM formation. At first, discussions on consequentiality focused on the personal impact of a public event through the lens of appraisal theories (Lazarus & Smith, 1988). Based on these theories, one should assess an event as personally important to develop a strong emotion, and as a result form FBM (Conway et al., 1994; Lazarus & Smith, 1988; Tinti et al., 2014). Several studies, however, showed that low personal impact of a public event does not necessarily prevent the formation of FBM (Curci & Luminet, 2006; Kvavilashvili et al., 2003). Consequentiality also refers to the consequences of a public event for one's community. In this way, it can bear on social identity. Consequentiality can thus operate both at the personal and the collective level (Hirst & Phelps, 2016; Tinti et al., 2009; see Rice et al., 2017 for a review on the taxonomy of consequentiality).

Rehearsal has been studied as a post-encoding variable, which can also entail an individual and a collective focus (Conway et al., 1994; Tinti et al., 2014). At the collective level, people can be exposed repeatedly to the facts about the event (event memories) through media. People can also rehearse both event and reception memories through communication with others. Some studies focused on these two types of (more collective) rehearsal: media frequency and verbal communication (Cordonnier & Luminet, 2021; Curci et al., 2015; Gandolphe & El Haj, 2017). At the individual level, one can also rehearse event and reception memories by recalling personal details associated with hearing the news and event details through rumination (Curci et al., 2001; Luminet et al., 2004; Tinti et al., 2009, 2014). There are, then, three major means of rehearsal: media exposure, communication, and rumination. Rehearsal either generates FBMs directly (Conway et al., 1994) or its effect on FBM is considered as being mediated by event memory (Tinti et al., 2009).

The emotional-integrative model suggests two routes for FBM formation (Finkenauer et al., 1998; for a review see Luminet, 2017). The direct route is through activation of novelty and surprise. The indirect route begins with the evaluation of event importance leading to emotional response, which in turn increases rehearsal and finally FBM formation. The choice of the indirect or direct path seems to depend, to some extent, on social identity activation (Cordonnier & Luminet, 2021; Luminet & Curci, 2009). Social identity is defined as "those aspects of an individual's self-image that derives from the social categories to which they perceive themselves belonging" (Tajfel & Turner, 1979, p. 40). In psychology, social identity is typically measured via group membership, whether, for instance, it is based on religion (Tinti et al., 2009) or nationality (Berntsen, 2009; Curci & Luminet, 2006). For example, Luminet and Curci (2009) compared FBMs of the 9/11 attacks for American and non-American participants. Results showed that regarding this model, the direct path was significant only for the American participants, whereas the non-direct path was significant only for the other group. In the present study, then, surprise might play a more important role in FBM formation for Americans, whereas rehearsal might play a more important role for Belgians. Other studies also showed more subtle links between social identity and FBM. For example, Cordonnier and Luminet (2021) showed that social identification to Brussels and Europe (for Belgian participants) correlated with measures of FBM formed for the Brussels bombings in 2016, whereas it was not the case for identification to Belgium.

Collective memory and shared representations

How about the memory for the public event itself? Our interest here is whether the FBM-eliciting events, which are by definition public, become shared across the public and hence potentially become incorporated into the collective memory of the affected community. A growing

number of studies have investigated the cognitive mechanisms underlying the formation and retention of collective memories (see Hirst et al., 2018; Hirst & Merck, 2022; Manier & Hirst, 2008 for reviews). Some studies investigated collective memories for historical events, such as WWII, that happened before the birth of participants (e.g., Zaromb et al., 2014). Other studies investigated lived collective memories, which encompass memories formed around public events that happen during one's lifetime (Choi et al., 2021; Hirst & Meksin, 2009; Liu et al., 2021), such as terrorist attacks (Hirst et al., 2009), governmental terrorism (Muller et al., 2016) or, at a more mundane level, sports events such as baseball game (Merck et al., 2020) or football games (Kopietz & Echterhoff, 2014; Tinti et al., 2014; see Manier & Hirst, 2008 for a discussion of lived collective memories).

We treat collective memories here as individual memories shared across a community that bear on member's social identity (Hirst & Manier, 2008). According to this definition, a critical step in the formation of a collective memory is for individual memories to become shared across the community. The relation between social identity and collective memory is interactive: the formation of collective memory may affect social identity, but social identity can in turn shape the creation of collective memories. For example, Merck et al. (2020) examined collective representations of championship sporting events among sports fans and found that fans of a particular team recalled more details about events associated with that team and formed more shared memories compared with sports fans in general.

There are a variety of reasons to expect that people are more likely to form shared memories of an FBM-eliciting event if they are members of the affected community. For instance, inasmuch as FBMs are associated with members in the affected community and news coverage may be more likely in the affected community than in unaffected communities, there might be greater opportunity for rehearsal across the affected community for details about the event itself (see Hirst et al., 2009, 2015). Along the same lines, those in the affected community may be more likely to talk to others about the event. This may occur because the event may be more emotionally evocative to them or more consequential for their community, both of which should lead to more conversational sharing (Rimé, 2009). The affected community could thus share similar emotions (collective emotions) in response to the event (Goldenberg et al., 2020). Collective emotions are usually triggered through social identity (Tajfel, 1982). Finally, people have greater mnemonic access to memories of events that affect their community rather than a community to which they do not belong, suggesting that they may be more likely to form memories of events important to their community (Sahdra & Ross, 2007).

On the other hand, the formation of FBM seems to involve different mechanisms than the formation of collective memories. The extent of media coverage is not always an important variable for the formation of FBMs, but it is for the formation of memories for the event itself (e.g., Hirst et al., 2009, 2015). Moreover, the international nature of much of media coverage, especially when the event involved the United States, makes it likely that those outside the affected community may be as exposed – or at least substantially exposed – to the relevant news as those in the US. Finally, given the hegemonic place of the US in the world, events such as the Capitol Riots may be viewed as consequential and emotionally evocative for both Americans and non-Americans. Whether or not FBMs of the Capitol insurrection will be associated with the formation of shared memories is an empirical question worth exploring.

A variety of methods have been used to measure the level of convergence in people's representations of public events. One method for quantifying convergence in memories is to compute how many individuals in a group report a given detail about the event (Merck et al., 2020; Zaromb et al., 2014). Additionally, one can measure similarity in collective memory representations by computing how many details contained in the memory of one participant are also present in the memories of other participants from the same group (Cheriet et al., 2021). This method is called *inter-subjects similarity analysis*. Compared to frequency of recall of specific details, this method has the advantage of considering the narrative as a whole and to identify commonalities in the retelling of the unfolding of events. It, thus, allows researchers to identify distinct items in a narrative that corresponds to the elements in a narrative template (i.e., abstract forms of narrative representations used to narrate events (Wertsch, 2008)) such as causes, details about unfolding events, and consequences. In the present research, we will explore similarities in narratives across participants. To our knowledge, the influence of social identity on collective memory representations has not been studied using such a similarity measure. We aim to see if similarity levels change as a matter of identity. Tracking these convergences in memory and exploring its relation to identity is important because, as noted, the critical step in forming collective memories is the formation of shared representations (Hirst & Manier, 2008).

From memory to collective future thinking

Collective future thinking refers to "the act of imagining an event that has yet to transpire on behalf of, or by, a group" (Szpunar & Szpunar, 2016, p. 378; Merck et al., 2016; for a review of the extant psychological literature, see Topcu & Hirst, 2022). The extant research reveals two major findings. Firstly, as in episodic mental time travel (Schacter & Addis, 2007) there is a strong correspondence between collective memory and collective future thinking in terms of the specificity, phenomenal characteristics, content, and valence of events (Öner & Gülgöz, 2020; Topcu & Hirst, 2020). Moreover, when people use certain schematic

narrative templates to remember the collective past, they are likely to rely on them when imagining the collective future (Topcu, 2021). These findings indicate that people's representations of the collective past can inform their representations of the collective future. The second finding reveals a valence-based dissociation between personal and collective future thinking: people exhibit a positivity bias when imagining the personal future while they exhibit a negativity bias when imagining the collective future (Deng et al., 2022; Shrikanth et al., 2018).

In the aforementioned studies, participants are usually asked to remember and imagine collective events. Studies to date have not asked about whether people expect to remember specific public events in the future. Can people agree on whether a specific public event will be remembered in the near or the far future? Do they think that the memory of the event would be transmitted to future generations and would be crystallised in cultural formations like history books? Do they believe that the government should make an effort to memorialise the event? These questions are important because they tap into the formation of cultural memories (Assmann & Czaplicka, 1995) by measuring people's prospections for the future remembrance of a public event. In Assmann's conceptualisation, communicative memory relies on everyday communications and its temporal horizon is very limited, whereas cultural memory refers to more stable and long-term memories that inform cultural identity. Communicative memory transforms into cultural memory when memories are crystallised in cultural formations that reflect the community's self-image (Assmann & Czaplicka, 1995). In the present research, we are interested in whether people think Capitol Riots would transform into collective memory in the future with a focus on the effects of social identity and memory characteristics.

As we were with collective memories, we are also interested in the relation between flashbulb memory formation and collective future thinking involving the Capitol Riots. As noted above, flashbulb memories can serve as markers of membership within the affected community, with the stronger one identifies with the affected community, the more likely the formation of an FBM (Hirst et al., 2020). Because of these characteristics, someone with an FBM may not only expect that the event itself will be remembered over the long term, but also that the emotionally charged event associated with the FBM should be memorialised. So, the question is: Does the existence of FBMs influence people's projections of future remembrance? Will its presence also influence people's projections for similar future attacks? These explorations will constitute a first step to study the intersection of personal and cultural memory through the examination of future thinking.

Present research

In the present study of FBMs, shared memories, and future prospections concerning the Capitol insurrection, we will contrast the representations of Americans with those of Belgians. We chose these two nations because of our concern about community membership and social identification. The affected community, at least in a narrow sense, was clearly the United States, since the insurrection was an assault on the government of the United States. Although Belgium has many connections to the United States, it can reasonably be viewed as an "unaffected community". Employing samples from these two communities will allow us to assess the main concerns of the present paper.

Our main prediction for FBM formation is that Americans will provide more reception details than Belgians, thereby suggesting that Americans are more likely to form FBMs of the Capitol insurrection than are Belgians. Based on the extant FBM literature, we also expect Americans to be more confident in the accuracy of their reception memories, to be more emotionally touched by the events, to rehearse the event more through media and communications, and to view the event to be more consequential compared to Belgians. We will also explore the relation between reception memories and these associated variables such as confidence, emotionality, rehearsal, etc.

Collective memory for the event will be assessed via inter-subjects similarity analyses, which measures the degree of sharedness in memory. We will examine whether Americans have more similar memory with other Americans compared to the similarity Belgians have with other Belgians. We make this prediction based on the claim that the proximity of the place where the event took place, along with the sense of national identity, favours a more coherent collective representation (Merck et al., 2020). Memories will be analysed using a narrative structure distinguishing event details, causes and consequences in order to identify what aspect of narratives shows potential differences as a function of nationality (Cheriet et al., 2021). As for the shared memories association with FBMs, we will explore the relation between inter-subjects similarity and FBM formation and memory characteristics.

As for future representations, we include three main constructs: future remembrance, governmental effort, and future attack. We are interested in participants' evaluations for the degree to which the event will be remembered in the future, the degree to which the government should make efforts to memorialise the event, and the possibility of a similar attack in the future. We will investigate whether national identity, FBM formation, memory characteristics, and collective memory have any effect on people's ratings of future remembrance, governmental effort, and future attack.

Methods

Participants

A priori power analyses using G*Power 3.1 (Faul et al., 2007) based on a t test for independent groups (to test the group differences on collective memory measures) for a medium

effect size $d = 0.5$, with alpha = 0.05 and a power = 0.80 recommended a minimum of 64 participants per group.

One hundred and five American (US) and 83 Belgian (BE) citizens answered an online survey anonymously from 14 May to 21 June 2021. The survey took approximately 15–20 minutes to complete. Both American and Belgian participants were remunerated 2.50$ using the Prolific database. Belgian participants were also recruited through social media due to the small number of French-speaking Belgian citizens in the Prolific database.[1] Participants took part in the study on average 134 days after the event occurred (SD = 9.76). Americans completed the survey in English, whereas Belgian participant completed the same survey translated in French.

Several participants were excluded from the analyses because of the following reasons: they did not remember the event (American $n = 1$, Belgian $n = 8$); they did not answer all the questions of the survey (American $n = 1$; Belgian $n = 1$); they failed to provide the correct answer to one of the control questions (Belgian $n = 1$). Additionally, 24 Americans and 4 Belgian participants were excluded from the analyses because they reported to be under medication for a diagnosed psychiatric disorder or neurological disease (such as bipolarity, depression, anxiety disorder …). The final sample consisted of 79 American adults (30 women) aged between 20 and 40 years ($M = 28.90$; $SD = 5.86$) and 70 Belgian adults (32 women) aged between 20 and 40 years ($M = 26.1$; $SD = 4.34$). Americans were older than Belgian participants, $t(147) = -3.278$, $p = .001$, 95% CI [−4.49, −1.11], d = −0.54. Belgian participants attained a higher educational level (from 1 = primary school to 6 = PhD) than American adults ($M_{US} = 3.84$; $M_{BE} = 4.17$) ($W = 3367.5$, $p = .015$).[2]

Regarding political identification, 53% of American participants described themselves as Democrat, 8% as Republican, 30% as Independent, and 10% as "other". 60% of Belgian participants indicated that they would be Democrat if they were Americans, 7% Republicans, 20% Independent, 7% did not want to answer, and 6% answered "other". In terms of their voting behaviour in the 2020 presidential elections, 65% of Americans indicated that they voted for J. Biden, 18% that they did not vote, 8% that they voted for D. Trump, 4% that they voted for another candidate, and 4% did not wish to answer. Belgians reported that they would have voted for J. Biden mostly (73%), followed by no vote (18%), D. Trump (8%), and no wish to answer (4%).

Materials

The representations for the Capitol riots in Washington that happened on the 6th of January 2021 are investigated in the survey, which consisted of three sections. The first section included questions on the memory of the event and FBMs. The second section consisted of questions addressing future representations about the event. In the final section, participants answered questions on political identity and demographics.

Before starting the survey, participants were asked whether they remembered the Capitol riots in Washington DC, U.S.A. (no further details were provided). If they answered "no", they had to click on an exit button and the survey ended. If they answered "yes", they moved on to the other questions. All participants viewed the questions in the order they are presented below. The methodology was inspired by several studies on FBMs which led us to assess event memory and several factors related to FBM formation (Finkenauer et al., 1998). Such as surprise (see Brown & Kulik, 1977; Luminet & Curci, 2017), consequentiality (Brown & Kulik, 1977; Curci et al., 2001; Tinti et al., 2009), emotions and rehearsal (Brown & Kulik, 1977; Curci et al., 2001; Tinti et al., 2009).

Event memory

Participants were asked to remember the event with as many details as possible and to write a description of what they remembered about the Capitol riots. There was no space limit. We also did not specify any time range for the event, so participants could mention the build-up and aftermath of the event. After that, they were asked to indicate how confident they were with the accuracy of their response on a 7-point scale ("not confident at all" to "very confident").

Flashbulb memory

Participants answered 5 questions that address reception memories (Brown & Kulik, 1977; Davidson et al., 2006; Wolters & Goudsmit, 2005). They could answer "yes" or "no" to each of the following questions: "Do you remember where you were when you heard about the event?" (place); "Do you remember at what time of the day you heard about the event?" (time), "Do you remember who you were with or whether you were alone when you heard about the event?" (presence of other); "Do you remember what you were doing when you heard about the event?" (ongoing activities); "Do you remember how you felt or what you thought when you heard about the occurrence of the event?" (own affect and thoughts). For each of these questions, they were also asked to make a confidence judgment as explained previously.

Associated variables

Rehearsal. To measure the degree to which they were exposed to the news relating the event they were asked 3 questions. First, they specified how they heard about the Capitol riots. The list contained 6 options: radio, television, written press, internet press, heard by someone else, social networks. They were asked to specify the social networks. This question was exploratory and is not included in the analysis. Second, they rated how often they followed the event on media on a visual analog scale (VAS, 0–100) from "never" to "very often" (media frequency). Finally,

they indicated approximately how many people they talked to about the event (number of persons they talked to). No time range was specified.

Emotion. The third page of the questionnaire concerned the intensity of *emotions* felt about the Capitol Riots. On a VAS scale of 0–100 that goes from "not at all" to "very much", they judged how emotionally touched they were by the event.[3] Using the same scale, participants also indicated how surprised they were by the events.

Consequentiality. Participants answered the following questions on *consequentiality* using a VAS scale (0–100) going from "not at all" to "extremely": "How important are the Capitol riots in Washington DC to you" (*personal importance*), "How do the Capitol riots in Washington DC affect your life" (*personal impact*), "How much do you feel concerned about the Capitol riots in Washington DC" (*concern*), "The extent to which the Capitol riots in Washington DC impact the society" (*societal impact*).

These four questions were entered into a principal component factor analysis, separately for American and Belgian participants. Details of theses analyses are reported in the supplemental materials (see Supplemental Table 1). For both samples, the analysis yielded a single factor that included all four items. Cronbach's alpha in both the US ($\alpha = .85$) and Belgium ($\alpha = .76$) samples exceeded .70. We computed a composite score for consequentiality by getting an average of participants' responses to these questions.

Future representations

The second part of the survey addressed projections for the future. For all questions participants used a VAS scale (0–100) from "definitely not" to "definitely yes" to respond.

Future Remembrance. The first set of questions addressed "future remembrance", and involved participants' expectations of how widely the Capitol Riots will be remembered in the future: "Do you think the Capitol riots would be widely remembered in the future?" "Do you think the Capitol riots would be widely remembered in 1 year, in 10 years, in 25 years, in 50 years, and in 100 years?" "Do you think the Capitol riots would enter US history books as an important national event?" "Do you think future generations will remember the Capitol riots?" "Do you think the Capitol riots would have a long-lasting effect on American politics?"

To create a composite score for "future remembrance" we conducted principal component factor analyses with all nine questions measuring future remembrance with orthogonal rotation (Varimax), separately for the American and the Belgian sample. In both samples all nine items for "future remembrance" loaded on the same factor. Details of these analyses are reported in the supplemental materials. We created a composite variable for future remembrance by taking the average of the scores for the nine items ($\alpha = .93$ in both samples).

Governmental Effort. Participants answered the following question to address the degree to which they think the government should memorialise this event: "Do you think the government should make efforts to remember this event?". This question was adapted for Belgian participants as the following: "Do you think the American government should make efforts to remember this event?".

Future Attack. Finally, participants indicated the likelihood of a similar attack in the future by answering the question: "Do you think there could be a similar attack on the Capitol in the future".[4]

Political identity and demographics

Following the section on future projections, participants answered questions about their political identity. American participants answered the following questions. "Generally speaking, do you usually think yourself as a Republican, a Democrat, an Independent or something else?". Responses included: Republican, Democrat, Independent, I prefer not to answer, Something else (please specify). We also asked them for whom they voted for the 2020 elections and if they voted through mails or at the office.[5] These items were adapted for Belgian citizens: "If you were American, would you think yourself as Republican, Democrat, Independent, I prefer not to answer, Something else (please specify)". For whom they would have voted in 2020 (Trump, Biden, other), how they would have voted (offices, mail …). Participants also indicated the extent to which they approved the attack on the Capitol on a VAS scale of 0–100. Finally, participants provided demographic information (age, gender, education, occupation, State/city, origin/ethnicity, and medical/psychological history).

Text analysis and inter-subjects similarity measure

We will now describe how we computed the degree of convergence in participants' responses for the event memory question. The instructions to the participant mentioned only the Capitol Riots, without specifying any time landmarks. Memories provided by participants clearly extended beyond the moment rioters were on the site of the Capitol and included some causes and previous events such as the mob gathering in Washington, DC after Trump's speech as well as some events that happened a few days after the incident. This corresponds to classical narrative templates involving causes, event unfolding and consequences (i.e., abstract forms of narrative representations used to narrate events). Therefore, we analyse inter-subjects similarity using this narrative template that encompass details involving the build-up, the event, and the aftermath of the Capitol Riots (Wertsch, 2008). These narrative templates are considered as cultural tools for remembering the collective past and therefore they can be culturally dependent and bear specificities as a function of nationality or other group memberships (Rimé et al., 2015; Wertsch, 2008), such as age (Cheriet et al., 2021).

The texts participants provided in response to the event memory in question were analysed through a method

used in a previous study (Cheriet et al., 2021) which allowed us to compute inter-subjects similarity values. First, we created a grid which contained several details related to the unfolding of the event. Based on this grid, the description about the event written by each participant was analysed: Each piece of information was segmented and compared to each item in the grid (see Table 2). If the participant mentioned an item, it was scored as 1, and if it was not mentioned by the participant, it was scored 0 in the grid. Table 1 illustrates the scoring grid for two narratives as examples.

All narratives were coded by the first author. The inter-rater reliability measure was based on the coding of 20% of the data by another author (AF). Inter-rater reliability across both groups was very good with standardised Cronbach's α = .84 (US α = .95, BE α = . 99).

Of note, only 2 Belgian participants and 2 American participants reported one item of information that was classified as false memories (e.g., "they attacked the White House"). Since the rate of false memories was very low and similar in both groups, this category was not analysed. Finally, the length of the descriptions was measured using the Linguistic Inquiry and Word Count (LIWC) (Pennebaker et al., 2007) and there was no significant difference for the word count between groups, $t(147) = 0.86$, $p = .29$, 95% CI [−10.13, 25.76], $d = .14$.

After the coding of each text, we computed inter-subjects similarity values (Cheriet et al., 2021). In each group (Americans & Belgians), each participant's narrative was compared to the narrative of every other participant from the group. For each pair of participants, we computed the number of common details recalled by the two participants, divided by the total number of details mentioned by at least one participant of the pair. For example, in Table 2, participants 1 and 2 share 36% of details in their memories in total. For the current analyses, we computed a similarity value for each narrative category: event, causes, and consequences. Then, the similarity scores obtained for each participant by comparing him or her to the others were averaged to provide summary similarity values for each participant, which was then used in the statistical analyses.

Table 2. An example of the coding protocol used for measuring inter-subjects similarity across participants.

	Similarity Analyses				
Major Details	*P* 1	*P* 2	*P* X	SIM. P1–P2	SIM P1-PX
Events					
Date	1	0		0	…
Capitol	1	1		1	…
Riots/attack	1	1		1	…
Place / City	1	0		0	…
Causes					
Votes/elections	1	0		0	…
Pro-Trump attackers	1	1		1	…
Trump's message	1	0		0	…
Consequences					
Death	1	0		0	…
Injured	1	1		1	…
Trump trial	0	0		0	…
Trump actions	1	0		0	…
Politicians resigned	0	1		0	…
			… Total similarity	4/11 = 0.36	

Note: *Participant 1's recall*: "It was in January; pro-Trump attacked the Capitol in Washington. This started because Trump had a meeting before and was saying that they cheated when counting the votes. People died during this attack and several other persons were injured. Even if Trump supposedly asked them after a few hours to stop, it was too late".

Participant 2's recall: "Pro-Trump attacked the Capitol. Some people got severely hurt and politicians were so afraid that they finally resigned".

Results

Statistical analyses

We conducted robust statistical analyses since the normality assumption was violated for almost all the variables (Mair & Wilcox, 2019). Dependent variables were compared between American and Belgian participants (groups) using a robust statistic test equivalent to the Student *t* test (Wilcox, 2012). For robust Student t test, the effect sizes were calculated using ξ. Small, medium, and large effect sizes correspond respectively to the values of .10, .30, and .50 (Mair & Wilcox, 2019). We also computed robust statistic test equivalent to ANOVA for the inter-subjects similarity analyses. Note that no effect size is available for the equivalent of ANOVA in robust statistics. Associations between reception memory and inter-subjects similarity measures on the one hand and variables such as emotion intensity, rehearsal, consequentiality and future thinking measures on the other hand were assessed with correlations. Pearson's correlations were replaced with their equivalent in robust statistical analyses using percentage bend correlations (Mair & Wilcox, 2019).

As indicated in the participants section, the distribution to political parties was very imbalanced (only 8% of Americans and 7% of Belgians were Republican while 53% of Americans and 60% of Belgians were Democrat). Therefore, we did not include political identification as a co-factor in our analyses. We do, however, report comparisons for political identity categories in supplemental materials Table 4. We used approval for the Capitol Riots as an additional measure of political views and entered it into correlational analyses with all variables of interest. There was only one significant correlation for governmental effort in the Belgian sample ($p_{pb} = -0.31$, $p = .008$).

Flashbulb memory

Memory formation

Reception memories associated with the formation of FBMs related to the news of the Capitol Riots were indexed by the total number of yes responses to the five questions regarding major features of reception memories in FBMs. A robust Student t test revealed a significant difference between groups, $Yt = 4.24$, $p < .001$, 95% CI [0.75, 2.01], ξ

= .52. Americans reported significantly more reception features ($M = 4.06$, $SD = 1.25$) than Belgian citizens ($M = 3$, $SD = 1.47$). We also created a categorical variable for the existence of FBMs. Those who responded with yes to at least three out of five reception memory questions were categorised as having formed an FBM for the Capitol Riots. According to this categorisation, 87% of Americans and 64% of Belgians formed FBMs. As expected, American participants ($M = 6.44$, $SD = 0.73$) were also more confident in their responses to the reception memory questions than Belgian participants ($M = 5.97$, $SD = 0.90$) ($Yt = 3.78$, $p < .001$, 95% CI [0.25, 0.77], $\xi = .42$), indicating that their reception memories were more characteristically FBM than Belgians'.

Associated variables

Rehearsal. Americans ($M = 73.89$, $SD = 23.33$) followed significantly more the news than Belgian citizens ($M = 52.25$, $SD = 26.87$) ($Yt = 5.32$, $p < .001$, CI [15.52, 33.34], $\xi = .58$) and they talked to more people about the events ($M = 7.46$, $SD = 6.75$) compared to Belgians ($M = 5.30$, $SD = 5.79$), $Yt = 3.26$, $p < .001$, 95% CI [0.13, 0.53], $\xi = .34$.

Emotionality. Robust Student t tests revealed that Americans were significantly more emotionally touched ($M = 59.23$, $SD = 29.77$) than Belgian citizens ($M = 41.90$, $SD = 29.59$), $Yt = 3.19$, $p = .004$, CI [8.22, 34.41], $\xi = .39$.

For the surprise felt about the event, the analysis showed no significant differences between groups (US, BE), $Yt = 1.23$, $p = .20$, 95% CI [−2.40–11.50], $\xi = .15$, ($M_{US} = 69.09$, $SD_{US} = 27.73$; $M_{BE} = 65.7$, $SD_{BE} = 24.48$).

Consequentiality. Americans ($M = 58.28$, $SD = 22.15$) thought that the event was more consequential compared to Belgians ($M = 38.53$, $SD = 18.81$), $Yt = 6.16$, $p < .001$, 95% CI [14.74, 28.96], $\xi = .63$.

Overall, these results indicate that American participants attended the media more, were more emotionally touched, and viewed the event as more consequential than Belgian participants.

FBM and associated variables. How does reception memories relate to memory features (media frequency, number of people talked to, emotionality, and consequentiality)? To address this question, we correlated FBM scores with these variables separately for each group. In the US sample, FBM scores correlated with media frequency ($p_{pb} = 0.46$, $p < .001$), the number of people that they talked to ($p_{pb} = 0.33$, $p = .003$), and emotionality ($p_{pb} = 0.28$, $p = .01$). In the Belgian sample, FBM only correlated with media frequency ($p_{pb} = 0.30$, $p = .01$) and the number of people they talked to ($p_{pb} = 0.29$, $p = .02$).

Collective memory

Confidence in event memory

Robust Student *t* test showed that Americans ($M = 6.30$; $SD = 1.24$) were significantly more confident in their recall than Belgians ($M = 5.67$, $SD = 1.14$), $Yt = 4.187$, $p < .001$, 95% CI [0.40, 1.19], $\xi = .44$. We next correlated confidence in event memory with FBM score and there was a significant relation in the US sample ($p_{pb} = 0.33$, $p = .003$) but not in the Belgian sample ($p_{pb} = 0.14$, $p = .23$). This result indicates that an increase in Americans' confidence in their event memory was associated with an increase in the number of reception details they remembered.

Inter-subjects similarity

We conducted a 3 (category: event, causes and consequences) x 2 (group: Americans and Belgians) robust ANOVA on the similarity values, with categories as within-subjects measure and group as a between-subjects measure (Figure 2). There was a main effect of group, F (1, 86) = 9.245, $p = .003$, revealing that inter-subjects similarity was in general higher in Belgian ($M = 0.28$, $SD = 0.11$) than American ($M = 0.22$, $SD = 0.08$) participants, $Yt = 3.70$, $p < .001$, 95% CI [−0.09, −0.03], $\xi = .39$. Results also showed a significant main effect of the categories, F (2, 83) = 221.02, $p < .001$. Post hoc Tukey tests showed that participants had significantly more similar representations about the event ($M = .30$, $SD = .13$) and the causes ($M = .32$, $SD = .20$) rather than the consequences ($M = .07$, $SD = .08$), $ps < .001$.

These main effects were informed by an interaction between the category and group, F (2, 83) = 14.964, $p < .001$. To explore this interaction, we conducted robust Student t tests to assess the difference between American and Belgian participants for the inter-subjects similarity for each category. We found significant differences in inter-subjects similarity between Americans and Belgians for all categories. Compared to American participants, the inter-subjects similarity in memory representations was higher in Belgian participants for the event category ($M_{US} = .28$, $SD_{US} = .11$, max_{US} [6] = .44; $M_{BE} = .33$, $SD_{BE} = .14$, $max_{BE} = .5$), $Yt = -3.049$, $p = .003$, 95% CI [-.10, .02], $\xi = .36$, and for the causes ($M_{US} = .27$, $SD_{US} = .18$, $max_{US} = .44$; $M_{BE} = .38$, $SD_{BE} = .19$, $max_{BE} = .54$), $Yt = -3.30$, $p = .002$, 95% CI [-.21, .05], $\xi = .37$. In contrast, Americans ($M = .09$, $SD = .05$, $max_{BE} = .22$) recalled significantly more similar details about the consequences of the event than Belgians ($M = .04$, $SD = .05$, $max = .14$), $Yt = -2.92$, $p = .002$, 95% CI [.02, .09], $\xi = .42$ (Figure 2).

Next, we correlated inter-subjects similarities with confidence in event memory, FBM score, and event features (media frequency, number of people talked to, emotionality, surprise, and consequentiality) separately for Americans and Belgians. In the US sample, inter-subjects similarities for consequences correlated with media frequency ($p_{pb} = .30$, $p = .007$) and the number of people they talked to ($p_{pb} = .23$, $p = .04$). In the Belgian sample, the only significant correlation was between the inter-subjects similarities for event and consequentiality (composite score), ($p_{pb} = .24$, $p = .049$).

Future representations

For all future variables we conducted a 2 (FBM: Yes vs. No) x 2 (Group: US vs. BE) between-subjects ANOVA. In these

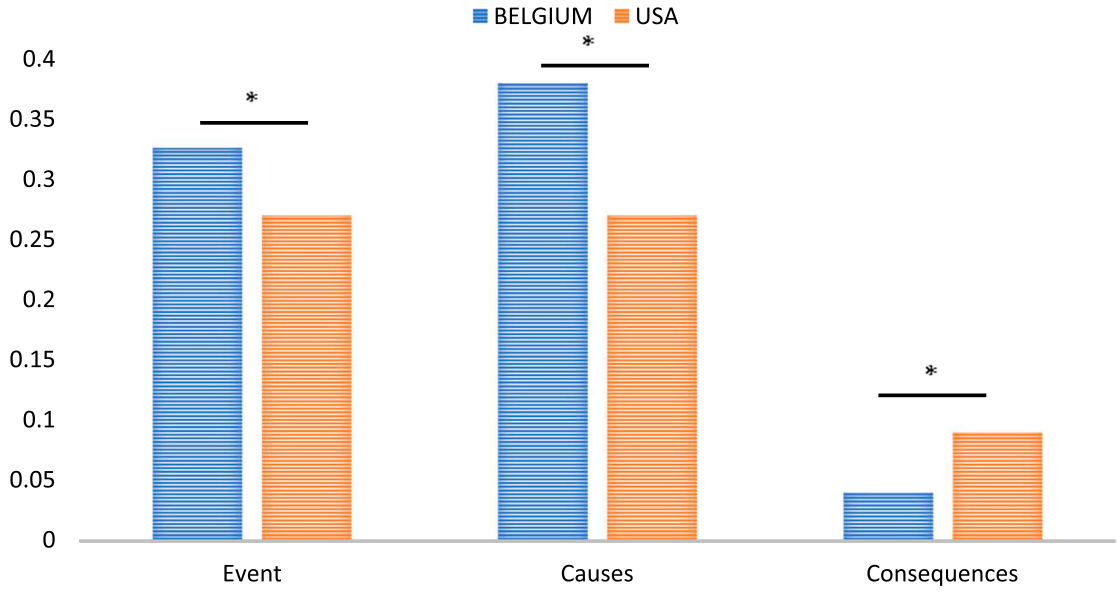

Figure 2. Inter-subjects similarity values as a function of recall categories and group.

analyses, we used the categorical variable for FBM, which indicates whether participants were able to remember three or more reception details or not. To explore the relation between memory constructs and future representations we correlated each future variable with FBM score and memory features (confidence in event memory & FBM, media frequency, number of people talked to, emotionality, and consequentiality), separately for US and Belgian samples (Table 3). We also correlated future variables with inter-subjects similarity measures. These analyses are presented separately for future remembrance, governmental effort, and future attack.

Future remembrance

The 2 × 2 ANOVA only yielded a main effect for FBM (F (1, 17) = 24.40, $p < .001$). Robust Student t-test revealed that people who formed reception memories that are indicative of the formation of FBM thought that the Capitol Riots will be remembered more in the future ($M = 65.03$, $SD = 21.22$) than those who did not form a FBM ($M = 42.29$, $SD = 17.74$), $Yt = -6.83$, $p < .001$, 95% CI [−32.2, −17.5], $\xi = .75$.

The correlational analyses of future remembrance with FBM and memory characteristics indicated that in the US sample, future remembrance correlated with confidence in event memory, FBM score, confidence in FBM, media frequency, number of people talked to, emotionality, surprise, and consequentiality. In the Belgian sample, on the other hand, future remembrance only correlated with FBM score and surprise (Table 3). These results indicate that the formation of FBM and the feeling of surprise is related to the belief that the events will be remembered more by society in the future, regardless of national group. Additionally, in the US sample, the more people are confident in their event memory and FBM, the more they think that the event is emotional and consequential, and the more they rehearse the event through media and communication the more they believe that it will be remembered in the future.

The correlational analyses with inter-subjects similarity measures did not reveal significant effects, see Table 5 Supplemental (Event: $p_{pb} = -.07$, $p = .39$; Causes: $p_{pb} = -.05$, $p = .96$; Consequences: $p_{pb} = .14$, $p = .09$)

Governmental effort

The 2 × 2 ANOVA yielded only a main effect for FBM (F (1, 22) = 12.14, $p = .002$). People with an FBM for the event ($M = 71.21$, $SD = 29.47$) thought that the government should make an effort to remember this event in the future

Table 3. Robust correlations between future variables and fbm, media frequency, emotionality, and consequentiality.

	Future Remembrance		Governmental Effort		Future Attack	
	US	BE	US	BE	US	BE
Confidence in event memory	**.39****	.18	.09	.12	**.26***	**.25***
FBM score	**.42****	**.29***	.20	.14	.18	**.26***
Confidence in FBM	**.29****	-.06	.07	.02	.18	-.14
Media frequency	**.41****	.15	**.49****	**.25***	**.49****	.17
Nr. of people talked to	**.27****	-.03	-.009	.002	.06	**.31****
Emotionality	**.49****	.21	**.46****	**.34****	.16	**.38****
Surprise	**.35****	**.26***	.19	**-.02**	**.06**	-.18
Consequentiality	**.38****	.17	**.56****	**.52****	**.34****	.13

Note. * < .05, ** < .01.

more than those who did not form an FBM ($M = 53.43$, $SD = 30.13$), $Yt = 3.46$, $p = .002$, 95% CI [−36, −9.29], $\xi = .44$.

The correlational analyses with FBM and memory characteristics indicated that governmental effort correlated with media frequency, emotionality and consequentiality in both samples. In the US sample there was an additional correlation with surprise (see Table 3). These results indicate that the more Americans and Belgians attended to media, felt emotionally touched, and thought that the event was consequential, the more they thought the government should memorialise the Capitol Riots.

The correlational analyses with inter-subjects similarity measures did not reveal significant effects see Table 5 in supplemental.

Future attack

Again, the 2 × 2 ANOVA only revealed a significant effect for FBM. The expectation of a similar attack in the future was higher for people who formed an FBM ($M = 67.99$, $SD = 25.01$) than those who did not ($M = 55.09$, $SD = 29.83$), $Yt = 2.41$, $p = .02$, 95% CI [−24.8, −2.04], $\xi = .35$.

The correlational analyses with FBM and memory characteristics revealed a significant relation with confidence in event memory, media frequency, and consequentiality in the US sample and with confidence in event memory, FBM score, number of people talked to, and emotionality in the Belgian sample (Table 3). This result indicates that the more Americans were confident in their event memory, followed the event via media, and thought the event was consequential, the more they expected a similar attack to happen in the future. For Belgians, on the other hand, confidence in event memory, the formation of FBMs, rehearsal through communication, and emotionality were associated with a belief that similar events could happen in the future. The divergence between the BE and US samples in terms of variables that correlate with future attack is noteworthy.

The correlational analyses with inter-subjects similarity measures only revealed a significant correlation between future attack and similarity for consequences ($p_{pb} = .22$, $p = .008$) in the US sample see Table 5 in supplemental.

Discussion

The Capitol Riots that happened in Washington DC on 6 January 2021 constitutes a distinctive case to study the individual to collective memory continuum. In the present research, we aimed to explore different realms of memory through the examination of reception memories in the context of FBM, shared memories in the context of collective memory, and future representations in the context of cultural memory. In these explorations, we focused on the comparison of American and Belgian participants to examine the effect of physical and psychological proximity to the event. Our analyses revealed novel patterns. We will first discuss the implications of these findings for FBM and collective memory, and then we will move on to the discussion of future thinking.

Flashbulb memory

As expected, American citizens formed more reception memories about the Capitol riots than Belgian citizens (Curci et al., 2001; Luminet & Curci, 2017). Not only did American participants report more features typical of FBMs than Belgian participants, but they were also more confident in their memory for the circumstances in which they learned about the event. According to Echterhoff and Hirst (2006), such high confidence when one is close to a shocking public event (either physically or psychologically) could be generated by normative beliefs related to a "duty to remember". A large proportion of American participants reported that they remembered three or more contextual elements relative to their hearing of the news about the riots (87%), whereas presence of FBMs was less frequent among Belgians (64%). These results are consistent with previous findings showing an influence of social identity on FBM (Brown & Kulik, 1977; Cordonnier & Luminet, 2021).

Research on FBM have considered variables that promote their creation (see Luminet & Curci, 2017 for a review). Here, groups differed on all examined variables, except the surprise felt when hearing the news. To be more specific, Americans attended the media more, they communicated with more people about the event, they were more emotionally touched by the events, and they viewed the events to be more consequential compared to Belgian participants. In this study, we considered individual emotions. Future work might assess the association between collective emotions and FBMs. The lack of difference in surprise is not in line with some studies (Christianson, 1989) but it is in line with others. A study investigating FBMs of a nuclear accident in Japan, for instance, showed no difference for the surprise among participants who formed FBMs and those who did not (Otani et al., 2005).

Here, Belgians and Americans were equally highly surprised by the occurrence of the event, which might be due to the unprecedented nature of the event in US history. Surprise also did not correlate with the creation of flashbulb memories in either group. In the US sample, FBMs did correlate with media frequency, the number of people talked to, emotionality attached to the events, and confidence in event memory. In the Belgian sample, FBM correlated with media frequency and number of people talked to. These results suggest that the formation of flashbulb memories for the Capitol Riots did not rely exclusively on a direct path through the activation of surprise, but rather on an indirect path through media attendance, communication, emotionality, and event memory confidence in the US sample, and through media attendance and communication in the Belgian sample (Finkenauer et al., 1998).

Collective memory

The collective representations formed about the Capitol riots was examined via inter-subjects similarity measures of representations in memory of the event across the cause, event and consequences categories of the schematic narrative structure. Previous work revealed that being a member of a community closely interested in a topic would favour memory for events about this topic (Merck et al., 2020). Therefore, we predicted that Americans should share more similar memory representations of the riots that happened in their country compared to Belgians. The findings did not fully support this prediction. Overall, the reverse pattern is observed with more similarity in memories among Belgians than among Americans. However, the group by category interaction suggested a more subtle pattern of results. Americans indeed had more similar collective representations than Belgians but only concerning the details relative to the consequences of the riots (e.g., several people died, rioters were arrested …), whereas Belgians had more similar representations for the causes and the unfolding of the events.

The degree of similarity between Americans' representations for the consequences of the event correlated with the frequency of media exposure and the number of persons they talked to. The link with media frequency could suggest a role of cultural artefacts in the collective representations of the aftermath of the riots. Indeed, media in the U.S.A. covered this event days and even weeks after it happened, thus elaborating a lot on the consequences of the event. Media coverage in Belgium, however, was intense during the first day of the riots and decreased rapidly afterwards, which could explain the relative dissimilarity of their representations for the consequences of the event.

In contrast, the memories Belgians reported about the event were more similar for details about the causes (e.g., Trump's message, Trump's meeting, Pro-Trump individuals attacked) and the event specifics (e.g., people entered the building, offices were vandalised, rioters were angry …). Conversely, Americans were more dissimilar to each other in terms of the details they recalled for the causes and the unfolding of the event. This finding might be explained by how media presented the news in Belgium as opposed to the U.S.A.. The coverage of the event in Europe leaned towards a more Democratic angle and thus portrayed former president D. Trump in a more negative way (Sintes-Olivella et al., 2021), suggesting that the riots were largely related to his contestation of the election results. In contrast, the coverage in US media outlets reflected the polarised public opinion on the events. Although some media outlets emphasised Trump's role in inciting the events, others downplayed his involvement.

The type of information provided by the media may also have influenced the type of details regarding the event that individuals were informed of. A more varied way of presenting the events in the U.S.A. would contrast with a more uniform discourse in Belgian media. In other words, Americans had more opportunity for diversity in their representations of the riots compared to Belgians, thus leading to more dissimilar collective representations for the causes and the event unfolding. Also, one should note that Belgians claimed more often than Americans that this event reflected what America stands for (see Supplementary Table 3). So, a stereotypical vision of America could have influenced the representations of the event in memory. Indeed, it is well known that collective memories are biased by stereotypes. Generally, one recalls more positive memories for one's ingroup (i.e., the group to which one identifies), whereas one recalls more negative memories for the outgroup (Baumeister & Hastings, 1997; Sahdra & Ross, 2007; Winiewski & Bulska, 2019). Altogether these interpretations echo with the notion that collective memories for public events are strongly shaped by cultural artefacts such as television and press documentaries (Assmann & Czaplicka, 1995).

It is also important to note that the data for the present study was collected only four months after the event, which might not have been enough for shared memories to emerge. In Assmann's (1995) conceptualisation, representations first exist at the communicative memory stage, which is characterised by "thematic instability and disorganization" (p. 126). Cultural formations are needed to transform communicative memories into more stable and organised representations in cultural memory, and such transformation takes time. In future studies, one can explore whether the level of inter-subjects similarities increase as a function of time through longitudinal designs.

Interestingly, we did not find a relation between FBM formation and collective memory formation, at least in terms of the present measurements. As we noted, the dynamics underlying these two types of memories are complex. Media coverage, conversational interactions, and social identity played a role in both the formation of FBMs and collective memories, suggesting that there should be an association. However, these seeming similarities may mask telling differences. As noted, media coverage is not always an important variable for the formation of FBMs (e.g., Hirst et al., 2009, 2015). Moreover, as we just outlined, the news coverage is substantially different, making the way it might shape FBM formation distinctive. Clearly, more research needs to be done about the relation between the two.

Future representations

The present research also involves a novel exploration of future representations in the context of FBM and collective memory. There were three constructs that addressed future representations: future remembrance, governmental

effort, and future attack. The first two constructs were included in the study to address the more long-term representations of the event, which would let us investigate whether and how people think the Capitol Riots would become part of cultural memory (Assmann & Czaplicka, 1995). With the "future attack" construct we wanted to measure the degree to which people think a similar attack on the Capitol is probable. In examining these constructs, we focused on the differences between Americans and Belgians, and the differences between participants who formed and did not form an FBM. The latter point is especially important because, so far, research that examines collective future thinking, either focused exclusively on the collective domain (Öner & Gülgöz, 2020; Topcu & Hirst, 2020) or on the differences between the personal and collective domains (Deng et al., 2022; Shrikanth et al., 2018), without exploring the relation between these two domains.

Findings revealed an association between the formation of FBMs and future representations. Participants who formed an FBM for the Capitol Riots believed that the event will be remembered more in the future, that the government should make more efforts to remember the event in the future, and that there could be a similar attack on the Capitol in the future. We should note that national identity did not interact with these patterns, and more importantly there were no overall differences between Americans and Belgians.

What can account for the relation between FBM and future thinking? Flashbulb memories involve a link between personal and collective memory as they consist of personal memories about the circumstances in which an individual learned of a public event (Brown & Kulik, 1977). When people form flashbulb memories of a collective event, they create a more personalised link between their own experiences and the collective event itself (Hirst & Meksin, 2009). This increased personal relevance might explain why people who form FBMs are more likely to think that the event will be remembered more in the future and that the government should engage in more effort to memorialise the event. Similarly, an increased personal relevance might also lead to an increased belief that there could be a similar attack in the future.

A more indirect explanation could be that the same factors that affect the formation of FBM might also influence people's future representations. We tested this possibility through a series of correlational analyses between future representations and memory features. Here, we will focus on the correlations that are common for both FBM and future representations. In the US sample, future remembrance correlated with media frequency, number of people talked to, emotionality, and confidence in event memory. The same variables were also associated with FBM formation, which indicates that these shared factors might underlie the relation between FBM and future remembrance. In the Belgian sample, there were no common variables that correlated with both FBM score and future remembrance. This might indicate that the relation between FBM and future remembrance is more direct in the case of a non-US sample.

Governmental effort, on the other hand, correlated with media attendance and emotionality in both the US and Belgian samples, which were also related to FBM formation. This result indicates that similar processes might be at work in these groups when it comes to the relation between FBM formation and governmental effort: the more they attend to media and feel emotionally touched the more they think that the government should memorialise the event. Finally in the case of future attack, the common factors that correlated with both FBM and future attack were confidence in event memory and media frequency in the US sample; and number of people talked to in the Belgian sample.

In these discussions, rehearsal, especially through media attendance, emerges as an important factor to consider when exploring FBM formation and future representations, and the relation between the two. The present study contributes to the research on collective future thinking by revealing a possible connection between flashbulb memories and future representations involving a collective event, which can shed light on the interplay between personal and collective memory. Additional studies with more fine-grained analysis are, of course, needed to explore the dynamics of the relation between FBM and future representations. Future studies can, for instance, focus on more group-based variables such as collective emotions (Goldenberg et al., 2020; Páez et al., 2015), collective angst (Wohl et al., 2012), and identity fusion (Swann & Buhrmester, 2015) and explore how they might interact with FBM and collective future thinking.

Limitations and conclusion

We would like to acknowledge some limitations of this study. First, regarding the evaluation of FBMs, references to FBMs in the current study involved only the number of reception memories as we did not assess consistency over time, accuracy or the vividness of representations which are key characteristics of FBMs. In the present research, our focus was on group differences and the relation between memory realms. Future studies on FBMs should use a multi-component approach, which includes longitudinal designs that explore consistency, accuracy, and vividness (see Luminet, 2022). Such an approach could shed light on how these factors might influence the relation between FBM, collective memory, and future thinking. Additionally, the questions assessing FBMs are based on classical questions assessing FBMs (Brown & Kulik, 1977; Davidson et al., 2006; Wolters & Goudsmit, 2005). However, future studies could rely on more recent literature and assess additional canonical categories.

Second, we did not measure the presence and nature of cultural stereotypes. We suggested that stereotypes could

have biased the creation of collective memories, but we could not formally confirm this hypothesis. Third, the media coverage in Belgium and in the US were different. Whereas it only lasted a few days in Belgium, media in the US covered the event weeks and months after its happening. To control for the differences in media coverage, a study could investigate collective memories right after the incidence happens (Cordonnier & Luminet, 2021). Additionally, one should note that the sample used in this study mostly consisted of liberals/democrats, which might make it difficult to explore differences in memory and future representations between different political groups. We also did not observe the changes between inter-subjects similarity for collective representations over time. As discussed before, it would be interesting to investigate how collective memories evolve in time. We could hypothesise that, with time, memories of a public event will become more schematised and less specific, as in the case of autobiographical memories (Conway, 2009).

In summary, the current study indicated that nationality affects the creation of flashbulb memories for a surprising public event as well as the similarity of memory representations among citizens of a country. Whereas findings are consistent with past research in showing that people tend to form more flashbulb memories for events that happened in their country and concerned them, results were unexpected for collective representations. Although hypothetical, results indicate that the influence of nationality on the similarity of memories might be driven by media attendance, which could also provide an explanation for the differences in future representations. Finally, the present research unravels novel patterns for the relation between FBM and future representations, which can inform the discussions on the intersection of personal and cultural memory.

Notes

1. Analyses revealed no significant differences between Belgian participants recruited through Prolific and social network for memory scores. Also, no significant differences were found for age, education and gender between Belgian subgroups.
2. Correlational analyses revealed that these variables did not correlate with the variables of interest.
3. We also asked participants questions about their level of anger, anxiety/fear, guilt, interest, pride, and boredom. These questions were included for exploratory purposes and therefore are not analyzed. In the memory section we also included a measure for identification with the US for exploratory purposes. Its analysis did not yield any noteworthy results and therefore it is not included in the paper.
4. Two more questions were asked in this section about whether the Capitol Riots and its aftermath represent what America stands for. The analysis of these two questions is included in the supplemental materials. There was also an exploratory open-ended question that asked participants to describe the details of how a similar incident in the future would unfold.
5. There was also a question that measured political identity on a scale form very conservative to very liberal. Since this data was only collected for American participants, we did not include it in the paper.
6. For each group and each category the minimum scores were equal to 0.

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Data availability statement

Data are available on https://osf.io/un7dt/.

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