

Pleasantness bias in flashbulb memories: Positive and negative flashbulb memories of the fall of the Berlin Wall among East and West Germans

ANNETTE BOHN AND DORTHE BERNTSEN
Aarhus University, Aarhus, Denmark

Flashbulb memories for the fall of the Berlin Wall were examined among 103 East and West Germans who considered the event as either highly positive or highly negative. The participants in the positive group rated their memories higher on measures of reliving and sensory imagery, whereas their memory for facts was less accurate than that of the participants in the negative group. The participants in the negative group had higher ratings on amount of consequences but had talked less about the event and considered it less central to their personal and national identity than did the participants in the positive group. In both groups, rehearsal and the centrality of the memory to the person's identity and life story correlated positively with memory qualities. The results suggest that positive and negative emotions have different effects on the processing and long-term retention of flashbulb memories.

On Thursday, November 9, 1989, the Berlin Wall fell after having divided East and West Germany for 28 years. On that day at 6:57 p.m., Günther Schabowski, a leading member of the ruling communist party in East Germany, had casually announced to a stunned audience during a live televised press conference that all East Germans were "immediately" allowed to travel freely to wherever they wanted. Even though East Germany had been in turmoil for some time, this announcement came unexpectedly and took almost everybody by surprise. The East German border police had not been informed about the new development and had no guidelines or instructions on how to react to the thousands of East Germans (especially in Berlin) who rushed to the border and demanded to visit West Germany. Finally, at 11:14 p.m., the border guards at the Bornholmer Strasse in Berlin simply opened the gates, since this was their only option to keep the ever growing crowd of people from turning into a violent mob.

For the vast majority of East and West Germans, the fall of the Berlin Wall after 28 years was an event greeted with enthusiasm and happiness, or at least gladness. However, for a smaller group of East Germans, who were convinced communists and believed that East Germany had been a better state than West Germany, the fall of the Wall was experienced as an extremely negative event with severe consequences, such as being permanently unemployed and feeling socially degraded. Do these two groups differ with respect to how clearly they remember the personal context in which they received the news of the fall of the

Wall, and how well do they remember factual details in relation to the event? These are the chief questions raised in the present article. By addressing these questions, we wish to investigate whether positive versus negative affect is associated with different qualities of flashbulb memories.

In previous studies of flashbulb memories for positive and negative events, the same participants' memories for different events have been compared. The events had been judged by the researchers as either positive or negative prior to the study. This strategy, however, can be viewed as problematic. First, it is not clear that the events that researchers nominate as either positive or negative will, in fact, be experienced as such by the participants in the study. Second, different public events may vary on a number of variables in addition to valence, such as political importance, time when the event took place, level of surprise associated with the event, and so forth. As an alternative, we compared participants' memories for one and the same flashbulb event that was judged as clearly positive by one group of participants and clearly negative by another group. Thus, here, the operationalization of affect was based on participants' actual responses, not on the characteristics of the public event as judged by the researcher. In the following, we will review the relevant literature and generate hypotheses for our study.

Pleasantness Bias in Memory

Matlin and Stang (1978) found that people tend to be better at recalling pleasant life experiences and that people

rehearse pleasant items more often than unpleasant items. Furthermore, people judge events as more pleasant with the passage of time. On the basis of their review, Matlin and Stang suggested two principles for the retention of positive events: the *intensity principle* and the *Pollyanna principle*. The intensity principle states that positive and negative stimuli above a certain threshold of intensity are “processed with equal efficiency” (p. 12), whereas the Pollyanna principle states that positive stimuli are favored over time. Matlin and Stang’s proposal of an intensity principle is in agreement with neuropsychological studies showing that the amygdala plays a key role in the encoding of negative emotional stimuli (Cahill & McGaugh, 1990, 1998; Canli, Zhao, Brewer, Gabrieli, & Cahill, 2000), as well as in the encoding of positive emotional stimuli, provided the stimuli reach a certain threshold of intensity (Guy & Cahill, 1999; Hamann, Ely, Grafton, & Kilts, 1999; Kensinger & Corkin, 2004; for overviews, see McGaugh, 2004, and Rolls, 2000). Likewise, laboratory studies, as well as studies on autobiographical memories, have robustly shown that highly arousing positive or negative stimuli enhance recall, relative to neutral information (e.g., Blake, Varnhagen, & Parent, 2001; Bradley, Greenwald, Petry, & Lang, 1992; Reisberg, Heuer, McLean, & O’Shaughnessy, 1988; Rubin & Kozin, 1984; Talarico, LaBar, & Rubin, 2004). At the same time, many studies have shown a *pleasantness bias* for the recall of positive autobiographical events, even though positive and negative events were rated as equally intense (e.g., Holmes, 1970; Thompson, Skowronski, Larsen, & Betz, 1996; Tromp, Koss, Figueredo, & Tharan, 1995; Wagenaar, 1986; Walker, Vogl, & Thompson, 1997), suggesting that intense positive events may be better maintained over time.

Studies comparing autobiographical memories of highly negative and highly positive events. Most studies in which highly negative and highly positive autobiographical memories have been compared have provided empirical evidence that memories of negative events are generally reported to be less clear and/or to involve less sensory imagery (Berliner, Hyman, Thomas, & Fitzgerald, 2003; Byrne, Hyman, & Scott, 2001; D’Argembeau, Comblain, & van der Linden, 2003; Larsen, 1998; Porter & Birt, 2001; Schaefer & Philippot, 2005; Tromp et al., 1995). This has been found also for imagined future events with a pleasant versus unpleasant content (D’Argembeau & van der Linden, 2004; Destun & Kuiper, 1999). Several studies have also shown that memories for negative events come with less reliving or mentally travelling back in time (D’Argembeau et al., 2003; Porter & Birt, 2001; Schaefer & Philippot, 2005; Talarico et al., 2004), which are measures of the extent to which the person reexperiences the event in consciousness—a defining feature of autobiographical memory (Brewer, 1996; Wheeler, Stuss, & Tulving, 1997). In addition, memories for negative events have been found to involve more focus on central than on peripheral details (Berntsen, 2002) and to be less frequently talked about than positive memories (Baker-Ward, Eaton, & Banks, 2005; Byrne et al., 2001; Tromp et al., 1995).

Furthermore, the emotional intensity associated with negative memories has been shown to fade more quickly

over time than the intensity of positive memories—a phenomenon known as the fading affect bias (Walker, Skowronski, & Thompson, 2003; Walker et al., 1997). Skowronski, Gibbons, Vogl, and Walker (2004) found the fading affect bias to be related to the rehearsal of an event. Talking a lot about a positive event to a variety of people helps to maintain the intensity of a positive event, whereas talking about a negative event seems to lead to the fading of negative intensity.

Whereas studies of the phenomenological qualities of positive and negative autobiographical memories can be seen as supporting the claim that positive events are remembered more clearly and involve more reliving at recall, the findings for accuracy are more complicated. Peace and Porter (2004) interviewed 52 participants twice within 3 months about a recently experienced trauma and a recently experienced positive event. They found that the memories of traumatic events were more reliable and consistent over time than were the memories of positive events. However, they also found that the overall memory quality and vividness of the positive events declined more over time than did those of the negative memories, which seems contrary to the fading affect bias reported in other studies (e.g., Holmes, 1970; Skowronski et al., 2004; Walker et al., 2003; Walker et al., 1997).

Levine and Bluck (2004) asked students who were either happy or unhappy about the O. J. Simpson verdict how clearly they recalled the news event 2 months, as well as 1 year, after the event had occurred. They also asked the participants whether minor real or fictitious public events related to the verdict had occurred or not. They found that the participants who were happy about the verdict rated their memories of both real and false events as clearer than did the participants who were unhappy about the verdict. Furthermore, happy participants erroneously reported memories for significantly more false events than did the group of unhappy participants, whereas the overall number of recognized true events did not differ between the groups.

Levine and Bluck’s (2004) finding that positive emotion is associated with more errors is in agreement with findings from laboratory studies with nonautobiographical information, such as word lists (e.g., Bless et al., 1996; Storbeck & Clore, 2005). Levine and Bluck argued that the discrepancy between the perceived clarity of positive and negative memories and their correctness may be due to different information-processing strategies for positive and negative events. With happy events, there are usually no problems to be solved, which might leave room for cognitive flexibility and open-minded processing (Ashby, Isen, & Turken, 1999), whereas negative events might be perceived as threats to the attainment of our goals and, therefore, more attention to the details and specifics of the situation might be required in the processing of information. On this view, people remembering negative events are, therefore, more likely to scrutinize information systematically, whereas people remembering positive events seem to rely more on their general knowledge, scripts, and intuitions, thus being more likely to reconstruct their memories—and to make errors (see also Levine & Pizarro,

2004). Support for this view has come from empirical studies on the *affect-as-information* hypothesis (Schwarz & Clore, 1983), which states that negative affect signals a problem situation to be solved and positive affect signals a safe or benign situation. Whereas a negative situation craves bottom-up processing with attention to the specific details of the situation, a positive situation invites top-down processing, which relies more on general knowledge structures and scripts. Studies on processing strategies related to positive and negative moods have consistently shown that people in a happy mood rely on information processing based on scripts and general knowledge structures, which leads to more errors than does the more detail-oriented processing during negative moods (e.g., Bless et al., 1996; Storbeck & Clore, 2005). Also, studies in the areas of psycholinguistics and visual perception have shown evidence for differing information-processing strategies for positive and negative situations (Basso, Schefft, Ris, & Dember, 1996; Schrauf & Sanchez, 2004).

Studies comparing positive and negative flashbulb memories. Brown and Kulik (1977) have claimed that flashbulb memories are generated in response to highly surprising and consequential news events. Critics of their theory have argued that it is the amount of rehearsal during the retention period, rather than surprise and perceived consequentiality at the time of encoding, that leads to the formation of memories with flashbulb-like qualities (e.g., Larsen, 1992; Neisser, 1982). Under both assumptions, emotional valence would be likely to interact with the mechanisms underlying the formation of flashbulb memories. First, several studies (as has been reviewed above) have shown that memories for intensely negative events are typically less rehearsed than memories for intensely positive events. Second, studies of autobiographical memories have shown that when people are asked to recall memories of self-chosen positive versus negative events, the former are typically rated as less surprising than the latter (e.g., Berntsen, 2002; Rubin & Kozin, 1984; Tromp et al., 1995), suggesting that negative events are generally more surprising than positive events. This is in agreement with the observation that most studies of flashbulb memories have been concerned with emotionally negative news events. Apparently, memory researchers have found it easier to find highly surprising public events with a negative, rather than a positive, content. Also, Brewer's (1992) review of the role of surprise in the formation of flashbulb memories suggests, together with more recent work, that flashbulb memories for positive events often occur with low levels of surprise (e.g., Berntsen & Thomsen, 2005; Winograd & Killinger, 1983), whereas studies that have shown surprise as essential have been studies involving negative events (e.g., Christianson, 1989; Er, 2003; Finke-nauer et al., 1998). Thus, mechanisms that are assumed to be crucial for the formation of flashbulb memories can be seen to interact with whether the target event is emotionally positive or negative. This has implications for the extent to which positive versus negative public events are likely to generate flashbulb memories. If rehearsal is decisive, flashbulb memories may be more common for

positive events. If surprise is crucial, more negative than positive events may lead to flashbulb memories.

We could find only three studies in which memories for positive and negative flashbulb events were compared. Scott and Ponsoda (1996) investigated possible differences between flashbulb memories for positive and negative events by asking 150 participants for their memories of 10 positive and 10 negative events. The events were matched for year—that is, 1 positive and 1 negative event were chosen for each year from 1982 to 1991. The selected events had been rated as being equally vivid in a pilot study. In the main study, the participants scored each event on vividness, amount of rehearsal, and canonical categories. No differences were found between the two classes of memories.

Tekcan (2001) compared the memories of college students for the beginning of the Gulf War and for receiving their admittance to college. The 41 participants in Tekcan's study scored their memories of the two events for canonical categories, surprise, amount of rehearsal, and intensity of emotional reactions. Like Scott and Ponsoda (1996), Tekcan presupposed that the two events had a specific emotional valence by explicitly asking the subjects to rate how *upset* they felt about the beginning of the Gulf War versus how *happy* they felt about their acceptance to college. Although it is quite reasonable to presuppose that people who apply to college are happy about being accepted, it is not clear that all the participants perceived the beginning of the Gulf War as negative. In fact, the very same event had been used by Scott and Ponsoda as a positive event. Tekcan found no significant differences concerning the canonical categories remembered for the positive and the negative events, whereas the positive event was rehearsed significantly more than the negative event. Both events were rated as only moderately surprising.

Berntsen and Thomsen (2005) studied 145 older Danes' memories of receiving the news of the German invasion of Denmark in April 1940 and the news of the ensuing liberation 5 years later. The participants generally rated the invasion as a highly negative event and the liberation as a highly positive event. The participants were asked about their memory for factual details related to the two events (such as the weather and the weekday). They also rated the clarity of the memories on a number of measures. Few differences were reported between these two events with respect to number of accurate details, but the memories of the liberation were rated higher on almost all measures of reliving and sensory imagery, and more canonical categories were reported for this event than for the invasion. This advantage for the positive event was not replicated in a comparison of the same participants' self-chosen most positive versus most negative personal memories for the time of the war. Berntsen and Thomsen speculated that the advantage for the memories of the positive public news event, relative to the other memories recorded in their study, might have been due to the liberation's having been more celebrated and commemorated than any other event from the period of the German occupation of Denmark, according to historians.

The Present Study

At least two problems characterize previous studies on positive versus negative flashbulb memories. First, the emotional valence assigned to the events by the researchers may not have been shared by all the participants in their studies or by other researchers in the field. For example, the beginning of the Gulf War was classified as a positive event by Scott and Ponsoda (1996; "Allied forces liberate Kuwait," p. 469) but as a negative event by Tekcan (2001). In Berntsen and Thomsen's (2005) study, some of the older Danes may not have seen the German capitulation as a highly positive event—for example, if members of their families had collaborated with the Germans. Second, the events chosen may have differed on many other variables than those associated directly with valence. We tried to remedy these problems in the present study by comparing memories for the same event—namely, the fall of the Berlin Wall on November 9, 1989—between two groups of participants. The groups were formed on the basis of the participants' own ratings of the emotions associated to the event. One group experienced this event as highly positive, and the other group saw it as highly negative.

On the basis of the review of previous work on memory characteristics for pleasant and unpleasant events, we expected the participants in the positive group to remember the reception of the news with greater subjective clarity and to experience a stronger sense of reliving the event than would the participants in the negative group. We expected the positive group to have rehearsed the event more, especially in conversations. Following Levine and Bluck (2004), we expected that the participants in the positive group would suggest more answers—but not more correct answers—to questions addressing memory for facts and, thus, would show a higher proportion of incorrect responses than would the participants in the negative group.

METHOD

Participants

Five hundred thirty questionnaires were sent out by mail or were directly distributed to the participants in December 2002, 13 years after the event. Two hundred twenty-nine questionnaires (43%) were returned. All the participants were German citizens; 144 participants (63%) were East German. To avoid developmental issues relating to memory, only participants who were at least around 30 years old at the time of the study were recruited. Mean age was 55 years ($SD = 14.12$; range, 29–82 years). One hundred thirty-three of the participants (58%) were male.

In order to recruit participants who presumably had experienced the event as either very negative or very positive, two political parties were contacted: the Partei des Demokratischen Sozialismus (PDS) and the Christlich Demokratische Union (CDU). The PDS is the political party that emerged directly from the former Sozialistische Einheitspartei Deutschlands (SED), the ruling communist party in East Germany at the time of the event.¹ It seemed reasonable to assume that people who, 13 years after the fall of the Wall, were still members of the party whose predecessor had initiated the building of the Wall in 1961 might be very dissatisfied with the fall of the Wall and the ensuing reunification of Germany. The CDU is the conservative party that was in power in West Germany when the Wall fell. Participants were recruited from this party, because the wish for German reunification had always played a prominent role in

their party program. A third group of participants consisted of East and West Germans with no party affiliations.

The Questionnaire

The questionnaire was modeled after questionnaires used in the flashbulb literature (e.g., Conway et al., 1994; Finkenauer et al., 1998). However, the questions on the phenomenological properties of the memories were inspired by research on traumatic and other vivid memories (Berntsen, Willert, & Rubin, 2003; Sheen, Kemp, & Rubin, 2001). Two versions of the questionnaire (Versions A and B) were constructed, with the questions in counterbalanced order. Version A of the questionnaire was returned by 52% of the participants, and Version B by 48% of the participants. The two groups differed significantly ($p < .05$) on 2 of the 52 questionnaire items. This can be most parsimoniously explained as a random effect of repeated testing, and the data from the two groups will be collapsed in our analyses. The questionnaire consisted of six sections, to be described in the following.

Flashbulb-related items. The first question addressed whether the participant possibly had a flashbulb memory of the event by asking whether he/she could remember the situation of hearing the news about the opening of the Wall. If the participants answered "no" to this question, they were asked to go directly to the section containing factual questions about the news event (see below). If the participants answered "yes" to this question, they were asked to continue in the first section with questions related to *canonical categories* of flashbulb memories (cf. Brown & Kulik, 1977): Where were you? What were you doing? From whom did you hear the news? How did you react? How did others react? What happened directly after you heard the news? The participants were asked to answer these questions by writing a few sentences. They could also check "I don't remember," if this was the case. This section of the questionnaire also contained questions about the amount of *surprise* (1 = *not at all surprised*; 7 = *extremely surprised*), the intensity of emotion (*intensity then*) when receiving the news (1 = *completely indifferent*; 7 = *more intense than anything else in my life*), the *affective attitude now and then* toward the event (−3 = *extremely negative*; +3 = *extremely positive*), and the *type of emotions* experienced at the time of the event (11 options were given: happiness, gladness, fear, pride, nervousness, anger, disappointment, sadness, indifference, worry, and other [to be specified by the participant]).

Consequences and rehearsal. The participants were asked to rate the amount of *consequences* of the event for their lives (1 = *no consequences*; 7 = *more consequences than any other event in my life*). They were also asked about the *valence of the consequences* for them *personally* and *financially* (−3 = *extremely negative*; +3 = *extremely positive*). In addition, the participants who had rated the consequences as extreme could describe the *types of consequences* in a few sentences, if they wanted to. The participants were asked to rate (1) the frequency of having *talked about* the reception event (1 = *next to never*; 7 = *very often*), (2) the frequency of having *heard about/read about* or *having watched* something on TV about the event (1 = *next to never*; 7 = *very often*), and (3) how often they had *thought about* the reception event (1 = *next to never*; 7 = *very often*). They were also asked to assess the frequency of *involuntary memories* of the event (1 = *next to never*; 7 = *very frequently*).

Two questions concerned the participants' general *interest in politics* and their interest in the *East–West German relationship* (1 = *next to none*; 7 = *very much*). Furthermore, the participants were asked how *unusual* the event seemed to be (1 = *not at all*; 7 = *extremely*).

Phenomenological aspects of the memory. The participants were asked to try to recall the reception event as well as possible before answering the questions in this section. They were then asked to rate, on a scale from 1 to 7 (1 = *not at all*; 7 = *very much so*) their memories for the following items: the strength of *vividness*, *reliving*, *body reactions*, *clarity*, and *hearing sounds and voices*, *confidence* in the correctness of the memories, and to which extent the memo-

ries appeared detailed and clear like a video (*videolike*, hereafter). One item was concerned with the *valence of emotions* experienced when remembering ($-3 = \text{extremely negative}$; $+3 = \text{extremely positive}$). The last two items assessed (on a scale from 1 to 7; $1 = \text{not at all}$; $7 = \text{very much}$) whether the memory was experienced from the participants' own point of view (*field view*) or whether it was experienced from an onlooker's perspective (*observer view*; Nigro & Neisser, 1983).

Centrality to identity and life story. The items in this section assessed the experienced impact of the event on the life story and identity of the participants (cf. Berntsen & Rubin, 2006; Berntsen et al., 2003). The following items were rated on a scale from 1 to 7: The memory of the event is an important part of my *identity* and self-understanding ($1 = \text{not at all}$; $7 = \text{very much so}$). The memory of the event is an important part of my *national identity* ($1 = \text{not at all}$; $7 = \text{very much so}$). The memory of the event is a *benchmark* or turning point in my life ($1 = \text{not at all}$; $7 = \text{very much so}$). I spontaneously experience *connections* between my life now and the memory of the event ($1 = \text{next to never}$; $7 = \text{very frequently}$). If history could be rewritten, I would wish to *keep the event* in history ($1 = \text{definitely not keep event}$; $7 = \text{definitely keep event}$).

Demographics. This section addressed questions about the participants' *age, sex, education, and citizenship* (East German, West German, or other) at the time of the event.

Questions about facts. There were seven questions concerning the facts of the public event: Who was head of state (1) in East Germany and (2) in West Germany at the time of the event? When did the event take place: (3) year, (4) month, and (5) day? On which (6) day of the week and at which (7) time of day did the event take place? In order to calculate a score for accuracy, answers to Items 1–5 were scored as 1 point each if they were correct and as 0 if they were wrong. The correct weekday (Thursday) was scored as 2, whereas the days closest to the correct answer (Wednesday and Friday) were scored as 1. All other answers were scored as 0. The time of day was scored as follows: 3, if the time was exactly correct; 2, if the time was within half an hour after the event or “late in the evening”; 1, if the answer was vague but generally correct (e.g., “after 6 o'clock”); and 0 for wrong answers (e.g., “in the morning”).

RESULTS

The presentation of the results will be divided into four main sections. We first will describe the demographics of the positive and the negative groups and the differences in emotion and affective attitudes between the two groups, in comparison with a neutral group. In the second part, findings on the accuracy of memory for facts will be presented. In the third part, measures of reliving and imagery will be compared between the two groups, together with event characteristics and amount and type of rehearsal. In the fourth section, correlational analyses will be reported.

Characteristics of the Positive and the Negative Groups

The positive group consisted of those 55 participants (31 of them male; mean age = 51.8 years, $SD = 15.0$; age range, 30–78) who had rated the personal consequences of the event as either very positive or extremely positive ($+2/+3$, on a 7-point scale from -3 to $+3$). The negative group consisted of those 48 participants (36 of them male; mean age = 61.9 years, $SD = 11.0$; age range, 31–82) who had rated the personal consequences of the event as either very negative or extremely negative ($-2/-3$ on the same scale). To separate the effects of valence from the

effects of emotion, we included a neutral group in some of the analyses. The neutral group consisted of those 64 participants (33 of them male; mean age = 56.1 years, $SD = 13.7$; age range, 31–79) who had rated the event as 0 on the -3 to $+3$ scale for positive versus negative personal consequences. The remaining 62 participants were not included in the statistical analyses.

We used the ratings of positive versus negative personal consequences to form the groups because this variable speaks directly to the participants' appraisal of the event as either beneficial or harmful to their personal well-being (a key feature in appraisal theories of emotion; see, e.g., Lazarus, 1991). We used relatively extreme ratings for the division in order to ensure that the participants in the positive and negative groups had clearly different emotional attitudes and that all showed emotional involvement in the event.

Party affiliation. In the positive group, more than half of the participants had no party affiliation; 40% were CDU members, and only 5.5% were members of the PDS. In the negative group, 95.8% of the participants were members of the PDS [$\chi^2(2) = 84.15, p < .0001$]. These results are not surprising, since members of the CDU and the PDS were specifically recruited to find participants who would be extremely upset or extremely happy about the fall of the Berlin Wall. All the participants in the negative group were East German, whereas there were about equal numbers of West and East Germans in the positive group.

Age. The participants in the negative group were significantly older than the participants in the positive group [$t(101) = 3.84, p < .001$]. This difference likely reflects the fact that East Germans, in general, are older than West Germans and that members of the PDS are generally rather old (68% of all PDS members are older than 60 years; Die Linke, 2003).

Education and gender. In the negative group, 79% of the participants had a university degree versus 53% of the participants in the positive group [$\chi^2(1) = 11.09, p < .05$]. Thus, both groups were, on average, very highly educated. Finally, the ratio of men to women was slightly higher in the negative than in the positive group [$\chi^2(1) = 3.91, p < .05$].

Emotions when receiving the news. The reported emotions upon hearing about the flashbulb event in the positive and the negative groups were compared in order to decide whether the categorization of the positive and the negative groups by the valence of the personal consequences was justified. A series of chi-square tests showed that there were substantial differences between the positive and the negative groups concerning emotions toward the flashbulb event (see Table 1). Furthermore, the two groups differed significantly in the expected directions from the neutral group (ps for being afraid or sad $< .05$; all other $ps < .001$).

Affective attitude toward the event. The affective attitude variable *then* measured how the participants felt toward the fall of the Wall when the event happened. The affective attitude variable *now* referred to the feelings of the participants toward the event today. There were significant differences between the groups with respect to both

Table 1
Emotions Experienced by Participants When
Receiving the News in the Positive Group ($n = 55$)
and in the Negative Group ($n = 48$), As Percentages

Emotion	Positive	Negative	χ^2
Worry	10.9	93.8	70.4***
Disappointment	0.0	56.3	41.9***
Fear	9.1	36.5	12.1**
Anger	1.9	33.3	18.1***
Sadness	3.6	27.1	11.3**
Gladness	89.1	12.5	60.4***
Happiness	65.5	0.0	48.3***
Pride	20.0	0.0	10.7**
Nervousness	20.8	20.0	0.0
Indifference	1.8	2.1	0.0

Note—Happiness (German: *Glück*) is considered a stronger emotion than gladness (German: *Freude*). ** $p < .001$. *** $p < .0001$.

the affective attitude toward the event then [$M = 2.72$, $SD = 0.67$, in the positive group; $M = -1.83$, $SD = 1.43$, in the negative group; $t(99) = 20.92$, $p < .0001$] and the affective attitude now [$M = 2.56$, $SD = 0.71$, in the positive group; $M = -1.06$, $SD = 1.49$, in the negative group; $t(101) = 16.04$, $p < .0001$]. The ratings in both groups differed significantly from the ratings of affective attitude in the neutral group (all $ps < .0001$).

To examine possible differences in the strengths of the positive and negative attitudes in the two groups, t tests with unsigned values were conducted. The strength of affective attitude toward the event was significantly higher for the positive than for the negative group [$t(99) = 4.19$, $p < .0001$, for emotional attitude then; $t(101) = 6.64$, $p < .0001$, for emotional attitude now].

Previous studies had shown that the decrease in affective intensity was larger for negative memories than for positive memories (Holmes, 1970; Skowronski et al., 2004; Walker et al., 1997). In order to see whether such a fading affect bias would also be found in the present study, we compared the differences between affective attitudes now and then within each group. The difference between attitudes now and attitudes then was significantly smaller in the positive group than in the negative group [$t(99) = 3.01$, $p < .005$]. In fact, the difference within the positive group between attitude now and attitude then was not significant [$M = 0.16$, $SD = 0.69$; $t(54) = 1.77$, $p > .05$], whereas the two measures differed significantly in the negative group [$M = -0.83$, $SD = 1.47$; $t(45) = 3.82$, $p < .0001$]. Thus, according to these retrospective ratings, the participants in the positive group felt generally as posi-

tive about the event 13 years later as they did when the event happened, whereas the participants in the negative group felt substantially less negative about it.

From these results, it seems safe to state that the participants in the positive group had strongly positive feelings about the fall of the Berlin Wall, whereas the participants in the negative group had strongly negative feelings about the same event, both when the two groups were compared with each other and when compared with a neutral group. Thus, it is justified to categorize the positive group as a group of participants who experienced a highly positive flashbulb event and the negative group as a group of participants who experienced a highly negative flashbulb event.

Memories for Facts

All the questions on facts about the news event had very high response rates (from 88% to 100%), except for the question concerning the weekday of the event, which was answered only by 43% of the participants in the positive and the negative groups. Generally, both groups remembered the facts of the event very well (correct answers ranged from 62% for weekday of event to 100% for West German head of state).

We calculated the following four measures within each participant: (1) number of questions answered, (2) number of questions answered correctly, (3) proportion of questions answered correctly, and (4) a sum score for accuracy based on the scoring principles described in the Method section. We conducted one-way ANOVAs with group (positive, negative, neutral) as the independent variable and these four new measures as dependent variables. The main findings are shown in Table 2.

Tukey HSD post hoc analyses showed that the positive group provided more answers than did the negative group ($p < .05$) and also tended to provide more answers than did the neutral group ($p = .06$). No differences were found between the three groups regarding the number of correct answers (see Table 2). A main effect was found for the proportion of correct answers, which was significantly lower for the positive group in comparison with the negative group ($p < .05$) but not in comparison with the neutral group ($p > .4$), as documented by Tukey HSD post hoc tests. Finally, a main effect was found for the accuracy score for which only the participants who had answered all seven questions were included and for which points for degrees of correct answers were used for some of the questions (see the Method section for details).

Table 2
Performance on Questions Addressing Memory for Facts
in the Positive, Negative, and Neutral Groups

Measure	Positive			Negative			Neutral			$F(2,164)$
	M	SD	n	M	SD	n	M	SD	n	
Number answered	6.22	0.90	55	5.63	1.47	48	5.70	1.28	64	3.73*
Number correct	5.18	1.39	55	5.35	1.52	48	4.97	1.53	64	0.94
Proportion correct	0.83	0.18	55	0.95	0.10	48	0.86	0.18	64	9.01**
Accuracy score	6.73	1.12	26	8.00	1.15	13	7.16	1.30	19	4.95*

Note—Degrees of freedom were only 55 for analysis on the accuracy score; for details on scoring, see the Method section. * $p < .05$. ** $p < .01$.

Tukey HSD post hoc tests showed that the negative group scored higher on this measure than did the positive group, whereas the neutral group did not differ significantly from either of the two emotion groups. In sum, the negative group showed a better performance relative to the positive group and (in one analysis) also in comparison with the neutral group. The positive group did not show a performance that was reliably better or worse than that of the neutral group.

To control for the fact that the participants in the negative group had higher levels of education (in that more had a university degree), we performed a two-way ANOVA with education (university degree vs. no university degree) \times group (positive vs. negative) as independent variables and proportion of correct answers as the dependent variable. A main effect was found for positive versus negative group [$F(1,98) = 11.92, p < .001$], as well as for level of education [$F(1,98) = 5.52, p < .05$]. No interaction was found ($p > .6$). When a similar analysis was performed with accuracy score (see Table 2) as the dependent variable, a main effect was found only for positive versus negative group [$F(1,35) = 8.09, p < .05$].

These findings can be seen to support the idea of a more detail-oriented, bottom-up processing strategy related to negative affect (cf. Basso et al., 1996; Bless et al., 1996). Some additional observations regarding answers to the questions on weekday and the date of the event point in the same direction. Of the participants answering in the negative group, 80% were correct about the day of the event, whereas this was the case for only 52% of the participants answering in the positive group. Whereas the positive group covered all seven weekdays with their answers, the negative group used only four. The same tendency was found for the date of the event. The positive group mentioned six different dates; the negative group, only the correct date and the two preceding dates. Of course, these results might simply reflect the fact that more participants in the positive group supplied answers to the questions. Nevertheless, the results are striking, since the answers in the negative group tended to cluster around the correct day and date, whereas this was much less the case for the answers given by the positive group. The participants in the negative group were more often accurate about the correct month of the event (November), whereas more participants in the positive group erroneously chose October as the right month, although this difference was only borderline significant [$\chi^2(1) = 3.60, p < .06$]. Likewise, 4 participants in the positive group chose the 3rd as the date of the fall of the Wall, whereas no participants in the negative group did so. Even though this result also only approached significance [$\chi^2(1) = 3.43; p < .07$], it suggests—together with the results for the month—that some participants in the positive group reconstructed the date of the event as the 3rd of October. The correct date is the 9th of November, but the 3rd of October became the official date of the German reunification. Unlike the 9th of November, this date is celebrated and commemorated annually as a public holiday, for which reason the 3rd of October is likely to have had an advantage in a schema-based search and reconstruction.

Phenomenological Measures

To investigate whether the positive and the negative groups rated their memories differently on measures of reliving and imagery, t tests were conducted. Table 3 shows that memories in the positive group were rated significantly higher on reliving, clarity, and emotional intensity while remembering² than were memories in the negative group.

Similar, but nonsignificant, differences were found for hearing sounds, body reactions, and how videolike the memory was experienced as being. A composite variable of memory *qualities* was calculated on the basis of ratings of vividness, reliving, clear memory, emotional intensity, body reactions, hear sounds, confidence, and videolike. These variables were highly intercorrelated (Cronbach's $\alpha = .90$, average interitem correlation = .55). The positive group scored significantly higher on this composite variable ($M = 4.65$ of a possible 6.5, $SD = 1.26$) than did the negative group ($M = 4.07, SD = 1.42$) [$t(97) = 2.15, p < .05$].

To examine whether the two groups differed from the neutral group, we conducted a one-way ANOVA with group (positive/negative/neutral) as the independent variable and the sum score for qualities as the dependent variable. A significant effect of group was found [$F(2,158) = 9.25, p < .001$]. A univariate test of significance for planned comparison showed that the positive group scored higher than the negative group ($p < .05$) and that both the positive and the negative groups scored higher than the neutral group ($p < .001$) [$F(2,158) = 9.25, p < .001$]. This suggests that the *live-quality* that is considered to be an important characteristic of flashbulb memories (Brown & Kulik, 1977) was more pronounced for memories in the positive group than for those in the negative group (consistent with the Pollyanna principle; see Matlin & Stang, 1978), as well as more pronounced in the two emotional groups than in the neutral group (consistent with the intensity principle; see Matlin & Stang, 1978).

Event Characteristics and Rehearsal

In the following section, the results will be presented in clusters of related variables. Means and standard deviations for the positive and the negative groups are presented in Table 4.

Table 3
Means and Standard Deviations for Phenomenological Qualities of the Memories in the Positive and Negative Groups

Quality	Positive		Negative		t	df
	M	SD	M	SD		
Canonical (1–7)	5.7	0.6	5.6	1.0	0.6	101
Vividness (1–7)	5.8	1.6	5.6	1.7	0.6	100
Reliving (1–7)	5.1	1.7	4.2	2.3	2.3*	100
Clear memory (1–7)	5.2	1.7	4.4	2.0	2.2*	100
Intense memory (0–3)	2.2	0.9	1.8	1.1	2.3*	100
Bodily reaction (1–7)	4.1	1.8	3.5	1.9	1.6	99
Hear sounds (1–7)	4.5	1.9	3.9	2.2	1.3	98
Confidence (1–7)	5.0	1.8	5.0	1.8	0.0	99
Like a video (1–7)	4.9	1.7	4.5	2.1	1.1	99
Field view (1–7)	5.5	1.6	5.4	1.7	0.1	97
Observer view (1–7)	2.6	1.8	3.0	2.2	1.1	97

* $p < .05$.

Surprise, unusualness, and intensity. Even though Brown and Kulik (1977) argued that surprise was the “sine qua non” for flashbulb memories (p. 74), the higher live-quality of the memories in the positive group was not associated with higher levels of surprise in this group. In fact, the participants in the positive and negative groups rated the event as equally (highly) surprising. The positive group rated the event as significantly more unusual than did the negative group. No significant differences were found in the ratings of the emotional intensity of the event (rated retrospectively for the time when the event took place).

Consequences. The negative group rated the amount of consequences as significantly higher than did the positive group. Also, more participants in the negative group than in the positive group specified the types of consequences that they had experienced after the fall of the Wall [89.6% vs. 54.5%; $\chi^2(1) = 15.2, p < .0001$]. Although many participants in the positive group mentioned such consequences as being able to travel freely or to visit relatives, only a few mentioned political consequences, such as freedom. The participants in the negative group, on the other hand, described severe personal consequences (e.g., “unemployment”), as well as severe political consequences (e.g., “lost life perspective,” “against my life’s goal,” “lost chance to reform socialism,” “East Germany was turned into a colony”). As was mentioned earlier, the positive versus negative group was defined according to whether their ratings of personal consequences were either highly positive (i.e., ≥ 2 on the 7-point scale) or highly negative (i.e., ≤ -2 on the 7-point scale). Therefore, ratings of personal consequences were highly different. Ratings of whether the financial consequences were positive or negative followed the same pattern (see Table 4). In addition, *t* tests conducted with unsigned values of the means showed that the negative group experienced the personal consequences as significantly more negative than the positive group experienced the personal consequences as positive [$t(101) = 3.33, p < .001$]. Likewise, a *t* test with unsigned values showed that the negative group perceived the economical consequences as stronger than did the positive group [$t(99) = 2.15, p < .05$]. Also, this finding contradicts Brown and Kulik’s (1977) original formulations on flashbulb memories, according to which we should expect higher consequentiality in the negative group to be associated with more live-quality, not less, contrary to the results presented in Table 3.

Rehearsal. There were no significant differences between the two groups for the *read about the event* variable. This variable included exposure to the event through TV, radio, and printed media. The means for the positive group was numerically higher for all the rehearsal variables included, even though a statistically significant difference was obtained only for how often the event had been talked about (see Table 4). Earlier studies also showed that positive events are more talked about than negative events (e.g., Baker-Ward et al., 2005; Byrne et al., 2001).

Three of the four measures of rehearsal—thought about, talked about, and involuntary memories—were highly intercorrelated (Cronbach’s $\alpha = .86$, average interitem correlation = .68). These three items were averaged within

Table 4
Means and Standard Deviations for Event Characteristics and Rehearsal in the Positive and Negative Groups

Variable	Positive		Negative		<i>t</i>	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Emotion						
Surprise	5.8	1.4	5.7	1.5	0.3	101
Unusualness	6.6	0.9	5.9	1.4	2.8*	100
Intensity then	5.7	1.1	5.6	1.4	0.8	101
Consequentiality						
Consequences	4.8	1.9	6.2	1.2	4.6***	101
Personal consequences	2.2	0.4	-2.5	0.5	52.2***	101
Financial consequences	0.9	1.4	-1.7	1.3	10.0***	99
Rehearsal						
Thought about	4.8	1.7	4.4	1.8	1.2	100
Talked about	4.2	1.9	3.3	1.9	2.5*	100
Read about	5.8	1.2	5.6	1.6	0.8	100
Involuntary	3.6	1.9	3.2	2.0	0.9	98
Identity						
Keep event	6.9	0.5	4.3	2.0	8.9***	100
Personal identity	5.3	1.6	4.3	2.3	2.4*	99
National identity	5.7	1.6	3.6	2.3	5.4***	98
Connections	4.3	1.7	4.6	2.1	0.8	99
Benchmark	5.3	1.7	5.0	2.1	0.5	100

* $p < .05$. *** $p < .0001$.

each participant to form a composite score for rehearsal. A *t* test for independent samples showed a marginally significant difference between the two groups on this measure [$t(98) = 1.81, p < .08$].

Identity and benchmark. Both the positive and the negative groups strongly considered the event to be a benchmark in their lives (see Table 4). However, the positive group perceived the event as substantially more central to their personal, as well as their national, identity. In line with this result, there were significant differences between the groups for the *keep the event in history* variable. Both the positive and the negative groups considered the event to have connections to their everyday lives.

All of the identity-related variables were highly intercorrelated, except for the variable addressing whether the participants wanted to keep the event in history (Cronbach’s $\alpha = .79$, average interitem correlation = .51, for the remaining three variables). Scores for personal identity, national identity, benchmark, and connections were therefore averaged within each participant to form a composite variable for identity. The positive group scored significantly higher on this composite variable ($M = 5.11, SD = 1.29$) than the negative group ($M = 4.36, SD = 1.79$) [$t(97) = 2.45, p < .05$].

Summary. The negative group performed better than the positive group on questions addressing memory accuracy. The performance of the positive group did not differ reliably from that of a neutral group. At the same time, the positive group relived their memories more strongly, and their memories were associated with more emotional intensity and clarity at recall than were the memories in the negative group. An analysis based on a sum score of variables measuring reliving and sensory imagery showed that the memories in the positive group were more “lively” than the memories in the negative group. Both groups scored higher on this composite measure than a neutral

group, suggesting that the memories in both groups had a substantial level of live-quality (considered typical for flashbulb memories; see Brown & Kulik, 1977), relative to a neutral baseline.

The participants in the positive group had talked more about the event than the participants in the negative group and tended to have higher scores on all rehearsal measures. They also agreed more with the statement that the event was central to their life stories and identities. On the other hand, the negative group perceived the event as substantially more consequential than did the positive group, both with respect to total amount of consequences and, more specifically, with respect to personal and financial consequences (which were generally perceived to be highly negative in this group). Both emotion groups had experienced the fall of the Wall as a highly surprising and as an emotionally very intense event.

Correlational Analyses

We correlated composite scores for memory qualities, rehearsal, and identity and scores for surprise, unusualness, intensity, and consequences within each group. Conducting the correlations separately for each group allowed us to examine possible differences in the pattern of correlations between the two groups. Where comparisons of means indicate quantitative differences between two groups, comparing correlations between two groups is a way to examine whether the relations among the variables differ between the two groups, which may suggest differences in how the memories are processed in the two groups (see Berntsen et al., 2003, for more details). Table 5 shows that the correlation coefficients in the two groups follow largely the same pattern. For both groups, the composite scores for identity and rehearsal are most strongly related to memory qualities. Also, emotional intensity (at the time of the event) correlates positively with memory qualities (although this correlation is only marginally significant in the negative group). One difference between the two groups is that ratings of consequences show substantial positive correlations with memory qualities, identity, and rehearsal in the negative group, but not in the positive group. Proportion

of correct answers (not included in Table 5) did not correlate significantly with any of the variables in Table 5 in either of the two groups (all *ps* > .1)

Following the correlations presented in Table 5, one possible explanation for the higher scores on memory qualities in the positive group, relative to the negative group, is that the former participants had rehearsed the event more and regarded it as more central to their identity and life story. To examine this possibility, a multiple regression analysis was conducted with memory qualities as the dependent variable and the remaining variables in Table 5 as predictor variables, together with a dichotomous dummy variable for positive versus negative group. Only the composite variables for rehearsal and identity were significant predictors [for rehearsal, $\beta = .46, t(88) = 4.78, p < .0001$; for identity, $\beta = .34, t(88) = 3.22, p < .01$; R^2 for the entire analysis = .53]. A multiple regression analysis with the same predictor variables was also conducted for the proportion of correct answers. Here, only positive versus negative group showed a significant effect [$\beta = -.42, t(90) = -3.69, p < .001$; R^2 for the entire analysis = .21].

Because the positive and the negative groups differed on some measures of demographics, we conducted two multiple regression analyses, one with memory qualities and one with proportion of correct answers as the dependent variable, and with the following predictor variables: positive/negative group, gender, university education, and age. For memory qualities, both positive/negative group and age were significant predictors [$\beta = .32, t(93) = 3.02, p < .01$, for positive/negative group, and $\beta = .31, t(93) = 2.98, p < .01$, for age; R^2 for the entire analysis = .14]. For proportion of correct answers, positive/negative group again showed a significant effect [$\beta = -.34, t(97) = -3.39, p < .01$], and so did education [$\beta = .22, t(97) = 2.37, p < .05$; R^2 for the entire analysis = .23]. Thus, even though age and education had some effects, this did not remove the effect of positive versus negative emotion. Also, it should be noted that the relation between age and memory qualities was positive, contrary to what would be expected if the younger age of the positive group explained the higher scores on memory qualities in this group.

Table 5
Correlations of Memory Qualities, Identity, and Rehearsal (Composite Scores) With Scores of Unusualness, Surprise, Intensity, and Consequences

Variable	Group	1	2	3	4	5	6	7
1. Qualities								
2. Identity	Positive	.54***						
	Negative	.67***						
3. Rehearsal	Positive	.75***	.52***					
	Negative	.57***	.74***					
4. Unusual	Positive	.06	.23	.05				
	Negative	.20	.11	.11				
5. Surprise	Positive	.08	.28*	.17	.39**			
	Negative	.06	-.11	-.03	.70***			
6. Intense then	Positive	.29*	.44**	.25	.34*	.49***		
	Negative	.27	.38*	.36*	.33*	.27		
7. Consequences	Positive	-.10	.17	-.04	.29*	.14	.06	
	Negative	.44**	.43**	.40**	.27	.19	.53***	

Note—Positive group, *n* = 53; negative group, *n* = 43. **p* < .05. ***p* < .01. ****p* < .0001.

DISCUSSION

The participants in both the positive and the negative groups experienced the fall of the Berlin Wall as extremely surprising and highly emotionally intense. They generally had very clear, vivid, and detailed memories for how they received the news of the fall of the Wall, and they rated their memories substantially higher on measures of imagery and reliving than did the participants in a neutral group with very little emotional involvement in the event. In addition to such overall effects of emotion, a pleasantness bias appeared to be present, in that the participants with a positive view of the event scored higher on measures of reliving and sensory imagery than the participants with a negative view of the event. As expressed in terms of notions developed by Brown and Kulik (1977), the participants with a positive view thus had more live-quality associated with their memories than the participants in the negative group. For both groups, scores of memory qualities correlated positively with amount of rehearsal and with the centrality of the event to the participants' life stories and identities. Our analyses suggested that the increased live-quality of the memories in the positive group might partly reflect that the participants in this group had rehearsed their memories more and regarded the event as more central to their identities and life stories.

Performance on questions addressing memory for facts showed a different pattern. The participants in the positive group answered more questions, but the proportion of correct answers was lower for the positive than for the negative group, suggesting that the former were more willing to base their answers on guesses and inferences. An accuracy score calculated for the participants who answered all the questions was also higher in the negative than in the positive group. These findings are in agreement with those in previous work (e.g., Levine & Bluck, 2004) and lend some support to the affect-as-information hypothesis (Schwarz & Clore, 1983). The participants in the negative group seemed to have used a more detail-oriented, conservative processing strategy (Bless et al., 1996; Storbeck & Clore, 2005) when answering the questions about historical facts—that is, they were more reluctant to answer unless they were confident in the correctness of their reply—whereas the participants in the positive group were more willing to guess and/or more likely to reconstruct their memories by drawing from general and schematic knowledge (Levine & Pizarro, 2004).

The finding that positive and negative emotions show differential effects on memory qualities and memory accuracy can be seen to support the view that people remembering events of differing emotional valences engage in different information-processing strategies. An increased reliance on schema-based knowledge in the reconstruction of memories with a positive emotional content may lead both to more inaccurate answers and to a greater subjective experience of completeness of the memories (Levine & Bluck, 2004; Levine & Pizarro, 2004).

Alternatively, the interaction may be explained in terms of the fading affect bias (Walker et al., 2003; Walker et al., 1997). The emotions involved in reliving a negative mem-

ory may be highly unpleasant, and therefore, reliving a negative memory may be avoided. This avoidance might lead to the reduced emotional intensity reported in studies on the fading affect bias (Holmes, 1970; Walker et al., 2003; Walker et al., 1997). Walker et al. (1997) showed that such toning down of the emotional qualities associated with the event did not affect the ability to recall the factual details of the event accurately. They suggested that people tend to tone down the emotional side of negative memories, "while the memory for these events remains intact" (p. 412).

In the present study, the differential effects of positive and negative emotions on memory qualities and memory accuracy may also reflect the fact that the positive memories were more rehearsed and regarded as more central to the person's identity and life story. Talking and thinking repeatedly about an event and relating this event to one's personal life and identity may endow the memory with greater subjective clarity, as has been suggested in the present study by the positive correlations between memory qualities, on the one hand, and measures of rehearsal and identity, on the other. Such rehearsal processes may increase confidence in the memory (Talarico & Rubin, 2003) and, at the same time, lead to the incorporation of incorrect details into the memory representation (Fallshore & Schooler, 1995; Tversky & Marsh, 2000).

Another possible explanation for the dissociation of accuracy from reliving and imagery is that all of the questions on historical facts were concerned with details about the public event itself, whereas the questions of reliving and imagery addressed the personal context for receiving the news. Previous research has suggested that memory for the personal context (measured in terms of consistency with an earlier report) is often better than memory for the public event itself (e.g., Bohannon, 1988; Smith, Bibi, & Sheard, 2003; Tekcan, Ece, Gülgöz, & Er, 2003; but see Nachson & Zelig, 2003).

The few studies in which consequentiality ratings for positive and negative events have been compared have yielded contradictory results (Berntsen, 2002; Berntsen & Thomsen, 2005; Byrne et al., 2001; Tekcan, 2001; Tromp et al., 1995). In the present study, the participants in the negative group considered the fall of the Wall as having substantially more consequences (both in a general sense and with respect to their personal lives and finances) than did the participants in the positive group. It is somewhat surprising that the negative group nonetheless rated the event as less central to their personal and national identities and as less rehearsed. This apparent paradox may indicate some sort of defensive coping mechanism that allowed the participants to come to terms with an event that, on the one hand, is highly celebrated and commemorated as a positive public event in the mainstream view of the society while, on the other hand, being associated with highly negative consequences for the individual and the social group to which he or she belongs. According to our results, the participants in the negative group accepted the fall of the Wall as an important turning point or benchmark in their lives, but they perceived it much less than the participants in the positive group as a part of their personal and national identities. At the level of personal identity, this might be indica-

tive of successful coping, since the degree to which a person makes a negative memory central to his or her identity and life story has been found to be positively correlated with the amount of posttraumatic stress disorder symptoms and depression (Berntsen & Rubin, 2006; Berntsen et al., 2003; Rubin, Feldman, & Beckham, 2004). The reluctance to integrate the event into one's national identity in the negative group might be related to differences concerning the commemoration of the event. According to Frijda (1997), the development of a group identity is supported by joint public commemoration of one's shared past. Commemoration of public events is likely to lead to an advantage for the memory of these events (Pennebaker & Banasik, 1997). The members of the positive group and the social groups to which they belong shared the mainstream view of the fall of the Wall as a positive event and have, therefore, been more likely to participate in the annual commemoration of the event. This regular, spaced rehearsal is likely to have led to a stronger integration of the event into the national identity of the participants in the positive group. This suggestion is in agreement with findings reported by Berntsen and Thomsen (2005) on older Danes' memories for receiving the news of the German invasion on the 9th of April 1940 and the liberation on the 4th of May 1945. Berntsen and Thomsen found that measures of reliving, imagery, and rehearsal were consistently higher for the liberation than for the invasion, whereas a similar advantage was not found for a self-chosen positive versus negative memory from the war period. The advantage for the memory of the liberation may reflect the fact that there is more public commemoration of this event, relative to the invasion, and that the former is more central to the national identity of the Danes.

We believe that the present study has some advantages over previous studies on positive and negative flashbulb memories primarily because positive versus negative flashbulb memories for the same public event were examined among participants whose attitudes toward the event were rated as clearly positive versus clearly negative. Thereby, the present study corrects some of the problems associated with previous work in which the same participants' memories were examined for different flashbulb events, classified as positive and negative by the researchers. It is, at the same time, indisputable that the two groups examined here differed from one another on dimensions other than emotional attitude (e.g., gender, education, age). We have demonstrated that our main findings regarding positive versus negative emotion were maintained when controlling statistically for the influence of such demographic factors. Nonetheless, in a naturalistic and quasi-experimental design such as the present one, there are likely to be group differences associated with negative and positive affect that are very hard to control for (e.g., party affiliation, in the present study). Future research should, therefore, examine whether the present findings can be replicated when different populations are used. Another disadvantage of the present study is its reliance on retrospective reports regarding the characteristics of the original event. Although this is a common strategy in research on autobiographical

memory, it may raise problems (Nisbett & Wilson, 1977). The fact that the present findings are in agreement with findings from previous studies in which different procedures were used (e.g., Bless et al., 1996; Levine & Bluck, 2004) supports the validity of the results.

Taken together, the findings suggest that consequential negative events may be remembered more accurately than highly positive events. At the same time, people do not indulge in their negative flashbulb memories, as they do in their positive flashbulb memories, by making them central to their life stories and frequently sharing them with others. As a consequence, reliving qualities and sensory imagery may be maintained better for highly positive than for highly negative memories. From an evolutionary standpoint, this seems to be a sensible and adaptive behavior, since, on the one hand, it is important to remember (potentially dangerous) negative situations accurately, whereas, on the other hand, having highly negative memories central to one's life story and identity has been shown to be dysfunctional (Berntsen & Rubin, 2006; Berntsen et al., 2003). At the same time, remembering and reliving positive events may be adaptive. Pleasant memories help to support our personal and social identities and may form reference points for generating optimistic expectations. A positive outlook on life makes it possible to think about and plan for the future without being paralyzed by having to think about all the bad things that have happened, or could happen, in our lives and in the historical reality of our time.

AUTHOR NOTE

The authors thank David C. Rubin, Dorte Thomsen, Charles P. Thompson, and two anonymous reviewers for comments and helpful suggestions. The authors also thank the PDS in Berlin, Dresden, Magdeburg, and Schwerin, as well as the CDU in Berlin and Kiel, and Bernhard Klein, for their help in distributing the questionnaires. Correspondence concerning this article should be addressed to A. Bohn, Department of Psychology, University of Aarhus, Jens Chr. Skous Vej 4, 8000 Aarhus C., Denmark (e-mail: anetboh@psy.au.dk).

REFERENCES

- ASHBY, F. G., ISEN, A. M., & TURKEN, A. U. (1999). A neuropsychological theory of positive affect and its influence on cognition. *Psychological Review*, *106*, 529-550.
- BAKER-WARD, L. E., EATON, K. L., & BANKS, J. B. (2005). Young soccer players' reports of a tournament win or loss: Different emotions, different narratives. *Journal of Cognition & Development*, *6*, 507-527.
- BASSO, M. R., SCHEFFT, B. K., RIS, M. D., & DEMBER, W. N. (1996). Mood and global-local visual processing. *Journal of the International Neuropsychological Society*, *2*, 249-255.
- BERLINER, L., HYMAN, I., THOMAS, A., & FITZGERALD, M. (2003). Children's memory for trauma and positive experiences. *Journal of Traumatic Stress*, *16*, 229-236.
- BERNTSEN, D. (2002). Tunnel memories for autobiographical events: Central details are remembered more frequently from shocking than from happy experiences. *Memory & Cognition*, *30*, 1010-1020.
- BERNTSEN, D., & RUBIN, D. C. (2006). The centrality of event scale: A measure of integrating a trauma into one's identity and its relation to post-traumatic stress disorder symptoms. *Behaviour Research & Therapy*, *44*, 219-231.
- BERNTSEN, D., & THOMSEN, D. K. (2005). Personal memories for remote historical events: Accuracy and clarity of flashbulb memories related to World War II. *Journal of Experimental Psychology: General*, *134*, 242-257.
- BERNTSEN, D., WILLERT, M., & RUBIN, D. C. (2003). Splintered memo-

- ries or vivid landmarks? Qualities and organization of traumatic memories with and without PTSD. *Applied Cognitive Psychology*, **17**, 675-693.
- BLAKE, T. N., VARNHAGEN, C. K., & PARENT, M. B. (2001). Emotionally arousing pictures increase blood glucose levels and enhance recall. *Neurobiology of Learning & Memory*, **75**, 262-273.
- BLESS, H., CLORE, G. L., SCHWARZ, N., GOLISANO, V., RABE, C., & WÖLK, M. (1996). Mood and the use of scripts: Does a happy mood really lead to mindlessness? *Journal of Personality & Social Psychology*, **71**, 665-679.
- BOHANNON, J. N., III (1988). Flashbulb memories for the space shuttle disaster: A tale of two theories. *Cognition*, **29**, 179-196.
- BRADLEY, M. M., GREENWALD, M. K., PETRY, M. C., & LANG, P. J. (1992). Remembering pictures: Pleasure and arousal in memory. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, **18**, 379-390.
- BREWER, W. F. (1992). The theoretical and empirical status of the flashbulb memory hypothesis. In E. Winograd & U. Neisser (Eds.), *Affect and accuracy in recall: Studies of "flashbulb" memories* (pp. 274-305). New York: Cambridge University Press.
- BREWER, W. F. (1996). What is recollective memory? In D. C. Rubin (Ed.), *Remembering our past: Studies in autobiographical memory* (pp. 19-66). Cambridge: Cambridge University Press.
- BROWN, R., & KULIK, J. (1977). Flashbulb memories. *Cognition*, **5**, 73-99.
- BYRNE, C. A., HYMAN, I. E., & SCOTT, K. L. (2001). Comparisons of memories for traumatic events and other experiences. *Applied Cognitive Psychology*, **15**, 119-133.
- CAHILL, L., & MCGAUGH, J. L. (1990). Amygdaloid complex lesions differentially affect retention of tasks using appetitive and aversive reinforcement. *Behavioral Neuroscience*, **104**, 532-543.
- CAHILL, L., & MCGAUGH, J. L. (1998). Mechanisms of emotional arousal and lasting declarative memory. *Trends in Neurosciences*, **21**, 294-299.
- CANLI, T., ZHAO, Z., BREWER, J., GABRIELI, J. D. E., & CAHILL, L. (2000). Event-related activation in the human amygdala associates with later memory for individual emotional response. *Journal of Neuroscience*, **20**, RC99.
- CHRISTIANSON, S.-Å. (1989). Flashbulb memories: Special, but not so special. *Memory & Cognition*, **17**, 435-443.
- CONWAY, M. A., ANDERSON, S. J., LARSEN, S. F., DONNELLY, C. M., MCDANIEL, M. A., MCCLELLAND, A. G. R., ET AL. (1994). The formation of flashbulb memories. *Memory & Cognition*, **22**, 326-343.
- D'ARGEMBEAU, A., COMBLAIN, C., & VAN DER LINDEN, M. (2003). Phenomenal characteristics of autobiographical memories for positive, negative, and neutral events. *Applied Cognitive Psychology*, **17**, 281-294.
- D'ARGEMBEAU, A., & VAN DER LINDEN, M. (2004). Phenomenal characteristics associated with projecting oneself back into the past and forward into the future: Influence of valence and temporal distance. *Consciousness & Cognition*, **13**, 844-858.
- DESTUN, L. M., & KUIPER, N. A. (1999). Phenomenal characteristics associated with real and imagined events: The effects of event valence and absorption. *Applied Cognitive Psychology*, **13**, 175-186.
- DIE LINKE. PDS (2003). *Statistiken: Altersstruktur der PDS*. [The Left. PDS. *Statistics: Age Structure of the PDS*]. Retrieved January 24, 2006, from sozialisten.de/partei/daten/statistiken/struktur.htm.
- ER, N. (2003). A new flashbulb memory model applied to the Marmara earthquake. *Applied Cognitive Psychology*, **17**, 503-517.
- FALLSHORE, M., & SCHOOLER, J. W. (1995). Verbal vulnerability of perceptual expertise. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, **21**, 1608-1623.
- FINKENAUER, C., LUMINET, O., GISLE, L., EL-AHMADI, A., VAN DER LINDEN, M., & PHILIPPOT, P. (1998). Flashbulb memories and the underlying mechanisms of their formation: Toward an emotional-integrative model. *Memory & Cognition*, **26**, 516-531.
- FRIJDA, N. H. (1997). Commemorating. In J. W. Pennebaker, D. Paez, & B. Rimé (Eds.), *Collective memory of political events: Social psychological perspectives* (pp. 103-127). Mahwah, NJ: Erlbaum.
- GUY, S. C., & CAHILL, L. (1999). The role of overt rehearsal in enhanced conscious memory for emotional events. *Consciousness & Cognition*, **8**, 114-122.
- HAMANN, S. B., ELY, T. D., GRAFTON, S. T., & KILTS, C. D. (1999). Amygdala activity related to enhanced memory for pleasant and aversive stimuli. *Nature Neuroscience*, **2**, 289-293.
- HOLMES, D. S. (1970). Differential change in affective intensity and the forgetting of unpleasant personal experiences. *Journal of Personality & Social Psychology*, **15**, 234-239.
- KENSINGER, E. A., & CORKIN, S. (2004). Two routes to emotional memory: Distinct neural processes for valence and arousal. *Proceedings of the National Academy of Sciences*, **101**, 3310-3315.
- LARSEN, S. F. (1992). Potential flashbulbs: Memories of ordinary news as the baseline. In E. Winograd & U. Neisser (Eds.), *Affect and accuracy in recall: Studies of "flashbulb" memories* (pp. 32-64). New York: Cambridge University Press.
- LARSEN, S. F. (1998). What is it like to remember? On phenomenal qualities of memory. In C. P. Thompson, D. J. Herrmann, D. Bruce, J. D. Read, & D. G. Payne (Eds.), *Autobiographical memory: Theoretical and applied perspectives* (pp. 163-190). Mahwah, NJ: Erlbaum.
- LAZARUS, R. S. (1991). *Emotion and adaptation*. New York: Oxford University Press.
- LEVINE, L. J., & BLUCK, S. (2004). Painting with broad strokes: Happiness and the malleability of event memory. *Cognition & Emotion*, **18**, 559-574.
- LEVINE, L. J., & PIZARRO, D. A. (2004). Emotion and memory research: A grumpy overview. *Social Cognition*, **22**, 530-554.
- MATLIN, M. W., & STANG, D. J. (1978). *The Pollyanna principle: Selectivity in language, memory, and thought*. Cambridge, MA: Schenkman.
- MCGAUGH, J. L. (2004). The amygdala modulates the consolidation of memories of emotionally arousing experiences. *Annual Review of Neuroscience*, **27**, 1-28.
- NACHSON, I., & ZELIG, A. (2003). Flashbulb and factual memories: The case of Rabin's assassination. *Applied Cognitive Psychology*, **17**, 519-531.
- NEISSER, U. (1982). Snapshots or benchmarks? In U. Neisser (Ed.), *Memory observed: Remembering in natural contexts* (pp. 43-48). San Francisco: Freeman.
- NIGRO, G., & NEISSER, U. (1983). Point of view in personal memories. *Cognitive Psychology*, **15**, 467-482.
- NISBETT, R. E., & WILSON, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, **84**, 231-259.
- PEACE, K. A., & PORTER, S. (2004). A longitudinal investigation of the reliability of memories for trauma and other emotional experiences. *Applied Cognitive Psychology*, **18**, 1143-1159.
- PENNEBAKER, J. W., & BANASIK, B. L. (1997). On the creation and maintenance of collective memories: History as social psychology. In J. W. Pennebaker, D. Paez, & B. Rimé (Eds.), *Collective memory of political events: Social psychological perspectives* (pp. 103-127). Mahwah, NJ: Erlbaum.
- PORTER, S., & BIRT, A. R. (2001). Is traumatic memory special? A comparison of traumatic memory characteristics with memory for other emotional life experiences. *Applied Cognitive Psychology*, **15**, S101-S117.
- REISBERG, D., HEUER, F., MCLEAN, J., & O'SHAUGHNESSY, M. (1988). The quantity, not the quality, of affect predicts memory vividness. *Bulletin of the Psychonomic Society*, **26**, 100-103.
- ROLLS, E. T. (2000). Precise of The brain and emotion. *Behavioral & Brain Sciences*, **23**, 177-233.
- RUBIN, D. C., FELDMAN, M. E., & BECKHAM, J. C. (2004). Reliving, emotions, and fragmentation in the autobiographical memories of veterans diagnosed with PTSD. *Applied Cognitive Psychology*, **18**, 17-35.
- RUBIN, D. C., & KOZIN, M. (1984). Vivid memories. *Cognition*, **16**, 81-95.
- SCHAEFFER, A., & PHILIPPOT, P. (2005). Selective effects of emotion on the phenomenal characteristics of autobiographical memories. *Memory*, **13**, 148-160.
- SCHRAUF, R. W., & SANCHEZ, J. (2004). The preponderance of negative emotion words in the emotion lexicon: A cross-generational and cross-linguistic study. *Journal of Multilingual & Multicultural Development*, **25**, 266-284.
- SCHWARZ, N., & CLORE, G. L. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *Journal of Personality & Social Psychology*, **45**, 513-523.

- SCOTT, D., & PONSODA, V. (1996). The role of positive and negative affect in flashbulb memory. *Psychological Reports*, **79**, 467-473.
- SHEEN, M., KEMP, S., & RUBIN, D. [C.] (2001). Twins dispute memory ownership: A new false memory phenomenon. *Memory & Cognition*, **29**, 779-788.
- SKOWRONSKI, J. J., GIBBONS, J. A., VOGL, R. J., & WALKER, W. R. (2004). The effect of social disclosure on the intensity of affect provoked by autobiographical memories. *Self & Identity*, **3**, 285-309.
- SMITH, M. C., BIBI, U., & SHEARD, D. E. (2003). Evidence for the differential impact of time and emotion on personal and event memories from September 11, 2001. *Applied Cognitive Psychology*, **17**, 1047-1055.
- STORBECK, J., & CLORE, G. L. (2005). With sadness comes accuracy; with happiness, false memory: Mood and the false memory effect. *Psychological Science*, **16**, 785-791.
- TALARICO, J. M., LABAR, K. S., & RUBIN, D. C. (2004). Emotional intensity predicts autobiographical memory experience. *Memory & Cognition*, **32**, 1118-1132.
- TALARICO, J. M., & RUBIN, D. C. (2003). Confidence, not consistency, characterizes flashbulb memories. *Psychological Science*, **14**, 455-461.
- TEKCAN, A. I. (2001). Flashbulb memories for a negative and a positive event: News of Desert Storm and acceptance to college. *Psychological Reports*, **88**, 323-331.
- TEKCAN, A. I., ECE, B., GÜLGÖZ, S., & ER, N. (2003). Autobiographical and event memory for 9/11: Changes across one year. *Applied Cognitive Psychology*, **17**, 1057-1066.
- THOMPSON, C. P., SKOWRONSKI, J. S., LARSEN, S. F., & BETZ, A. L. (1996). *Autobiographical memory: Remembering what and remembering when*. Mahwah, NJ: Erlbaum.
- TROMP, S., KOSS, M. P., FIGUEREDO, A. J., & THARAN, M. (1995). Are rape memories different? A comparison of rape, other unpleasant, and pleasant memories among employed women. *Journal of Traumatic Stress*, **8**, 607-627.
- TVERSKY, B., & MARSH, E. J. (2000). Biased retellings of events yield biased memories. *Cognitive Psychology*, **40**, 1-38.
- WAGENAAR, W. A. (1986). My memory: A study of autobiographical memory over six years. *Cognitive Psychology*, **18**, 225-252.
- WALKER, W. R., SKOWRONSKI, J. J., & THOMPSON, C. P. (2003). Life is pleasant—and memory helps to keep it that way! *Review of General Psychology*, **7**, 203-210.
- WALKER, W. R., VOGL, R. J., & THOMPSON, C. P. (1997). Autobiographical memory: Unpleasantness fades faster than pleasantness over time. *Applied Cognitive Psychology*, **11**, 399-413.
- WHEELER, M. A., STUSS, D. T., & TULVING, E. (1997). Toward a theory of episodic memory: The frontal lobes and autonoetic consciousness. *Psychological Bulletin*, **121**, 331-354.
- WINOGRAD, E., & KILLINGER, W. A. (1983). Relating age at encoding in early childhood to adult recall: Development of flashbulb memories. *Journal of Experimental Psychology: General*, **112**, 413-422.

NOTES

1. PDS, Party of Democratic Socialism; CDU, Christian Democratic Union; SED, Socialist Unity Party.
2. Intensity during remembering was calculated by taking the absolute values of the participants' ratings of feeling while they were remembering (i.e., 0, 1, 2, 3).

(Manuscript received September 7, 2005;
revision accepted for publication February 3, 2006.)