

**Towards a Better Integration of Emotional Factors in Autobiographical Memory**

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**Memory (in press)**

**special issue on the Nature of human memory**

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### **Abstract**

While the role of emotion in autobiographical memory (ABM) is acknowledged in some models, its specific effects are blurred by narrow approaches towards emotion that are often limited to a distinction between intensity and valence. After presenting a critical review of the role assigned to emotion for the development of ABM, this paper surveys current perspectives which encourage a broader approach to emotion in the development of ABM. Research on Flashbulb memories provides an important context where the role of emotion has been the most extensively investigated. This paper makes three important recommendations for future research, which are to (1) provide an assessment of emotional responses that includes appraisals, action tendencies, bodily sensations, and emotion intensity; (2) investigate the role of specific emotional states; and (3) adopt systematically a multi-component approach of ABM measurement, which takes accuracy, consistency, vividness, degree of details, and confidence into account.

**Keywords:** Appraisals - Autobiographical memories - Emotion – Flashbulb memories

## **Towards a Better Integration of Emotional Factors in Autobiographical Memory**

### **Overview**

Having studied autobiographical memories (ABM) for more than two decades, I have always been intrigued by the limited integration of contemporary emotion theories, and this is in spite of major developments in the field of emotion research (e.g., Frijda, 1986; Izard et al., 2011; Niedenthal & Wood, 2019; Scherer, 2019) and the recognition that emotional responses play a central role in the formation of ABM (e.g., Holland & Kensinger, 2010; Kensinger, 2009; Kensinger & Ford, 2020). The goal of this paper is to provide recommendations that encourage new approaches towards the study of emotion in relation to autobiographical memory (ABM).

The paper starts with an overview of the current models of autobiographical memories, highlighting the minimal presence of emotional factors, which often provide no more than a simplified conceptualization of them. Such approaches are often limited to a bi-dimensional perspective, where only arousal and valence are considered. In the second section, I present contemporary approaches to emotion that consider a large set of discrete emotions and focus on different dimensions of emotion experience. In the third section, I review the contribution of the literature on flashbulb memory (FBM) in order to offer a more sophisticated approach to the study of emotion and ABM. FBM is a specific category of ABM that refers to the circumstances during which people learned about significant public or personal event (e.g., Luminet & Curci, 2018). In the last section, I propose a number of recommendations in order to improve the quality of research examining the effects of emotion on ABM.

## 1. Autobiographical Memory and Emotion

ABM models rarely consider the role of emotions as contributing factors in the elaboration of ABM and, when they do, they do so in a rather simplified manner. Tulving (e.g., 2002) proposes the most radical perspective, in which affective processes are not considered at all. Conway's approach is mainly cognitive and mainly focuses on autobiographical knowledge, which covers conceptual, generic, and schematic knowledge of our lives (Conway & Pleydell-Pearce, 2000). His model does, however, acknowledge the role of personal importance in memory representations, which includes a central appraisal component (see section 2). Rubin (2019) explicitly includes emotional responses by considering emotional intensity and uncertainty as two central features of his model. Nevertheless, this model only limits emotional intensity to a bi-dimensional structure, dividing it into positive and negative components. Finally, Wang (2008) considers heightened emotional reactions as important predictors of ABM but she fails to detail their specific modes of action.

A survey of the literature spanning the last 20 years provides further evidence that the current literature on the effects of emotional dimensions on ABM is underdeveloped (Scopus database, September 11, 2020). It revealed that 2014 papers were published with "autobiographical memory" in the title, with an average number that only exceeded 100 papers per year from 2012 onwards<sup>1</sup>. Among those papers, only 191 (9.4%) included the words "emotion(s)", "emotional", "affect" or "affective", with an average of approximately 10 papers per year including these words over the last ten years. For this review article, I only consider experiments that examined emotional responses following natural events (excluding mood induction in the lab), were tested on non-clinical populations, and included

self-reported questionnaires of emotion and memory. I also excluded any study which measured emotion as an outcome and not as a predictor of ABMs (e.g., Gibbons & Bouldin, 2019; Rollins et al, 2018).

This selection process whittled down the number of papers to just 20 published since 2001. These papers can be criticized for their simplified conceptualization of emotion, with the majority adopting a bi-dimensional approach in which only differences in arousal and/or valence were considered. Such an approach neglects other important components of emotions that may predict ABM elaboration (see following section). Another key reason to push for a new approach towards the assessment of emotion in the field of ABM is the current lack of coherent patterns. While some studies did not find an emotion effect on memory (e.g., Al-Hatmi et al., 2015; Platz et al., 2015), others found the effect, but only in some age groups (e.g., Ford et al., 2016), or only when the valence dimension was considered (e.g., Kensinger, 2009; Schulkind et al., 2005; Stone et al., 2013). Conversely, other studies found the effect only when the arousal dimension was considered (e.g., Talarico et al., 2004).

Despite the limited number of studies examining the role of emotion in ABM elaboration and their lack of coherence, some key explanations have been proposed to explain the facilitating role emotion plays in ABM elaboration. First, emotional activation triggers special encoding and consolidation mechanisms that facilitate memory formation. Emotion content also provides a meaningful organizational structure to process and represent significant information that facilitates its integration into ABM (Conway & Bekerian, 1987). Finally, facilitating effects are explained by the valence of information, with positive affect promoting relational processing and negative affect promoting referential processing (Holland & Kensinger, 2010).

Thus, while the role of emotion in autobiographical memory appears crucial, the current literature has not tested this hypothesis in a valid way. This is due to the application of overly simplistic approaches to the analysis of emotional responses in the field of ABM.

## **2. An Overview of Current Perspectives in Emotion with a Focus on Cognitive Approaches**

Emotions are “episodic, relatively short-term, biologically-based patterns of perception, experience, physiology, action, and communication that occur in response to specific physical and social challenges and opportunities” (Keltner and Gross, 1999, p. 468). The study of emotion involves different approaches including constructivist (e.g., Barret, 2006) and appraisal ones (e.g., Scherer, 2019), in which emotions are organized within two central axes, arousal and valence. These perspectives contrast with discrete approaches that distinguish a limited number of basic emotions (e.g., fear, sadness, anger, joy, surprise, disgust) (Ekman, 1992) or up to 25 different emotional states (Keltner, 2019). The latter is based on the idea that some emotions are particularly relevant in some cultural contexts and cannot be reduced to “basic” emotions. These 25 emotional states can be grouped in families of emotions, including self-conscious emotions, such as embarrassment and shame; and a larger conceptualization of pleasant emotions, including attachment-related (love, gratitude, desire, and sympathy) or self-transcendent emotions (awe, gratitude, joy, and ecstasy) (Keltner, 2019). The role of some specific emotions (e.g., anger, fear, disgust) on the cognitive processing of information, including effects at the implicit level of processing, has now been well-demonstrated (Levenson 2019).

A largely under-explored area of research is the study of emotional experience and its experiential dimensions (Lieberman, 2019), which could be a very fruitful domain for the establishment of clearer links between emotion and autobiographical memory. The

cognitive-experiential component of emotion includes two major initial responses, appraisals and action readiness (Frijda, 1986). Appraisals are triggered when people detect, identify or recognize information that is relevant to reach goals they judge important. For instance, heightened appraisals of risk and threat in the environment would trigger fear, while appraisals of harm and vulnerability would trigger compassion. A state of action readiness allows for the interruption of current actions and processes in order to initiate urgent responses. It is through these initial responses that people experience a subjective and distinct mental state. Appraisal theories provide a dynamic view of emotional responses, in which feelings are continually modified because appraisals may change in relevance and intensity over time, depending on an individual's values, beliefs, goals, and previous experiences (Ellsworth & Scherer, 2003). The central dimensions of appraisal include valence, as mentioned above, as well as novelty, expectedness, importance, familiarity, agency, coping potential, goal conduciveness, fairness, compatibility with social standards and norms (e.g., Ellsworth & Scherer, 2003; Roseman, 1991; Scherer, 2019; Scherer & Moors, 2019). Significantly, although appraisals and action tendencies occur automatically, people are able to identify their responses retrospectively in these two facets of the emotional response. Experiencing emotions also includes bodily responses related to cardio-vascular, respiratory, gastro-esophageal, or muscular sensations. A final important dimension of emotion experience is emotion intensity (Frijda, Ortony, Sonnemans, & Clore, 1992; Sonnemans & Frijda, 1994), which involves different components (total emotional impact, peak, and duration among others).

These four dimensions of emotion experience are largely neglected in the studies examining the impact of emotion on ABM. Future studies should consider appraisals, actions

tendencies, bodily responses, and emotion intensity, together with a discrete emotion approach. The specific role of these dimensions will be discussed further in section 4.

### **3. A Need for Naturalistic Situations to Examine the Effect of Emotional Factors on ABM**

#### **Elaboration: The Case of Flashbulb Memories (FBM)**

The setting in which the effects of emotional factors on ABM are examined is also of primary importance. Using the laboratory is usually recommended to achieve controllability and standardization. However, it also creates an unnatural environment. Interest in the study of ABM was initially built around a rejection of artificial lab-based stimuli and a desire to capture more realistic “everyday” memory phenomenon (e.g., Neisser, 1978; Conway, 1991; Rubin, 1996). Within ABM, FBM is probably the most relevant domain to test the effect of emotions in a naturalistic environment<sup>1</sup>. FBM research systematically involves naturalistic studies in which intensity of emotions is high; such situations cannot be investigated in the laboratory for ethical reasons. Moreover, surprise, which is a key predictor of FBM elaboration, is often elicited, but it cannot be easily manipulated. Finally, FBM is the domain within ABM that has most extensively integrated the central dimensions of emotion to predict memory elaboration (Berntsen, 2018; Finkenauer et al., 1998; Luminet et al., 2009). The model developed by Finkenauer et al. (1998) and adapted by Luminet et al. (2009) first shows the independent contributions of two appraisals (novelty and importance/consequences) on two emotion dimensions (overall intensity and surprise). Differentiating the role of surprise from overall intensity indicates the importance of considering general and specific approaches to emotional states simultaneously, something which very few studies have done. This model also extends the role of emotion beyond

immediate responses by showing the mediating effect of rehearsal (rumination, social sharing of emotion) in the relation between immediate emotion responses and FBM elaboration. Finally, it shows the role of moderating variables with the path from novelty to FBM being contingent upon the level of social identity involved. Despite these important contributions, there are still significant limitations in the way emotional responses are considered in ABM. The next section will present different recommendations that are aimed at improving the validity of future research.

#### **4. Towards a Better Integration of Emotional Factors to Predict Autobiographical Memory**

In this final section, I propose three major recommendations aimed at improving future research on the effects of emotion on ABM. They call for: (1) a detailed assessment of emotional experience through appraisals, action tendencies, bodily responses and emotion intensity dimensions; (2) a shift towards the assessment of specific emotional states; and (3) a multi-component approach of ABM measurement.

The first proposal relates to broadening the assessment of emotion. Regarding the assessment of appraisals, the distinction between unexpectedness and exceptionality has been neglected in the literature on FBM, while the literature on emotion emphasizes their specificities (Frijda, Kuipers, & ter Schure, 1989; Leventhal & Scherer, 1987; Scherer, 1988). Some events can indeed be exceptional but not unexpected (e.g., Curci & Luminet, 2009). Another distinction worth highlighting is the extent to which an event is unexpected or unbelievable. The first refers to probabilistic evaluations, while the second involves more emotional content. Importance and consequentiality also need to be distinguished. Consequentiality involves a behavioral component of collective action tendencies, while importance only conveys a cognitive aspect. Furthermore, each appraisal can be broken

down into individual (importance/consequences for the self) and collective levels (importance/consequences for a country or for the world) (e.g., Finkenauer et al., 1998; Luminet et al., 2009). Some data suggest that the activation of one and/or the other could affect FBM in different ways (Koppel et al., 2013). Consequentiality should also be considered as a multi-dimensional construct that includes the distance between the event and the respondent, the nature of the threat, and the event's valence (Rice et al., 2018). Broadening the assessment of appraisals will allow for a better understanding of their specific links with emotion dimensions. In the field of FBM, this will help disentangle the effects of general (emotion intensity) from specific (surprise) emotion dimensions on the activation of direct and indirect paths that both predict FBM elaboration (Luminet, 2018).

A full emotional response also involves action tendencies. Based on the model developed by Frijda et al. (1989), it would be relevant to include central aspects such as moving against, moving away, approach, inhibition, or hyperactivation. Along with measurements of bodily sensations, these measures can act as a complementary assessment of emotion intensity. Action tendencies and bodily sensations are activated only when high levels of emotion are triggered, thus making the assessment of extreme levels of emotion more accurate.

Broadening the assessment of emotion intensity by considering additional dimensions, such as the peak, the end or the duration of emotions (Sonnemans & Frijda, 1994), would be particularly relevant to the prediction of memory effects. From this perspective, Fredrickson (2000) has demonstrated that individuals' memories of past affective episodes are best predicted by the peak affect moment and the end of the episode, while the duration of episodes did not contribute to its prediction. These findings have practical effects that seem paradoxical at first. They suggest that adding more pain to the

end of an episode can actually improve its retrospective global evaluation as long as the end pain represents an improvement over the peak pain. This has actually been observed in the domain of medical pain, where prolonging a colonoscopy procedure in this manner improved patients' later global evaluations of their experience. This finding suggests that such a modification to medical protocols might increase patient's willingness to undergo further colonoscopies if needed (Van Den Bergh, & Walentynowicz, 2016).

A second suggestion to improve research in this domain concerns the need to shift towards the assessment of specific emotional states. A comparison between positive and negative events could help to clarify potential differences in terms of memory characteristics, such as consistency, vividness, details, or confidence. However, the available data do not distinguish any clear pattern based on simple valence criteria (Stone and Jay, 2018). A more promising avenue would be to compare the effects of specific emotional feeling states of both valences on ABM. In the domain of FBMs, in addition to surprise, many events involve fear, sadness, or anger. In the case of positive events, distinguishing those eliciting pride from the ones eliciting joy seems also relevant. Considering the notion of emotion families developed by Keltner (2019), another promising direction would be to disentangle the impact of attachment-related (love, gratitude, desire, and sympathy) and self-transcendent emotions (awe, gratitude, joy, and ecstasy) on ABM features.

Finally, a full examination of the role of emotion on ABM requires us to consider the different operationalizations of the dependent variables, including accuracy, consistency, vividness, and confidence. However, not many studies have considered these aspects together, while the literature on ABM suggests discrepancies across them. For instance, Phelps & Sharot (2008) found that arousal does not have the same impact on accuracy and vividness, while other studies have shown that positive emotions are associated with lower

accuracy and higher confidence. (e.g., Bohn & Berntsen, 2007; Kensinger & Schacter, 2006).

In a recent study, Cordonnier and Luminet (2021) showed that the overlap between consistency and vividness of FBMs is relatively low, and that confidence is unrelated to the other two dimensions. A valid assessment of the impact of emotion on ABM should therefore systematically involve a multi-level assessment of the dependent variable.

In conclusion, in order to obtain a more accurate assessment of the emotional response in ABM, researchers need to consider appraisals, action tendencies, bodily sensations, and emotion intensity, and assess each of them with a sufficient number of items or dimensions. They will also need to look beyond the arousal by valence dichotomy and investigate the role of specific emotional states and/or emotion families. Finally, the assessment of ABM needs to be extended by a systematic multi-component approach that includes accuracy, consistency, vividness, degree of details, and confidence.

### Notes

1. The purpose of this literature review was to select a reasonably extensive period of time (the last 20 years) that also corresponded with a key turning point in the literature: 9/11. I made the selection based on paper titles and not abstracts because I wanted to test the proportion of papers that consider emotion as a major domain of investigation in the paper. Titles are better at revealing the main focus of a study, while abstracts can include issues that are presented in a minor way.

2. There have also been some attempts to investigate FBMs with an experimental approach in the laboratory (see Lanciano et al., 2018). Although these approaches are interesting to evaluate issues like misleading post-event information (Niedzwienska, 2003) or prospective memory (Lanciano & al., 2010), they do not allow for the examination of the effect of eliciting a surprising situation in FBM elaboration in a sufficiently ecologically valid context. There has only been one attempt to do so (Lanciano & Curci, 2011).

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