



Involuntary memories and restrained eating



Christopher T. Ball*

Psychology Department, College of William & Mary, USA

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ABSTRACT

Most involuntary memories are elicited by external cues (e.g., smells, sounds) that have unique associations with specific memories (Berntsen's cue-retrieval hypothesis), but involuntary memories can sometimes be elicited by weak, even imperceptible, cues that raise the activation level of an already primed memory (Berntsen's motivation-priming hypothesis) to also reach conscious awareness during times of low attentional focus. The current study examined the effects of a motivation bias (restrained eating) on the involuntary memories recorded in daily diaries for seven days by 56 female participants. A large proportion of the involuntary memories were elicited by food-related cues and occurred in food-related contexts. A significant correlation was found between the participants' scores on a restrained eating scale and the percentage of involuntary memories involving cooking and eating content. These results parallel previous research involving voluntary memory retrievals during restrained eating.

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1. Introduction

Involuntary memories are personal experiences that come to mind without any deliberate, premeditated attempt to recall this experience; in contrast to voluntary memories that are recalled to satisfy a conscious need for this information. Research on the voluntary retrieval of autobiographical memories began in the 1970s, but it was not until the 1990s that the first empirical studies of involuntary memories were conducted by Berntsen (1996, 1998). Participants in these studies recorded involuntary memories in diaries as soon as possible after the memories were recalled. The naturalistic diary method allowed Berntsen to overcome the experimental difficulty of studying this fleeting and unpredictable memory phenomenon. Since Berntsen's pioneering research, additional diary and laboratory based studies of involuntary memories have increased our understanding of the factors that influence their occurrence and content (see recent reviews by Berntsen (2009, 2010)). We now know that involuntary memories are a common daily experience for most people and generally involve positive content. We also know that the majority of involuntary memories involve specific personal events that are commonly elicited during times of low attentional focus by external cues (e.g., smells, sights, sounds) that most likely have unique associations with the memory content. Although, it is not uncommon for involuntary memories to be elicited by abstract internal cues (e.g., thoughts and feelings), and occasionally, without any apparent cue at all.

1.1. Retrieval-cue hypothesis

Berntsen's (1996, 1998) theoretical explanation for the occurrence and content of involuntary memories initially focused on the retrieval cue and the role of attention in these cue-elicited retrievals. She proposed that involuntary memories result

* Address: Psychology Department, College of William & Mary, Williamsburg, VA 23187, USA.
E-mail address: ctball@wm.edu

from the same basic memory mechanisms underlying voluntary memories in that a retrieval cue activates a memory, but in the case of involuntary memories these activations can result in the accidental or unanticipated retrieval of a memory because they were not elicited by conscious goal-directed cues. She argued that a state of diffuse attention enhances access to environmental cues present in the retrieval context, and therefore the involuntary retrieval of cue-related memories is more likely to occur during these times. More recently, Berntsen and colleagues have suggested that it is the uniqueness of the association between the retrieval cue and the memory content that explains why a specific involuntary memory is retrieved at a specific time (Berntsen, Staugaard, & Sorensen, 2013). The uniqueness of this association can also explain why we are not being constantly flooded by involuntary memories, especially during times of low attentional focus (Berntsen et al., 2013). However, Berntsen also realized that a cue-retrieval hypothesis could not explain the occurrence of all involuntary memories and she introduced a second theoretical hypothesis to account for involuntary memories elicited by abstract internal cues and involuntary memories elicited without a perceptible cue.

1.2. Motivation-priming hypothesis

Berntsen (2009) suggested that motivational factors can increase the salience of cues present in the retrieval context and therefore provide greater chances for eliciting involuntary memories associated with these cues. Considerable research on attentional biases from a number of research domains support this basic inference, with the most striking examples of these attention biases often coming from individuals whose motivations may be considered as maladaptive, such as the attention bias shown by individuals suffering from emotion disorders (MacLeod, Mathews, & Tata, 1986). Berntsen also suggested that another consequence of motivation biases is that they could prime subclasses of autobiographical memories so that these memories become more accessible and therefore easier to activate involuntarily. A motivation-priming hypothesis for involuntary memories still allows for the fortuitous match of an external retrieval cue with the content of a memory, but now extends this continuum of matches to include abstract cues. Berntsen suggested that a person's life situation can prime clusters of thematically related autobiographical memories, and that emotions, thoughts, and personal goals could provide the bases for such themes. The motivation-priming hypothesis allows for the activation of involuntary memories by abstract cues and even the elicitation of involuntary memories by cues that fall below the individual's conscious awareness if the accessibility of these memories is highly primed. Given the long history of complex activations constantly spreading throughout the autobiographical memory networks from one moment to the next, it could therefore be very difficult for participants to identify the weak cues that elicited these highly primed involuntary memories. A similar argument was proposed by Kvavilashvili and Mandler (2004) to explain the occurrence of involuntary mind pops that involve semantic content (e.g., songs and names). This type of involuntary memory experience can often occur without a clear identifiable retrieval cue.

Empirical support for the motivation-priming hypothesis has come from two methodological approaches. The first approach involves recording participants' concerns or before or after collecting involuntary memories from these same participants to determine if there is a relationship between concerns and the content of the involuntary memories recorded. The second approach involves comparing participants who can be distinguished on a specific motivation bias.

Utilizing the first approach, Mace (2005) required his participants to record involuntary memories in daily diaries for 14 consecutive days. After the diary phase, each participant was interviewed and asked to identify if they had been preoccupied with a thought or thoughts during the data collection phase. Four participants indicated that they had been preoccupied in such a way, and in each case the source of these thoughts was a significant person in their lives. In support of the motivation-priming hypothesis, Mace found these participants had recorded five times as many involuntary memories that related to a significant person when compared to the recordings of the other participants.

Johannessen and Berntsen (2010) examined the relationship between self-reported current concerns and diary recorded involuntary memories by requiring their participants to complete a modified version of the Personal Concerns Inventory developed by Cox and Klinger (2002). After a period of one to two weeks had passed since completing the questionnaire, the participants were required to record 30 involuntary memories in a daily diary. The third phase of the study was completed one to three weeks after completing the diary phase, when participants were interviewed by the experimenters about possible relationships between the previously recorded concerns and the involuntary memories they had collected in their diaries. As predicted by the motivation-priming hypothesis, a large number of the involuntary memories ($M = 51\%$) recorded by these participants were deemed by the participants to be related to their concerns, although there were also large individual differences in these frequencies (8.3–91.7%). Further support for the motivation-priming hypothesis came from the additional finding that concern-related involuntary memories were also more likely to be elicited by abstract cues than involuntary memories not related to the self-reported concerns.

Although the previous studies provide support for the motivation-priming hypothesis, a demand characteristic issue is raised by this methodological approach because the participants are required to explicitly look for relationships between their concerns and the content of their involuntary memories. This problem was addressed to some degree by the fact that participants in both studies reported that they were unaware of the experimental goals of the researchers during the diary recording. However, one way to overcome this demand characteristic problem is to follow the second methodological approach that does not explicitly ask participants to identify such relationships, because the participants can be discriminated on a specific concern or motivation bias using some form of standardized testing procedure.

For example, previous research has identified that depressed individuals are prone to intrusive memories of negative events (Brewin, Hunter, Carroll, & Tate, 1996). Subsequently, Watson, Berntsen, Kuyken, and Watkins (2012) collected

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