Consciousness and Cognition 46 (2016) 163–172

Contents lists available at ScienceDirect

Consciousness and Cognition

journal homepage: www.elsevier.com/locate/concog

Trauma-related versus positive involuntary thoughts with and without meta-awareness

Deanne M. Green [a], Deryn Strange [b], D. Stephen Lindsay [c], Melanie K.T. Takarangi [a,*]

[a] Flinders University, School of Psychology, GPO Box 2100, Adelaide, 5001 SA, Australia
[b] John Jay College of Criminal Justice, CUNY, Department of Psychology, 445 West 59th St, New York, NY 10019, USA
[c] University of Victoria, Department of Psychology, P.O. Box 1700 STN CSC, Victoria, B.C. V8W 2Y2, Canada

ARTICLE INFO

Article history:
Received 18 April 2016
Revised 26 September 2016
Accepted 27 September 2016
Available online 7 October 2016

Keywords:
Emotion
Intrusions
Mind-wandering
Meta-awareness

ABSTRACT

In earlier work, we asked subjects to report involuntary thoughts relating to a trauma film and also probed subjects periodically. Subjects often reported involuntary thoughts in response to probes, suggesting they lacked meta-awareness of those thoughts. But it is possible that some or all probe-detected thoughts were continuations of thoughts subjects had spontaneously reported, leading us to overestimate involuntary thoughts lacking meta-awareness. It is also unclear whether failures in meta-awareness occur for other emotional events. We exposed subjects to a negative or positive film. Subsequently, they reported involuntary film-related thoughts and responded to probes that distinguished new from continuing thoughts. Many (54%) but not all probe-caught thoughts were thought continuations. This result supports our earlier finding that people can lack meta-awareness for trauma-related thoughts, but suggests caution in how meta-awareness is assessed. We also found that self-caught negative and positive involuntary thoughts occurred at a similar frequency, with different characteristics.

1. Introduction

Involuntary memories are recollections that enter consciousness without any specific effort to retrieve them (Berntsen, 1996; Rasmussen & Berntsen, 2009). These memories share some characteristics with other types of spontaneous thought processes, such as mind wandering (Smallwood & Schooler, 2015), remindings (Hintzman, 2011), "earworms" (Hyman et al., 2015), and traumatic flashbacks (Brewin, 2014). Recent research has focused on whether these phenomena are related, and how they might be differentiated (Kvavilashvili, 2014; Meyer, Otgaar, & Smeets, 2015; Takarangi, Lindsay, & Strange, 2015).

Mind-wandering is the shift of attention from external information, such as an ongoing task, toward self-generated, internal information, such as thoughts and memories (Smallwood & Schooler, 2006). These shifts in attention are frequent, perhaps occurring as often as half our waking lives (Killingsworth & Gilbert, 2010). They can arise without deliberate intention (i.e., involuntarily), and lack meta-awareness; in other words, when people are not explicitly aware that the current contents of their consciousness are "off-task" thoughts (Smallwood & Schooler, 2015). This phenomenon appears to extend to thoughts about negative autobiographical events (Baird, Smallwood, Fishman, Mrazek, & Schooler, 2013).

* Corresponding author.
E-mail address: melanie.takarangi@flinders.edu.au (M.K.T. Takarangi).

http://dx.doi.org/10.1016/j.concog.2016.09.019
1053-8100/

People also sometimes lack meta-awareness of thoughts about analogue trauma. Takarangi, Strange, and Lindsay (2014) used the typical trauma film paradigm, whereby subjects watched a stressful film intended to cause involuntary thoughts (Holmes & Bourne, 2008). They then had subjects engage in a reading task during which they measured film-related mind-wandering (see Baird et al., 2013). Subjects indicated when they were aware of having a thought about the film (by pressing a computer key). To capture thoughts of which subjects were not aware, probes appeared intermittently throughout the reading task (e.g., as in Schooler, Reichle, & Halpern, 2004). Each probe asked subjects whether or not they had been thinking about the film at the moment the probe was presented. Along with spontaneously reporting involuntary thoughts from the film, subjects also sometimes responded "yes" to probes. According to Takarangi et al., these responses could indicate that subjects had been thinking about the film but had not yet become aware that they were doing so. If the frequency of involuntary thoughts extends beyond that which a subject can accurately self-report, there may be important implications for research on and treatment of maladaptive intrusions. One example is how involuntary thoughts—such as those that arise from Post-traumatic Stress Disorder (PTSD)—are captured and addressed.

A limitation of Takarangi et al.'s (2014) study is that some or all of what they classified as "probe-caught" involuntary thoughts might really have been non-reported (but meta-aware) continuations of a previously self-caught thought. In other words, it is possible that subjects may have self-reported thinking about the film and then continued to ruminate about that thought until the next probe appeared. In these cases subjects' "yes" responses to probes would not represent failures in meta-awareness. If this explanation is accurate, then the rate of probe-caught involuntary thoughts Takarangi et al. reported may exaggerate the rate of subjects' genuine failures in meta-awareness of thoughts about the trauma film. Of course, it is important that probe-caught methods accurately identify failures in meta-awareness. Thus, in the present study we altered the probe instructions so that we could identify whether subjects had a previously reported thought in mind when they responded to probes. Hence, our first question in the current study is: Do involuntary thoughts classified as lacking meta-awareness sometimes reflect the non-reported (but meta-aware) continuation of a previously self-caught thought?

If subjects do lack meta-awareness for involuntary thoughts about a negative event—in a similar way to instances of mind wandering without awareness—then it is also important to examine whether lapses in meta-awareness also characterize thoughts about other emotionally significant material. Some clinicians and theorists have argued that the process of remembering emotionally significant events—that are typically negative or traumatic—is different to that of ordinary, everyday experiences; in particular, some have argued that memory for emotional experiences involves a "special" mechanism (e.g., "flashbulb memories"; Brown & Kulik, 1977; see also Shobe & Kihlstrom, 1997, for a review) or an absence of certain elements of normal memory processing. For example, according to Brewin (2014) the emotional intensity and difficulty in conceptualizing traumatic events can lead to an incomplete narrative of those experiences. The result is a disjointed narrative in which voluntary retrieval of the memory is less prevalent than involuntary, unwanted memories.

According to these models of trauma memory, an increase in involuntary memories is accompanied by an inability to recall memories voluntarily. Yet studies of voluntary and involuntary memory show that frequency of both types of memories correlate positively with PTSD symptoms (Berntsen & Rubin, 2008). Berntsen and Rubin (2008) argued that these involuntary thoughts reflect *basic* memory processes. Indeed, we know that recurrent, intrusive, and involuntary cognition also occurs for neutral and positive information. For example, surveys, diary studies, and laboratory analogues (akin to the trauma film paradigm but with a positive film used as the target event) have shown that people also experience positive involuntary thoughts and memories (see Berntsen & Rubin, 2008; Clark, Mackay, & Holmes, 2013; Davies, Malik, Pictet, Blackwell, & Holmes, 2012). Do involuntary thoughts share underlying characteristics, such as meta-awareness, regardless of valence? That is the second question we address here.

What do we know about the differences between positive and negative memories? Research indicates that there are differences in the frequency with which negative and positive involuntary memories are experienced. For example, using a diary method, Berntsen and Rubin (2008) found that positive involuntary memories were more common than negative involuntary memories in daily life. Similarly, when probed with questions about their past, people recalled both positive and negative autobiographical memories, with a clear reminiscence bump—remembering more personal events from adolescence and early adulthood than other periods of life—for positive memories. When questioned about the content of their last involuntary memory, subjects were more likely to report positive memories (Berntsen & Rubin, 2002). However, this bias toward positive involuntary cognition can be reversed. There is evidence that negative cues (e.g., "childhood nightmares") more often trigger an involuntary autobiographical memory than positive cues ("going on holiday"), or neutral cues ("buttering bread"; Schlagman & Kvavilashvili, 2008). Thus, when positive and negatives cues are equally available—as in a controlled laboratory study, where there is an equivalent number of each—the negative cues may be more likely to trigger involuntary memories.

It may be that prior findings of differences in the frequencies of positive versus negative involuntary memories reflect a difference in meta-awareness of thoughts. On the one hand, negative involuntary thoughts might be characterized by stronger meta-awareness than other involuntary cognitions, due to their nature as intrusive and distressing, or because negative memories are subject to special processing (e.g., Brewin, 2014). Our previous data suggest that people experience at least some negative involuntary thoughts without meta-awareness, but it might be that positive involuntary thoughts are even more likely to occur without meta-awareness. On the other hand, perhaps people are actually more meta-aware of their positive involuntary thoughts. If so, then that could explain their apparent accessibility in everyday life.

To summarize, we address two main questions in this study: Did involuntary thoughts defined as "probe-caught" in Takarangi et al.'s (2014) procedure sometimes reflect non-reported (but meta-aware) continuations of a previously