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## Visual imagery in autobiographical memory: The role of repeated retrieval in shifting perspective



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### ABSTRACT

Recent memories are generally recalled from a first-person perspective whereas older memories are often recalled from a third-person perspective. We investigated how repeated retrieval affects the availability of visual information, and whether it could explain the observed shift in perspective with time. In Experiment 1, participants performed mini-events and nominated memories of recent autobiographical events in response to cue words. Next, they described their memory for each event and rated its phenomenological characteristics. Over the following three weeks, they repeatedly retrieved half of the mini-event and cue-word memories. No instructions were given about how to retrieve the memories. In Experiment 2, participants were asked to adopt either a first- or third-person perspective during retrieval. One month later, participants retrieved all of the memories and again provided phenomenology ratings. When first-person visual details from the event were repeatedly retrieved, this information was retained better and the shift in perspective was slowed.

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## 1. Introduction

Since the origins of systematic empirical research, visual imagery has been considered a central component of autobiographical memory (Galton, 1883; for reviews see Brewer, 1988; Rubin, 2006). Visual imagery gives rise to a sense of reliving (Rubin, Burt, & Fifield, 2003) and severe amnesia can result from damage to brain regions that subserve long-term visual memory (Rubin & Greenberg, 1998; Rubin & Umanath, 2015). One important aspect of visual imagery is the perspective from which a memory is viewed – individuals report seeing the event through their own eyes for some memories (a first-person or field perspective) and from an external vantage point for other memories (a third-person or observer perspective) (e.g., Freud, 1899/1953; Henri & Henri, 1896; Nigro & Neisser, 1983; Rice, 2010). Visual perspective varies greatly across autobiographical memories (Rice & Rubin, 2011), and it has been linked to a host of diverse phenomena, including emotion (Berntsen & Rubin, 2006), self-concept (Libby & Eibach, 2002), depression (Kuyken & Moulds, 2009), dissociation (Sutin & Robins, 2010), and post-traumatic stress disorder (PTSD; McIsaac & Eich, 2004).

The existence of third-person perspective memories presents an interesting puzzle: How do events that are originally experienced from a first-person perspective come to be remembered from a third-person perspective? In the present study,

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we investigated the possibility that the shift in perspective results from a decrease in the availability of visual information from the event (Rice & Rubin, 2009; Rubin et al., 2003). When visual information from the original event is retained and is more accessible, people may naturally experience the memory from a first-person perspective; however, once visual information is forgotten, the memory for the event may be reconstructed to a greater degree based on general knowledge (Rice & Rubin, 2009). Before describing our experiments, we briefly review relevant literature on visual perspective and then discuss the potential role of repeated retrieval (i.e., rehearsal) as a mechanism that can either maintain or shift perspective.

### 1.1. Visual perspective in autobiographical memories

The experience of remembering an autobiographical event from a particular perspective necessarily implies the construction of a visual scene that locates the person recalling the memory relative to the memory (Rubin & Umanath, 2015). Although visual imagery is needed to construct a memory from either a first- or third-person perspective, a greater amount of visual information is required to experience a first-person perspective. In order to construct a memory from a first-person perspective, the person must recall visual details encoded through their eyes and locate themselves in the exact location where they were when the event occurred. In contrast, third-person perspective can be located anywhere relative to the memory, and location varies considerably across memories (Rice & Rubin, 2011). Given that the person did not encode the event from a third-person perspective, they likely do not have as much visual information available to construct the scene from this perspective. Indeed, memories that are experienced from a first-person perspective are rated as more vivid than those memories experienced from a third-person perspective (Rice & Rubin, 2009).

The phenomenon of remembering out-of-body experiences during traumatic events provides an example of how visual information is critical to experiencing a first-person perspective. People sometimes report the experience of mentally leaving their body during a traumatic event and observing it from a distance, which some researchers have considered a marker of dissociation (van der Hart, van der Kolk, & Boon, 1998). An alternative explanation revolves around the limited amount of visual information that is encoded during the traumatic event (see Rubin, Berntsen, & Bohni, 2008). During highly arousing negative events, people experience a narrowing of attention to focus on the threat, which results in enhanced encoding of central details and impaired encoding of peripheral details (i.e., “tunnel memory”; Berntsen, 2002; Christianson, 1992). With insufficient visual information available to construct the memory from a first-person perspective, memories of the traumatic event are reconstructed from a third-person perspective and interpreted as an out-of-body experience.

Of course, the phenomenon of tunnel memory is an extreme example – more typically, a large amount of visual information is encoded during the course of experiencing an autobiographical event. However, this visual information can become inaccessible over time. The most consistent finding in the visual perspective literature is that recent events are more likely to be recalled from a first-person perspective than older events (McIsaac & Eich, 2002; Rice & Rubin, 2009; Robinson & Swanson, 1993). Given that events are originally experienced from a first-person perspective, this finding has been interpreted as evidence of the reconstructive nature of memory (Freud, 1899/1953; Nigro & Neisser, 1983). The older the event, the greater the opportunity for mnemonic change to have occurred (e.g., forgetting); as visual information from the original event is lost, then general knowledge is used to reconstruct this aspect of the memory.

Although the loss of visual information may naturally produce third-person perspective memories, people are also capable of intentionally constructing a third-person perspective (Blackmore, 1987; McIsaac & Eich, 2002). The changes in content and phenomenology that occur when individuals purposefully shift from a first- to third-person perspective during retrieval correspond with the differences observed with naturally occurring first- and third-person perspective memories. For example, when memories are naturally remembered from a first-person perspective, shifting to a third-person perspective results in decreased vividness, sense of reliving, and intensity of emotion (Berntsen & Rubin, 2006; Robinson & Swanson, 1993; Williams & Moulds, 2008). Interestingly, when memories are naturally remembered from a third-person perspective, shifting to a first-person perspective has little or no effect on memory phenomenology. The asymmetry of these findings suggests that the lack of availability of visual information from the original event may be critical to reporting a memory from a third-person perspective.

Given the mnemonic consequences of purposefully shifting from a first- to a third-person perspective, it is no surprise that people often use this cognitive strategy to cope with memories of negative events. For example, individuals with PTSD sometimes report intentionally adopting a third-person perspective in order to avoid reliving the trauma again through their own eyes (McIsaac & Eich, 2004). The use of third-person perspective as a cognitive avoidance strategy has been documented in other clinical populations as well, such as individuals with depression (Williams & Moulds, 2007) and chronic pain (McNamara, Benson, McGenny, Brown, & Albert, 2005). The repeated use of such a strategy over time may lead to the forgetting of visual information, thus hindering the ability to remember the event from a first-person perspective. Indeed, individuals with PTSD or symptomology characteristic of PTSD often naturally remember trauma from a third-person perspective (Berntsen, Willert, & Rubin, 2003; Porter & Birt, 2001; Rubin, Boals, & Berntsen, 2008).

The degree of self-focus during the encoding of an event also affects the visual perspective experienced during subsequent retrieval. Third-person perspective memories are more prevalent for events that induce self-awareness (e.g., public speaking; Nigro & Neisser, 1983; Rice & Rubin, 2011) and in individuals who are high on trait self-consciousness (Robinson & Swanson, 1993). Third-person perspective memories also occur with greater frequency in clinical populations that have mental disorders characterized by abnormal self-focused processing (Wells & Papageorgiou, 2001), such as agoraphobia (Day, Holmes, & Hackmann, 2004), body dysmorphic disorder (Osman, Cooper, Hackmann, & Veale, 2004), and

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