RUNNING HEAD: Nonbelieved Memories

On the Existence and Implications of Nonbelieved Memories

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Abstract

In this paper, we review the state of knowledge about a previously assumed to be rare memory phenomenon called nonbelieved memories. Nonbelieved memories refer to a counterintuitive phenomenon in which vivid autobiographical memories are no longer believed to have happened although vivid recollective features remain present. Such memories stand in contrast to the more typical situation that when events are recollected they are also believed to have genuinely occurred. Data regarding the frequency, characteristics, and factors that contribute to the development of naturally occurring and laboratory induced nonbelieved memories is reviewed. Relationships of nonbelieved memories to theories of autobiographical remembering and the study of remembering in applied domains are discussed.

Keywords: Memory; Nonbelieved memories; Autobiographical; Belief; False memory; Omission

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Nonbelieved memories (NBMs) are a counterintuitive phenomenon in which vivid recollective characteristics are present for autobiographical events that are no longer believed to represent genuine past occurrences (Mazzoni, Scoboria, & Harvey, 2010). While various conceptualizations of memory articulate that memories are typically believed to be true (e.g., James, 1890/1950; Brewer, 1996), few examine the possibility that autobiographical recollections might exist without accompanying *autobiographical belief* (or *belief in occurrence*). When participants are asked to report memories in experimental studies, they predominantly report strongly believed and recollected events (Scoboria & Talarico, 2013). Hence, the literature is replete with the study of *believed memories*, and it is thus not surprising that until recently NBMs were considered to be rare anecdotes.

Naturally Occurring Nonbelieved Memories

Anecdotal reports of NBMs have occasionally surfaced. Jean Piaget (1951) described a childhood memory of a kidnapping attempt which he later learned had been fabricated. Despite this knowledge, he retained a vivid memory of the incident in adulthood. Oliver Sacks (2005) wrote in his 60s about a childhood memory of a bomb falling near his home, a memory that he was later told originated in a letter from a relative. Sacks no longer believed the memory, despite continued vivid recollection.

The first systematic study of naturally occurring NBMs (Mazzoni et al., 2010) was conducted in light of anecdotes reported to GM (second author) during lectures, Piaget's story and the finding that autobiographical events sometimes receive higher ratings on memory than on autobiographical belief (Scoboria, Mazzoni, Kirsch, & Relyea, 2004). The authors screened a large sample to identify people with NBMs. Participants described a NBM, the reason(s) that they stopped believing the memory, dated the memory and the age at which belief was withdrawn, and rated the memory on phenomenological characteristics

associated with remembering. Participants also rated age-matched believed memories and believed-not-remembered events (e.g., family stories).

Five key findings emerged. First, NBMs were reported by ~20% of those screened, indicating that NBMs are not rare. Second, phenomenological ratings showed that NBMs were rated high and similarly to believed memories on key recollective features (e.g., visual detail, re-experiencing), indicating that NBMs are experienced as 'memory-like' despite the withdrawal of belief. Third, NBMs were rated as less personally important and less connected to other memories, suggesting lower embeddedness in memory networks and sense of self. Fourth, the events depicted in NBMs were most frequently dated to middle-to-late childhood (sample M_{age} = 22.9 years). Finally, participants described choosing to withdraw belief in occurrence due to social feedback, changes in event plausibility, and encountering contradictory evidence.

Examining NBMs in the Laboratory

To obtain experimental control, researchers have brought NBMs into the laboratory. Two approaches have been taken: 1) experimentally creating NBMs, and 2) indirectly eliciting NBMs from memory. Experimental studies have capitalized on the finding that many NBMs originate in disconfirmatory social feedback. This parallels false memory implantation studies in which false events are suggested and then the fabrication is revealed at the end of the study. Such post-study debriefings are a form of social feedback about a memory, one consequence of which may be the creation of NBMs.

Otgaar, Scoboria, and Smeets (2013) used a false memory implantation procedure to study the impact of debriefing on the creation of NBMs (see the Appendix for methodological details of all studies). They reported two studies in which adults or 10-year-old children were falsely told that they had been on a hot-air-balloon ride as a young child. After suggestive interviews they were informed of the fabrication, and rated belief and memory about the false event (adults rated the event again one month later). Most relevant,

40% of those with false memories reported a NBM post-debriefing. The likelihood of NBMs was positively associated with pre-debriefing subjective memory ratings, and NBMs were retained over the month.

Clark, Nash, Fincham, and Mazzoni (2012) adapted a false memory procedure (Nash, Wade, & Lindsay, 2009) to elicit NBMs. This method uses doctored video clips to produce multiple false memories for performed actions. After creating false memories, participants were informed about the doctored clips and rated autobiographical belief and memory for false and true actions. For the false actions, autobiographical belief ratings were reduced to a greater extent than recollection ratings. Information on the doctored clips produced NBMs showing that autobiographical belief is more responsive to social feedback than recollection.

Scoboria and Talarico (2013) used an indirect cueing method to examine the spontaneous retrieval of naturally occurring NBMs. Participants received general cues to recall five events from a specified period. A small but reliable number of NBMs (3.0% to 6.4% of events) was found, with the highest rate in the 6-12 year age range. The cueing procedure also affected the rate of elicitation of NBMs. They argued that the findings of a discrepancy in NBM rates between direct and indirect methods (~20% vs. ~5%) and differences in NBM rates depending on the cueing procedure reinforces the argument that participants in memory studies produce the ‘types’ of memorial phenomena that they think experimenters are seeking when asked to recall events from their lives (i.e., events that are both strongly believed and strongly recollected).

Phenomenology Associated with Nonbelieved Memories

All of the papers in the preceding section also examined phenomenological ratings in manners similar to Mazzoni et al. (2010). A central question in the study of NBMs is what occurs to memorial representations after autobiographical belief is reduced. A consistent picture has emerged: high levels of visual detail, spatial characteristics and re-experiencing characterize NBMs, consistent with preceding findings linking these characteristics with the

recollection of events (Johnson, Foley, Suengas, & Raye, 1988; Rubin, Schrauf, & Greenberg, 2001). These findings underscore that NBMs "feel" like authentic memories (Clark et al., 2012).

Other characteristics are lower for NBMs relative to believed memories. Compared to believed memories, NBMs are rated lower in connectedness to other events in memory, complexity, specificity, personal importance, plausibility, and higher in susceptibility to persuasion. Either the memories which become NBMs are weaker on these dimensions to start, or the withdrawal of belief for an event is associated with devaluation of the personal importance and weakening of the ontological status of the event.

NBMs and Objective Accuracy.

While attention to objective accuracy is not critical to the study of the subjective experience of remembering, memory researchers are often interested in the accuracy of reports. The objective status of naturally occurring NBMs is frequently unknown, and hence some events may have been appropriately 'relinquished' and others inaccurately 'disowned' (Mazzoni et al., 2010).

To partly address the issue of accuracy, recent studies have examined the elicitation of nonbelieved *true* memories. This research dovetails with research on memory omission errors showing that suggestions can lead to failures to report information (e.g., Wright, Loftus, & Hall, 2001), and that omission errors are not caused by faulty memory mechanisms (Otgaar et al., 2010). Thus, suggestions may lead to the creation of nonbelieved *true* memories.

Mazzoni, Clark, and Nash (2014) extended the doctored video approach to examine the effects of feedback on memory for genuinely performed actions. They again found that social feedback undermined autobiographical belief to a greater extent than recollection. The patterns of belief, recollection and phenomenological ratings were similar across studies,

regardless of whether the challenged events were objectively true (Mazzoni et al., 2014) or false (Clark et al., 2012).

Otgaar et al. (2013) adapted the Goff and Roediger (1998) imagination inflation methodology to simultaneously induce true and false NBMs (see Appendix). During the recognition test at the end of the procedure, some actions described by participants as having been previously performed were labelled as not performed by the researcher. While participants frequently resisted this challenge, a majority reported one or more NBM(s). NBMs were more frequent for false memories than for true memories, indicating that participants did partly discriminate between true and false memories when challenged.

Belief in Occurrence and Recollection are Distinct

The preceding studies provide a clear picture: memories can lose part or all of their belief status without losing the sense of recollection. Thus, autobiographical belief and recollection should be conceptually independent and dissociable. This was demonstrated by Scoboria et al. (in press) in two studies using confirmatory analytic procedures with indirectly cued events (Study 1) and naturally occurring NBMs (Study 2). Both studies revealed that belief in occurrence and recollection are distinct latent constructs.

What are then the factors that influence autobiographical belief appraisals? Scoboria, Boucher, and Mazzoni (in press) examined NBM reports and identified eight primary reasons for withdrawing belief in remembered events. These are in order of frequency: social feedback, changes in plausibility, source re-attribution, internal features (e.g., references to internal or emotional aspects), non-social external evidence (i.e., discovering relevant photographs or videos), general memory beliefs, discrepancy with views of self or others, and personal motivation. This confirms that numerous processes other than recollection impact autobiographical belief, and that in particular social feedback plays a key role in NBMs.

Theoretical Links

The dissociation between autobiographical belief and recollection is consistent with

the view that appraisals of mental representations as past states arise from mental experience at the time of retrieval (Rubin, 2006; Johnson & Raye, 1981; Mazzoni & Kirsch, 2002). Similarly to Rubin's (2006) view, NMBs indicate that multiple metacognitive appraisals contribute to remembering. However, while Rubin's conceptualization of 'belief' in remembering focuses on beliefs about the accuracy of the remembered details (e.g., did they occur as remembered) research on NBMs focuses on the appraisal of the actual occurrence of the event itself (for more on the distinction between 'belief in accuracy' and 'belief in occurrence', see Scoboria et al., in press).

NBMs are frequently accompanied by statements that the mental representation originated in another source (e.g., a dream). This is explained by the reality monitoring (RM) framework (Johnson & Raye, 1981). According to RM, memory statements are attributions that are derived from cognitive experience at retrieval. Representations once attributed as memories can later be re-attributed as not-memory. In the case of NBMs, recollection is challenged by evidence that contradicts the truth status of the event represented in the memory, a discrepancy that is resolved by re-attributing the memory to a different source. This may lead to the personal meaning associated with the event being undermined, perhaps via mechanisms such as those linked to the self-distancing of events (Kross & Ayduk, 2011).

Theories of memory are widely influenced by Tulving's (1989) distinction between episodic and semantic memory. Hence, it is tempting to draw parallels between the remember/know distinction originating in that view and the distinction between autobiographical belief and recollection. While 'remember' and 'recollection' do refer to the same concepts, 'knowing' and 'belief in occurrence' are not related. Differently from 'knowing', belief in occurrence is a summative judgment of the truth status of the occurrence of an event based on all available information (Mazzoni et al., 2010). Thus, belief in occurrence can be equally influenced by most processes that contribute to 'remembering' or 'knowing' (see Scoboria & Talarico, 2013).

Implications of NBMs

The study of NBMs has implications for decision-making about the occurrence of events. As NBMs sit at the interface between recollection, other knowledge, external evidence and social influence, areas of research associated with memory and suggestibility might be revisited, including false memory, memory retraction, misinformation effects, and false confessions. More broadly, NBMs point to the importance of non-memorial factors in the appraisal and re-appraisal of event representations. They reveal dynamic memory editing processes that are sensitive to the acquisition of new information (Mazzoni et al., 2014). The study of NBMs, in conjunction with related work on memory verification (Wade, Nash, & Garry, in press), has the potential to inform models of remembering that simultaneously account for the memory maintenance, forgetting, false memory formation, and the relinquishing of belief in vivid memories.

For example, more nuanced questions might be asked about what happens in cases of retraction of recovered memories of abuse. Evidence indicates that at times retractors come to question recovered memories due to social influences and qualities of memorial representation (Ost, Costall, & Bull, 2002), conditions similar to those associated with the creation of NBMs. Hence, when individuals retract recovered ‘memories’, some may develop NBMs. This raises the possibility that vivid imagery for negative experiences might be retained following retraction.

NBMs have also potential applications to the study of traumatic memory. To the extent that NBMs are a general memory phenomenon, the distinction between autobiographical belief and recollection should matter for negative and impactful events. Traumatic events frequently lead to involuntary, intrusive memories of those events (Berntsen, 2010). Do some individuals cope with intrusive memories by suspending or reducing the degree to which they ‘feel’ such events to be genuine? Scoboria and colleagues (in press) report cases supportive of this idea. In such cases, it would be interesting to

examine the degree to which individuals continue to be distressed by the memory and whether rates of intrusions are altered. The fuzzy boundary between wishing that an event did not occur and convincing oneself that the event did not happen is worthy of further investigation.

Research on NBMs also invites a new perspective on the possible effectiveness of debriefing in false memory implantation studies. The evidence indicates that false memories persist in a small number of participants, and that up to half of those reporting false memories later report that vivid recollective material remains post-debriefing (Otgaar et al., 2013). These findings reinvigorate questions concerning the ethics of false memory implantation studies (Goodman, Quas, & Redlich, 1998).

Summary and Concluding Remarks

Research on NBMs has expanded rapidly. NBMs are not as rare and exceptional as once assumed. They originate not only in retrospective self-reports, but following false memory implantation procedures, controlled laboratory procedures, and when memory is cued indirectly. This indicates that NBMs reflect a general memory phenomenon. The existence of NBMs challenges assumptions about memory editing and raises new questions about the relationship between recollective processes and truth attributions about events.

This review documents the defining features of NBMs, and lays the groundwork for examining how NBMs relate to other behaviour. The study of false memory formation began by asking whether false memories occurred. Subsequent studies demonstrated that suggesting events produced changes in attitudes and behavior (e.g., Bernstein & Loftus, 2009; Scoboria, Mazzoni, Jarry & Bernstein, 2012). The groundwork has been laid for examining the behavioural impact of NBMs. For example, it seems logical that when a memory is no longer believed to be genuine it will then have less influence on current decision-making.

Current views of autobiographical memory emphasize that memories play important self, social and directive functions (Bluck, Alea, & Habermas, 2005). While people

sometimes maintain the ownership of memories (Sheen, Kemp, & Rubin, 2001), at other times they decide to relinquish belief in the occurrence of events. Along with other lines of evidence (e.g., Fivush, 2011), NBMs underline that the truth status of remembered events is often subject to social negotiation. The study of instances in which people choose to question, reinforce, or withdraw belief in the occurrence of memories has considerable potential to shed light on the linkages between remembering, the self, social interaction, and behaviour.

Key readings

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Appendix

Laboratory methods used to study nonbelieved memories

Doctored video procedure. (Used in: Clark, Nash, Fincham & Mazzoni, 2012; Mazzoni et al., 2014). The procedure involves one session in which participants imitate actions, a second session in which they receive a fake video clip and a final session which includes a memory test. In session one, participants imitated actions (e.g., flex your arms) that were video-recorded. In a subsequent session two days later, participants viewed video clips in which doctored segments were inserted implying that the participant had performed actions that they had not. Also, they provided memory and belief ratings. The final session occurred approximately 4 hours after the second session. Participants were told that some of the clips were doctored, after which participants provided new memory and belief ratings. NBMs were operationalized as recollection ratings largely exceeding belief ratings.

False memory implantation (Used in: Otgaar et al., 2013, Studies 1 & 2). In this procedure, participants receive narratives about experienced and non-experienced events (e.g., hot air balloon ride). During multiple interview sessions, participants are suggestively interviewed about their recollection of the events. The primary finding is that a sizeable minority come to report false memories following elaborate suggestive procedures (e.g., Hyman & Billings, 1996; Loftus & Pickrell, 1995; Otgaar, Candel, Scoboria, & Merckelbach, 2010). Such studies end with a debriefing in which the fabrication is revealed. This debriefing is strong social feedback about the truth status of the memory. Indeed, participants are often surprised that the event is false (Wade, Garry, Read, & Lindsay, 2002), and some participants continue to belief the false event even after the debriefing (Otgaar, Verschuere, Meijer, & Van Oorsouw, 2012). In the adapted procedure, after the debriefing participants were explicitly asked about their memory and beliefs concerning the false event. NBMs were operationalized as stating that the event is not believed and that the event is recollected.

Imagination inflation for actions. (Used in Otgaar et al., 2013). The standard procedure (see Goff & Roediger, 1998) results in multiple 'miniature' false memories within each participant. In the adapted procedure, participants performed, imagined, or heard numerous action statements (e.g., break the toothpick), two days later imagined the actions numerous times, and one week after the first session completed a recognition and source-monitoring test. In the adapted procedure, the experimenter challenged randomly selected hits and false alarms labelled by participants as "performed" in the first session by stating that the actions were not performed. After each challenged and unchallenged "performed" item, participants rated belief that they performed the item and recollection for the item. In this way, challenges can simultaneously lead to the creation of nonbelieved true and false memories. NBMs were operationalized as stating that the event is not believed and that the event is recollected.

Indirect cueing of events. (Used in: Scoboria et al., in press, Study 1; Scoboria & Talarico, 2013, Studies 1–3). In these studies, participants received a general cue to recall five events from some specified period in the past. After cueing, individuals were presented with each event in a random order and rated autobiographical belief, recollection, and other phenomenology associated with remembering for each event. NBMs are operationalized as cases in which recollection ratings exceed belief ratings, excepting when recollection was at the scale ceiling and belief is rated just one point lower than the ceiling. Rates and ratings for nonbelieved memories, believed memories, and believed-not-remembered events were then contrasted.