

**On the persuadability of memory: Is changing people's memories no more than
changing their minds?**

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The observation of parallels between the memory distortion and persuasion literatures leads, quite logically, to the appealing notion that people can be ‘persuaded’ to change their memories. Indeed, numerous studies show that memory can be influenced and distorted by a variety of persuasive tactics, and the theoretical accounts commonly used by researchers to explain episodic and autobiographical memory distortion phenomena can generally predict and explain these persuasion effects. Yet despite these empirical and theoretical overlaps, explicit reference to persuasion and attitude change research in the memory distortion literature is surprisingly rare. In this paper, we argue that stronger theoretical foundations are needed to draw the memory distortion and persuasion literatures together in a productive direction. We reason that theoretical approaches to remembering that distinguish (false) beliefs in the occurrence of events from (false) memories of those events—compatible with a source monitoring approach—would be beneficial to this end. Such approaches, we argue, would provide a stronger platform to use persuasion findings to enhance the psychological understanding of memory distortion.

Key words: Memory distortion; false memory; autobiographical belief; social influence; persuasion; attitude change; source monitoring

On the persuadability of memory: Is changing people's memories no more than changing their minds?

Many metaphors have been used to describe human memory: from computers, to libraries, to compost heaps (Randall, 2007; Roediger, 1980). Among the less-noted of these metaphors is the use of the language of *persuasion* when describing distortions of episodic or autobiographical memory. Belli and Loftus (1994), for example, claimed “the psychological literature [...] has shown that people can be persuaded to remember events that never took place.” (p. 415). Likewise, in a study of children's memory suggestibility, Bjorklund, Brown, and Bjorklund (2002) wrote that “the suggestions and misinformation we provided children were sufficient to alter their answers but not sufficient to change their minds (i.e., memory representations of the witnessed event).” (p. 109). More recently, Leding (2012) issued a renewed use of this interesting metaphor, describing processes of “being persuaded into false memories” (p. 265). These remarks lead to a challenging and thought-provoking question: Are statements like these indeed only colourful uses of metaphor, or is changing somebody's memory *actually* the same as changing somebody's mind? In this paper we collate previous observations concerning overlapping findings in the memory distortion and persuasion literatures. We argue that whereas noting these similarities is important, few memory researchers have taken this endeavour further by embedding persuasion accounts explicitly in the interpretation or understanding of episodic and autobiographical memory distortions. Specifically, we argue that to realise the full potential of the mutual overlap it would be vital to understand how persuasion relates to memory change, and thus how these two fields of research could be better integrated theoretically. Through examining recent theoretical developments relating to autobiographical memory and belief construction as a potential foundation

for such integration, we argue that persuasion research could inform our understanding of almost every aspect of this metacognitive process.

A tale of two literatures

For decades, researchers have grappled with understanding when, how, and why a person will become convinced they remember events that they could not possibly have encoded themselves, or indeed that never even occurred. In other labs, meanwhile, other researchers grappled with understanding when, how, and why a person will be persuaded by particular messages. Evidence of theoretical dialogue between these two groups of researchers has been notably scarce, perhaps in part because of a tendency for the former group to identify as ‘cognitive psychologists’, and the latter as ‘social psychologists’ (Manier, 2004; Roediger, 2010). Even though some of the earliest classic empirical work on memory distortion took a social psychological standpoint (e.g., Bartlett, 1932), over time it may be that authors’ citation practices have reinforced and exaggerated the separation of theories from these two sub-disciplines (Tang & Safer, 2008).

Whatever the reasons for this lack of dialogue, the notion that there are important similarities to be explored between these two groups of researchers’ pursuits and findings is not a new one. Indeed, as Leding (2012) noted, whereas persuasion tactics are not necessary to cause memory distortions or ‘false memories’, they do invariably seem to make such distortions more likely to happen. Both attitudes and memories, for instance, are changed more readily by credible messengers than by non-credible messengers (Dodd & Bradshaw, 1980; French, Garry, & Mori, 2011; Hovland & Weiss, 1951; Pornpitakpan, 2004), yet these effects diminish over time as memory for the message becomes stronger than memory for its

source (Hovland & Weiss, 1951; Underwood & Pezdek, 1998). Both attitudes and memories are often bolstered against change when a warning is provided in advance of an attempt to influence (Gallo, Roberts, & Seamon, 1997; Landau & von Glahn, 2004; Petty & Cacioppo, 1977), but are typically less so when the warning is instead provided afterwards (Gerrie & Garry, 2011; Greene, Flynn, & Loftus, 1982; Kiesler & Kiesler, 1964). Both attitudes and memories tend to become more malleable in response to repeated influence attempts (Hyman & Pentland, 1996; Weiss, 1969), particularly when the individual messages are similar but not identical (Mitchell & Zaragoza, 1996; Schumann, Petty, & Clemons, 1990). Both attitudes and memories are typically more resistant to change when held with high confidence (Babad, Ariav, Rosen, & Salomon, 1987; Wright & Villalba, 2012), but in both cases this degree of confidence is in itself susceptible to influence (Briñol & Petty, 2009; Mazzoni & Memon, 2003; Tormala & Petty, 2002; Wells & Bradfield, 1998). In all of these cases, whether the target is an attitude or a memory, the end result is the incorporation of the message into the recipient's belief system. In this paper, we will argue that *beliefs* may well be the key to promoting the interface between these disciplines.

It is worth noting at the outset that when discussing 'memory' throughout this paper, we refer to the introspective judgment of perceptually re-experiencing events (as per Rubin, 2006, and Scoboria et al., in press). As such, our discussion does not explicitly extend to semantic memories, from which this sense of re-experiencing or 'mental time travel' is absent (Rubin, 2005). Memory distortions are almost always studied through the lens of 're-experienced' past episodes. Indeed, some researchers have argued that among all fields of memory research, the study of memory for the personal past has most to gain from borrowing from social psychological perspectives (e.g., Manier, 2004). This reasoning underlies the scope of our focus in this paper,

although the notion that attitudes are represented in semantic memory might well provide much further food for thought (Pratkanis & Greenwald, 1989). Our arguments could apply to many instances of episodic or autobiographical memory distortion, including those for simple stimuli such as words and pictures. For instance, we know that persuasion variables such as perceived source knowledge and the use of explicit warnings can moderate people's susceptibility to falsely recalling unseen pictures, or members of associative word-lists (e.g., Gabbert, Memon, & Wright, 2007; Watson, McDermott, & Balota, 2004). However, here we mostly draw arguments from research that concerns memory for directly witnessed or personally-experienced 'events.'

Toward bridging the gap. Based on findings that highlight parallels between the two literatures, such as those reviewed above, Leding (2012) proposed that research on persuasion could ultimately inform research on memory distortion, and indeed vice versa. We support this proposal and, like Leding, note that she was not the first to call for dialogue between the research literatures, nor to suggest that the two could be mutually informative. For example, Leding notes reasoning to this effect by Greene et al. (1982):

The similarity between attitudinal and memory change paradigms may be conceptualized as follows: In the belief arena, a belief exists, a persuasive communication follows, and belief change results. In the memory arena, a memory exists, misleading information follows, and memory change results. (p. 208)

Despite its clarity, Greene and colleagues' argument did not generate much momentum. Sixteen years later, Strauman (1998) remarked "I have yet to find recent

studies of memory distortion from a social influence perspective” (p. 709), and noted that interaction between these fields could constitute “a fruitful marriage, or at least a healthy courtship” (p. 709) that might help our understanding of reconstructive memory processes. Another eleven years on from Strauman’s paper, Blank (2009) argued “Attitudes and memory traces have a lot in common”, but “[few researchers] have in my view exploited the full richness of this analogy” (p. 167).

A crude bibliometric analysis supports these observations. We searched the scientific database Scopus for all publications tagged with the key-terms “memory distortion” or “false memor*” that were listed from each calendar year from 1998 to 2012 ($N = 743$). We then used the database’s search functions to check among these publications for use of relevant social psychological terms in the text, and finally we calculated the proportion of the memory distortion papers published in each year that contained each of those terms. Scopus revealed that the use of terms such as “persuasion” (3% of the sample, $b = -0.0\%/year$, $r = -.12$, $p = .67$) and “social influence” (3% of the sample, $b = +0.2\%/year$, $r = .44$, $p = .10$) were very rarely located in this sample, and with no substantive increases in use over time. Memory distortion scientists, it seems, rarely talk about persuasion. In contrast, there were significant year-on-year increases in the proportion of these memory distortion publications that referred more broadly to “social psychology” (26% of the sample, $b = +1.2\%/year$, $r = .68$, $p < .01$).¹ This result perhaps hints at an increasing *general*

¹Comparable results were obtained when a more complex search string was used, designed to focus more narrowly on papers that emphasised autobiographical and episodic memory distortions. In this case, we searched for papers which, alongside the original constraints, also contained one or more of the following terms in the keywords, abstract or title: *event*, *experience*, *autobiographical*, *episodic*, *action*, *implant**, *behaviour*, *behavior*. Moreover we excluded papers that contained one or more of the

dialogue between cognitive and social psychologists, of the type that Roediger (2010) and others have encouraged, and may reflect the growing popularity of ‘social memory’ as a domain of study in its own right.

Incidentally, it is worth noting that while memory distortion research might be becoming more ‘social’, current trends in persuasion research might simultaneously be bringing that literature closer to the memory distortion literature. In particular, there has been a shift toward metacognitive explanations of attitude-change, which take into account the confidence with which people hold their generated thoughts (e.g., Petty & Briñol, 2008; Petty, Briñol, & DeMarree, 2007). These explanations consider how metacognitive cues, including confidence, help individuals to determine whether an attitude is ‘true’ or ‘false’ – that is, whether the activated content is truly the individual’s viewpoint or is, for example, a reflection of popular culture (Petty et al., 2007). Clearly, this recent emphasis covers familiar and comfortable territory for the memory theorist, particularly with regard to influential theorising about cultural reality monitoring and the strategic regulation of memory (Johnson, 1998; Koriat & Goldsmith, 1996). Attitude researchers might, therefore, have much to import from studies on how people distinguish true from false memories. An instance of applied persuasion research moving toward the memory distortion literature comes from consumer psychology and advertising, where interest in false memories (e.g. Mantonakis, Whittlesea, & Yoon, 2008) has led to attempts to use memory distortion

following terms in the keywords, abstract or title: *DRM*, *word*, *picture*. The search found 273 publications, 32% of which referred to “social psychology” ($b = +2.0\%/year$, $r = .57$, $p = .03$). Only 4% referred to “persuasion” ($b = -0.8\%/year$, $r = -.36$, $p = .18$), and 5% to “social influence”, ($b = +0.5\%/year$, $r = .51$, $p = .05$).

measures as a way of indexing individuals' yielding to persuasion (Braun-LaTour & Zaltman, 2006).

In light of the shared optimism among experts that the persuasion and attitude change literatures could strengthen and supplement our understanding of memory distortion (cf. Strauman, 1998), these indices of greater dialogue are promising. Given that reconstructive memory processes are likely to play a role in many of the effects observed in both the memory distortion and persuasion literatures, a healthy courtship between the domains may well lead to better specified and more comprehensive accounts of these reconstructive processes.

The missing link

The apparent scarcity of dialogue between the memory distortion and persuasion literatures, it seems, cannot be attributed to a lack of appreciation of their relatedness, nor indeed to a lack of interest in their relations. So what might be missing? We argue that the missing ingredient is likely to be a robust theoretical foundation for integrating the two literatures: one that permits us to move beyond noting similarities—as has heretofore been the extent of most theoretical discussion—and to begin integrating knowledge. A similar conclusion was also reached in a broader sense by Blank (2009), who emphasised the need for a theoretical interface that would permit assimilation of findings between memory and social psychology. Considering theoretical perspectives, Leding (2012) outlined several 'cognitive' explanations of memory distortions, but singled out the Source Monitoring Framework (SMF; Johnson, Hashtroudi, & Lindsay, 1993; Lindsay, 2008) as an ideal foundation for understanding persuasion effects on memory. Importantly, she noted that the SMF can account well for these effects, and argued that the SMF should

therefore be used to predict how various persuasive strategies would influence judgments of recollection. Before evaluating this argument, we first briefly outline the most fundamental assumptions of the SMF.

The SMF encompasses a broad set of ideas intended to explain the processes by which mental experiences can be attributed to sources. For instance, when attempting to mentally reconstruct an experience, or remembering, we might try to decide whether a particular mental image brought to mind is a memory, or whether it is only a thought or dream. Alternatively we might try to decide whether we learned a piece of information from a TV show, or from a book. The SMF posits that memory distortions are the product of an imperfect and usually unconscious judgment process wherein mental experiences that originate from internal sources such as dreams, or from external sources such as informants, are wrongly attributed as having originated from perception, and misclassified as ‘memories’. According to the SMF, we employ a variety of strategies to distinguish real memories from internally-generated mental experiences. But memory distortions are particularly likely to occur when (1) a fictional mental event is especially memory-like – when it is rich in colours, sounds, emotional and contextual detail, when it feels familiar and plausible, and so forth (e.g., Bernstein, Whittlesea, & Loftus, 2002; Johnson, Foley, Suengas, & Raye, 1988), and (2) the rememberer is inclined to base their judgments on unreliable forms of information or reasoning (see e.g., Nash & Takarangi, 2011; Wade, Nash, & Garry, in press). In short, according to the SMF, a memory distortion is simply a mental experience that a person incorrectly attributes to her or his own memory, rather than to an external or otherwise inaccurate source or influence.

That the SMF can account for the effects of persuasion-like manipulations upon memory judgments is unsurprising. Despite evidence that memory scientists

rarely talk about persuasion, the SMF is explicitly informed by the principles of Chaiken and colleagues' Heuristic-Systematic Model – one of the most commonly cited and comprehensive theories of persuasion and attitude change (HSM; Chaiken, 1980; Chaiken, Liberman, & Eagly, 1989). Indeed, Johnson et al. (1993) quoted from Chaiken et al. (1989) in their seminal paper that formalised the SMF. Like the HSM, the SMF proposes that people adopt heuristic (i.e., rapid, low-effort) and systematic (i.e., analytic, effortful) means for making attributional judgements: in this context, for scrutinising mental experiences to determine whether or not they are memories. Moreover, like the HSM, Johnson et al. argue that the likelihood of people using the more rigorous systematic route depends on an assortment of motivational and social factors. Considering that this account of memory construction and distortion draws so explicitly on ideas from attitude change theory makes it more surprising that these two literatures have not been more intrinsically linked.

In fact, researchers have long used the SMF to predict and explain the memory effects that arise when 'persuasive' variables are manipulated. For example, Bink, Marsh, Hicks, and Howard (1999) used source monitoring principles to guide their predictions about unconscious plagiarism:

The evidence from the social psychological literature suggests that people tend to elaborate on or spontaneously generate implications to ideas that come from more credible sources as opposed to less credible sources [...]. From this [source monitoring] perspective, ideas from more credible sources might be better remembered because they have additional or more detailed characteristics encoded, and consequently they may be unconsciously plagiarised less often. (p. 295)

Elsewhere, Echterhoff, Hirst, and Hussy (2005) have drawn on the SMF to predict how explicit post-warnings would influence the misinformation effect:

eyewitnesses who are postwarned may monitor the source of their memories with increased effort or stringency, as compared with unwarned eyewitnesses [...]. Superficial or lax source monitoring during retrieval impedes correct source identification, allowing memories of misleading items to pass as memories of a witnessed event [...]. According to this account, a postwarning reduces the misinformation effect because it induces eyewitnesses to examine the characteristics of candidate memories more closely at the time of test.
(p. 772)

In short, it is clear that the SMF is already being used frequently to predict and explain the persuadability of memory judgments. Yet the application of the SMF in such analyses almost always occurs without any mention of persuasion or of persuasion research, with regard to process, content or context. It is therefore unclear why an established and widely-adopted theoretical framework that can so neatly tie together the processes of persuasion and memory distortion has not already provoked a courtship between the two disciplines. Is the SMF insufficient as a theoretical interface? On the contrary, we believe that the SMF serves a crucial role in permitting theoretical dialogue between the two fields, as we explain shortly. Nevertheless, it is clear that memory distortion researchers have frequently used the SMF as a *substitute* for persuasion theory and findings, rather than as a theoretical interface that would draw the two literatures together.

Given the existence of an elegant theoretical framework that resonates with both domains, why has this source monitoring perspective not worked to integrate these literatures? One reason might be that the leap of inference required to make predictions about memory distortion based on persuasion research is at odds with the basic intuition that attitudes are inherently unlike memories. There is considerable variation in laypeople's and experts' understanding of the stability of individual attitudes and opinions (Fazio, 1995; Petrocelli, Clarkson, Tormala, & Hendrix, 2010; Schwarz & Bohner, 2001), yet most people agree that attitudes are constructs that a person might reasonably set out to 'change' in others. Indeed, entire industries—politics, marketing, health promotion, and so forth—depend on the possibility of attitude change. In contrast, rather fewer people understand memories to be reasonable targets for attempted influence. Laypeople commonly understand memories to be analogous to video-recordings, etched as lasting physical traces into the brain's circuitry and replayed accurately and reliably whenever they are activated. Almost two-thirds of US respondents in Simons and Chabris' (2011) study indicated this belief (see also Clifasefi, Strange, & Garry, 2007); a similar proportion of California undergraduates in a more recent study agreed that "memories of everything we ever experience are stored permanently in the brain" (Patihis, Ho, Tingen, Lilienfeld, & Loftus, in press). Such 'entitative' characterisations of memory—as being a fixed 'object' or entity in the head rather than as a behavioural process—are clearly difficult to reconcile with the idea of those memories being persuadable (Blank, 2009). Of course, these naive conceptualisations do not reflect scientific consensus. The SMF and related theoretical perspectives typically focus on metacognitive appraisals of mental activity, rather than on memories as tangible 'objects', and are therefore not entitative as such (e.g., Jacoby, Kelley, & Dywan,

1989; Rubin, 2006). Nevertheless, perhaps the reluctance of memory distortion researchers to draw upon persuasion findings stems from an implicit or explicit concern about making inferences that appear to rely on analogy or metaphor, in the absence of psychological theory that robustly links persuasion and memory change processes together.

Recent theoretical accounts of remembering appear to offer room to circumvent this problem, allowing us to extend the arguments put forward by previous commentators on this topic and to more usefully conceptualise the link between the persuasion and memory distortion literatures. In these accounts, source monitoring errors are seen to represent only the final stage in a process of false remembering (Mazzoni, Loftus, & Kirsch, 2001; Scoboria, Mazzoni, Kirsch, & Relyea, 2004). Crucially, these accounts distinguish *memories* from *beliefs in occurrence*, and we argue that this distinction is an important condition for better integrating persuasion research into a memory framework.

From memory to belief

Recent theoretical views stemming from the autobiographical memory literature have framed ‘memory’ as a construct that is subordinate to ‘belief in occurrence’ – that is, the truth judgment concerning whether or not an event actually happened (sometimes referred to as ‘autobiographical belief’; Scoboria et al., in press). In almost all cases, remembering something implies also believing it happened, whereas believing something happened does not imply remembering it (Mazzoni & Kirsch, 2002; Scoboria et al., 2004; Scoboria et al., in press; Smeets, Merckelbach, Horselenberg, & Jelicic, 2005). For example, a person might be led to confidently believe that she was once abducted by aliens, yet this does not necessarily mean she

will develop a recollection of the abduction. Conversely, a person who recalls being abducted should by implication also believe that it happened, according to this conceptualisation. More recently, memory and belief in occurrence have been characterised as fully dissociable constructs with unique phenomenological fingerprints, rather than as only partially dissociable constructs as proposed in the earlier work (Mazzoni, Clark, & Nash, in press; Mazzoni, Scoboria, & Harvey, 2010; Scoboria et al., in press). According to this framework, the judgements of believing in an event's occurrence and of recollecting the event are two separate decisions that sometimes nonetheless inform each other. For example, Scoboria et al. (in press) argue that strong recollection should typically be used as a cue to belief in occurrence (see also Garry, Loftus, and Brown's (1994) description of 'memory as the justification of belief'). These current theoretical emphases on the belief/memory distinction follow criticisms of many earlier studies in which researchers claimed to have induced false memories of events, despite using methods and measures that arguably only assessed false beliefs about the occurrence of those events (see Smeets et al., 2005 for discussion).

One consequence of the theoretical shift from memory to belief in occurrence is that it has encouraged many researchers to be more conservative when making claims about creating 'false memories'. An equally important consequence has been that many memory researchers have become increasingly interested in beliefs in occurrence too, because they acknowledge that [1] believing is an integral and fundamental part of remembering, and [2] false beliefs, like false memories, can have considerable real-world consequences (see e.g., Brown & Marsh, 2008; Scoboria, Lynn, Hessen, & Fisico, 2007). In other words, treating beliefs as distinct from memories has caused memory researchers to broaden—not narrow—their interests.

Beliefs in occurrence are not the only variety of belief to play important roles in memory construction. For example, susceptibility to memory distortions might be influenced by beliefs about the commonality of particular events, or about how memorable such events would be (Mazzoni & Kirsch, 2002; Pezdek, Blandon-Gitlin, Lam, Hart, & Schooler, 2006), or beliefs about the extent of correspondence between our recollection and the original event (i.e., belief in memory accuracy; see Rubin, 2006). These other kinds of beliefs play important roles in memorial and meta-memorial processes, and persuasion and attitude change research may be applicable to these too. For instance, Rubin, Schrauf, and Greenberg (2003) include an item in their Autobiographical Memory Questionnaire labelled 'persuasion', which is designed to capture respondents' preparedness to accept that their memory is inaccurate if it were challenged. Belief in occurrence and belief in memory accuracy might sometimes be related; nonetheless here we focus on belief in occurrence, because there is now a considerable body of research devoted specifically to distinguishing this type of belief from recollection (e.g. Mazzoni & Kirsch, 2002; Scoboria et al., 2004; Scoboria et al., in press).

How does conceptualising memories as distinct from but related to beliefs in occurrence add to our understanding of the relevance of persuasion science to memory theory? Although persuasion tactics can lead to source monitoring errors, they can also lead to false beliefs that are *not* accompanied by source monitoring errors. People are, for instance, more likely to develop false beliefs in response to suggestions about events that ostensibly come from credible rather than non-credible sources (Scoboria, Wysman, & Otgaar, 2012), or when they are plied with information that makes the suggested event seem to be a common experience (Pezdek et al., 2006). It is therefore apparent that beliefs should be an important ingredient in

the theoretical development of a persuasion-informed memory science, as Greene et al. (1982) illustrate:

The overall similarity between the two paradigms suggests that belief and memory change may function in similar ways, that is, variables that affect the process of belief change may also apply to the transformation of memory. (p. 208)

Persuasion researchers clearly share memory researchers' interest in beliefs. Whereas some researchers have treated attitudes as particular kinds of belief (e.g., Abelson, 1986; Abelson & Prentice, 1989), others have conceptualised beliefs as being one of the building blocks of attitudes; specifically, as a 'cognitive,' knowledge-based attitude component that can be distinguished from affective and behavioural components (Ajzen, 1980; Breckler, 1984; Eagly & Chaiken, 1993; Rosenberg & Hovland, 1960). In both definitions, it is evident that the techniques and processes that govern attitude change are typically the same as those that govern belief change (Petty & Wegener, 1998). In short, changing beliefs is clearly strongly related, both theoretically and empirically, to changing both attitudes and memories.

In light of the theoretical accounts of the relationship between belief in occurrence and memory, social psychologists' accounts of beliefs as key components of attitudes invite us to consider that attitude change might have more in common with autobiographical belief change than with memory change. Here, a belief in the occurrence of an event might be conceptualised by attitude researchers simply as an instance of cognitively linking an 'attitude object' (i.e., the event in question) with an attribute ('has happened'; Eagly & Chaiken, 1993). A theoretical remembering framework that distinguishes beliefs in occurrence from memories therefore offers a

comfortable home for persuasion: beliefs in the occurrence of past events should follow the laws of persuasion more closely than do judgments of remembering past events. In fact, the crux of the argument here is that memory distortion might share similarities with persuasion precisely *because* memory change often follows from autobiographical belief change. That is to say, beliefs in occurrence are persuadable, and remembering can be informed by those beliefs.

Evidence in support of the reasoning that persuasion primarily targets belief in occurrence rather than judgments of recollection comes in at least two forms. The first is that various persuasive manipulations tend to elicit false beliefs in occurrence, but only in a smaller proportion of cases are these beliefs accompanied by false memories (e.g., Berkowitz, Laney, Morris, Garry, & Loftus, 2008). Hence, a persuasive manipulation can alter the personal past, and perhaps the way people consequently behave, despite it not changing memory judgments. The second form of evidence comes from recent studies of non-believed memories. In those studies, researchers were able to use persuasive techniques to undermine participants' beliefs in the truth-value of their memories, without fully undermining the memories themselves (Clark, Nash, Fincham, & Mazzoni, 2012; Mazzoni et al., in press; Otgaar, Scoboria, & Smeets, 2013). These authors showed that the persuasive techniques left behind 'non-believed' memory content that shared many of the same subjective and experiential characteristics as believed memories. Indeed, one study showed that these non-believed memories occur commonly in naturalistic settings, often as a product of social influence from family members and friends (Mazzoni et al., 2010). Again, these studies demonstrate that belief in occurrence is more responsive to persuasive tactics than is memory. Future work that dissociates the two constructs in the same way might teach us more about the roles of persuasion in memory change. Indeed, it

is perhaps no coincidence that a recent paper concerning the belief/memory dissociation is among the very few that discuss cognitive dissonance concepts in the context of memory distortion theory (Scoboria et al., in press; for another recent example see Rodriguez & Strange, in press).

A helpful feature of this theorising is that beliefs bridge the gap between the ‘subjective’ and sometimes transient nature of attitudes and opinions, and the seemingly more ‘objective’, truth-driven nature of memories referred to above. When we conceptualise remembering as a process of activating physical and permanent memory traces, it is difficult to conceive of how changing a memory is like the social process of changing an attitude or opinion. Yet when we conceptualise remembering as a judgment process that is informed both by memorial *and* non-memorial sources of information about events’ occurrence, the notion that persuasion processes should play a role seems inevitable. Blank (2009) has used a similar line of reasoning to explain the importance of distinguishing manipulations that influence *memory* (as an ‘entity’, to apply the terminology used above) from those that influence *remembering* (as a behavioural process; see also Manier, 2004 for an interesting discussion of this issue). It is important to further note that the theorising presented here is compatible with and consistent with the SMF. To illustrate this point, we now consider how a persuasion-induced false belief in an event’s occurrence might develop into a (believed) false memory.

From belief, back to memory

One of the theoretical issues targeted in recent memory distortion research has been to establish how changing people’s beliefs in the occurrence of an event could in turn change their memories. The answer to this question, in the framework outlined

here, should provide us with a clearer account of how persuasive tactics influence memory. As part of a broader theoretical model of autobiographical belief construction, Mazzoni and Kirsch (2002) proposed one possible mechanism. They suggested that when people firmly believe that an experience happened to them, they might lower their source monitoring criteria for attributing mental images of that experience to memory. In other words, when an event's occurrence seems highly likely and thus is highly believed, people are more susceptible to making source monitoring errors because they become more liberal in their judgment. Consistent with this hypothesis, numerous studies have shown that source credibility plays a crucial function in susceptibility to various forms of source monitoring error (e.g., Dodd & Bradshaw, 1980). In particular, Nash, Wade, and Brewer (2009) found that the capacity of fabricated evidence to distort episodic beliefs and memories could be largely accounted for by a credibility mechanism, rather than by other mechanisms driven by 'cognitive' factors such as subjective familiarity and mental imagery.

An inspection of Mazzoni and Kirsch's (2002) full theoretical model permits us to outline more clearly how persuasive tactics might distort our memories through first distorting our beliefs. Specifically, persuasive influence will inform our assessments of an event's likelihood of past occurrence, providing evidence and reasoning either in support of or against a suggestion that the event occurred. In Mazzoni and Kirsch's model, this perception of likelihood is sufficient in itself to produce false beliefs in the absence of supporting memories, unless the absence of those memories is considered diagnostic that the event never occurred (i.e., "I would remember that, if it had happened"). We suspect, incidentally, that even this 'diagnosticity' judgment could be amenable to persuasive forms of social influence. To our knowledge no study to date has explored this possibility, and this is an avenue

worth pursuing. Indeed, as we noted above, whereas our primary focus here is upon belief in occurrence, it seems reasonable that other metacognitive beliefs would be susceptible to persuasive influence.

For false beliefs in events' occurrence to be transformed into (believed) false memories, according to Mazzoni and Kirsch's (2002) model, it might be that little extra is required than some reasonable mental content. That is, if judgments of especially high event likelihood can lead people to adopt liberal source monitoring criteria, then the only other necessary ingredient is something that can be judged as meeting these criteria, such as a clear mental image (see Hyman & Kleinknecht, 1999). The generation and appraisal of this mental content should in many respects be independent of persuasive influence. Persuasion, we reason, should not affect people's subjective assessments of the 'goodness' of their candidate memories: how fluently they come to mind, how much contextual detail they contain, and so on. In this sense, the persuasion literature does seem more relevant to the process of autobiographical belief change than to memory change. Nonetheless, persuasive techniques *could* influence the effort an individual invests into searching for 'good' memories, and into mentally elaborating upon the results of those efforts (see e.g., Garry, Manning, Loftus, & Sherman, 1996). In other words, although we probably cannot persuade somebody that their vague and sketchy mental image—for example—is in fact rich and vivid, nonetheless we could persuade them to try harder to find a mental image that *is* vivid, or to visualise and elaborate upon the sketchy image until it *is* richer.

In short, we have argued here that attitude-change is more akin to false belief construction than to false memory construction, yet it is clear that even some elements of the transformation of false autobiographical beliefs into believed memories might

be susceptible to persuasion. For the reasons outlined above, though, we think that distinguishing autobiographical belief change from memory change—and aligning persuasion primarily with the former rather than the latter—will be the most fruitful way of encouraging cross-disciplinary dialogue.

What is to gain from integration?

If the SMF can lead us to the same predictions and explanations that the persuasion literature might lead us to, then what use would memory scientists have for the persuasion literature? It is worth briefly considering what the persuasion literature has to offer that the source monitoring and false-beliefs literatures, at present, do not. We will outline just a few broad yet important suggestions, although many others can be envisaged.

Interactions of key variables. A striking dissimilarity between the experimental approaches in both of these literatures is the level of complexity of the study designs used. In the persuasion literature there exists a philosophy that any comprehensive theory should be capable of incorporating the effects of ‘who says what to whom, how, and under what circumstances’ (Lasswell, 1948, cited in Crano, 2000). Consequently, many persuasion studies have used complex factorial designs that manipulate several of Lasswell’s factors within single experiments. For example, Petty, Cacioppo, and Goldman (1981) manipulated source expertise (i.e., who), argument quality (says what), and issue involvement (under what circumstances) in a 2 x 2 x 2 between-participants study. Other persuasion studies have invoked designs of even greater complexity (e.g., Chen, Reardon, Rea, & Moore, 1992). Consequently, an important lesson to be learned from these persuasion studies is that the effects of single variables on attitudes are usually qualified by higher-order

interactions with other variables. As Leding (2012) put it, “the field of attitude change became more coherent because these models helped to explain why different persuasion techniques were effective only in certain circumstances.” (p. 258).

In contrast, autobiographical belief/memory distortion researchers are typically predisposed to studying just one or two of Lasswell’s factors at a time, no doubt at least in part because the experimental methods used in that field of research rarely lend themselves so easily to large sample sizes. As a result, it seems fair to argue that compared to persuasion researchers, memory distortion researchers currently have a less developed understanding of the effects of complex interactions between ‘source,’ ‘medium,’ ‘message,’ ‘receiver,’ and ‘context’. Importing knowledge from the persuasion literature into our understanding of the development of false beliefs could improve our ability to predict how these higher-order interactions of variables would in turn affect susceptibility to false memories.

Information-seeking. We observed above that both attitude change and memory change researchers draw upon theoretical frameworks that distinguish heuristic (or peripheral) from systematic (central) processing (e.g., Chaiken et al., 1989; Johnson et al., 1993; Petty & Cacioppo, 1986). A key goal for persuasion researchers has been to understand and predict when people will use heuristic and when they will use systematic reasoning, as both processes can be expected to lead to persuasion under different circumstances. In contrast, memory distortion researchers have arguably placed considerably greater emphasis on heuristic than on systematic processes. This is unsurprising, because those latter researchers are interested in the production of *errors*, and heuristics are of course by definition more error-prone than systematic strategies.

The active gathering of information from external sources is one systematic route by which both attitude change and memory change can be fostered and also resisted. Participants in a large proportion of memory distortion studies have been provided with false suggestions about past events, but rarely have they been encouraged to actively seek out and aggregate ‘evidence’ to support or refute those suggestions as they might in ‘real-life’ (Wade & Garry, 2005). A small but growing evidence-base concerns people’s strategic use of external information sources to systematically validate and verify the occurrence of past events (Kemp, Burt, & Sheen, 2003; Mazzoni et al., 2010; Nash & Takarangi, 2011; Ross, 1997; Wade & Garry, 2005; Wade et al., in press). Yet it is noteworthy how little is still known about the role of information-seeking in the development or prevention of false memories. This situation is in stark contrast with the basic and applied persuasion literatures, where well-specified accounts exist of information-seeking, and of the roles of evidence in shaping attitudes and beliefs (e.g., Reinard, 1988; Reynolds & Reynolds, 2002; Schmidt & Spreng, 1996; Verplanken, Hazenberg, & Palenéwen, 1992). Persuasion research, then, might direct the future theoretical understanding of how and when people seek and use external evidence to validate their memories.

Behavioural consequences. The attitude change and persuasion literatures have a long historical interest in the behavioural consequences of holding a given attitude, and the extent to which people’s behaviour tends to change when their attitudes change (Ajzen & Fishbein, 1977; LaPiere, 1934). Relationships between episodic/autobiographical memory and behaviour are of course also well-established (Pillemer, 2003; see also Pezdek & Salim, 2011), but until recently the remote behavioural consequences of memory *distortion* were disappointingly under-studied

(Smeets et al., 2005).² The last decade has seen a flurry of false-belief research wherein the dependent variables included remote behavioural measures, to augment the usual subjective memory reports ascribed by participants within the lab setting. One of the most successful of these research programmes involved researchers attempting to implant a suggestion that the participants had become sick from eating particular foods when they were children (see Bernstein & Loftus, 2009, for a review). Studies in this vein have shown that implanting false autobiographical beliefs can affect people's behavioural intentions: participants' plans to eat the specific foods targeted by the suggestion (e.g., Bernstein, Laney, Morris, & Loftus, 2005). But these manipulations can also change people's actual behaviour: participants who develop false beliefs or memories about having become sick after eating a particular food actually do eat less of that food when given the opportunity to do so (Geraerts et al., 2008; Scoboria, Mazzoni, Jarry, & Bernstein, 2012). In fact, these findings prompted media commentators to applaud the birth of the 'false memory diet' (see Glassie, 2005).

The shift toward exploring remote behavioural consequences in false-belief and memory distortion research is particularly significant for the argument being made here – the social psychological literature can offer decades of theoretical and empirical guidance about the conditions under which attitude change leads more predictably to behaviour change (see e.g., Glasman & Albarracín, 2006 for a meta-analysis). This literature could therefore be used to inform predictions about when false autobiographical beliefs and memories might or might not lead to behaviour

² We refer here to *remote* behavioural consequences to distinguish from immediate intra-experimental consequences of false remembering, such as reporting misinformation on a memory test, or choosing a higher subjective rating of likelihood after imagining an event (see Blank, 2009).

change. Indeed, one interesting and as-yet unanswered empirical question is whether memories per se do indeed guide behaviour, or whether it is the belief in the occurrence of those remembered events that is the active agent.

Conclusion

Researchers have discussed the many similarities between persuasion and memory distortion, and on this basis we began with a question: is changing people's memories any different to changing their minds? Aligning persuasion with the construct of belief—rather than with the construct of memory—in the way we have described would imply that the answer to this question is “yes, but only slightly different.” If attitude change processes determine autobiographical belief formation, and those beliefs in turn can be transformed into believed memories, then changing somebody's mind should be superordinate to—but highly associated with—changing somebody's memory. However, we think that even this answer is a conservative one because, as we have noted, there are elements of the ‘belief to believed-memory’ transformation process that also seem amenable to persuasive influence.

We join a growing number of researchers who have observed and argued that the persuasion and attitude-change literatures should be better integrated with the memory distortion literature (e.g., Blank, 2009; Leding, 2012). We argue that the growth of theoretical and empirical focus upon belief in the autobiographical memory literature will better allow this dialogue to move beyond observations of similarity, and toward true theoretical integration. The theoretical issues outlined here surrounding belief and belief change might begin to establish a roadmap for such integration; at the very least, these might advance an important discussion that has already been decades in the making.

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