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Citation: Conway, M. A., Justice, L.V. & Morrison, C.M. (2014). Beliefs about autobiographical memory and why they matter. *Psychologist*, 27(7), pp. 502-505.

This is the accepted version of the paper.

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RUNNING HEAD: Beliefs About Memory

What people believe about autobiographical memory and why it matters

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Tuesday, February 4, 2014

The Psychologist (2014). In press.

When memory is the only evidence in, for instance a criminal trial, how is it to be evaluated? In this paper we show how everyday beliefs about memory often run counter to the scientific evidence and how they can mislead in legal settings. Judges, jurors, barristers, solicitors, and indeed any trier-of-fact need to be aware of what we term *the modern view of human memory*, as described below. Although we focus here, by way of example, on a case of childhood sexual abuse our concern is not with the frequency and terrible consequences of such abuse but rather with how such accounts are to be judge in an informed way, in cases where memory is the only evidence. Imagine then that you are on jury duty. During the trial, under cross-examination, but also earlier in a police video interview (PVI), the complainant, a 34 year-old woman, (referred to as ‘C’), provided a series of descriptions of memories of being sexually abused from the ages of 4 to 6 years. An excerpt from her evidence¹ is shown in Table 1.

When questioned in court the defense council quizzed C about these memories and in most cases she was able consistently to recall the details of her earlier accounts of her memories, from the PVI. She was not always consistent, however. For instance, she forgot what the defendant had been wearing that night and could not recall what he did with his jacket. On the other hand she remembered the alleged abuse in detail, including what hand he had used. She also recalled when asked by the prosecution, that she had been wearing her pink Barbie nightie and additionally remembered that John, her brother, had been wearing Star Wars pajamas (see Conway, 2013, and Howe, 2013 for more detailed accounts of similar cases).

¹ This ‘evidence’ is based on an amalgam of evidence from several real cases, all anonymised, in which the first author acted as a memory expert witness.

You are the juror. This is the only evidence in this case². What do you make of it? If you are a typical juror you will have no knowledge of the scientific findings on memory. Most probably your only knowledge about such cases of ‘historic’³ sexual abuse’ derives from reports in the media. The view taken by the law is that as all jurors have memories then by reflecting on their own memory, and perhaps that of others, they will be able to make informed ‘common sense’ judgments of memory evidence. But will they? They will have beliefs about their own memory and beliefs about the memories of others too, but such beliefs are not based on scientific evidence and are open to all the usual problems of beliefs – most notably, that they are wrong. Let’s look at some common beliefs about autobiographical memory, consider how they might have influenced judgments in this example case, and also take a brief look at the modern view of human memory and consider what conclusions that would lead us to concerning the present memory evidence.

Beliefs about autobiographical memory

There have been have been a number of surveys of beliefs about memories, (Magnussen, et al., 2006; Simons & Chabris, 2011). Some surveys have focused too on beliefs about memory repression, see Patihis, et al., (2014) for a recent survey, or on eyewitness memory, see Wise, et al. (2011). For a particularly interesting account of beliefs about childhood memory see Howe (2013). Over all these studies there are a wide range of beliefs that run counter to our current scientific understanding of human memory, one of the most common erroneous belief being that memory is like

² This is usually the case, the remembered events themselves having allegedly taken place many years previously.

³ These cases are referred to in the law as ‘historic’ because they typically feature an adult recalling memories from childhood, usually over retention intervals measured in decades.

a video or a movie. Here we will focus on three key beliefs about autobiographical memory that we identified in a recent survey⁴ (Justice, 2012, Justice, Conway, & Morrison, 2014).

The Memory-Accuracy-Details (MAD) Belief

Bell and Loftus (1989) originally found that if an eyewitness reported very specific details, e.g. the robber was wearing a green jumper, then their evidence was judged more likely to be accurate than the evidence of witnesses who did not report such specific details. They called this *trivial persuasion* because the specific details they used were peripheral details. In our survey we were interested in whether this was a more widely held belief. We found that it was and 70% of our respondents agreed with the statement *The more details a memory has the more accurate it is*. However, only 58% of respondents agreed with the statement when applied to memories from childhood (13% neither agreed nor disagreed – so, presumably open to persuasion one way or the other). A similar pattern was evident for the statement *The more vivid a memory is the more accurate it is* with 68% of respondents agreeing for memories of everyday events and 54% for memories of childhood events (21% neither agreed nor disagreed). Overall these findings indicate that there is a strong and pervasive belief that the more detailed and vivid memories are, the more likely they are to be accurate. In fact, the scientific evidence is that the more detailed and vivid memories are, the greater is the likelihood of error.

The Burnt-In-Memory (BIM) Belief

⁴ We sampled 233 people with a 21-item memory questionnaire. Full details can be found in (Justice, 2012, Justice, Conway, & Morrison, 2014).

Turning next to beliefs about emotional experiences and specifically to the belief that highly emotional experiences give rise to highly accurate memories. Controversial though this belief may be it is nonetheless a widespread belief and Magnussen, et al., (2006), for instance, found that over 70% of respondents in their survey believed memory for a dramatic event to be better than memory for an everyday event. We found this figure was even higher and in response to the question *Do you believe your memories of emotional events (e.g., weddings, funerals, tragic events such as 9/11, etc.) are more or less accurate than memories for everyday events?* over 80% of respondents believed that their own and the memory of others for emotional events would be more accurate than memories of less emotional more everyday events. Taken together with the findings on vividness and accuracy we termed this the *Burnt-In-Memory Belief* to capture the idea that there is a widespread belief that the more emotional an experience the more accurate a memory is likely to be, and this because intense emotion somehow acts to create a very accurate representation of experience in long-term memory. The scientific evidence does not, however, support this belief, see Morgan & Southwick, 2014 for a recent review. In fact, the relation between memory and emotion is a highly complex one. Indeed, very intense emotional experiences can lead to distorted memories and amnesia.

Age-of-First-Memory (AFM) Belief

Popular beliefs about the age at which first memories are formed (age at encoding, AaE) and can later be retrieved, are the least well informed by (scientific) knowledge of memory (Howe, 2013). These beliefs are, however, highly critical when

judging cases of alleged historic sexual abuse and also in many situations where adults recall childhood memories (Wells, Conway, & Morrison, 2013). In order to gain some insight into this we asked our respondents two simple questions: *Bring to mind the first memory you have. What age are you in this first memory?* and *In your view, what is the earliest age someone can have a memory from?*

Table 2 about here

Table 2 shows the distribution of estimated AaE of one's own first memory and for the first memories of others. What is most interesting about the estimates in Table 1 is that they clearly reflect a belief that other people can have first memories that are *earlier* than one's own first memory. For respondents' own memories less than 31% were estimated to date to the age of 3 and earlier in contrast to the earliest memories of others 63% of which were judged to date to the age of 3 or younger. For one's own first memory 71% were judged to date to the age of 4 or older whereas for the first memories of others only 37% were estimated to date to the age of 4 and older. We suggest that this pattern of AaE estimates is based on a widely held belief that other people can have earlier memories than one's own first memory. Possibly, this belief may have arisen because other people do in fact, occasionally describe memories with very early AaEs. Strange & Hayne (2013) and Wells, et al. (2013) both note that it is not unusual to encounter a small sub-set of participants in studies of first memories who recall memories from the preverbal period (considered not to be possible on the basis of scientific findings). We suggest that it is accounts of such (implausible) very early memories that lead to the belief that others may have much early memories.

The Three Beliefs and Judgments of Memory Accuracy

We have identified 3 important beliefs that are likely to influence groups, such as jurors, judges, et al., in making judgments of the validity of memories as evidence⁵. The MAD belief would lead someone who held it to be inclined to judge as true or accurate an account of a memory that contained highly specific details. The BIM belief would lead an individual who held it to ascribe a higher degree of accuracy to a memory of an emotional event, with degree of accuracy increasing with the intensity of the emotion. The AFM belief would lead those who held it to accept that people can report memories from very young ages, even early infancy, and that most people would have earlier memories than they did.

Importantly our survey found that people held the three beliefs to varying degrees, some of them strongly, some weakly, thus different individuals in judging the veracity of a memory account would tend to emphasize different aspects such as, detail, emotions, or age of a memory. It seems possible that individuals may hold clusters of related beliefs. For instance, if I believe that emotional experiences lead to (accurate) encoding of more details this may reinforce my belief that the more specific details recalled the more likely the memory is to be accurate and, in turn, make me more likely to judge a memory true than questionable or inaccurate. Thus, in terms of the earlier example of alleged abuse during an episode of baby sitting, holding the three beliefs or some subset of them might lead me to quite strongly argue that the memories must be true. Remembering what he was wearing, what she and,

⁵ Note that there are many more beliefs about memory than just these 3, Justice, et al., describe 10 beliefs and other research has identified even more. We focus on these 3 beliefs here as they are most relevant to cases of historic sexual abuse where memory is the only evidence.

later, what her brother was wearing, remembering her thoughts (what he looked like), remembering her emotions, her and her brother's age at encoding, the time of day, day of the week, and even season of the year, all of this confirms the beliefs and reciprocally they confirm that the details must be accurate. Indeed in an actual case the Crown closed their comments to the jury with the statement: "...and she can even remember wearing her pink Barbie nightie", implying that recall of such a detail undoubtedly confirmed the truth and accuracy of the complaint's memories.

The Modern View of Human Memory

Are these beliefs correct? Short answer is that they are not. They are oversimplifications that avoid the complexity of human memory. And this will be the concluding message of this paper: memories are highly complex mental representations that serve many functions and in order to make informed judgments of memories some familiarity with the modern view of memory is essential. Table 2 lists 10 key points of the modern view of human memory derived from research over the last 50 years. In the modern view memories are fragmentary and temporary mental constructions. They are highly prone to error and falsity and they are never full recollections of an experience: this is true of all memories no matter what experience they derive from. Moreover, their principle function may not even reside in maintaining a record of the past. Instead they are an important part of the content of the self, they drive social interactions, and allow us to generate meaning in our lives. Also, critically they allow us to have a future.

The modern view of human memory would then lead us to a rather different conclusion about the account of memories given in the above baby-sitting example (Table 1). The details that so impressed under the MAD belief - remembering what Terry was wearing, what she and her brother were wearing, remembering her thoughts (what he looked like), remembering her emotions, her and her brother's age at encoding, the time of day, day of the week, now seem highly unusual and in several instances wholly implausible. To take just one example, remembering what hand he used seems unlikely given that children of this age (4 years) do not yet understand handedness. It would be extremely unusual that something that could not be understood at the time is remembered some 30 years later. What we might conclude is that these details seems more like 'trivial persuasion' than the recall of specific details.

Conclusion: The Clash of Scientific Understanding and Everyday Beliefs

Nobody wants to be told that their beliefs are wrong or even that they have implicit beliefs that are guiding their judgment, erroneously as it turns out. We believe that this is one of the main, but largely implicit reasons, that courts, and others, are so resistant to the modern view of human memory. But beliefs about autobiographical memory, as we hope we have shown, can mislead and when they do so in formal settings such as courts, the consequences can be severe in either direction: wrongful exoneration or conviction. The study of human memory is now beginning to focus on what might reasonably be expected of memory in our courts and how, largely implicit, beliefs might underlie ill-informed decision making. And, perhaps most importantly, how all this can take place outside conscious awareness, from the

generation of false memories to error-prone judgments of memory veracity. This is why 'common sense' judgments need to be based on scientific understanding and why everyday beliefs about autobiographical memory really do matter – because they are so often wrong.

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Author's Note

The first author was supported by an Economic and Social Research Council project grant, RES-189-25-0226, and the second author by a University of Leeds, Institute of Psychological Sciences postgraduate grant. Both authors thank the respective institutions for their support. Electronic mail correspondence can be directed to Martin.Conway.1@city.ac.uk

Table 1. Excerpt From a Transcript of a Police Video Interview in a case of Historic Sexual Abuse

Policewoman (P). You told us a lot before the coffee break and I just want see if I have got it right, please tell me if I've missed anything or got it wrong. Your Mother worked Saturday nights and got back home late at about midnight. You had different babysitters while she was working and sometimes this would be her then boyfriend Terry Peter?

C (Complainant). Yeh

P. One the night, the night you remember the first incident from, Terry, your mother's then boyfriend, arrives back, drunk and smelling of alcohol, sends the babysitter, possibly Jean from across the road, home and proceeds to put you and your brother John to bed.

C. (nods) ... Yeh

P. He puts John to bed first while you get changed and then comes over to your bed to tuck you in and kisses you on the lips and puts his tongue in your mouth and you were shocked.

C. Actually I think I was astonished and then like at almost the same time I felt his hand under the sheet and he started he started touching me (sobs) stroking me...

P. I know this is difficult, (hands C some tissues) but I have to know as many details as I can. Where was he touching you?

C. Between my legs, my vagina.

P. Thank you – I know it is difficult ... you're doing ever so well. Let's come back to this when we've established some other things.

P. Let's go back to when first he arrives. He's come in the house all red faced and drunk. How drunk was he?

C. Well he seemed unsteady, you know swaying a bit...

P. Can you remember what time it was?

C. Well I think it must have been about 10 'cause that's usually when we went to bed, it was a sort of treat, bit of a treat staying up late, while Mum was at work.

P. And can you remember what time of year it was? Maybe you can remember the weather?

C. I'm pretty sure it was near Christmas, 'cause there'd been some snow and we'd played in it the week before ... well, winter anyway.

P. And can you remember what he was wearing?

C. He had on a black leather jacket and jeans and I remember he took his jacket off and just threw it on the floor before taking us upstairs.

P. Ok and when you were upstairs he's like put John to bed and you've got changed, what did you get changed into?

C. At that time I always wore my favorite pink Barbie nightie, so that is what I would have been wearing.

P. When he tucked you in and put his hand under the covers can you remember which hand he was using?

C. It was his left hand, must have been, 'cause his other hand was resting next to my head, he was leaning on it.

P. And just to confirm as your brother was 3 at the time, given you are one year older, you would have been 4 years old when this first incident occurred?

C. Yes, just, 4 that's right ...

Table 2. Age of own and others' first memory

Age at Encoding	Own Memory	Others' Memory
Birth	0.0	1.7
1	0.0	0.9
2	6.4	18.0
3	24.9	41.6
4	37.8	24.5
5	21.0	8.6
>5	9.9	4.7

Table 3. Ten Key Points of the Modern View of Human Memory

- I. Memories are mental ‘constructions’. They contain various types of information, procedural and conceptual knowledge, and imagery.
- II. Neuropsychologically they are generated in a wide and complex set of interlocking neural networks distributed throughout the neo-cortex and mid-brain, reflecting their constructive nature and the multiple sources of information they contain.
- III. Important parts of this network develop over childhood and adolescence and are not mature until late adolescence/early adulthood (see the Royal Society report, *Neuroscience and The Law*, December 2011).
- IV. Childhood amnesia and the ability to remember have a long development trajectory (Howe, 2013).
- V. Because of this complexity in the brain, memories are particularly prone to the deleterious effects of brain damage, psychological illnesses, pharmacological interventions, alcohol and other recreational drugs.
- VI. Memories represent only short time slices of experience, they are ‘time - compressed’, and because of this they *never* fully represent an experience, rather the fragments derived from experience that they contain are more a ‘sample’ of experience than a (full or literal) record of it. In this respect then memories are *psychological* representations and not like photographs, videos, or other types of recoding.
- VII. Memories often contain information that is non-consciously inferred by the brain, and sometimes consciously inferred, such as dates, clothes worn, weather, etc.
- VIII. Because of their constructed nature memories are prone to error, distortion, confabulation and even wholly false memories may at times arise.
- IX. A general rule is that the more specific and detailed a memory the more the possibility for error increases.
- X. Research has found that memories that people are highly confident they have recalled accurately can in fact be incorrect in their details and even wholly false (Roediger, Wixted, & DeSoto (2012).