When imagination and reality combine

Rebecca Poole

General Prize

I have vivid memories from about the age of 6 or 7 of going ice-skating with my Dad and Uncle. I remember my Dad taking me by the hand, whisking me around the rink and teaching me to skate backwards. He wouldn't let me join the queue of first time skaters clinging desperately to the barriers, "hold on to me, you will learn quicker this way" he was right and in no time at all I was off! During an afternoon of reminiscing with my parents I recounted this story and was somewhat confused when I discovered that my memory had failed me. I had gone ice-skating with my Dad and his brother, but from there my memory deviates from the truth. My Dad has never been able to ice-skate without the aid of the rink wall and I had, in fact, been taught by my uncle. I had confabulated! I had confused my imagination with reality. The result of my confabulation was a false memory.

Perhaps one of the most fantastic functions of the human brain is the ability to generate memories, which apart from providing me with countless hours of entertainment recounting times gone by, helps to shape the person I am today. I had always accepted that we often forget things, but what became apparent that afternoon was that even our memories are not infallible. I was left a little bemused, how could such detailed and vivid memories be so wrong?

There are three main stages in the production and recall of memories, the first is the 'encoding' phase, where information is processed and combined. The second is the 'storage' phase where a record of the information is made and finally the 'retrieval' phase where cues are used to recall the stored information. At what stage had my memory failed me?

Dr. Steve Dewhurst, Senior Psychology Lecturer at Lancaster University was able to shed some light on my experience. Memories are not set in stone, but "updated each time we bring them to mind to fit our current knowledge and beliefs". He also points out that "children are more prone to confabulation than adults and often confuse reality with imagination, which may make them more vulnerable to false memories". In fact, many people discover they have false memories from their childhood. It is common for individuals to remember an event only to later discover it had actually happened to a sibling. This is because, if imagined enough times, a memory can effectively be learnt.

Dr. Dewhurst's most recent research has indicated that false memories can be generated at the encoding phase. Participants listened to the same ambiguous story, but with different titles and were later asked to recall which words from a list were present in the story. Some of the words on the list were not in the story, but were related to one of the titles. Participants told the story was about a football match 'remembered' words such as referee and players, whilst those who believed the story to be about a wedding 'remembered' words like bride and priest despite none of these words being present in the story. When no title was given or not given until after the story had been heard, no such false memory patterns were observed, illustrating how our expectations and previous knowledge of an event may shape our memory of it.

As both true and false memories appear to be associated with the same patterns of brain activation, even with modern brain imaging techniques it is virtually impossible to tell

them apart and therefore accurately estimate the frequency of false memories. In some laboratory experiments false recollections can occur approximately 50% of the time, "but obviously you have to be cautious in generalising from the laboratory out to the real world" cautions Dr. Dewhurst.
I had never before stopped to think that sometimes our memories can deceive us, but at least now can appreciate how. I think I prefer my modified versions of the truth as I believe they reflect how I felt about the world and in this case how I saw my Dad as my mentor, which ultimately helps mould the person I am today.

Information sources:
Interview via email with Dr. Steve Dewhurst, Lancaster University

Stephen A. Dewhurst, Selina J. Holmes, Ellen R. Swannell, Christopher Barry (2006). The role of script-based inferences in false recognition. *In preparation*.

http://en.wikipedia.org/wiki/Confabulate
http://en.wikipedia.org/wiki/Memory

Biography
Rebecca Poole graduated with a degree in Biology from Southampton University in 1999. She stayed at Southampton to study for a PhD. in Plant Pathology and in 2003 joined the Functional Cereal Genomics group at Bristol University to investigate genetic factors that influence bread making quality in wheat. Rebecca enjoys the challenge of science communication and currently volunteers for the Bristol and Bath branch of the British Association for the advancement of science. She still enjoys reminiscing with her parents and has recently started ice-skating lessons, but has trouble remembering her instructor's name!