

Precognition, dreams. and McTaggart's paradox

We have a very tricky problem here, as everyone realises there is a past, a present and a future and yet this fact is not expressed correctly in the existing Newtonian/Einsteinian style models of punctal (or point) time. Furthermore neuroscientists recognise the existence of the concept of the so-called 'specious present' which any thoughtful individual notices. Even that particular choice of the words 'specious present' in itself implies the real possibility of scotomisation, almost to the point of agnosia, a possibility which I have been suggesting for well over 25 years. After all, why should reality as we observe it, be necessarily specious in any way ? Possibly partly so we can simplify the mathematics, an approach which may in itself be worthy enough but is probably not a complete goal..

The common resort is that of authors like Goguen (2006), Fauconnier and many others, whose efforts even get to the level of philosophical/psychological experimental tests. Whilst obviously Goguen's work in particular, is very important in any further developments of category theory which is, itself, probably embedded in the correct approach to the problem, nonetheless in practice the method is frequently simply used for semantic collaborations within the existing ultimately Newtonian based frame of reference. Goguen has commented (dramatically and very correctly) in other papers (Goguen, 2005) that he sees no point in a speedy and unnecessary descent into what I would term mathematical metaphysics and of course I wholeheartedly agree with these sentiments ! The trouble is that an unduly semantic interpretation may savour of what might be called the opposite, you could say that it almost becomes, before it starts, a sort of 21st century logical positivist or Popperian stance of the 'metaphysics is nonsense' variety, not a good starting point that, either. I think however, Goguen's basic category theory approach is praiseworthy and worth saving.

What does worry me is how few practical results of a foundational kind that we would like have, in practice have emerged from category theory, after the many thousands of pages on the mathematics.. Isham's work, for example, is clearly an exception to this, which I hope illustrates the direction of progress I would eventually hope for. And you could say that Coecke could be getting closer to the right approach, though he mainly confines his determinations to quantum theory.

What seems to be worse is the work of Penrose or Stapp, who by descending steeply to quantum theory for explanations of phenomena, is almost certainly simply wrong. (The reasons and areas of these errors were stated briefly in earlier posts.)

That being said, and the clear warning being given that we are exploring everyday phenomena like 'past, present and future', and not simply unstructured and unproved fantasies, we continue with the blog.

It seems that apparently working cases of precognition (Note 1) often seem to have involved emotional involvement, amongst other things. From our present standpoint there are very few obviously useful studies available of precognition involving sleep which can be regarded as anything other than anecdotal, so it will be necessary to dip into the results for more conventional work in order to obtain enlightenment.

The Walker sleep lab results (Walker, 2006) seem to suggest that a 36 hour sleep deprivation period before the learning, profoundly reduced encoding of positive emotional stimuli, and to a lesser extent, emotionally neutral stimuli, but the encoding of negative stimuli was more resistant to the prior sleep deprivation.

On the other hand Tilley A. and Statham D. (1989) say that sleeping immediately prior to learning impairs subsequent retention, but did improve after 20 minutes. Grosvenor and Laack (1984) had

also noted a strong detrimental effect of sleep prior to learning.

Since the latter two experiments many tests have been made of awakening sleeping people and performing tests on them. It becomes clear that the amount of sleep these people have had on previous days (Arito, 2000), whether they have been awoken during SWS, NREM sleep, REM sleep etc can give different results and interpretations. Now Patrick McNamara (2004) holds a currently minority sleep interpretation but at any rate he seems to roughly take the view that NREM sleep is used for processing the pleasant areas and REM sleep for the unpleasant areas.

It seems to me that there is perhaps an as yet clearly undefined difference between emotionally negative/positive stimuli and pleasant/unpleasant stimuli (sodomasochism is only one example) as well as memories involving social situations evoking high/low anxiety levels. Obviously we try to keep it all simple and avoid hairsplitting but to note this fact may be one way to make that easier.

The most commonly held belief among the scientific community (Rauchs, 2006) seems to be that REM sleep consolidates memories and aids in learning. An article in Science recently declared that "neuroscientists have long known that memory consolidation goes on during sleep." A more recent discovery is that NREM sleep may also play a role, albeit a different one, in learning. Stickgold found that different phases of sleep are tied to different types of learning. Learning visual skills, he stated, depends on the slow-wave sleep of the first quarter of the night and also on the REM sleep of the last quarter. Learning movements relies much more on the NREM in the later part of the night. In 2001, Wilson found that rats dream about their activities (i.e. running through a maze) during NREM sleep in addition to in REM sleep. Unlike during REM replay, where the experience occurs approximately in real time, the memory segments that were replayed during NREM seemed to be snippets of experience. Also, unlike REM sleep, slow wave sleep seemed to replay only what had happened immediately before and not something twenty-four hours ago. Because of the possible time-delay REM memory reactivation, it might be representative of a more gradual reevaluation of slightly older memories.

From the Walker (2006) sleep labs I further quote: "Within the sleep control group, both positive and negative stimuli were associated with superior retention levels relative the neutral condition, consonant with the notion that emotion facilitates memory encoding. However, there was severe disruption of encoding and hence later memory retention deficit for neutral and especially positive emotional memory in the sleep-deprived group, which exhibited a significant 59% retention deficit relative to the control condition for positive emotional words. Most interesting, however, was the resistance of negative emotional memory to sleep deprivation, showing a markedly smaller (19%) and nonsignificant impairment.

Taken as a whole, these studies suggest a rich and multifaceted role for sleep in the processing of human declarative memories. Although contradictory evidence is found for a role in the processing of simple, emotion-free declarative memories, such as the learning of unrelated word pairs, a substantial body of evidence indicates that both SWS and REM sleep contribute to the consolidation of complex, emotionally salient declarative memories, embedded in networks of previously existing associative memories. In light of this evidence, pronouncements of a lack of relationship between REM sleep and "memory" appear to be unfortunate overgeneralizations that disregard evidence that specific sleep stages play distinct roles in different stages of memory"

When a tranquilizing drug was given to rats 5 min after rats were put in a "fear chamber"(Bustos, 2006) a second time, after they had learned to fear impending foot shock (even though feet were never shocked again). When retested some 10 days later, the rats that had been given tranquilizer during the earlier recall trial showed little freeze behavior, indicating that they had forgotten what they learned and what they were forced to rehearse when they were put into the fear chamber a

second time. The drug treatment and its timing caused them to forget to be afraid. Note that there was a rather surprising finding that the drug had no convincing impairing effect when given during the consolidation period of the initial learning trial. But when given during a re-consolidation period of a second rehearsal trial, profound forgetting effects were noted. The drug interference effect could be seen for up to 60 minutes after re-consolidation, not later.

This suggests strongly that during recall, a memory trace becomes vulnerable once again. The memory may be lost altogether. The memory can also be altered, leading to a false memory. On the other hand, the memory can actually become enriched, if re-consolidation involves new information that expands the amount of information stored and the improves the quality of the original information. So, remember, that even though rehearsal promotes retention, it may not always be helpful. Many advise being careful about what happens during the process of recall, staying focused during rehearsal of things you are trying to remember, and making certain there are not distractions or extraneous information being inserted into your memorizing process.

Frank Logan's NMU handbook mentions "One of the memory mysteries is the prior sleep effect. It has long been known that sleeping after learning is beneficial to memory. This may be because learning is consolidated during sleep or it may simply be that nothing happens during sleep to interfere with what was learned. Whichever, we may ask whether sleep before learning also affects memory. It does, but the effect is negative! When sleeping people are awakened and given new material to learn before going back to sleep, they seem to learn perfectly well. But when they are later tested over the material, they remember very little. How much they remember depends on how long after waking before the learning occurs. There is some negative prior sleep effect for up to an hour. This may be one reason that dreams are quickly forgotten. One implication of the prior sleep effect is that you best not schedule study time immediately after sleeping or napping. A second implication is that, if you have an early morning class, you should be sure to get up early. A final implication is that, if you doze off during a lecture or while studying, you not only lose that time, you won't remember much of what happens next. Students need plenty of sleep, but you should be sure to sleep after, not before learning."

At this point we may well be best considering Harnad's symbol grounding problem, and the interpretations of Barsalou in 1999 and the Glenberg and Kaschak (1997, 2002) studies. In this case here, at its simplest, Harnad's problem is that in order to be able to interpret and use a symbol, you'll need another symbol that expresses its meaning, and so on. Glenberg and Kashak try to avoid this in a series of experiments relating reaction time to actual movement. Participants read sentences one at a time, some of which made sense and some of which did not. They had to press one of three buttons, one close to the body, one about arms length from the body, and one in between the two. When participants read the sentence "Open the drawer," for example, they will respond that it makes sense faster when their answering involves moving from the middle to the closest button.

But, our own studies to date suggests that there won't be a simple optimality model along the lines of that of John McNamara.(2001) i.e. a semi-markovian model or even one using a fairly easy chaos (or biological statistical) interpretation. John McNamara was certainly 'sold' on the idea of using category theory in his later years but this, too, has to be done very basically as I've tried to do earlier. And there is no need yet to use an image-based or action-based system yet - necessarily. We also want to avoid so far unresolved logic-based problems (as in the Wason selection test) as far as we can.

We will conclude so far that further experiments along the lines of our earlier post at <http://tjohn.blogspot.com/2006/04/do-we-dream-of-future.html> may be possible but not easy in concept. Some incorporation of ideas referred to in Levy (1996) but modified for present purposes may help.

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Notes

1. By 'precognition' in this blog post I simply mean instantiations of the realization of the future by some means, which could be conjecture, hypothesis, predictions, mathematical predictions, mental pictures, dreams, revelations or some other as yet specifically undefined way. It is something which in essence has to be real and solid. We know that we can predict tomorrow and even visualise it. It may be that to actively foretell it as a soothsayer or fortuneteller etc might claim to do successfully, could fall into a rather extreme bracket, but that in itself is a matter of opinion, and following say Mercea Elaide, could even be a matter of social context and spiritual comitment to it. The thing we should hold to is the idea that we are dealing with something which is real and observable everywhere, in fact it is part of the way our minds work. We do not wish to be unduly judgemental about what its specific manifestations are (or should be) at a very early stage in the piece. To do so would be totally wrong and misleading, perhaps as wrong in its own way as to fall into the trap which Goguen (2005) warns us of.

Simple attempts to fathom anticipatory behaviour are referred to for example in Butz (2004) and experiments described in Holley (2004).. We could consider Watzlawick (1983) and his views on the past as they could also relate indirectly to the future, Pattee, and von Uexkull and his ideas of achieving of common realities, Cariani etc. and whilst we bear them in mind, this blog is for the moment taking a somewhat differing viewpoint.