Do we Dream of the Future ?

Abstract

Stickgold's Tetris experiments were repeated with variations to allow the possibility of category theoretic backwards leakage to be observed. Backwards leakage in dreams, sometimes referred to imprecisely and in a rather more semantically loaded way as precognitive dreaming, seems to have occurred.

Introduction

Blackmore's (2002) paper is possibly the most up to date detailed account of controlled trials on precognition. Her remarks go back as far as the early dream work of Kilbracken. Any results reported in Blackmore (2002) or implied by it seem to suggest that the subject does not present much future hope for precognition. Specifically with regard to dreams, Hobson (2006, 2005) doubts if there is any precognitive element in dreams though he seems to have had at least one dream which could be fitted to that category (a totally different thing, of course). I am largely in agreement with Hobson's position on interpretations to date though there is still much exciting work to do, some of which I begin in this essay .

There are of course a great number of papers in the popular literature. For example Obringer (2006) gives a detailed 'popular' account with many citations and links, Stowell (1995, 1997, 1997a) has some older literature and Ben Goertzel mentions some ideas in his journal "Dynamical Psychology" which appears mainly on the web. By and large Hobson's and Blackmore's contributions, at any rate, should not be disregarded.

So generally speaking Hobson's and Blackmore's results and the largest fraction of similar work carried out with reasonable scepticism suggests that precognition does not happen, inside or outside of dreaming, under the constraints and conditions which have been imposed to date..

However we have already pointed out in earlier essays in this blog (see references at end) that existing statistical methods may be inappropriate here and also that there is much more to be found or interpreted through observations.

The Experiment as Performed

This experiment helps us to discover the degree if any of backward leakage using the present category theory approach which can be obtained by dream studies. The category theory approach does not stand or fall on the basis of such studies but they could certainly provide a pleasant confirmation of its correctness. It may ultimately replace the present crude 19th/20th Century idea of punctal time, which seems like only a dim shadow of reality in comparison.

Stickgold (2000, 2003, 2005) controlled the content of 17 different people's dreams after the first hour of sleep. Twenty-seven test subjects played Tetris on Nintendo sets for three days, with a two-hour morning session and a one-hour evening session the first day, and a one-hour morning and evening session the following days. Of the 27 people, 12 were beginners to the game and 10 were experts. Five of them were amnesiacs as well.. Seventeen members of the group recalled dreaming of falling Tetris pieces at least one hour after falling asleep. Most of the dreams occurred the second night.

As far as I am aware these are the first major trials in history which so consistently seem to induce specific and definite dreams, and as such they should be extremely relevant to the present backward

leakage study. The problem with psychological tests as compared to simple physics measurements has usually been the great difficulty in obtaining clear and consistent results. The chequered history of, for example, the Perky effect which I mentioned in detail earlier is an extreme but only too typical example. At the other end of the scale we have, say, Milgram's (1974) torture experiments which seem to have had very high repeatability all over the world.

Therefore we first did simple tests with just one subject (subject X). I do not recall dreams frequently so I was simply an observer. An abbreviated process was used during which from Night 1 to Night 9 the dreams were simply recorded with particular reference to anything like falling Tetris pieces, from Night 10 to Night 23 subject X played space invaders or other games without Tetris shaped pieces, from Night 24 to Night 26 the subject was also primed with 3 Tetris demo games (though was instructed to casually observe these but not able to play, and subsequent to this was asked to play the usual number of games of space invaders). From Night 27 to Night 29 the subject played Tetris and recorded the score and from Night 30 to Night 40 no games were played.

The results are given below in tabular form. SI means "Space Invaders", T means "Tetris", TD means "Tetris demos but no play" and N means "No game". DSI means "Dream reflecting Space Invaders or alternative games to Tetris" DT means "Dream reflecting Tetris", DO means "other dreams recorded", DN means "no dream available (or dreamed)". A query appended means ambiguity, usually only slight ambiguity.. We have more details than the brief ones below, and of the other games unlike Tetris played but those given illustrate the point made. We have not previously used the subject (subject X) for dreams tests before nor did subject X play Tetris for at least a year prior to the tests. X claims to have been a medium to strong Tetris and Space Invaders player some years ago, and really never to think at all about the games nowadays and this seems a realistic assessment. Attempts were made to have the subject play at least 2 to 3 hours per day of the games as in the Stickgold trials.

Night Game Played Result
1 N DO
2 N DN
3 N DO
4 N DN
5 N DO
6 N DO (often fragmented), DT (white pieces)
7 N DO (often fragmented), DT (boxes appeared like lights)

8 N DO
9 N DO
10 SI DO, DSI
11 SI DO
12 SI DO, DSI
13 SI DO, DSI
14 SI DO, DSI, DT?

15 SI DO
16 SI SI, DT?
17 SI DSI, DSI
18 SI DO, DSI, DT?
19 SI DSI, DO
20 SI DO, DT/DSI (SIMULTANEOUS)
21 SI DT/DSI? (uroboric symbolism?)

22 SI DO, DT/DSI, DT
23 SI DT/DSI (MORE T THAN SI)
24 SI, TD DO, DT?
25 SI, TD DO/DT?
26 SI, TD DO, DT?
27 T DO/DT?
28 T DO, DT

29 T DT/DO
30 N DT/DO
31 N DO
32 N DO
33 N DO
34 N DO/DT
35 N DO/DT

36 N DN
37 N DO
38 N DO
39 N DO
40 N DO

There were thus up to at least 12 Tetris dreams on 12 nights prior to the actual playing of Tetris, by a person with no interest or thought of Tetris or of video games. The above results therefore show a clear backward leakage effect (or what a tyro might interpret as precognition) for both Tetris and, to a lesser extent, for the Space Invaders style games. Probably many more experiments, with additional subjects, need to be carried out to establish this effect with certainty. It should be warned that no clear interpretation, whether of a positive or a negative nature, is going to be easy, but early results look promising. Yet again, I remind of the tricky nature of this work. As an example, I see Hobson's 'rejection' of precognition, after giving an example of a 'precognitive' style dream - and on grounds of simple statistical merit I wholeheartedly confirm agreement with his view. The fact remains: Hobson had at least one 'precognitive' dream and by altering experimental circumstances I have very easily encountered probably more than another 10 'precognitive' dreams. And I do not believe in 'precognition' either, but there certainly are some interesting effects out there to study. I will not wager any bets as to my interpretation of further 'independent' trials.

Appendix A "Two time dimensions ?"

Do we really need to use category theory to achieve our results? My answer would be "Probably, if we want to get a result we can in some way easily understand, anyway".

An alternative approach might be, effectively, to have two time dimensions in (normal) punctal time.

Feynman, almost needless to say, apparently tried to devise such a world with two time dimensions in henry.pha.jhu.edu/Henry.Feynman.pdf but did not follow it up further though he found the idea interesting.

Wikipedia and other such sources also have their own take on more than one time dimension, as for example in http://en.wikipedia.org/wiki/Second_Temporal_Dimension.

Astronomy-cafe give a much more basic approach. At http://www.astronomycafe.net/qadir/q1980.html they say: "What would a universe be like with two time dimensions? Pretty weird. I do not know the details, but because there are two time dimensions, it is very difficult to avoid creating 'loops' in which one traveller leaves location A and travels to location B and arrives at a specific time in the future, and another traveller making the same journey but arriving at 'B' before he left 'A'. Presumably, we would have the same freedom to move in this second time dimension as we do in a second space dimension, and because closed curves can be created in 2-dimensional spaces, the two time dimensions would allow us to 'move' along paths that violate causality. Every pair of points in space would be threaded by a multitude of such possible curves, and the concept of cause-and-effect would become meaningless"

Foster (2003) did a PhD thesis on a system with two time dimensions which is available for reading and to which I give a reference. This could be an alternative approach, still using punctal time. But I would imagine that to use punctal time would be the equivalent of using epicycles to explain an earth-centred solar system, that is to say it might do for some aspects to provide a link, an interpretation, an understanding - I say this, bearing in mind only such factors as the long run that the Copenhagen Interpretation of quantum mechanics had, or indeed the idea of the earth being at the centre of the Universe. But the diversity from fact here, seems much wider and is of a theoretical nature, not simply an explicatory one. For the moment, we will stick with what we have.

Gott (2001) used the term "dream time" or "dreamtime" (a term used by native Australians in what is normally taken to be a mythological sense) to describe a second time dimension and pointed out the possible analogy or comparison with time states during dreams, but, like Feynman, did not elaborate the model though he pointed out the fact that the unbridled use of a second time dimension could make comparison of such a model with the real world unrealistic.

Appendix B Can simple logic avoid the use of category theory?

Can simple logic (Lob logic or indeed any kind at all) avoid the use of category theory? My answer would be: "Simple logic without bowing the head to McTaggart only makes things worse, not better. And if we admit McTaggart we probably need category theory. We probably really do need category theory, anyway ".

I consider for example the Ostrogorski paradox and what it entails. Pigozzi (2005, 2006) expounds on the Ostrogorski paradox in some detail usefully and in logical terms.

A brief non technical example from Widerquist (2003) may simply illustrate the matter, as follows "The Ostrogorski paradox shows how the fulfilment of the majority's preferences can make everyone worse off, such as electing a candidate who holds a minority opinion on all issues [Kelly, 1989; Nermuth, 1992, op. cit.]. In one version, three voters use the majority rule to redistribute income. Each of the three possible majority coalitions votes to take two dollars from the third voter and redistributed it among themselves, but one dollar is lost in transactions costs. Thus, although each decision benefits the majority that votes for it, every voter is worse off than they would have been if none of the votes had taken place. This example involves pure rent seeking, and cannot happen if people are unselfish. Something very similar, however, can happen. Milton Friedman [1962] used an informal example in his book Capitalism and Freedom that was in fact an Ostrogorski paradox motivated solely by concern for the public interest. He argued that many different majority coalitions could be persuaded to ban many other kinds of speech and nearly everyone would find herself wanting to say something that had been banned by the majority. Thus, it would be possible, he hoped, for a majority coalition of voters to see that it is in the interest of

society to ban the banning of any kind of speech.

The Ostrogorski paradox may be more difficult to resolve when individuals are altruistic than when they are selfish. Tullock [1984] argues that intellectuals could make a real contribution by pointing out the costs of special interest legislation, and hopefully the bulk of such legislation would not pass. Economists have made efforts for many years to point out these costs with little success. If voters are motivated purely by self-interest and these government actions are inefficient forms of rent seeking, it would be in the interest of everyone to form a broad coalition to ban all such government actions. Why has no such coalition formed?" And of course I am talking about statistical analysis not political coalitions, but real political coalitions involve specific votes or voting patterns and statistical analysis involves comparison of measurements so there is quite a direct parallel. I am not simply looking for an analogy, but for physics. But in the early stages we have to walk warily. A simple statistical analysis of dreams and their contents along the lines of Domhoff's work is not going to have a one to one mapping onto future or present scientific results. Certainly Domhoff does not seem to claim in the circumstances he is dealing with that it will, and we will not come up with dream prediction statistics that way either.

Another case: Bacchus (1989) and Chau (2006) also illustrate non-transitive effects which are found everywhere, for example in the children's game "Scissors, Paper or Stone ?" and indeed in betting wagers such as those surrounding the Penney-Ante 'paradox' (Andrews 2006). There could be plenty of food for thought for further work in those examples.

The factors above do apply to statistical methods for correlating and computing psychological effects during dreams (as perhaps unlike those of the Stickgold priming experiments done slightly after dreams and prior to dreams for priming. During dreams these effects may well apply in a different way). Here we are trying to statistically 'average' results not readily susceptible to averaging. For example we cannot simply 'combine' or 'count' results on different peoples dreams. It is not just a matter of statistical correlation coefficients or something of the type but of trying to avoid giving entirely different meanings to phenomena. e.g. One persons dream of a certain horse winning a race may have, in the scope of different person's day to day activities, have a totally different meaning to another's. e.g. a sporting or racing enthusiast may have one interpretation and an artist with personal problems have another, and a small boy still another. That is not to say an overall slant or impression can never be made but it certainly may not be easy or mathematically mindless, as statistical correlations frequently try to be for simplicity and/or objectivity.

So the idea of "dreaming racehorse winners or share prices" is not a testing exercise, it is simply generally outside our remit as a day to day possibility.

Also we must remember here that, for a simple statistical analysis we are (or at least expect to be) essentially also very far from punctal time or the time of Einstein/special relativity. We briefly remarked on that in the two earlier Varela essays, "Neurophenomenology and Category Theory" I and II. In Gamow's "Mr. Tompkins in Wonderland" we see how very easy changes in physical parameters can change the conception of parts of the universe markedly and of course in this present case we only have category theory and McTaggart to fall back on, not a very easy 4D space or even some string theory manifestation of much the same thing.

But it is in the light of the above paragraphs and the earlier work in the blog that we can legitimately try to interpret whatever relevant results we obtain. We are not totally in the field of the unknown and we can interpret whatever reasonable results we can obtain. But it may not be easy. For example a real comparison between our present situation and conventional statistics would be as between a politician's interpretation of a vote on an EU committee (e.g. as in Widerquist 2003) as compared to a simple minded mathematical interpretation of the same vote, using common statistics

as would be applied to say a set of elementary readings in an undergraduate physics or even a psychology class. You are looking at very different viewpoints I am not afraid to say. But I have to say that what we are trying seems difficult but not impossible nor outside physics or its criteria. Maybe Popper's approach or Kuhn's approach or some other such approach has as much merit as we can expect on rough new ground. But we cannot, for example, necessarily predict horse races by comparing the results that various people get in their dreams and/or taking some simple average of the results of dreams, nor do we claim to.

Appendix C Philosophical Problems and Specific Details

Many of the philosophical details of this approach have already been discussed in previous blog entries. What will be dealt with here is mainly matters relating to further philosophical matters specifically conserning the dream state and the experiments in hand.

We consider the difference between explicit knowledge and implicit knowledge. Bertil Rolf comments as follow: "The most important type of implicit knowledge consists of representations that merely reflect the property of objects or events without predicating them to any particular entity or event. The clearest case of explicit knowledge of a fact are reflective representations of one's own attitude of knowing that fact. These distinctions are discussed in their relationship to similar distinctions like procedural-declarative, conscious-unconscious, verbalizable-nonverbalizable, direct-indirect tests, and automatic-voluntary control". Many people choose to write in depth about such matters, and the topic is dealt with from various views in the Stanford Encyclopedia and elsewhere.

To explain what I am getting at here it is possibly easiest to quote Bo Newman (2000) who gives a simple example "One thing that characterizes implicit knowledge is that meaning must be inferred. This is because, unlike with explicit knowledge, the codification process is incomplete. Explicit knowledge can be interpreted totally based on content, whereas interpreters of implicit knowledge must rely on some form of previously retained knowledge. The potential for ambiguity is one of the characteristics of implied knowledge. Most readers of the sentence, "Ann put on her heavy coat and locked up her classroom," implicitly understand that it is winter and Ann is a teacher, but there are other inferences that could be made as well. For consistent interpretation, both the person making the statement and the person interpreting it must share some common frame of reference to understand when heavy coats are worn and who locks up classrooms.
Implicit knowledge artifacts can also be found in process-specific software. In developing the software, the designers had to conceptualize the processes that the software would be supporting. That knowledge will then show up in the way the software is intended to be used and in the range of behaviours it directly supports. Even if not explicitly apparent, these implicit knowledge artifacts will effectively constrain users' actions". The profound difference between implicit and explicit knowledge as defined therein makes it clear just how difficult a statistical assessment of results obtained from dreams can be. To go back to the racing dream prediction problem referred to in Appendix B, it becomes particularly obvious that whatever the limits and areas which may well be defined for both explicit and implicit knowledge, these will likely appear to be different for a racing tout and an average small child, for example, and to differ from one individual to the next..

Julian Holley (2004) suggests mathematical models to describe dreamlike cognitive processing. This is a good idea but, especially bearing in mind the above, I am still at a loss to see how an accurate model is to be developed. Briefly "A simple extension is made to the ACS that uses the incomplete information contained in the classifier list as a basis for an abstract world model in which to interact or 'dream'. The abstract thread or dream direction is an emergent property of the

selection process, this can be used to recycle around well known states and reduce
real world interaction. The system is applied to two simple problems, the random
walk and T.maze experiment and demonstrate that they require considerably less
interactions with the real world to develop confident world models. Further models
and extensions are proposed to advance the system, such as environmental directed generalisation
and speculative rule creation." Further progress will be interesting
and some of the techniques in that paper could possibly be incorporated in the
present model, though if possible it would be best to get some concrete results in
the present direction.

Appendix D Further Problems with Results and Observations

The chief problem likely to arise is exactly the same one that seems to have worried Stanley
Milgram (1974) in his "Obedience to Authority" program. This is simply that the strength of the
authority can determine the results themselves. Milgram tried to get round this by using several
different locations for his experiments, for example an office in a run down suburb as compared to a
well equipped Ivy League University laboratory and he found that in his case, the very noticeable
authority effect which he was measuring was thereby strongly diluted.. Our problem here is greater
in that also such effects can work in the opposite direction and the our 'leakage effect' may clearly
be not as strong as Milgram's obedience effect. I must say that on beginning these experiments I had
some strong doubts about the previous Stickgold (2005,2004,2000) experiments and wondered if
even Stickgold's experiments would work at all outside of an Ivy League ambience and was indeed
gratified to discover that they did work and not only did we obtain Stickgold's result but we were
fortunate enough to apparently go one better. But does it pay to do better than an Ivy League
University ? Not really a good scientific question, perhaps, and only time will tell. But there is one
serious rider to the situation, and that is that Stickgold's experiments did not seem to cover the case
where Tetris was simply observed but not actually played. I thought deeply about priming before I
set the experiment up. I was unsure that I would even get the Stickgold result (and am still mildly
surprised that I did), and in fact prior to carrying out the experiment I mentioned to Professor
Hobson (2006) a slightly more elaborate and much larger scheme which I had had in mind. I still
have my doubts as I think that something even more carefully designed (but not necessarily
enormously large) is needed. But in fact my point has been made and the ideas probably only
require further careful testing, whilst taking considerable care of ambience.

References

Earlier entries in the present blog will give best details for any other queries which may arise about
theory and methodology. These entries are at http://ttjohn.blogspot.com/ . A website containing
earlier information and some brief preliminary details of other matters such as the Vasai, India
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www.john999.f2s.com and a group allowing limited posting facilities is available at
http://groups.yahoo.com/group/ttj . Correspondence can be sent at those locations or to
ttj@busiNOSPAM8.freeserve.co.uk (remove NOSPAM)

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