A study of attempts at precognition, particularly in dreams, using some of the methods of experimental philosophy.

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Abstract: Actual situations where folk philosophy might have predicted precognition effects were studied and dealt with experimentally and theoretically. Extremely strong experimental results were obtained but the findings supported not precognition but the Many Bubble Interpretation, which uses at this time dynamical systems theory as applied to the physics of the brain. Further experiments and theoretical work were discussed.

Introduction:

Blackmore's (2002) analyses are possibly the most up to date detailed appropriate account of controlled trials on precognition. Her remarks go back as far as the early dream work of Lord 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 (2005, 2006) doubted 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 some aspects of Hobson's position on interpretations to date though there is still much exciting work to do, some of which I begin in this essay .

I have already considered the dreamwork of Domhoff (2002, 2003), Hobson, Metzinger (2004) and others elsewhere (Yates, 2008). The point has to be made that Domhoff has tried to computerise many aspects of dreamwork and his approaches to the multifarious problems of detail and interpretation plus his genuine attempts to involve internet interactions have to be borne in mind at all times, if not necessarily to be followed. Hopefully further experiments may be carried out at least partly on the internet, but many additional considerations, including those of experimental philosophy, will need to be dealt with.

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. I think that both Hobson (2006) and Blackmore (2005) were willing to be convinced otherwise by an effective proof, and therein lies the rub.

However we have already pointed out in earlier essays (Yates, 2008, 2008a, 2008b) that existing statistical methods may be inappropriate here and also that there is much more to be found or interpreted through observations.

I have also looked at other statistical and quasi-statistical aspects of the situation and have come to the conclusion that the methods of experimental philosophy have led to surprisingly exciting insights into dreamwork from a rather different angle.

Of course I refer to the continuing work of Schwitzgebel (2002, 2003, 2006, 2009) into colours in dreams as being seminal in this regard, and also with regard to specific methodologies.

Accordingly and also consequent to Yates (2008a,2008b), some experiments have been carried out on a number of subjects, as detailed below.

Whilst we have said that conventional statistics will not give a full picture of events (Yates, 2008) we now point out relatively conventional alternative methods by which dream studies can be carried out (Schwitzgebel, 2002, 2003, 2006, 2009) and there is doubtless much more to come. Schwitzgebel (2005) favours up to a point the classical traditional methods of the Titchener school of psychology and we could see that these can be leavened by some comments of Sosa (2007) (for example "if philosophers are ill-equipped to probe the brain in the ways of neuroscientists, it would be easy enough to broaden the movement's self-conception to include interdisciplinary work, provided neuroscientists care enough about such issues with philosophical import, as no doubt some already do. Indeed, many experimental philosophers would probably define the movement in this interdisciplinary way").

We also have to bear in mind that much work of the Titchener school seems to have been only repeatable precisely enough by the Titchener school. I refer particularly to the chequered history of the Perky effect

(Segal, 1964), (Martens, 2005) as a clear instance, but have to point out that Baars (2003), for example, still seems to take the Perky effect, or what it seems to imply, quite seriously and we have to consider the at least roughly feasible interpretations of Brockmole (2002). So whilst we cannot but concede that the general Titchener approach can be taken as somewhat of a curate's egg (addled but good in parts, as the curate proverbially says), it is a valiant attempt at a difficult problem in consciousness and as Schwitzgebel (2005) says, can be suitable for improvement. Schwitzgebel's own work at least hints as to directions which this may take.

The Experiment as Performed

This experiment helps us to discover the degree if any of backward leakage using the present approach which can be obtained by dream studies. The MBI ('Many Bubble Interpretation') approach and the importance of McTaggart's work certainly do not stand or fall on the basis of such studies but they could provide a pleasant confirmation of its correctness. The MBI may ultimately replace the present crude 19th/20th Century idea of punctal time, which seems like only a dim shadow of reality in comparison.

In Stickgold's experiment he had his subjects perform sequences of tasks and then showed that many of the subjects subsequently dreamt about these tasks. The present experiments record the dreams and then have the subjects carry out the tasks, which of course are chosen prior to the dreaming without informing the subjects in any way of the tasks, prior to the dreams. In terms of folk psychology, successful results could be regarded as precognition but according to the Many Bubble Interpretation, it is simply backwards leakage.

One idea will be to then try to obtain some parameters to enable us to improve our existing dynamical systems models (Yates, 2008) along the lines of the work of Hannon and Ruth (1997) or using other mathematical brain models such as those of Baars, Franklin or Koch, appropriately modified.

But first we will describe briefly the original Stickgold experiment. Following this we give an explicit mathematical account of how a reverse Stickgold effect can be produced. Then we will go on to obtain results which may help to confirm or indicate the reverse Stickgold effect, referred to in an earlier paper.

Stickgold's experiment

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.

Mathematical Representation of Stickgold and reverse Stickgold effects

To write down a mathematical model of the reverse Stickgold effect (Yates, 2008, 2008b), we use experimental philosophy and the work of Pizarro (2006).

This concerns the ripple effect. Now we consider a simple B1 series representation of the A series bubble. This is only a preliminary model and is not necessarily an accurate description. Because the A series cannot be precisely mapped onto the B series the model will never be completely accurate,

because it cannot be. Thus the B1 series representation may appear to have substantial weaknesses as compared to a bona fide B series, and indeed may be inconsistent with it. We regard a present time bubble as PaPrFu(n) at Tn.

The ripple effect - the giving of an individual at a present time, information about an event which he remembers, is supposed according to Pizarro (2006) to alter his real (perceived) memory of the event. Here we have a physical effect on the brain from an applied information input. Say by an application of information f in the present the new configuration becomes PafPrfFu?(n) . Paf is the modified memory. Prf is the new present situation. We have not filled in Fu? because we do not need to for present purposes.

Now we need to remember that we are dealing with the neurology of the brain and presumably other factors. Now along the B or the B1 series we have a simple timeline. So one way of writing it would be that at T(n) we have one bubble PafPrfFu?(n) and at T(n-) , an earlier time, we have PaPrfFuf(n-). This is only a rough preliminary model but we are talking about real neural and perhaps other configurations at two different times. I do not deal with Fu?(n) at T(n) because in the present treatment we do not need to, but the work of Hohwy and Frith (2004) and others, makes it clear that Fu? is likely to be a real 'physical' configuration in a real 'physical' B series.

Here Fuf(n-) represents the future in the B1 series where there is going to be a a perturbation f. At this point we do not have to immediately consider many of the problems and paradoxes which one might normally expect as we know that it is not physically likely to be possible to get a completely accurate and consistent B1 series model as we would expect in the B series.

Now what is the relation of PafPrfFu?(n) to PaPrfFuf(n-) ?

Well these are two representations of a individual at times T(n) and T(n-). They are both brain models which can or should be each writeable down consistently and mathematically although we are not certain of their mutual consistency.

Well we specifically defined PafPrfFu?(n) above. As for PaPrfFuf(n-) , common sense hopefully tells us that it will exist too. It seems to mean that could well be a future perturbation of Fuf(n-) and that this will also occur in a simulated present Prf(n-) which of course is combined with past and future to form the bubble PaPrfFuf(n-) at T(n-).

So at T(n-) we should be able to write down, or to predict, the future. It is possible that it will only be a weak prediction, at the present state of the art, as we remember that Pa(n) was clearly weak.

But the general point is made that, in the B1 series at least, we can perturb the system by a perturbation f at time T(n) and that this will appear in the bubble PaPrfFuf(n-) as Fuf(n-). One's first reaction is that in a normal block time B series, this would be expected as that is how mathematics works. We might take the view that it could hardly be any other way anyway, and that toy models should also wrap up quantum and chaos effects in the same kind of system.

But this is a B1 series in the MBI . And the existence of the bubble PaPrfFuf(n-) implies that at time T(n-) we already have in our system enough information to write down (or if you like in folk philosophy terms 'forsee') something concerning the future. And we can use methods like those, for example, of Hannon and Ruth (1997) to actually mathematically represent the system at time T(n-) and to include the future of that system at T(n).

So now we have to ask what PaPrfFuf(n-) is in real terms. Well one representation might be a person in a particular psychological state. For example the dream state in Stickgold's experiment seems to represent Paf2Prf2Fu?(n) where f2 is a perturbation in the past (in Stickgold's case, the playing of Tetris), mirrored in a present dream state Prf2(n) (where Tetris is presumably dreamt about), in a simple situation where future involvement is not concerned.

So the equivalent representation of PaPrfFuf(n-) is the dream of a future perturbation, perhaps the playing

of a game of Tetris in the future. All this does not prove the matter but it makes it clear that it can be written down mathematically using say the methods of Hannon and Ruth (1997). So perhaps the big question is: how reliable and consistent can such experiments be made ?

The work of Jones and Pashler (2007) suggests that prediction is never superior to retrodiction, even when subjects are forewarned of a forward-directional test. Only 217 and 353 subjects were used in their two experiments and of course the test was carried out subsequent to all the images to recall being memorised. It has been suggested that prediction may be an organizing principle of the mind and/or the neocortex, with cognitive machinery specifically engineered to detect forward-looking temporal relationships, rather than merely associating temporally contiguous events. There are not many tests for this idea, other than Jones (2007). The fact that Jones's work seemed to show no evidence of temporal asymmetry tends to bode well for the more advanced cases we consider in the present paper.

Factors taken into account in experiment planning. These include the idea suggested by Montague, Hyman, and Cohen (2004), it may be that events as reward or punishment cause prediction-focussed mechanisms to become active, whereas affect events like those used in Jones (2007) do not. The common observation that people are better at reciting the alphabet forward than backward also reflects the existence of inherently directional motor plans. A temporal asymmetry confined to sequential motor plans that have been repeatedly performed is quite different from an overall specialization of the memory system for prediction, however, although it could point to prediction improvement methods.

Freewill, intentionality (Malle (2001,2004) and such ideas as free will illusionism (Nadelhoffer, Feltz, (2007) may be the subject matter of further discussion and also they could have an obvious role in future experiment design.

Reverse Stickgold effect experiments

We did several studies. Here are two of them:

(1) This was essentially a repetition of the Stickgold experiment using 8 of our own subjects but recording dreams on evenings 7 days before and 7 days after, the Tetris plays.

The dreams were recorded by the subjects themselves, in English. The subjects also filled in a brief questionnaire as to dreaming habits. The subjects were from 6 to 15 years of age. Their mother tongues were Marathi and Hindi, but all could write and speak fluent English, as they were students at a local school where English was taught as a first language. A primary reason for their learning of English was allow personal advancement in whatever sphere of life they were later to lead. Their level of English presentation and expression was thus of a higher standard than would be the case in the average UK school for children of the age range.

Subjects were not told why or how the experiment was being carried out. The Tetris console was simply supplied to them in the middle of the testing session, when they were preoccupied with school, their hobbies and other such things. The subjects had just been asked to record dreams for a fortnight and, in mid session, were given the use of a Tetris gameboard and told to play Tetris a lot over a brief mid session period.

Briefly, the results were that for the 8 subjects there were 10 dreams of a probable Tetris type before play and 6 such dreams after play. Of these dreams, there were 4 very Tetris like dreams before play and none after play. These dreams averaged over the subjects, and there were no notable peak scores. One subject reported no dreams at all after play and one reported no dreams during the entire session.

(2) In this experiment, another group of subjects gave detailed answers to a dream questionnaire. Incidentally, the contention of Schwitzgebel (2006, 2009) that few people dream only in black and white was true for all our subjects. No test subject said that they dreamt solely in black and white. We used 13 subjects, aged between 8 and 15. The mother tongue of all these subjects was Marathi, but they all spoke good Hindi and reasonably fluent English as well. Detailed dream results were collected for four days

before, and four days after the mid session day. Details were taken down carefully by an experienced and quadrilingual test assessor over a period of over 10 days and for many hours per subject.

I do not at this point propose to give a quantitative assessment of the results but I bear in mind Stickgold's apparent contention that form rather than specific substance is what is best measured. i.e. in his Tetris and Alpine Skier experiments he was looking generally in the first case for activities which had the same qualities as Tetris and Alpine Skier. Thus in the case of Tetris he might have considered simply pieces moving in the air or at a pinch even raindrops or such like of an appropriate design or pattern. In the case of Alpine Skier he seems to have been looking for the visceral effect of someone actually skiing, or perhaps one of the more advanced multicolored Virtual Reality ski or switchback games now to be found at the better grade of amusement parks. Specifically I saw an excellent such VR game at the seaside in Blackpool, England some years ago. Such games are roughly like the switchback equivalent of a Link Trainer for pilots, and ambitious home construction details are available on many websites (Wikipedia, 2008)   There is clearly scope for more ambitious experiments in this regard but the time and effort involved will mean that careful advance experiment planning, relatively speaking as detailed, thought out, and meticulous as the Titchener school had expected to realise, is likely to be required.

At the midsession period, Tetris was not played but a small gift given to each child, of a kind they might like. Examples are a remote control toy car and a remote control toy helicopter. Scoring was based on dreams about the chosen object, i.e. car, helicopter and so on. They were not told before the test what they were getting as a gift. This was a relatively poor area and the subjects rarely received gifts, in fact some had never had any gifts before.

Be all that as it may, on the broad criterion above, which counted some cases of running in motor traffic as amounting to a dream of a car, and so on, the score was 10 subjects having prior (in folk philosophy perhaps precognitive) dreams and 9 having subsequent dreams. One subject claimed to have had only one dream during the entire period and one subject could only recall a vague prior dream. Now this is an extremely good prior score !

On a more narrow criterion, where only dreams specifically about an object exactly the same as the chosen object were included, the prior score was again high, being 6 prior with 7 subsequent dreams. The total number of all dreams per subject recorded was not high, being on average 2 or 3 before and 1 or 2 subsequently. The criterion here was that if they got a toy car (for example), a positive result would be if they dreamt about a car. One subject's prior dream was not only about a car, but he specifically dreamt the correct color which he mentioned without prompting, being the only subject to mention the relevant color (yellow) of the significant object in the dream series.

Now these subjects were all impartially and individually quizzed and questioned over a period of time, without any leading of them in a particular direction. But of course we cannot yet draw too many conclusions, nor determine whether we will always get the same result. One interesting problem (Haidt, 1993) concerns the idea of quizzing subjects about their views on a story in which a person has a pet dog, which unexpectedly dies, probably by accident. The dog is then eaten by its owner. Most people react that such a thing seems to be quite disgusting and gross, given the particular tale, and the relatively limited questionnaire and possible replies allowed, but in some ways it is hard to understand why it should be disgusting and maybe further experiments would clarify the situation. What I am trying to say is that these projects are often hard to understand and are not basically necessarily having a simple and clearcut follow up.

There is probably no very simple external situation either. The subjects' main interest tended to be not in (cars or whatever the gift was) but in sports and football. They did not know what the gift was, and whilst like any small child they liked presents, there was no special liking for motor vehicles, the closest connection being perhaps that one child's father was a rickshaw driver. The subjects had no known motive to 'cheat' or to make wild guesses at what they might have dreamt, or to invent dreams. Of course, mirroring the Tetris experiment, the idea was that the subjects should play a lot with the present voluntarily when they received it. They indeed did so, so at that level the technique used was cheap, modest, but apparently adequate to get a preliminary result.

Possibilities for further improvement in performance

The use of a very large number of experimental subjects of differing backgrounds and personality types could be one step forward. Another step could be the use of virtual reality apparatus during the experiment as mentioned earlier in this paper.

The use of email experiments and some form of content analysis as in Domhoff (2002, 2003) could also lead to more results though such methods become very mechanical sometimes and important detail is likely to be lost.

On that latter theme, epidemic tracking via Google (2008) is by now a commonly used method and with some variations epidemic tracking might be usable for this work. And then of course there is Google Trends, another powerful tool. Careful use of these and similar techniques could eventually be incorporated in or even replace the humble questionnaires. Less conventional internet approaches to detection as in FindTimeTravel.com have not succeeded to date.

Vul (2008) appears to take the view that cognition may be described as statistical inference, and points out that averaging reasonable guesses is better than having only one try - a result which seems to hold for one person as well as for a statistically designed goup. There are several reasons why this may be so, including the idea that the brain is continually generating hypotheses and checking them against reality. Such methods may be considered in a brain model under development. and indeed were implied in one or two earlier attempts to create a model (Yates, 2008).

Philosophical Comment

Philosophically, we are left with the interesting speculation that, using reasonable present day B-series only physics, from the work of Watanabe (1955) right up to the present day (e.g., (Gott, 1997) time travel to the past from the future as well as from the past to the future could become possible. In Gott's example, this form of time travel would be subsequent to the discovery of the first time machine. How this would apply in the case of effects relating to the reverse Stickgold effect, which we may be demonstrating in the present work, still may need to be determined. But clearly the physics might well force that Gott's condition above to apply, and we certainly cannot assume otherwise without good reason. Information theory might seem to make the restriction apply to retain consistency with current theoretical physics. But for the record, my own first patent (Yates, 1980) of time travel was made public in Patent GB2051465A during 1971 to 1979. There are plenty of potential paradoxes here for philosophers, and in my opinion, especially experimental philosophers.

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