DO OUT-OF-BODY EXPERIENTS HAVE BETTER VISUAL IMAGERY SKILLS THAN NON-EXPERIENTS?

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INTRODUCTION

According to Blackmore (1984) at least two things are needed for an OBE to occur: the failure of the somatosensory input-controlled model, and the substitution of an imagery-based one built-up from memory. Therefore, for Blackmore the OBE represents an attempt by the brain to re-establish a model of the self within the environment. The 'bird's-eye' point-of-view commonly reported by out-of-body experients (OBErs) is said by Blackmore to be due to the economical way in which environmental information is stored in and recalled in memory. The required incapacitation of the somatosensory-based input model leads Blackmore to argue that her theory explains why the OBE is frequently occasioned by such experiences as sensory deprivation, relaxation, illness, and certain drug use.

Blackmore suggests that if OBEs are in part an imaginal experience, then OBErs might be expected to have better visual imagery skills than non-OBErs. This contrasts with Irwin's dissociational theory, in which he argues that only a basic visual-spatial skill is required (in conjunction with other factors) for an OBE to occur. However, the research on this issue provides a mixed picture (Alvarado, 2000). Precisely which types of visual imagery skills OBErs might be expected to perform better on has not been clear. Irwin (1980) found no evidence to suggest that OBErs were any more habitual 'visualizers' or 'imagers' than the normal population. OBErs also scored lower than the norms for that group would predict on a questionnaire assessing vividness of visual imagery. Blackmore (1983a) found no differences between OBErs and non-OBErs on a vividness of imagery scale, and no differences between a second OBE and non-OBE sample on Gordon's (1949) Control of Imagery Questionnaire. She also found no differences between OBErs and non-OBErs when combining the scores of two questionnaire items assessing vividness of visual imagery, and concluded that "in general vividness of imagery does not seem to be a good predictor of the people who have these [OBE] experiences" (p.242).

Some supporting evidence for better visual imagery in OBErs is available. Alvarado and Zingrone (1994) did find that vividness of mental imagery was positively correlated with the OBE. Cook and Irwin (1983) found that OBErs were better at judging how an object would appear from different perspectives, but found no relationship between having an OBE and performance on the Necker Cube Fluctuation Test of imagery.

A finding by Blackmore (1983b) that OBErs report more hypnagogic imagery than non OBErs is sometimes cited as evidence for better imagery skills in OBErs. However the question used to assess this ('Have you ever experienced very vivid and realistic images just before going to sleep?') addresses experiences rather than measuring any specific imagery skill. It also presents problems of interpretation as many people who have an OBE might equate that experience with the one posed in the question. Both Irwin (1986) and Blackmore (1987) have found that people who dream as though they were spectators have more OBEs though there were no differences in the waking use of different viewpoints.

Perhaps the strongest evidence for better visual imagery skills in OBErs comes form Blackmore (1983a, 1987), who asked OBErs and non-OBErs to imagine familiar scenes and try to switch their viewpoint to other and more unfamiliar viewpoints of the same scene. OBErs were (self-reported to be) better able to switch viewpoints in imaginary scenes, although they did not remember scenes any more

frequently from above than at eye-level. However, it is not known if this self-reported ability is indicative of actual ability or reflective of a cognitive bias in OBEs to simply report the task to be easier than non-OBEs.

In a precursor to the present study, Murray, Fox and Wilde (2006) explored the relationship between paranormal belief and performance on visual imagery measures and tasks. They pointed out that OBEs tend to score higher on measures of paranormal belief, which in turn has been found in the research literature to be related to a number of cognitive distortions. In Murray et al's study involving a student sample of predominantly non-OBEs a positive correlation between self-reported ability and performance on a bird's eye visual imagery computer task was found. However, paranormal belief and performance on the bird's-eye view task were negatively correlated, indicating participants high in paranormal belief made more incorrect identifications.

Given that OBEs tend to score higher on measures of paranormal belief (around 50% higher that the mean for the whole sample in the present study — see Murray & Fox, 2004, 2005) this suggests that OBEs might perform worse than non-OBEs on the same task. Only 5 of the 46 participants in Murray et al.'s study reported a prior OBE, but an exploratory analysis of the data indicated a tendency for them to score higher in paranormal belief and lower on the computer bird's-eye view task than non-OBEs.

The design of the present study sets out to examine if OBEs performed better on a computer-administered visual imagery task than non-OBEs, and to examine the relationship between self-reports of imaginal visual imagery (which are not open to verifiable observation by the researcher) and performance on a computer-administered visual imagery task. It was hypothesised that, for the whole sample, there would be a (significant) correlation between self-reported ability and performance on the computer task. If a positive relationship was found this would seemingly give support to Blackmore's (1984, 1987) hypothesis of better visual imagery skills in OBEs. However, based upon the body of literature on the relationship between paranormal belief and cognitive styles, and the higher levels of paranormal belief characteristic of OBEs, it was further hypothesised that OBEs would perform (significantly) poorer on all computer task measures.

METHODS

Design

This study employs a between subjects design. Participants who reported and who did not report having had an OBE were compared on Blackmore's Imagination Task (1987), the Space Relations Test, the Vividness of Visual Imagery Scale, the Belief in the Paranormal Scale, and performance on a visual imagery computer task.

Participants

Participants were recruited via two methods: 1) From a list of people who had been participants in previous OBE studies and who have indicated they would be interested in taking part in further research; and 2) via posters and advertisements on email distribution lists at Manchester and Liverpool Hope Universities inviting them to take part in a study of visual imagery and paranormal belief. A total of 33 people took part in the study (10 OBEs, 23 non-OBEs, with a mean age of 25.1, SD = 10.1) which took approximately 45 minutes.

Materials

Blackmore's Imagination Task: This scale assesses (1) the habitual visual recall of familiar environments and (2) the ability of participants to switch imaginary viewpoints within the scenes recalled. The participant is asked to recall 6 familiar environments (e.g. their bedroom, the last time they were at the seaside) and for each environment is asked whether they recall the scene from "eye-level, as you would have seen it at the time of being there", "from above, as though watching yourself ", or "from some

other vantage point". They are then asked to imagine the same scene again and asked the following: "Try to imagine the [e.g. bedroom] again. Can you try and switch to a different viewpoint?" Next they are asked "How easily could you do this? (1) Easily, (2) able to do so, but with difficulty, or (3) could not do so?" Depending on the response chosen by the participant they are given a score of 2, 1 and 0 respectively. The range of possible scores on each sub-scale is 0-12.

Belief in the Paranormal Scale (BPS): The BPS is an 8-item measure designed to assess respondents' level of belief in paranormal phenomena developed by Musch and Ehrenberg (2002) based upon previous scales designed to assess paranormal belief (Brugger, 1991; Glickson, 1990). Responses are made to eight statements (e.g. "I remember an event that I can only explain as a case of telepathy") on a 6-point Likert-scale ('total disagreement' (1) to 'total agreement' (6)). The range of possible scores on the scale is 8-48.It was hypothesised that OBErs would score (significantly) higher in paranormal belief than non-OBErs.

2) The Vividness of Visual Imagery Questionnaire (VVIQ)

Marks (1973) VVIQ is a 32-item measure of manipulation of imagination and visual imagery skills. The respondent is asked to imagine four different scenarios; a relative or friend who they see regularly, a sunrise, a shop which they frequent often and a countryside scene. Each participant is asked to go through the four scenarios twice, the first time imagining the scenarios with their eyes open, and the second time with their eyes closed. In the present study we had participants complete all items first with eyes open and then the same scene with eyes closed. There are four questions per scenario. In each scenario the first question asks the participant to bring to mind the initial scene and later questions ask them to build upon this image using their imagination. The task is split into Part A (eyes open, 4 scenarios, 16 questions) and Part B (eyes closed, 4 scenarios, 16 questions). For each question, the participant is asked to rate the vividness of each image by marking a tick on 5-point scale: (1) Perfectly clear and as vivid as normal vision, (2) Clear and reasonably vivid, (3) Moderately clear and vivid, (4) Vague and dim, and (5) No image at all, you only "know" that you are thinking of an object. The possible range of scores for each part and for the whole task are; Part A (16-80), Part B (16-80), complete task (32-160).

The Space Relations Test (SRT) - taken from the Differential Aptitude Tests (DAT) battery

The SRT is a 60-item measure that tests the participant's ability to visualise a three-dimensional object from a two-dimensional pattern and to visualise how this object would look if rotated in space. It assesses the ability to "think in three dimensions." The test presents the participant with 60 patterns which can be folded up to make three-dimensional objects. Beside each pattern is a series of four three-dimensional figures, one of which represents the stimulus pattern when it is correctly folded up. Participants are asked to match the correct three-dimensional target figure with its corresponding stimulus pattern. Participants record their answers on a scorecard. A score of 1 is given for a correct choice and 0 for and incorrect choice, giving a possible range of scores from 0-60. (The Psychological Corporation, 1986). Blackmore (1983a) has previously found OBErs to score higher on the Space Relations test OBErs (mean = 46.2) than non-OBErs (mean = 41.3) but the difference was not significant.

Item for Assessing the Occurrence of Out-Of-Body Experiences: In order to ascertain whether participants had experienced an out-of-body experience, respondents were provided with the following statement from Palmer (1979) and asked to indicate 'yes' or 'no': "Have you ever had an experience in which you felt that 'you' were 'outside of' or 'away from' your physical body; that is, the feeling that your consciousness, mind, or centre of awareness was at a different place than your physical body? (If in doubt, please answer 'no')."

Computer visual imagery task: A computer software package (Carrera 3-D Basics) was used to construct two sets of stimuli images from galleries of backgrounds and other visual image elements (such as, bottles, planes, etc.). Two sets of images were produced using this method, an 'eye-level' set and a 'bird's-eye' level set. These images were imported into a computer program (reCOG) written for a previous similar study (Murray, Fox & Wilde, 2006) and has been upgraded for this study and is used to

present participants with stimuli images. The computer program was presented on an Apple Mac with a touchscreen. It was hypothesised that OBErs would perform (significantly lower) poorer on all computer task measures.

Stimuli

Two sets of images have been developed for this study. The eye-level set consisted of 20 sets of 4 (80 in total) colour images populated with different objects (e.g. bottles). The bird's-eye level set consisted of 20 sets of 8 (160 in total) colour images.

Procedure

Participants first completed Blackmore's Imagination Task, followed by the Vividness of Visual Imagery Test, The Space Relations Test, the Belief in the Paranormal Scale, and Palmer's item for assessing the occurrence of out-of-body experiences. Following the questionnaire, participants were asked to complete the computer visual imagery task. A set of standardised instructions were administered as follows: "During the experiment you will be shown a series of images on the computer screen. After each image is shown the computer will present you with a choice of four possible corresponding images. Only one of each four options will be the correct corresponding image. I would like you to pick the image which you think is the correct corresponding image as quickly as possible. Do you have any questions?"

The participant was then presented with one of the eye level target images described above on a computer screen. Each target image was first presented from an eye-level perspective for a period of 10 seconds. Following the presentation of each image, the participant was then presented with a choice of four images of the same scene but shown from either an 'eye-level' perspective or a 'birds' eye level' perspective. The four images comprised of one correct target image and 3 other images of similar scenes but with the object elements in the scene rotated by various degrees so as not to be identical to the target image. The participant had five seconds to make their choice. After five seconds, if no choice was made then the computer counted this as a 'miss' and moved onto the next trial. For the 'eye-level' image sets the participant was required to complete a simple recognition task. For the 'bird's-eye level' picture sets this involved a greater degree of visual imagery manipulation. The computer chose the images at random from a pool of images. One target image presentation and the presentation of its corresponding target/choice images represented 1 trial. The participant was asked to first complete a short practice run of 3 trials (not analysed) before completing the main task, which was 40 trials in total.

RESULTS

Participants' mean scores (with standard deviations) for each study measure are shown in Table 1, along with the mean ranks and results of Mann-Whitney U tests. An exploratory analysis of the group means shows us that the OBE group tended to score higher than non-OBErs on Part 1 (2.6 compared to 2.4) and Part 2 of Blackmore's Imagination Task (9.7 compared to 8.7), and Part A (eyes closed) of the VVIQ (39.9 compared to 37.8). When comparing the group means on observable performance of visual imagery ability a different picture emerges. OBErs score marginally more (40) then non-OBErs (39.8) on the SRT. When tested using the reCOG computer task; OBErs scored lower than non-OBErs (8.8 compared with 9.9).

However, when inferential statistical analysis is conducted, OBErs scored lower than non-OBErs (indicative of better self-reported visual imagery with the eyes open) on Part A of the Vividness of Visual Imagery Questionnaire ($U=61.5$, $p= .018$) and higher on the Belief in the Paranormal Scale ($U=111.0$, $p= .006$). There were no other significant differences.

Table 1. Differences Between OBErs and Non-OBErs on the Study Measures

Measure	OBErs (n=10)		Non-OBErs (n=23)		P Value
	Mean (SD)	Mean Rank	Mean (SD)	Mean Rank	
Blackmore's Imagination Task 1	2.6 (2.0)	17.8	2.4 (2.2)	16.6	.380
Blackmore's Imagination Task 2	9.7 (1.8)	20.5	8.7 (1.9)	15.5	.08
Vividness of Visual Imagery Test A	36.1 (7.4)	11.6	42.6 (8.3)	19.3	.018
Vividness of Visual Imagery Test B	39.9 (17.8)	17.4	37.8 (12.4)	16.8	.443
The Space Relations Test	40 (11.5)	16.1	39.8 (12.3)	17.4	.375
Belief in the Paranormal Scale	28.3 (11.2)	23.25	18.6 (6.6)	14.3	.006
Computer Task – Eye-Level Set No. Correct	19.4 (.84)	16.0	19.6 (.49)	17.4	.352
Computer Task – Eye-Level Set Reaction Time	1.6 (.25)	19.6	1.5 (.59)	15.9	.162
Computer Task – OBE Set No. Correct	8.8 (2.6)	14.6	9.9 (3.7)	18.0	.183
Computer Task – OBE Set	3.2 (.45)	16.3	3.2 (.52)	17.3	.401

A summary of the correlations between the study's measures are shown in Table 2. Significant correlations were found between Part 2 of Blackmore's Imagination Task and Part B (eyes closed) of the Vividness of Visual Imagery Scale (r = .374, p < 0.05, 2-tailed), and between the number of correct responses made on the Space Relations Test and the OBE set of the Computer Task (r = .454, p < .01, 2-tailed). There were no significant correlations between Belief in the paranormal and performance on any of the study measures.

Table 2. A summary of Spearman Correlations between the Study Measures

	Measure	1	2	3	4	5	6	7	8	9	10
1	Blackmore's Imagination Task 1	-	.086	.009	-.085	-.157	-.004	.008	.123	.013	.041
2	Blackmore's Imagination Task 2	.086	-	-.035	.374*	-.091	.132	-.283	.160	.102	-.105
3	Vividness of Visual Imagery Test A	.009	-.035	-	.528**	.115	-.040	-.146	-.054	.068	-.049
4	Vividness of Visual Imagery Test B	-.085	.374*	.528**	-	.172	.076	-.132	-.114	.104	-.235
5	The Space Relations Test	-.157	-.091	.115	.172	-	-.230	.008	-.057	.454**	-.049
6	Belief in the Paranormal Scale	-.004	.132	-.040	.076	-.230	-	.014	.246	-.251	.107
7	Computer Task – Eye-Level Set No. Correct	.008	-.283	-.146	-.132	.008	.014	-	-.408*	-.037	.014
8	Computer Task – Eye-Level Set Reaction Time	.123	.160	-.054	-.114	-.057	.246	-.408*	-	-.261	.406*
9	Computer Task – OBE Set No. Correct	.013	.102	.068	.104	.454**	-.251	-.037	-.261	-	-.467**
10	Computer Task – OBE Set	.041	-.105	-.049	-.235	-.049	.107	.014	.406*	-.467**	-

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

DISCUSSION

This study aimed to find out if OBErs had better visual imagery skills than non-OBErs by comparing self-report measures of visual imagery skills, namely Blackmore's Imagination Task and the Vividness of Visual Imagery Questionnaire (VVIQ), with more objective tests of visual imagery ability, the Spatial Relations Test (SRT) and the reCOG computer programme. The hypothesis was that OBErs would score higher on the self-report measures and lower on the objective tests. The only significant result found regarding difference in performance between self-report and objective measures was that OBErs scored lower than non-OBErs on Part A of the VVIQ (the eyes open task). This is a subjective report of how vivid a person's visual imagery of recalled scenes, objects and people are to them.

The mean scores which OBErs and non-OBErs obtained in the present study on Part 2 of Blackmore's Imagination Task (9.7 compared to 8.7) are comparable to those of Murray et al.'s smaller OBE sample (9.8 compared to 9.12) and the statistically different scores obtained by Blackmore herself (1987) with a larger sample (10 compared to 9). When comparing the group means on observable performance of visual imagery ability on the OBE set of the reCOG computer task; OBErs scored lower than non-OBErs (8.8 compared with 9.9) (as they did in Murray et al's study). However, against prediction, there was not a negative relationship between Paranormal Belief and performance on the OBE reCOG computer task.

Whilst nothing conclusive can be deduced from this exploratory analysis, the evidence suggests that when self-reporting visual imagery skills, OBErs are prone to overestimate their ability. Yet when put to the test using objective measures, they actually perform worse than non-OBErs.

The main limitation to note about this study is that it was conducted with a small OBE sample, which limits us to drawing any final conclusions regarding the study hypotheses. If these findings were repeated with a larger OBE sample this would add support to Irwin's claim that only a basic visual-spatial skill is required for a person to have an OBE, rather than supporting Blackmore's claim of more developed visual skills in OBErs.

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