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The Sense of Being Stared At

Part 1: Is it Real or Illusory?

I: The Sense of Being Stared At in People and Other Animals

Most people have had the experience of turning round feeling that someone is looking at them from behind, and finding that this is the case. Most people have also had the converse experience. They can sometimes make people turn around by staring at them. In surveys in Europe and North America, between 70% and 97% of the people questioned said they had had personal experiences of these kinds (Braud *et al*., 1990; Sheldrake, 1994; Cottrell *et al*., 1996).

The sense of being stared at is often alluded to in fiction, as in stories or novels by Tolstoy, Dostoyevsky, Anatole France, Victor Hugo, Aldous Huxley, D.H. Lawrence, John Cowper Powys, Thomas Mann, J.B. Priestley and many other writers (Poortman, 1959). Here is an example from Sir Arthur Conan Doyle, the creator of Sherlock Holmes:

> The man interests me as a psychological study. At breakfast this morning I suddenly had that vague feeling of uneasiness which overcomes some people when closely stared at, and, quickly looking up, I met his eyes bent upon me with an intensity which amounted to ferocity, though their expression instantly softened as he made some conventional remark upon the weather (Conan Doyle, 1884).

In questionnaire surveys about the details of these experiences I carried in Britain, Sweden and the United States, more women (81%) than men (74%) said they had felt they were being stared at. This experience occurred most commonly with strangers in public places, such as streets and bars. Also, significantly more women (88%) than men (71%) said they had found they could stare at others and make them turn around (Sheldrake, 2003a).

What emotions were involved when people turned round? For both men and women, curiosity was the most frequent reason for staring at others when they turned around, followed by a desire to attract the other person's attention. Less frequently, the motives were sexual attraction, or anger. Some people found that looking with distress, or affection, or good wishes could cause a person to turn

(Sheldrake, 2003a). In short, this sense seems to be associated with a wide range of motives and emotions.

Most people take these experiences for granted and pay little attention to them. But some people observe others for a living. The sense of being stared at is well known to many police officers, surveillance personnel and soldiers, as I have found through an extensive series of interviews. Most were convinced of the reality of this sense, and told stories about times when people they were watching seemed to know they were being observed, however well the observers were hidden (Sheldrake, 2003a). When detectives are trained to follow people, they are told not to stare at their backs any more than necessary, because otherwise the person might turn around, catch their eye and blow their cover.

According to experienced detectives, this sense also seems to work at a distance when the observers look through binoculars. Several celebrity photographers and army snipers told me that they were convinced that some people could tell when they were being looked at through telephoto lenses or telescopic sights.

In some of the oriental martial arts, students are trained to increase their sensitivity to being looked at from behind (Sheldrake, 2003a).

Many species of non-human animals also seem able to detect looks. Some pet owners claim that they can wake their sleeping dogs or cats by staring at them. Some hunters and wildlife photographers are convinced that animals can detect their gaze even when they are hidden and looking at animals through telescopic lenses or sights (Sheldrake, 2003a).

Conversely, some photographers and hunters say they have felt when they were being looked at by wild animals (Corbett, 1986; Sheldrake, 2003a). The early twentieth-century naturalist William Long described how, when sitting in the woods alone as a boy,

> I often found within myself an impression which I expressed in the words, 'Something is watching you.' Again and again, when nothing stirred in my sight, that curious warning would come; and almost invariably, on looking around, I would find some bird or fox or squirrel which had probably caught a slight motion of my head and had halted his roaming to creep near and watch me inquisitively (Long, 1919).

In a survey in Ohio, Gerald Winer and his colleagues at Ohio State University found that many people say they have sensed the looks of animals. In the Ohio survey, 34% of adults and 41% of children said that they had felt when animals were looking at them. About half the respondents believed that animals could feel their looks, even when the animals could not see their eyes (Cottrell, Winer and Smith, 1996).

If the sense of being stared at really exists, then it must have been subject to evolution by natural selection. How might it have evolved?

The most obvious possibility is that it evolved in the context of predator–prey relations. Prey animals that could detect when predators were looking at them would probably stand a better chance of surviving than those that could not (Sheldrake, 1999).

In spite of the widespread familiarity of this sense, until the late 1980s there was very little research on this subject, even by parapsychologists. I have been

able to find only five reports of experimental investigations between 1885 and 1985, including two in unpublished student theses. The three most recent gave positive, statistically significant results.

Since the late 1980s, there has been an increase in research activity, which I review below. Most experiments have given positive, statistically significant results supporting the reality of this sense.

The main reason for the persistent neglect of this phenomenon has nothing to do with evidence or experience. It flows from a belief that the sense of being stared at is impossible.

II: Theoretical Reasons for Scepticism

There are two main reasons for the conventional dismissal of the sense of being stared at. First, it is classified as 'paranormal'. It is normal in the sense that most people have experienced it for themselves. But it falls foul of the general taboo against psychic phenomena. For generations, educated people have dismissed it as a superstition.

Second, it conflicts with the orthodox scientific theory of vision, first published in 1604 by Johannes Kepler (1571–1630), best known for his discoveries in astronomy. Kepler's was an 'intromission' theory, according to which light came into the eyes, but nothing went out of them. Vision was not in the outer world where it seemed to be, but inside the head.

Kepler's theory of the retinal image seemed to resolve a debate about the nature of vision that had been going on for two thousand years, and it was one of the first great triumphs of modern science. But his theory raised a problem that Kepler admitted he could not solve, and which is still unsolved today. The theory explained how images form on retinas, but it did not explain how we actually see. We do not see two tiny inverted images of the external world on our retinas. We see the world outside us, right way up, and single, not double. The only way Kepler could deal with this problem was by excluding it from optics (Lindberg, 1981). Once an object's images had formed on the retinas, it was someone else's business to explain how we actually see.

The mystery was relegated to the interior of the brain, where it has haunted science ever since. Ironically, the intromission theory left vision unexplained.

III: Scientific Investigations up to 1985

On Kepler's theory, the sense of being stared at ought not to exist. Hence it has generally been ignored by scientifically educated people, or dismissed as a superstition.

The first scientific paper on the sense of being stared at was published in *Science* in 1898 by E.B. Titchener, one of the founding fathers of experimental psychology in the United States. He found that many of his students at Cornell University firmly believed they could feel when they were being stared at from behind, or make others turn round by gazing at the backs of their necks. He was

certain no mysterious influences could possibly be involved and proposed a 'rational explanation': people tend to turn round anyway; if by chance they see someone looking at them they remember it; if they do not, they forget it. Also, by turning round, their movement might attract the attention of someone behind them, so the two people might catch each other's eyes.

Titchener reported that he had carried out experiments on students' ability to detect stares and claimed they invariably gave 'a negative result; in other words the interpretation offered has been confirmed'. He published neither experimental details nor data. But he felt the need to justify doing the tests in the first place:

> If the scientific reader object that this result might have been foreseen, and that the experiments were, therefore, a waste of time, I can only reply that they seem to me to have their justification in the breaking-down of a superstition which has deep and widespread roots in the popular consciousness. No scientifically-minded psychologist believes in telepathy. At the same time, the disproof of it in a particular case may start a student upon the straight scientific path, and the time spent may thus be repaid to science a hundredfold.

Titchener's paper was very influential, and is still cited by sceptics today (e.g. Marks, 2003).

Another early American psychologist, J.E. Coover, was equally sceptical, but he was the first to publish methods and data (Coover, 1913). His experiments were carried out with his students at Stanford University. People worked in pairs; one was the subject, the other the looker. The subject sat with his back to the looker, who in a randomized series of trials either looked or did not look. In each trial, the subject guessed whether or not he was being looked at.

Coover claimed his results showed there was no significant ability to detect looks, and concluded that popular belief in the sense of being stared at was 'groundless'. By reinforcing Titchener's negative conclusions, Coover's work seemed to put an end to the matter from a scientific point of view, and apparently there were no more investigations in the English-speaking world for decades.

The next report in the scientific literature was in 1939, by J.J. Poortman, in Dutch. He published a summary of his paper in English twenty years later.

Poortman became interested in the subject as a result of his own experiences of being stared at, and through finding that many other people seemed to have experienced it too. Using a modified version of Coover's method, he carried out a series of trials with himself as the subject and a woman friend as the looker. She was a City Councillor in The Hague, and was accustomed to attracting the attention of other council members by the power of her gaze. Poortman was right significantly more often than wrong in guessing when she was looking at him (Poortman, 1959; statistical analysis in Sheldrake, 1994, ch. 4).

After Poortman's experiment, there was apparently no further research on this subject until 1978, when Donald Peterson carried out an experiment as a student project at the University of Edinburgh. The looker sat in a closed booth separated from the subject by a one-way mirror, and was invisible to the subject. The results were positive and statistically significant.

A few years later, Linda Williams a student at the University of Adelaide, Australia found a statistically significant effect when a person in a different room looked at the subject through closed circuit television (Williams, 1983).

IV: Recent Experiments with Direct Looking

Since the late 1980s, there has been an increase in research on the sense of being stared at, following two parallel approaches.

The first kind of experiment involves direct looking, using versions of the Coover procedure. People work in pairs, with a subject and a looker. In a randomized series of trials the subjects sit with their backs to the lookers, who either stare at the back of the subjects' necks, or look away and think of something else. A mechanical signal marks the beginning of each trial. The subjects guess quickly, in less than 10 seconds, whether they are being looked at or not. Their guesses are either right or wrong, and are recorded immediately. A test session usually consists of 20 trials, and takes less than 10 minutes.

In the second kind of experiment, the looker and subject are in different rooms connected through closed circuit television (CCTV), as discussed in the following section.

Direct-looking tests are far easier to perform than CCTV trials, and have now been carried out with many thousands of participants, both adults and children. Many tests have been conducted in schools. This research has been popularized through *New Scientist* magazine, BBC TV and Discovery Channel TV, and test procedures have been published on these organizations' web sites, as well as on my own (www.sheldrake.org), enabling numerous people to participate in this research. At least 20 student projects in schools and universities have involved staring experiments; several have won prizes at science fairs. Altogether, there have been tens of thousands of trials (Sheldrake, 2003a).

The results are remarkably consistent. Typically, about 55% of the guesses are right, as opposed to 50% expected by chance. Repeated over tens of thousands of trials this result becomes astronomically significant statistically (Table 1).

An alternative way of analysing the results, suggested to me by Nicholas Humphrey, is to use a 'sign' test, which gives an equal weighting to each subject. Those who are more right than wrong have a positive (+) sign, and those who are more wrong than right a negative (–) sign. For this analysis, all those equally right and wrong are ignored. By chance, the number of people with positive and negative signs should be the same. In fact (Table 1), 853 people were positive and 466 negative, a result very significantly above chance ($p = 1x10^{-20}$).

In experiments in which the same subjects were tested repeatedly and given trial-by-trial feedback, there was a striking learning effect, with a significant ($p=0.003$) improvement in scores with practice (Colwell *et al.*, 2000). In a German school, with repeated testing, some 8 to 9 year-old children achieved accuracies as high as 90% (Sheldrake, 1998).

Year	Trials	Right	% right	N	+	–	p
1998	3,240	1,843	56.8	160	97	42	$3x10^{-6}$
1999	13,903	7,636	54.9	661	387	186	$1x10^{-15}$
2000	4,800	2,544	53.0	294	150	94	.0002
2001a	8,060	4,385	54.4	403	197	134	.0003
2002	800	441	55.5	40	22	10	.03
Total	30,803	16,849	54.7	1,558	853	466	$1x10^{-20}$

Table 1. Results of direct staring experiments, expressed both as percentages of correct guesses and in terms of signs. Subjects who were more right that wrong were scored +, those who were more wrong than right, –. The total number of subjects is shown in the column N. The p values refer to the probability using the chi-squared test), with the null hypothesis that the number of + and – signs are equal. The year column gives the dates of my papers in which the results were published; thus, for example, 2000 refers to Sheldrake (2000).

This staring effect seems to be widely replicable. The data in Table 1 include the results from all 21 experiments of my own, in 20 of which the outcome was positive. They also include the results from 37 independent investigations in schools and colleges. Thirty-six of these investigations showed a positive effect, but one did not. I was notified of all these 37 investigations in advance, and have included all the data from them.

Dozens of other investigators have also taken part in this research and sent me their results, and again the great majority showed a positive effect. But because I was not notified in advance that these tests were taking place, I do not know whether there was a reporting bias: people who obtained positive results might have sent their data to me, while some of those that did not might not have sent them. Hence I have excluded all unsolicited data from the summaries in Table 1 because of this possible bias. Had unsolicited results been included, the overall significance of the positive effect would have been considerably higher.

Although most tests have shown the staring effect to be replicable, a few have not. Most notably, in a student project in the Psychology Department of the University of Amsterdam, in one out of three experiments, the results were at chance; in the other two, more subjects scored positively than negatively, but this effect was not statistically significant (Lobach and Bierman, 2004). But in these tests there were several differences in method from most other studies. Perhaps most importantly, in other investigations the subjects were blindfolded, whereas in this university study, subjects had to look at a computer screen throughout the tests, and to enter their guesses on the computer, which could have been distracting. In one experiment, they were also asked to evaluate their response to fragments of music during the tests, which could have provided an additional distraction.

Some of the studies conducted by sceptics have given statistically significant positive results, but others have been at chance levels, as discussed below.

In a student project in Ireland, Susan and Jennifer Brodigan compared the results with pairs of twins as lookers and starers with the results from pairs of untwinned siblings and people who were unrelated. In these trials, the subjects

were blindfolded and were not given feedback. The pairs of twins scored significantly higher than untwinned siblings or unrelated people (Sheldrake, 2001a).

The NeMo experiment

The largest experiment ever conducted on the sense of being stared at began in 1995 at the NeMo Science Centre in Amsterdam. By 2002, over 18,700 looker-subject pairs had taken part, with positive results that were astronomically significant statistically ($p = 10^{-376}$, Sheldrake, 2003a).

In the NeMo Centre the test is presented as a question: 'Do you have eyes in the back of the head?' The experiment is computerized. The subject sits about two metres in front of the looker, with his or her back to the looker. For each trial the looker is instructed whether to look or not by a signal on the computer screen, in a random sequence provided by a random number program. The signal for the beginning of each trial is given by a 'trrrrrr' tone lasting seven seconds, and the end of which the subject know the trial has ended, and guesses out loud whether he or she was being looked at or not. The looker enters the guess into the computer. Depending on the number of correct or incorrect guesses, after a maximum of 29 trials, the computer announces whether the subject has 'eyes in the back of the head' or not. This test is popular with children and their families.

The NeMo test was developed by Diana Issidorides, a cognitive psychologist, and Jan van Bolhuis, a statistician at the Free University of Amsterdam. The inbuilt statistical program is designed in such a way that if people guess at random, 20% would be classified as having 'eyes in the back of their head'. Against this chance expectation of 20%, with data from 18,793 subjects, between 32 and 41%, depending on age and sex, had 'eyes in the back of their heads'. The most successful subjects were boys under the age of 9 (Sheldrake, 2003a).

These tests were unsupervised, and there is no guarantee that some people did not cheat. Because this possibility remains open, the results can only be taken as an indication that test would be well worth carrying out under more controlled conditions.

Online tests

A staring test has been running online on my web site (www.sheldrake.org) since October 2002. Participants work in pairs, as usual, and do 20 trials in a randomized sequence, provided by a standard randomization program. When all 20 trials are completed, the computer gives participants a summary of their results and all results are stored on a spreadsheet. By January 2005, 343 pairs had taken part. The overall success rate was 61%. By the sign method, 232 subjects scored above the chance level, and 70 below. These results were astronomically significant statistically. But again because the tests were unsupervised, there is no way of assessing their reliability. Nevertheless, this online method makes it very easy for anyone who anyone who wants to take part in this research to do so. Those who suspect others of cheating or being influenced by subtle sensory clues can carry out their own tests as rigorously as they like, or get their students to do them under supervised conditions.

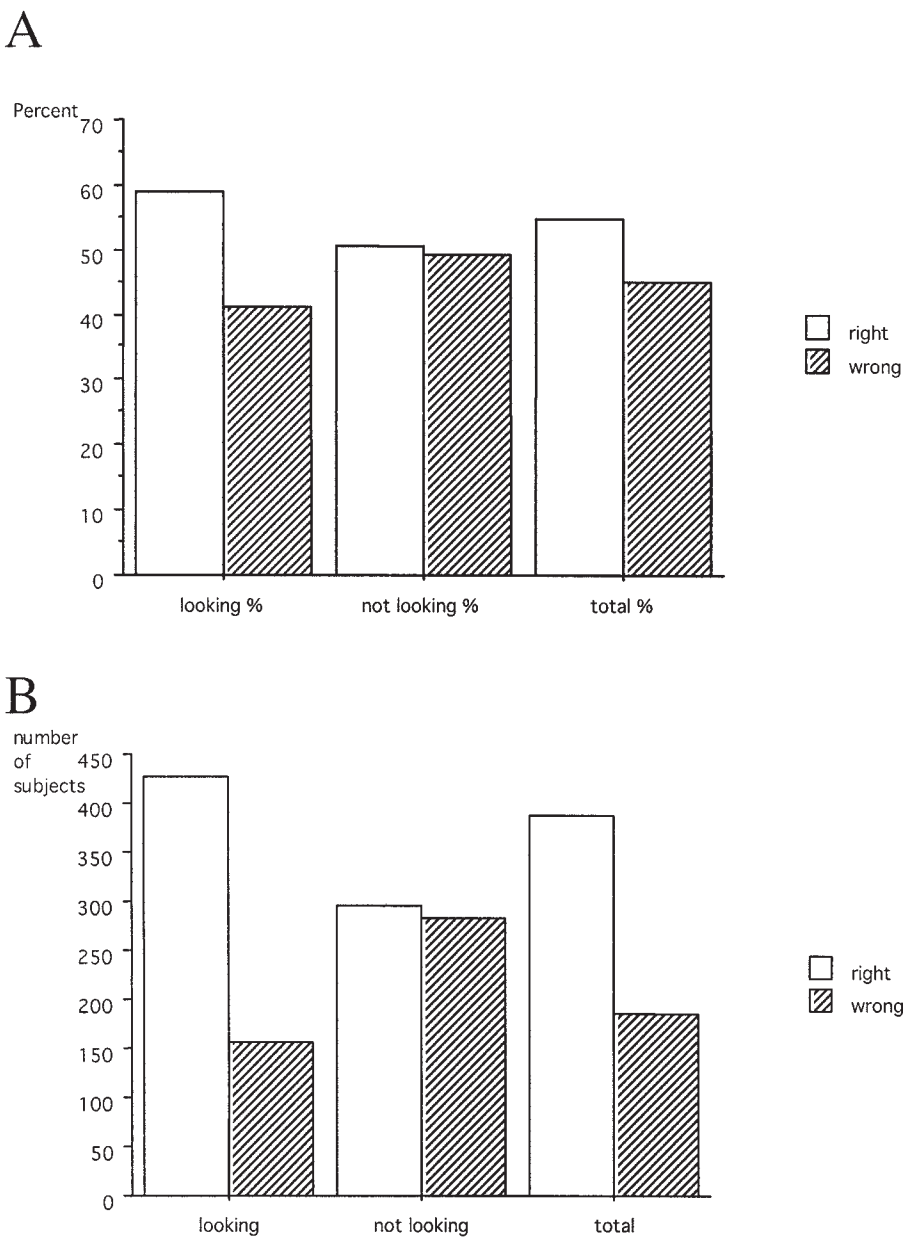

Figure 1. Combined results of experiments on the sense of being stared at carried out in Britain, Germany and the United States (data from Sheldrake, 1999, Table 5).

A (Above): The percentages of correct guesses in looking trials, not-looking trials and in total.

B (Below): The number of subjects who were more right than wrong compared with those who were more wrong than right in looking trials, not-looking trials and in total.

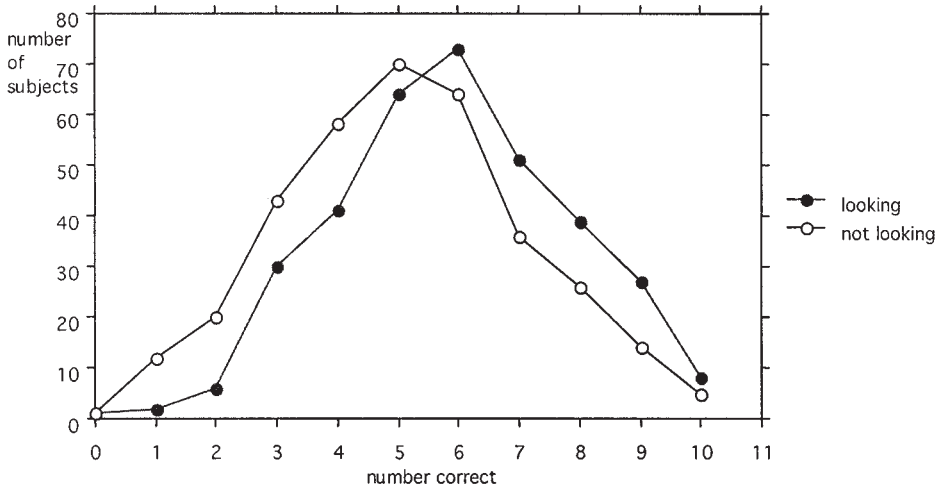

Figure 2. The distribution of scores in looking and not-looking trials in schools in Connecticut (Sheldrake, 1999).

The pattern of results

There is no doubt that most of these staring tests give positive scores. Could these be artifacts? I discuss this question below. But before doing so, it is important to consider a distinctive pattern of results that shows up again and again.

Typically, the percentage success rates in looking trials are above chance. In the not-looking trials they are at chance levels (Figure 1A).

This pattern shows up even more clearly when the data are analysed using the sign method (Figure 1B). Success in looking trials did not depend on a minority of especially sensitive subjects, but rather represents a general tendency for subjects to score better when they are being looked at than when they are not.

Another way of analysing the results points to the same conclusion. In the not-looking trials, more people scored 5 out of 10, than any other score, and this was the centre of a more or less normal distribution curve, as expected by chance alone (Figure 2). By contrast, in the looking trials, the entire distribution curve was shifted to the right, with its peak at a score of 6.

This pattern makes sense if people really do have a sense of being stared at from behind. The sense would operate when they are being stared at, giving positive scores in the looking trials. But in the control trials, no one is looking. The subjects are being asked to detect the *absence* of a stare, an unnatural request with no parallel in real-life conditions. Under these circumstances, subjects guess at random.

This characteristic pattern might imply that the results of the trials are not a result of cheating, subtle cues, implicit learning or errors in recording the data. These possible sources of error should have affected scores in *both* looking *and* not-looking trials, not just in looking trials.

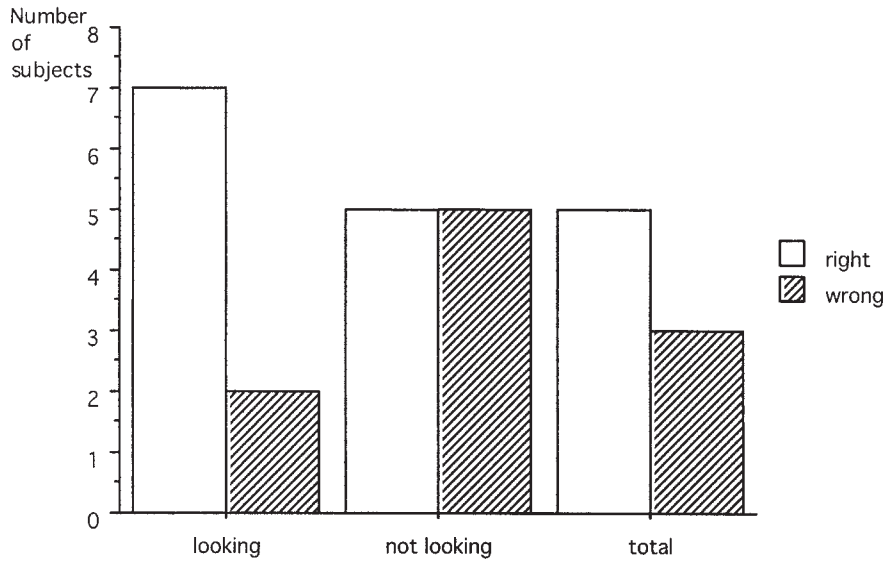

Figure 3. Results form the staring experiments of Coover (1913), showing the number of subjects who were more right than wrong compared with those who were more wrong than right.

However, as Schmidt (2001) has pointed out, there could be an alternative interpretation of this pattern. If subjects guess 'looking' more often than 'not looking', then by chance they will be more right than wrong in looking trials, and more wrong than right in not-looking trials. To take an extreme case, if a subject always said 'looking' she would be right in 100% of looking trials, and 0% in not-looking trials. The overall result would of course be at the chance level of 50%.

In a less extreme case, a 5% response bias in favour of saying 'looking' could give a pattern with 55% correct in looking trials and 45% in not-looking trials, again with a 50% overall.

Schmidt proposed that there was indeed an inbuilt response bias of 5% in favour of 'looking'. Hence by chance alone 55% of the guesses in looking trials and 45% of the guesses in not-looking trials would be correct. Now, if the subjects scored 5% above chance in *both* looking *and* not-looking trials, the overall result would be 60% correct in looking trials and 50% in not looking trials, with 55% success overall, as actually observed. Thus the characteristic pattern of results could be due to an underlying response bias of 5% in favour of guessing 'looking' together with a success rate 5% above chance in looking and not looking trials alike.

Both my own and Schmidt's interpretations fit the facts, and they cannot be distinguished from each other statistically (van Bolhuis, personal communication). However, Schmidt's interpretation depends on assuming that the response bias and success rate just happen to be the same, with the result that they cancel each other out in the not-looking trials. Schmidt also assumes that the response bias is the same in looking and not-looking trials. But this begs the question, because if the sense of being stared at is real, there will be a greater

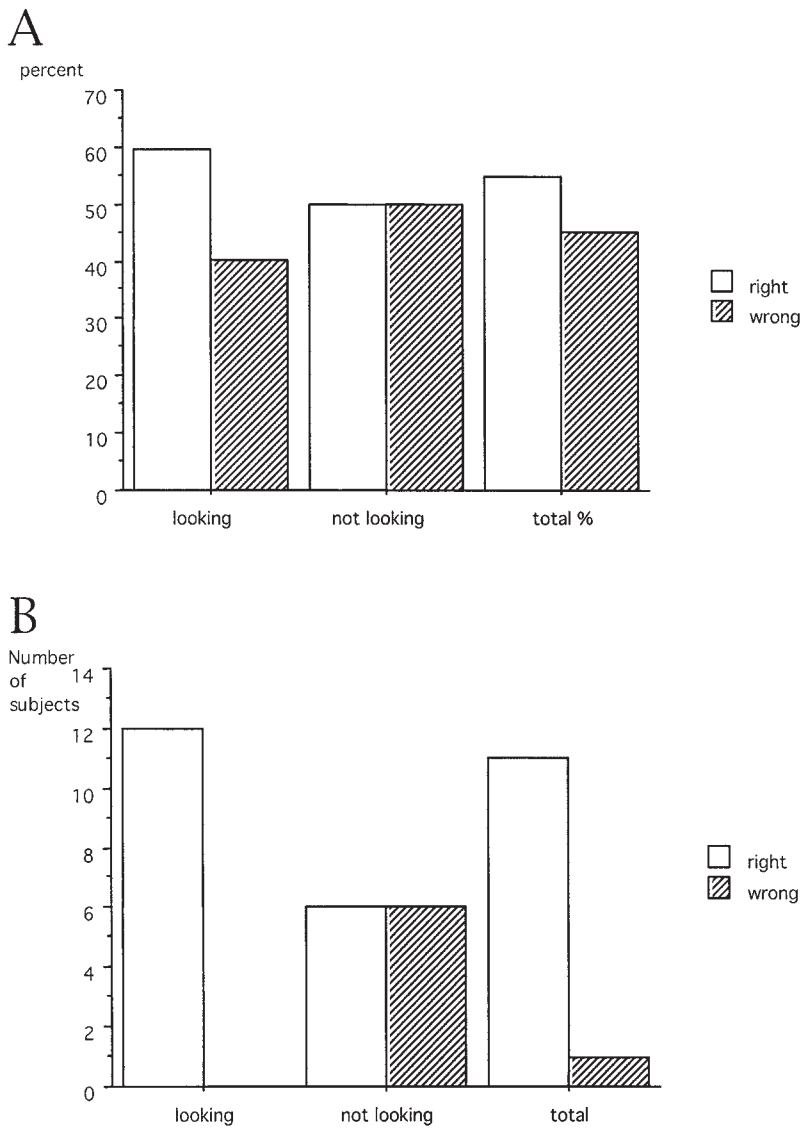

Figure 4. Results from the staring experiments of Colwell *et al.* plotted in the same way as in Figure 1. (Data from Table 1 of Colwell *et al.*, 2000, for trials in which subjects were given feedback.)

tendency for subjects to say they are being looked at when they really are, and so the 'response bias' will be greater in looking than in not-looking trials.

But however we choose to interpret it, this pattern of results is characteristic of direct-looking experiments. It even appears in the supposedly negative results of Coover (1913) when analysed by the sign method (Figure 3). This same pattern also appeared in an experiment that Colwell *et al.* (2000) carried out at Middlesex University, with the subjects and starers separated by a one-way mirror (Figure 4). A recent replication by Radin (2004) showed this same pattern again.

Possible artifacts

Perhaps one or more artifacts underlie these repeatable positive results. There are several possibilities:

1. *Subjects saw whether they were being stared at or not by peeping or peripheral vision*. This suggestion has been tested by blindfolding the subjects. Blindfolds made no significant difference (Sheldrake, 2001a). Also the positive results of Colwell *et al*. (2000) using a one-way mirror argue against this possibility (Figure 4).

2. *Subtle sensory cues*. When subjects and lookers were in the same room, perhaps the subjects could have heard sounds, picked up changes in infrared radiation or even detected different odours when the looker was staring or looking away. These possibilities were tested in experiments in which lookers and subjects were separated by closed windows and given no feedback. There was still a significant positive effect (Sheldrake, 2000). In addition, positive results in experiments using one-way mirrors and CCTV (described below) seem to eliminate the possibility of sensory clues.

3. *Cheating*. Separating lookers and subjects should have eliminated possible cheating. When they were separated by closed windows (Sheldrake, 2000), one-way mirrors (Fig. 4) or by closed circuit television, the results were still positive.

4. *Hand scoring errors*. In trials in which the lookers recorded the subjects' guesses by hand, there could have been errors in scoring. If these errors were non-random and biased in a positive direction, then the positive results could be a scoring artifact. In this case, the results should have fallen to chance levels when the subjects recorded their own guesses. Yet this did not happen; the scores were still positive (Sheldrake, 2000). The scores were also positive when subjects indicated their guesses by means of hand-held devices that recorded the results automatically (Colwell *et al.*, 2000; Radin, 2004). The data shown in Figure 4 were from automatically recorded trials. Also, there was no hand scoring in the CCTV trials, described below.

5. *Implicit learning*. In trials in which subjects are given feedback, they might learn to respond to subtle sensory clues or even to unintended patterns present in the trial randomizations. If so, these forms of learning should not take place when they are not given feedback. But subjects still scored very significantly above chance without feedback (Sheldrake, 1999, Tables 3 and 4; Sheldrake, 2000; Sheldrake 2001a, Tables 2 and 3).

The available data go against these artifact hypotheses.

Tests under 'real life' conditions

The kinds of experiments discussed above are very artificial. In experiments in more natural conditions, people are watched by hidden observers. Do they turn round more than when they are not being watched?

The lookers are hidden behind a one-way mirror or darkened window that overlooks a public space. Close to the lookers, a video camera films this public space continuously. In a randomized series of one-minute trials, the lookers either stare at the backs of people in this public space or do not look. Later, the

videotape is evaluated blind by a person not otherwise involved in the experiment. This evaluator scores how many people turn around and look towards the camera in each one-minute period.

I carried an experiment of this kind at the BBC Television Centre in London in which the subjects (who had signed releases agreeing to be filmed by hidden cameras) were waiting to go into a studio as a quiz show audience. They had their backs to the hidden lookers, of whom I was one. There were six lookers altogether, including a member of the BBC Karate Club. We were invisible to the subjects because the office window was made of darkened glass and the lights in the office were switched off.

During the staring periods, we quite often saw people turn around and look straight towards us. The video was analysed independently by a judge who did not know which one-minute periods were staring periods and which were not. There were significantly more turns during the staring periods than during the not-staring periods: 27 as opposed to 12 (Sheldrake, 2003a).

The same experimental method can be used with non-human subjects, and has already been the basis of a student project in Italy, carried out in a bird park near Rome. Five students hid in bushes near a lake, from which they could watch resting geese on the shore through binoculars. The geese were filmed continuously. During the three-minute watching periods, each of the students observed a different goose, and in the three-minute non-watching periods they did not. An analysis of the video revealed that during the looking periods, on ten occasions geese woke up and looked towards the hidden observers, whereas in the not-looking periods this happened only three times (Sheldrake, 1996).

Very little research has so far been done under ‘real life’ conditions, but these preliminary experiments show that this experimental method is feasible with both people and animals.

V: Experiments Using Closed Circuit Television (CCTV)

Millions of CCTV cameras are used routinely for surveillance in shopping malls, banks, offices, airports, streets and other public spaces. My assistants and I have interviewed a representative sample of surveillance officers and security personnel whose job is to observe people through CCTV systems. We asked them about their experiences when watching people on the TV monitors. Most, but not all, were convinced that some people could tell when they were being watched, and gave examples to support this opinion (Sheldrake, 2003a). However, to be taken seriously, anecdotal evidence for the sense of being stared at through CCTV would need to be supported by evidence from controlled experiments.

Such experiments have already been performed. Starting in the 1980s, several parapsychologists have done tests using CCTV, with the subjects and lookers in separate rooms. In these tests the subjects were not asked to guess whether they were being looked at or not. Instead, their galvanic skin response was recorded automatically, as in lie-detector tests. In a randomized series of trials the lookers

either looked at the subject's image on the TV monitor, or looked away and thought of something else.

Most of these experiments gave statistically significant positive results. The subjects' skin resistance changed when they were being looked at, even though they were unconscious of this change (Braud *et al*., 1990; 1993a,b; Schlitz & LaBerge, 1994;1997; Schlitz & Braud, 1997; Delanoy, 2001). A recent meta-analysis of 15 CCTV staring studies confirmed that there was an overall statistically significant positive effect (Schmidt *et al*., 2004).

VI: Sceptical Investigations

There are several campaigning organizations devoted to debunking 'claims of the paranormal', but the most active, prestigious and effective is CSICOP, the Committee for the Scientific Investigation of Claims of the Paranormal. CSICOP's publications include the *Skeptical Inquirer* magazine in the USA, and *The Skeptic* in Britain.

In response to the growing interest in the sense of being stared at, four CSICOP Fellows have recently investigated the phenomenon, namely Robert Baker, David Marks, Susan Blackmore and Richard Wiseman. So has Christopher French, the editor of *The Skeptic*. All five are academic psychologists. What have they found?

Robert Baker

Robert Baker, a retired professor of psychology at the University of Kentucky, made no secret of his preconceptions about the sense of being stared at: 'Skeptics … believe that it is nothing more than a superstition and/or a response to subtle signals from the environment' (Baker, 2000, p. 40). He regarded his enquiries not so much as experiments but as 'demonstrations' of the non-existence of an ability to detect stares.

In his first demonstration, Baker selected people who were engrossed in eating or drinking, watching TV, working at computer terminals or reading in the University of Kentucky library. He unobtrusively positioned himself behind them and stared at them for an average of 8.6 minutes. He then introduced himself and asked them to fill in a response sheet. Thirty-five out of 40 people gave the expected response: 'During the last 5 minutes I was totally unaware that anyone was looking at me'. Contrary to Baker's prediction, two people reported that they had been aware that they were 'being observed and stared at' and three reported they felt something was 'wrong'. Baker noted that while he was staring at the subjects who felt something was wrong, 'All three stood up, looked around, shifted their position several times and appeared to be momentarily distracted on a number of occasions.'

Baker dismissed these unexpected findings. He argued that the three people who said something was wrong were not really affected by his staring, instead, he assumed that their restlessness was the *cause* of their feeling something was wrong. But this argument begs the question.

Baker also 'discarded' the results from the two people who said they knew they had been stared at. He regarded them as 'suspect' because one claimed he had extrasensory ability and the other claimed she was constantly being spied on (Baker, 2000). But if the sense of being stared at really exists, people who claim to have extrasensory abilities might be more sensitive than the average, and so might paranoid people (Sheldrake, 1994).

Baker then carried out a second demonstration in which he himself stared at subjects through a one-way mirror (Baker, 2000). The results were non-significant. But his experimental design was poor, and the instructions he gave to the subjects were ambiguous, confusing and self-contradictory (Sheldrake, 2001b; Baker, 2001).

David Marks

David Marks, a leading British sceptic, encouraged a fellow psychologist, John Colwell, to carry out a staring experiment in his laboratory at Middlesex University. Staring took place through a one-way mirror and Colwell and his colleagues tested the same subjects repeatedly. Subjects were given trial-by-trial feedback and improved with practice (Colwell *et al.*, 2000). The overall results were positive and very significant statistically, and showed a pattern similar to that in other tests (Figure 4).

In an article in the *Skeptical Inquirer*, Marks and Colwell (2000) tried to explain this unexpected result as an artifact of the randomization procedures. In their experiment, Colwell *et al.* (2000) used a set of 24 instruction sheets that were at that time provided on my web site. In response to a previous recommendation by sceptics (Wiseman and Smith, 1994), the randomization was counterbalanced on these particular sheets. Marks and Colwell speculated that rather than showing that people really can feel stares, their participants' positive scores arose from 'the detection and response to structure' present in this set of randomized sequences. But they offered no evidence that their participants did in fact learn to detect hidden structures in the randomization. By looking at the trial-by-trial scores, they could have seen if there really was an excess of successful guesses as a result of any structure they chose to postulate. When I offered to examine their data to test their hypothesis, they declined.

Even if subjects had learned implicitly to detect hidden structures in the randomization sequence, they should have improved in looking *and* not-looking trials. But this is not what happened. Scores improved only in the looking trials (Figure 4). Marks and Colwell did not mention this problem.

After their unexpectedly positive result, Colwell *et al.* (2000) did a second experiment using 'structureless' randomizations. This time the results were non-significant. They took this to confirm their implicit learning hypothesis. But in this second experiment there were two major differences, although Marks and Colwell did not mention this fact; the experiment was confounded. There was both a different randomization method and also a different looker, a colleague of Colwell's. When I raised the possibility of an experimenter effect (Sheldrake,

2001b), they dismissed it as 'a red herring' (Marks and Colwell, 2001). In fact experimenter effects are known to occur in staring tests, as discussed below.

Marks and Colwell (2001) entitled their *Skeptical Inquirer* article, 'The psychic staring effect: an artifact of pseudo randomization.' They claimed that my own results and those of other investigators were artifacts arising from the implicit learning of hidden patterns in this particular set of counterbalanced randomizations. But this hypothesis was contradicted by the facts. First, this set of randomizations was only used in some of my tests, and in many thousands of other tests there were different randomization methods. For example, in more than 5,000 trials the randomizations were provided by tossing coins, with highly significant positive scores (Sheldrake, 1999). Their prediction was also contradicted by results from over 18,000 subjects in the NeMo experiment, where the computerized randomizations were 'structureless'.

Second, the Marks and Colwell hypothesis predicted that the scores should be at chance levels in trials without feedback. But trials without feedback gave very significant positive results (Sheldrake, 2000).

Marks has strong beliefs and disbeliefs. He has quantified his disbelief in the sense of being stared as a probability of a million to one against (Marks, 2000). Two years after our exchange in the *Skeptical Inquirer*, he reiterated his original arguments in *The Skeptic* (Marks, 2003), omitting any mention of the evidence that went against his implicit learning hypothesis (Sheldrake, 2003b).

Susan Blackmore

A student of Susan Blackmore's, Jonathan Jones, carried out a CCTV staring experiment in 1996. His unpublished thesis was entitled 'Automatic Detection of Remote Observation and Schizotypal Personality Correlates'. His hypothesis was that people who scored highly on a Schizotypal Personality Questionnaire would be more sensitive to being stared at than those who scored low. According to the Abstract of his thesis, which he and Blackmore kindly sent me, this is what he found:

> As hypothesized, high scorers on the Schizotypal Personality Questionnaire were significantly aroused during stare trials compared to non-stare trials (p=0.028, 2-tailed) whereas low scorers were not (p=0.313, 2-tailed). This indicates the detection of Remote Observation by high Schizotypal Personality Questionnaire scorers.

Christopher French

Neal Rattee, a student of Christopher French's, carried out a CCTV staring experiment in French's laboratory in 1996. He found that there was a difference between subjects' responses in the looking and not-looking trials. Was this difference statistically significant at the conventional $p = 0.05$ level? No, according to a two-tailed combined t-test ($p = 0.096$). Yes, if a one-tailed test were used ($p = 0.048$). I asked Rattee and French if I could analyse their data using other statistical tests, but unfortunately this was not possible because they had discarded the data.

Richard Wiseman

In initial experiments using the CCTV method in Richard Wiseman's laboratory there was a statistically significant positive effect (Wiseman & Smith, 1994).

Wiseman and Smith then went back over their data to look for a possible flaw to account for this. They found that in their randomizations, more looking trials preceded not-looking trials than vice versa. They argued that this could have given rise to an artifactual positive result if subjects' galvanic skin resistance (GSR) declined throughout the session as they became more relaxed. They did not examine their data to see if this was in fact the case. They took it for granted that their hypothesis was correct.

I asked Wiseman if I could analyse the data to test their hypothesis. At first he told me that the results were inaccessible, but he finally managed to retrieve the data for 17 out of 30 subjects, which he kindly sent to me. I found that in ten cases GSR declined throughout the test session, while in seven it increased. The available facts did not support the Wiseman-Smith hypothesis.

In Wiseman and Smith's initial experiments, students served as starers. In subsequent CCTV experiments, Wiseman changed the procedure so that the experimenters themselves did all the looking. The results were then at chance levels (Wiseman *et al*., 1995).

Could there be an experimenter expectancy effect when experimenters themselves serve as lookers? Experimenter expectancy effects are widely recognized in experimental psychology; experimenters tend to get results that confirm their expectations (Rosenthal, 1976), which is why many psychological experiments and clinical trials are carried out blind or double blind.

This possibility of an experimenter effect has been tested directly by Wiseman and Marilyn Schlitz, who jointly carried out a CCTV staring experiment in which half the subjects were tested with Schlitz as experimenter and looker, and half with Wiseman. As on previous occasions (Schlitz & LaBerge, 1994; 1997), Schlitz obtained significant positive results, while Wiseman's results were non-significant (Wiseman & Schlitz, 1997).

Such experimenter effects are not symmetrical. The detection of Schlitz's stares by the participants implies the existence of an unexplained sensitivity to stares. The failure of subjects to detect Wiseman's stares may imply only that Wiseman was an ineffective starer. He later said that he found staring 'an enormously boring experience' and that in most of the trials he was 'pretty passive about it' (Watt *et al*., 2002).

Interestingly, the research initiated by all four CSICOP Fellows, Robert Baker, David Marks, Susan Blackmore and Richard Wiseman, gave positive results to start with. Baker, Marks and Wiseman then reacted to their positive findings in a similar way. First they tried to dismiss the results as artifacts. Then in follow-up experiments, they themselves, or their colleagues, did all the staring, achieving the non-significant results they expected.

By contrast, in the vast majority of tests by other investigators, the experimenters acted only as coordinators; the participants served as both starers and lookers. Under these conditions the results were overwhelmingly positive.

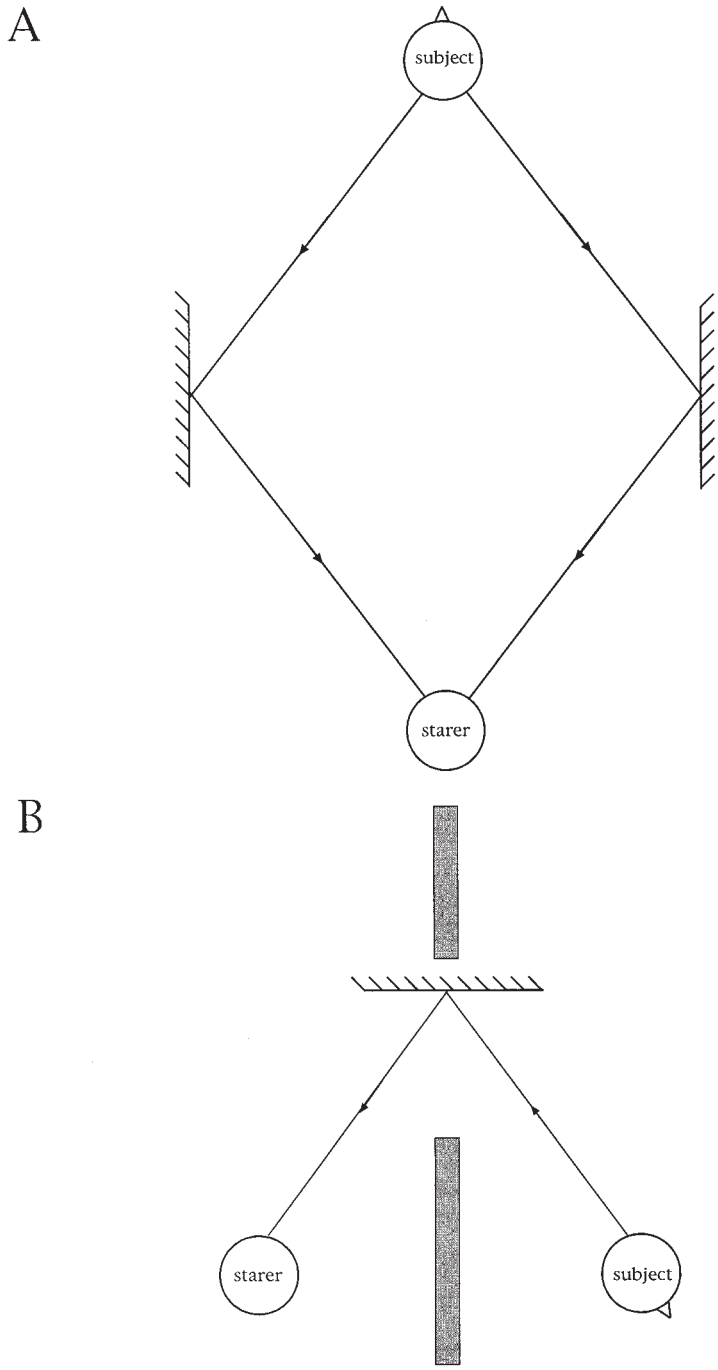

Figure 5. Diagrams showing the positions of starers and subjects in experiments involving mirrors, with rays indicating the reflection of light.

A (Above): The starer looks at the subject through a mirror on the left or on the right. The subject guesses which side the look is coming from.

B (Below): The starer looks at the back of the subject through a mirror in a doorway.

VII: Further Questions

Most of the available evidence implies that the sense of bring stared at is real. Given that the evidence is strong enough to merit further research, a series of new questions arise that can only be answered empirically. Some of these questions are as follows:

1. Does the sense of being stared at work through mirrors?

There is already much anecdotal evidence that people can tell when they are being stared at through mirrors, for example in bars. Many people say they have noticed that if they stare at someone through a mirror, that person may turn and look at them through the mirror.

My associates and I have carried out preliminary experiments on the effects of staring through mirrors using a variation on the usual procedure. Normally the starer sits behind the blindfolded subject, but in the mirror test, the subject sat in an adjacent room with the door open. The looker cannot see the subject's back directly, but only through a mirror positioned in the doorway (Figure 5B). The results were positive and statistically significant (Sheldrake, 2003a). This research needs to be repeated on a larger scale, and the effects of staring through mirrors need to be compared with the effects of direct staring. Is the effect just as strong through mirrors, or not? No one yet knows.

2. Is the sense of being stared at directional?

Most people who have felt they were being stared at say they have turned around and looked straight at the person staring at them. This implies that they detected the direction from which the look was coming, not just the fact that they were being stared at (Sheldrake, 2003a). People who have looked at others from upstairs windows often notice that the people not only turn round but also look up at them. Also people who have been stared at through mirrors usually say that they turn and meet the eyes of the person staring at them through the mirror, implying that they detect the direction of the reflected gaze.

This directional aspect can be tested by experiment. In one simple design, the looker sits behind the blindfolded subject. One mirror is placed on the looker's right and another on his left, in such a that he can see one side of the subject's head through one mirror, and the other side through the other (Figure 5B). In a randomized series of trials he looks at the subject through the mirror on the left or the right. The subject then guesses from which side she is being looked at, and raises an arm on that side to indicate her guess. In preliminary tests, I found that the guesses were correct significantly more than expected by chance (Sheldrake, 2003a).

3. Can people tell who is staring?

In real life, staring is often associated with emotions such as sexual desire and anger. For ethical and practical reasons it would be hard to test experimentally whether people can detect emotions associated with the staring. But it is possible

to test whether they can detect something about the quality of the gaze by comparing different lookers. In trials with two different lookers, one or the other looks in a random sequence. Can subjects identify who is staring at them?

In order to avoid confounding different lookers with stares from different directions, both should stare from the same direction, with one sitting at a slightly higher level behind the other.

4. Does the sense of being stared at work on television?

If people can detect when they are being stared at on CCTV, what might happen if they are looked at on live television? Instead of one looker, as in the CCTV tests, there could be millions.

One possible design for a live TV test is as follows. Four experienced TV presenters sit is separate rooms in a TV studio, and all have cameras pointing at them and running continuously. Then in a series of randomized trials, one of these four people is shown to millions of viewers for a short period, say 5 seconds, and no one sees the others. At the end of each trial, all four subjects guess if they were being looked at or not, yes or no. In a series of trials, are the guesses at chance levels, or above chance? The subjects' skin resistance would also be monitored electrically, to pick up any unconscious physiological responses.

5. Can people tell when looks begin and end?

A general feature of the senses is that that they respond to changes and differences. Is this also true of the sense of being stared at? Is it easier for people to detect when someone starts or stops looking at them that to detect a constant stimulus or lack of stimulus?

6. Animal sensitivity

There is much to be learned about the sense of being stared at in animals. Can prey animals, such as mice, tell when predators, such as cats, are looking at them? What role does the sense of being stared at play in predator-prey relationships under field conditions? Does this sense work underwater, and are fish sensitive to looks? Are some animal species more sensitive than others? Can sleeping animals be woken by looks, as many pet owners claim?

VIII: Conclusions

Most people say they have sensed when they were being stared at, and most people also say they have made others turn around by looking at them. The sense of being stared at is taken for granted by most surveillance professionals, security officers, soldiers, celebrity photographers, martial arts practitioners and hunters. The ability to detect makes biological and evolutionary sense. It may be deeply rooted in our animal nature, and widespread in the animal kingdom.

The great majority of the evidence supports the reality of this sense. But there is still much that remains to be discovered, and more research is needed.

Fortunately, most of the experimental methods are inexpensive, and are very suitable for student projects.

If this sense really exists, it has major theoretical implications, which I discuss in the following article in this issue of the *Journal of Consciousness Studies*.

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