Chapter 27: Anomalistic Dreams

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# Introduction

Irwin and Watt (2007, p. 1) define **parapsychology** as "the scientific study of experiences which, if they are as they seem to be, are in principle outside the realm of human capabilities as presently conceived by conventional scientists". These experiences can take many forms, but one of the most common types reported by ordinary members of the public seems to involve the acquisition of knowledge about the world without the mediation of the known senses, in which case they are referred to as instances of **extrasensory perception** (ESP). Cases of ESP are usually further classified as *telepathy* if the information that is acquired resides in the mind of another person, *clairvoyance* if the information seems to have been drawn from the environment directly rather than from another person, and *precognition* if the information only exists in the future and so is not available by any means at the time of the experience. To illustrate, Steinkamp (2000, p. 42) reports one case of precognition as follows

I had a dream in which I knew that my father had died. I saw myself and my sister in my parents' flat. I think my sister went towards my mother first and hugged her—then I did the same. Then we all three hugged. I was very aware that my father was missing from the scene. This happened in our kitchen. Then I was in a car with my mother and sister going to the funeral. The hearse was in front of us. We were stopped at traffic lights, waiting to make a left-hand turn into "Mill Street". As we sat at the lights with the other cars in the funeral procession behind us—a couple, quite elderly, came round the corner to our left. They stopped at the kerb when they saw it was a funeral and stood with their heads bowed. The man took off the cap he was wearing on his head. They were a conventional, respectable looking couple. Later, this all happened exactly as in the dream.

It is the task of parapsychology to account for such experiences. This may involve showing how their apparent paranormality is mistaken by explaining them in terms of conventional scientific principles, for example by noting how perception can be influenced by expectation, and memory can become distorted in ways that lead to more elegant or coherent but less accurate accounts of the experience which thus seem more impressive than they actually were. However, parapsychologists also seriously entertain the possibility that such experiences may have occurred as described and so look to test for the putative phenomena of ESP in the more controlled conditions of the laboratory. In this chapter I shall briefly outline some of the research that has been conducted to investigate the possible occurrence of ESP under circumstances that rule out those normal explanations, particularly as it relates to anomalistic dreams.

# Natural occurrences of ESP

Why should psychologists take an interest in apparent instances of ESP, especially if there seem to be plausible 'normal' explanations that could explain them away? Because such experiences are quite common and can occur spontaneously and without warning, potentially leaving the experient troubled by what has happened to them. By studying the phenomenon and popularising what we discover about it we have an opportunity to help people make sense of and assimilate their own experience. Surveys in the UK consistently show remarkably high levels of belief in ESP: a MORI[[1]](#footnote-1) poll in 1998 found that 54% believed in premonitions/ESP and 25% believed that dreams could predict the future, which rose to 64% and 30% respectively in a later poll (see Roe, 2009). A primary driver of belief seems to be personal experience: of those that responded affirmatively in 1998, 48% claimed to have personal experience of ESP and 58% reported having had a dream that later came true; ~~and~~ in 2003 it was 41% and 42% respectively. Similar levels of belief have been reported in the USA and across many European countries (see Haraldsson, 2011, for a summary).

In order to characterise the phenomenon, researchers have collected together cases volunteered by members of the general population on the principle that any meaningful features (such as necessary or sufficient conditions for ESP to occur) will emerge as relatively consistent patterns across cases, while irrelevant features, no matter how striking in any particular case, will tend to disappear if not replicated in other cases. Probably the most influential collection was compiled by Louisa Rhine, whose cases were generally taken from unsolicited letters sent to the Duke Parapsychology Laboratory in the wake of publicity for her husband's highly successful ESP experiments. Unlike earlier spontaneous case investigations by the Society for Psychical Research that took a legalistic approach to interviewing witnesses and gathering evidence to authenticate an account (especially Gurney, Myers & Podmore, 1886), Rhine accepted submitted accounts at face value if they appeared to have been written "in good faith and by apparently sane individuals" (Rhine, 1951, p. 166). This was justified because she was not interested in presenting such cases as persuasive evidence for the occurrence of ESP—in her view this could only come from experimentation—but rather she believed that they could provide insights into the process of ESP that could inform the design of those experiments and could help elucidate the personal meaning of such experiences for the percipient, an aspect that has remained somewhat elusive in the sterile confines of the laboratory.

Among Rhine's cases, over 65.2% involved death or serious injury and a further 9.4% involved slight injury or material damage, while 10.8% were for trivial events and only 4.5% were positive (Rhine, 1962). A similar pattern was reported by Sannwald (1963), whose proportions were 62.4%, 12.2%, 14.1% and 11.2% respectively. This preponderance of major negative events would make sense from an evolutionary perspective, since a psychic ability that confers some form of survival advantage—in precognising dangers and either avoiding them or coming to the aid of family or tribe members, in whom we have some genetic or social investment—would be more likely to be selected for. For example, Feather and Schmicker (2005, p. 148) report the following case:

"When I was seventeen, my sister Frances got married to a wonderful, talented musician. They were very much in love and happy together. One night, I had a dream that was so real I remembered every single detail of it. I dreamed that my brother-in-law, Ed, was out hunting with a young boy who was faceless in my dream. All of a sudden, Ed collapsed from a discharge from the boy's shotgun. The boy had climbed through a fence and didn't have the safety on his shotgun. The pellets hit Ed in the hip, and he bled to death before they could get him to a doctor." Frightened by her dream, she phoned her sister to warn her. Her sister and Ed laughed it off. That was on Saturday. Two days later, Ed and his friend set out on a hunting trip. "On Monday morning Ed was killed, just as in my dream."

Barker (1967) describes premonitions of the Aberfan disaster, in which a massive coal tip slid down a mountain side and engulfed various buildings including the village school, killing 144 people, of whom 128 were schoolchildren. One account is from the mother of one of the victims, who described her daughter's dream:

The day before the disaster she said to her mother, "Mummy, let me tell you about my dream last night". Her mother answered gently, "Darling, I've no time now. Tell me again later". The child replied, "No, Mummy, you must listen. I dreamt I went to school and there was no school there. Something black had come down all over it!"

In such cases the premonitions only become valuable in evolutionary terms if they afford some opportunity to intervene (which in the above instances were futile since the warnings went unheeded), but if the warnings *were* acted upon then this raises the thorny problem of the *intervention paradox*. Steinkamp (1997, p. 411) defines it thus:

If a person has a precognitive experience and if the future event in some way causes this perception, then if the person intervenes so as to prevent that foreseen event from happening, the future event will no longer have been there to have caused the original precognitive experience of it.

Some people do attempt to intervene (41% in Rhine, 1954; 22% in Steinkamp, 2000), and sometimes do change the event or its consequences (Rhine, 1955), suggesting that—in these cases, at least—the dream precognition does not represent a glimpse of a fixed future event.

The preponderance of crisis cases certainly seems of adaptive significance, but we must note that such striking events might be more commonly reported simply because they are more memorable; where researchers have conducted longitudinal studies of spontaneous dream ESP in which a record is kept of all dreams for their potential precognitive content the events that are claimed to have been confirmed can be much more trivial and of much less obvious value in evolutionary terms (e.g. Sondow, 1988). Hans Bender of the University of Freiburg received dream reports every fortnight over a period of 28 years from an actress known as 'Mrs M', along with descriptions of events from her life that she felt were confirmations of those dreams. This provided a rich body of material for analysis consisting of over 3,000 dreams (see Schreiver, 1987) that illustrated that relatively trivial but personally meaningful precognitions were the norm rather than some national tragedy. For example, 'Mrs M's dream of 20 August 1961 involved:

The 'Young Theatre'. Cases in an enormous disorder, with workers present. Brochures and programmes in many boxes. I leaf through a brochure with pictures of previous seasons. A certain Ilse Langen, which in my dream I mistake for the actress Inge Langen, in Biedermeier style poke bonnet.... In all this mess I am watching a rehearsal or performance. Very good and serious, with Vilka K. Suddenly it turns into a weird but skilful comedy and I laugh until tears come. The actor K.M. enters with a ladder, leans it against a rock and steps on one of the lower steps and falls over with the ladder, which falls on him. He is lying there motionless with a face distorted with pain, but very funny. Then he holds awfully funny masks in front of his face while standing on the ladder again—a perfect clown.

(Schreiver, 1987, p. 53)

The supposed confirming event was described in October 1961:

Now I am playing Molière for the first time, with both the actors K.M. and Ilse L. of my dream in the 'Young Theatre', and she does not wear a Biedermeier costume, but something similar. K.M. enters and leaves via a ladder—as some of us do as well—from the lower floor onto the stage. K.M.—heaven knows, he is not a comedian—raised a laugh in all of us. I happened to watch the final scene, where all colleagues have funny masks in front of their faces. The elastic of his mask was torn and he had to press the mask against his nose for the whole time and spoke his part through his nose.

(Schreiver, 1987, p. 54)

I can report a similarly trivial ostensible dream precognition of my own that came during a period when I was working on a new lecture on precognitive dreams as part of an undergraduate course in parapsychology and so was keeping a dream diary to be able to reflect on my own experience of dream content. On one night I recorded the following:

I woke up recalling a dream in which I was driving a Porsche somewhere exotic like the South of France. The car was only hired and I was trying to decide if it had been worth the money. It had cost me £20,000 to hire the car and I was weighing this up against the cost of buying a regular sports car like a Mazda or second hand Boxter. Bizarrely, I decided that to pay this was reasonable because they cost about £120,000 to buy. This is not a typical dream for me, and certainly not likely! That morning, friends who were visiting had bought the *Sunday Times* and I picked up one of the supplements and had time to read one article before breakfast. This was about a journalist visiting a racing club near Edinburgh where members can hire supercars like the Zonda and Koenigsegg (which cost around £350,000 to buy). He describes one case where a club member had booked the Zonda for a month to go to Rome at a cost of about £25,000.

These individual cases illustrate some of the difficulties in evaluating such accounts as evidence for some paranormal process, since they do not effectively rule out normal explanations. In the case of the hunting tragedy, the sister-in-law may have been familiar with the victim's liking for hunting and perhaps had always had worries about the lack of care he and his friends took with their firearms. Similarly, the dream reported by 'Mrs M.' may in part reflect reasonable inferences (albeit at an unconscious level) of future events and circumstances based on information that is available in the present. Given the delay of up to two months between dream and confirming event there is also an increasing possibility for at least some events of the dream to occur in real life just by chance. In reflecting on one's own cases there is a danger that confirmed features become more salient and unconfirmed features are minimised (note, for example, that no accident with the ladder is reported so that the mask-play becomes more central). It would be easy to imagine a quite different event (perhaps involving sorting brochures or a painful accident for K.M.) that might be regarded as an equally impressive confirmation of the dream. And if the experient is on the lookout for potential confirmations then this can affect the way that events are perceived, interpreted and recalled. Rush (1986, p. 48) refers to this difficulty as follows:

Even with the utmost integrity and the best intentions, one’s ability to observe and remember the details of even an ordinary experience is surprisingly limited. If an experient learns of the event to which a vision apparently relates before recording it, then any later record of it is severely compromised by the inevitable tendency to tailor the memory to fit the event.

My own sports car case is a trivial one that only becomes significant because it seems to have been confirmed. Although I had written a record of the dream before it was confirmed, and the event to which it referred exists in physical form (the newspaper article is still available on-line) so we are not dependent on my recollection of it, there is still a danger of self-fulfilling prophecy in the sense that that article may have gone unnoticed were it not for its resemblance to my dream. Other precognitive dreams may also have affected the percipient's behaviour in such a way as to make the confirming event more likely; for example, dreaming about being involved in a car accident may make the percipient's driving behaviour more nervous in such a way as to make an accident more likely. Morris (1986) offers a useful summary of some of the normal explanations we need to consider. For example, he notes that the dream and the confirming event can have some features in common because they reflect a shared antecedent: a dream about an old friend who subsequently gets in touch after many years without contact might simply be due to a nostalgic programme on television that was the impetus for the dreamer to dream of her school days and of her friend from that time, but was also the impetus for the friend to seek her out and get in touch. Morris notes (p. 85) that two dream ESP sessions with the celebrated psychic Eileen Garrett produced dreams that corresponded with the thoughts of a sender, but that these related to movies that were being highly publicised at the time, so that any evaluation in terms of telepathy was compromised.

# ESP and Dreams

One of Louisa Rhine's principal discoveries was that spontaneous ESP tended to occur during dreams and other shifts from ordinary waking states, suggesting that there was something psi-conducive about such states (see Honorton, 1977, for one particularly influential interpretation). Orme (1974) drew cases from a number of collections and similarly noted that the experience tended to occur when awareness was shifted away from the outside world, with dreams predominating. This suggests that laboratory work that incorporates some form of altered state of consciousness (ASC) is likely to be worthwhile.

Rhine (1981) found that dream ESP experiences were much more likely to be precognitive than contemporaneous (reported by 75% and 40% of the sample respectively). Experients also reported that such dreams felt different from ‘ordinary’ dreams in being particularly portentous or imbued with meaning (Barker, 1967; Dunne, 1927), such that they might actively attempt to prevent the precognised events from occurring or become increasingly agitated until the precognition was confirmed. The events also tended to involve others who were emotionally close rather than mere acquaintances or famous people (Steinkamp, 2000), were of important, often negative events (Schouten, 1981; Steinkamp, 2000), although they could be trivial (Orme, 1974; Sondow, 1988), and could elicit a sense of déjà vu when witnessing the confirming event (Sondow, 1988; Steinkamp, 2000). These are the characteristics of dream ESP that would need to be accounted for in any explanatory model.

Formal experimental tests of dream ESP should also address the question of how likely the observed coincidences between a dream and some future confirming event are just by chance. Zusne and Jones (1982) note most straightforwardly that since we all dream each night then some dreams will have the appearance of coming true simply by coincidence, and Vasiliev (1965, cited in Ullman et al., 1989, p. 9) complains:

Prophetic dreams are more often founded on misunderstanding. Nearly everyone has dreams, sometimes many dreams in one night. In a week, a month, a person accumulates tens, if not hundreds of dreams. Do many of them materialize? Of course not. Dreams as a rule do not materialize; only in exceptional circumstances do they coincide, more or less, with future events. According to the theory of probability this is as it should be: many dreams, many events — some of them must inevitably coincide. There is nothing wonderful in this.

This danger of capitalising on coincidence in spontaneous case collections is exacerbated by the fact that such collections are typically solicited by national appeals (e.g., Barker, 1967; Hearne, 1989) or are based on correspondence received by research centres that are known nationally or internationally for their work (e.g. Feather & Schmicker, 2005; Rhine, 1981), and so may reflect a relatively small response from a very broad sampling frame.

# Dream ESP experiments

Experimental approaches incorporate designs intended to control for the kinds of normal explanations described above that might account for (at least some) spontaneous experiences. By pre-specifying the number of participants or trials and reporting all data irrespective of outcome it is possible to field against criticisms of self-selection of cases. Concerns about the subjective nature of evaluating the degree of correspondence between dream and confirming event can be addressed by quantifying the outcome and comparing performance against a statistical benchmark of what might be expected by chance. Concerns that both the dream and confirming event might be due to some hidden common cause can be ruled out by ensuring that the target material for any given trial cannot be inferred by the participant from available information. Usually this is achieved by selecting targets from among a large set of alternatives using a random process such as dice or a random number generator. The possibility that information might be communicated by normal means from the target to the percipient is precluded by ensuring that physical barriers are in place that make such communication impossible. Finally, it is possible to ensure that accounts of the dream are not contaminated by exposure to the target by producing a permanent record of the dream before the confirming event is revealed. We shall see that these features are typical of laboratory based approaches, and in the remainder of this chapter will consider whether there remains any evidence for ‘anomalistic dreams’ once these extraneous factors are ruled out.

The first experimental work on dream ESP is normally attributed to researchers at the Maimonides Medical Center in Brooklyn, New York. Montague Ullman, Stanley Krippner and colleagues had access to a sleep laboratory and were able to exploit the then recent discovery that participants who were woken when they exhibited rapid eye movements (REM) and produced brain activity with a characteristic EEG pattern were more likely to recall having been dreaming than when woken during other stages of sleep. They were thus able to monitor participants while they slept and synchronise attempts to communicate with them telepathically during their dreams, and also to awaken the dreamer at a time when they would be more likely to recall their dreams to see if there was any sign of target-related material. In their first formal investigation of dream ESP, Ullman, Krippner, and Feldstein (1966) recruited 12 participants who reported that they were able to fall asleep easily, dream frequently, remember their dreams, and had positive attitudes towards the possibility of telepathy. Each participant spent one night in a sound-attenuated room in the laboratory. Once he or she was asleep, a target was randomly selected from among a set art prints that served as targets. A member of laboratory personnel designated to be their telepathic agent (or 'sender') retired to another sound-attenuated room in the building and removed the target from its sealed envelope. The experimenter monitored the receiver throughout the night and, after a REM period had progressed for 5-10 minutes, awakened them and asked for a description of any dream(s) they could recall. Responses were tape-recorded so that they could be transcribed later, and were relayed to the sender via a loudspeaker, which may have reinforced the latter's sending strategy. The receiver then went back to sleep and the process repeated for each REM period with the same target being sent each time. In the morning, the receiver was presented with twelve pictures consisting of a copy of the target and eleven decoys, which they had to rate for similarity to their dream experiences. Neither the receiver nor any of the researchers in attendance knew which of the 12 pictures had been the target for that night. Complete dream transcripts and target sets were also sent to independent judges who made similar judgements. The ratings/rankings from three independent judges were combined. A trial was a ‘binary hit’ if the target picture had been ranked in the top half of the target set and a ‘binary miss’ if ranked in the bottom half. Participants gave ten hits and two misses while the independent judges’ ratings gave eight hits and four misses, results which are described as “significant at the 0.05 level”.

The Maimonides procedure evolved over time, and by the time the laboratory closed researchers had completed a total of 3 pilot series and 13 formal experiments testing for dream ESP, including 11 studies of telepathy and two of precognition (see Ullman & Krippner with Vaughan, 1989, for a detailed summary). In this next section I will summarise some of the main features and their outcomes (see Roe & Sherwood, 2009, for a more detailed description and analysis).

During most of the telepathy studies the receivers’ dreams were monitored and recorded throughout the night and the same target was sent during each REM period, but there were some variations across studies. For example, in one study different targets were sent for each REM period. Successful sender and receiver pairings from the two screening studies were used in later studies, but in other studies more than one sender was used, either across a series of trials with the same receiver or with different receivers. Other variations included: for some trials there was a single sender for two receivers; for the ‘Grateful Dead study’ a concert audience of about 2,000 people acted as senders; during precognition and clairvoyance trials there was no sender. The distance between the sender and receiver also varied across the studies. Some studies employed “multisensory” targets rather than just static art prints or postcards. This included studies where targets consisted of sequences of related Viewmaster slides, but also included studies that provided the sender with materials they could interact with or use to act out scenes depicted in the target, or involved the dreamer himself in an activity on waking up in the morning that might thus serve as a precognitive target. In some trials targets were slide sequences with accompanying soundtracks.

The combined outcomes of all the 15 studies, consisting of 379 trials, gave a highly significant combined effect size, *r* = 0.33 (95% Confidence Interval = 0.24 to 0.43) that suggests that even under these controlled conditions, the participants' dreams sufficiently resembled the randomly selected targets for them to be distinguished from the decoy images to a highly significant degree. But the effect sizes vary from study to study (r = -0.22 to 1.10) and it is interesting to reflect on whether the outcomes are associated with the conditions of testing. The studies with the largest effect sizes mostly involved gifted single participants who had been pre-selected and two of the least successful Maimonides studies were two screening studies that recruited large numbers of senders in order to select promising candidates for inclusion in subsequent studies. This suggests, quite reasonably, that people may vary in their natural ability to succeed under task conditions and that more intensive work with selected individuals may prove more fruitful than using a broader sample of unselected participants. Precognition has been particularly associated with the dream state in case collections so it is interesting to note that those studies that focused on precognition were very successful, with effect sizes ranging from 0.47 to 0.73, whereas telepathy experiments were more varied in outcome, giving effect sizes between -.22 and .96, and clairvoyance trials were somewhat less successful (r = 0.35). This suggests that under appropriate conditions, precognition tasks need not be inherently more ‘difficult’ than forms of ESP supposed to operate in real-time. Studies that employed multisensory targets were also very successful, suggesting that dynamic interactive targets are more psi conducive than static targets.

There have been six replication attempts that have also used EEG monitoring but they have been relatively unsuccessful, though evaluation is difficult because of poor descriptions of methods and outcomes in published reports (see Roe & Sherwood, 2009, 219-221 for a more detailed consideration). Others have attempted conceptual replications using inexpensive and less labour-intensive methods that did not require access to a dream laboratory and EEG monitoring. For example, Braud (1977) recruited 50 “friends and acquaintances” who slept in their own homes, waking naturally and attempting to recall the content of their dreams, which they recorded in a dream diary. Between 2:00 and 2:30 a.m. on a pre-specified date, Braud concentrated on a randomly-selected target slide, attempting to 'send' its contents to the dreaming participants. Participants marked their dream impressions for the presence or absence of 10 features. The target slides had been coded for the same features and Braud calculated the number of matches between the target and dream codings. Only 3 of the 50 participants correctly identified more than the MCE of 5 binary features. Participant majority votes resulted in only two matches with the target. In two confirmation studies Braud restricted his sample to 10 “close friends”, who attempted to identify six different targets sent over three consecutive days. On each test night one target was sent in the evening (10:00 p.m. or 10:30 p.m.) and a second target sent in the early morning (5:30 a.m. or 6:00 a.m.). In both series scores were significantly greater than mean chance expectation.

Some studies have used computerised automated systems that allowed the experimenters to act as their own participants. For example, Dalton, Steinkamp and Sherwood (1999) acted as experimenters and participants in an investigation of dream clairvoyance. The experimenters were blind to the target because a computer randomly selected and played each target video clip repeatedly during the night (between 3:00 and 4:00 a.m.). During each of 32 trials, the experimenter/participants slept at home and kept a record of any dreams. In the laboratory the following morning, the computer program presented them with four video clips which they individually rated and ranked before sharing their night’s dreams with one another. These individual ranks were then combined to generate an objective consensus rank. The group consensus ratings and two of the three individuals achieved direct hit rates that significantly exceeded MCE. As expected, objective consensus performance was better than any of the individual performances, though no statistical examination of the difference was conducted. Post hoc inspection of the trial data suggested that the group had been more successful with emotional targets, particularly when they were negative.

Roe and Sherwood (2009) reviewed conceptual replications of the Maimonides dream ESP research and found a total of 21 studies consisting of 624 sessions. These gave an overall effect size, *r* = 0.14, which is significantly smaller than the outcome produced by the original Maimonides studies but is still significantly different from chance expectation (95% confidence interval = 0.06 to 0.22). This again suggests that under these controlled conditions participants were able to correctly select the target from among a set of decoys based on their dream descriptions. However, performance was much more variable, perhaps as a consequence of the large differences in approach taken by different researchers. It would be useful if a consensus could be reached concerning the most appropriate design for dream ESP studies that do not use sleep laboratories, and for researchers to adopt that method consistently. Given that these later studies fell short of the levels of performance found in the Maimonides studies, we should also look for differences in the two methodologies to see if conceptual replications might have failed to incorporate conducive elements.

Most obviously, most conceptual replications did not involve laboratory monitoring of EEG (or some other physiological measure) or deliberate awakening from REM sleep in order to record dream recall. The advantage of awakening participants from REM sleep is that dream recall is much more likely, and can lead to more detailed and longer overall reports. Reviews of studies involving laboratory awakening from REM have concluded that dreams are reported in about 75-80% of cases (see Goodenough, 1991). With spontaneous awakenings in the morning any dreams that are reported tend to be those from the last REM period only (Empson, 2002), or indeed may lead to no dreams at all being recalled. With the advent of mobile EEG systems it is becoming feasible to design an at-home study in which participants are monitored and awoken during the night. Another difference is that the Maimonides programme tended to use independent blind judges whereas post-Maimonides studies tended to use participant judging. Although the participant is best placed to draw on the fullness of their dreams and any personal (or symbolic) associations they may have for them, they are also more prone to be swayed by subjectively salient but unrepresentative features of their dreams at the expense of less impressive but more common features. It would be useful to design a study that directly compares the judging performance of naive participants against experienced independent judges. Few of the conceptual replications recruited participants based on prior success in similar studies despite the Maimonides researchers going to some lengths to screen for ‘effective’ senders and receivers, and finding that those initial screening studies were among the least successful. In future it would be advisable to begin with a screening study with the intention of working more intensively with those who fare well there. The majority of Maimonides studies incorporated a sender whereas the majority of conceptual replications adopted for a more convenient design without a sender. Given that telepathy trials tended to be more successful than clairvoyance trials in the Maimonides database, it may be preferable to include a sender. This need not imply that the sender plays an active role in the ESP process, but might simply reflect the psychological benefits of having a partner with whom to share responsibility for successes or failures (for an extended discussion see Roe, Sherwood, Farrell, Savva & Baker, 2007). Finally, the Maimonides team carefully selected target material based on its emotional intensity as well as vividness, colour and simplicity, and this was regarded as a crucial feature of the protocol (Ullman et al., 1973; Van de Castle, 1977), but this feature has been relatively neglected in later replication attempts.

# Conclusion

It has been possible to design experimental studies that explore the possibility of dream ESP while controlling for normal factors that in principle might account for impressive spontaneous experiences. The resultant findings, while subjectively less impressive than cases to be found in classic collections such as Louisa Rhine's, nevertheless are highly statistically significant and suggest that however one might account for instances of dream ESP it will not be solely in terms of available conventional mechanisms. Results have statistically replicated both within the Maimonides laboratory and across laboratories in subsequent conceptual replication attempts. However, the latter have produced quite heterogeneous effects that are likely a consequence of widely varying designs and there is a need for another wave of independent replications that adopt a standardised approach. If these also give rise to significant outcomes then the real challenge will begin as we attempt to identify and explain the processes at work.

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