

Altered States of Consciousness and Psi

Altered states of consciousness (ASCs) are defined as states that vary from the ordinary waking state in one or more dimension of consciousness, such as perception or bodily integrity. ASCs, such as those occurring with hypnotism and trance mediumship, have long been associated with paranormal experiences, and this association has been an object of contemporary research.

History

[Frederic Myers](#), a co-founder of the [Society for Psychical Research](#), was among the first scientists to draw attention to the links between ASCs and psychic phenomena, to be followed by many more distinguished parapsychologists.^[1] He speculated that changes in states of consciousness induced the movement of psychic material from the 'subliminal' (unconscious) mind to the 'supraliminal' consciousness (above the threshold of awareness), in the form of 'automatisms' such as telepathic interactions. Myers's ideas on state changes, consciousness and automatisms influenced scholars of consciousness, notably the American psychologist [William James](#).^[2]

General Discussion

States of consciousness need to be distinguished from the procedures used to induce them. This has unfortunately not been done with much research on ASCs, both within and outside parapsychology. Researchers often assume that the induction method is sufficient to produce the desired state of consciousness, failing to provide the phenomenological or physiological measurements that would establish this. Some go so far as to define the state as the experience that ensues from a specific procedure.^[3]

However, certain spontaneous experiences – notably [near-death experiences](#) (NDEs), [out-of-body experiences](#) (OBEs) and sleep paralysis^[4] – actually *are* the states of consciousness under study, since they are defined by their phenomenological features.

Another problem arises from the distortions to ordinary perceptual and cognitive processes in the altered state, which intensify the vulnerability of subjective psi-type experiences to ordinary cognitive biases and misperceptions. Sources of possible cognitive error include confabulation, misperception, misremembering, misjudgement of probability, situational context, prior beliefs and individual knowledge.^[5] On the other hand, it is arguably wrong to consign experiences that occur in altered states to the catchall wastebasket term of 'hallucination';^[6] insights arising from such states should be treated as potentially as insightful as those arising from ordinary states.^[7]

Furthermore, insights about the genuine nature of psi may arise from the exploration of such states outside laboratory-controlled conditions in their natural environment.^[8] Such work has in some cases led to the development of laboratory-based protocols – notably the [ganzfeld method](#) – that exploit specific altered states in order to maximize psi detection under controlled conditions.^[9]

Types of ASCs

Psychedelically-Induced States

'Psychedelics' is the name given to a class of psychoactive substances such as LSD, psilocybin, mescaline, ketamine and ayahuasca. They are defined as those 'which, without causing physical addiction, craving, major physiological disturbances, delirium, disorientation, or amnesia, more or

less reliably produce thought, mood, and perceptual changes'.^[10]

Intellectuals, scientists, explorers and academics in the developed world have only encountered them within the last hundred years or so. However, indigenous shamanic knowledge of psychedelic substances goes back several millennia, according to the archaeological evidence;^[11] while a wealth of spontaneous psi-related experiences has been [reported](#) in relation to the ingestion of psychedelics – in experimental, clinical and recreational contexts.^[12]

Many reports of psi experiences emerged the 1950s and 1960s, a time when psychedelics were being utilized extensively as aids to psychotherapy in the treatment of psychogenic disorders. Psi phenomena with good supporting evidence were found to occur in roughly 2% of cases where therapy patients ingested psychedelics. Thus, the prevalence of well-attested psi phenomena is much greater than that which occurs in ordinary psychotherapy.^[13]

Relative to other psychoactive substances, psychedelic substances are consistently reported to induce psi-like experiences. This is the case in historical reports by missionaries and explorers working in shamanic cultures, in later reports by anthropologists and ethnobotanists, and in surveys of recreational users.^[14]

There is a consistent trend in the surveys for increased reporting of psi-related phenomena from psychedelic substance users. Typically, the greater the use of such substances, the greater is the number of psi-type experiences.^[15] Their prevalence ranges from 18% for psi among Indian 'mind-expanding drug' users^[16] to 83% for telepathy experiences among Californian student cannabis smokers.^[17] Telepathy is generally the most commonly reported experience; [psychokinesis](#) tends to be the least common.^[18] Practically all psychedelics give rise to a high rate of out-of-body experiences too – the most reliable in this respect being the class known as dissociative anaesthetics, such as ketamine and methoxetamine.^[19]

Almost the entire range of exceptional psi-type experiences were found to occur with all psychedelics. They included [apparitions](#), auras, ancestral experiences, alien abduction experiences, early life experiences, entity encounters, interspecies communication, near-death experiences and phylogenetic experiences, to name a few.^[20]

There is also a consistent although weak relationship between kundalini experiences and both psychedelic and paranormal experiences, leading to speculation that endogenous (that is, made within the body) psychedelic substances such as *N,N*-dimethyltryptamine (DMT) may be implicated.^[21]

As much as psychedelic substances are associated with paranormal experiences, they are also weakly but consistently associated with paranormal beliefs too – as might be expected – and also with a lack of fear of the paranormal. These relationships are not evident with non-psychedelic drugs, and are even sometimes reversed with respect to alcohol, heroin and cocaine, as is also supported by a lack of ethnobotanical and anthropological evidence of these substances being used traditionally for shamanic purposes.^[22]

A drawback of the survey research is the lack of a clear identification of different substances and the experiences they seemingly produce; typically, all psychedelic substances are lumped together. However, one relatively recent survey^[23] does seek to develop a taxonomy of different experiences with different substances. The aim is to develop a system of parapsychopharmacological phenomenology, one that can inform a nascent transpersonal neurochemical taxonomy, and also help identify substances suitable for exploring particular experiences in laboratory-controlled conditions. One finding is that the primary transpersonal experience brought about by psilocin/psilocybin – containing 'magic mushrooms' – is one of encountering the actual spirit of the

plant/fungi, as also occurs with the psychedelic Mexican sage plant *Salvia divinorum* and the Amazonian jungle decoction known as ayahuasca.^[24]

However, such a taxonomy is somewhat nascent and needs to tease apart psychocultural and neurobiological factors, given that all psychedelic (and indeed all ASC) experiences arise as a combination of set, setting and substance.^[25] Further research to map the relations of states, not just the substances, to specific experiences is required to make further headway.^[26]

Despite a lack of clear evidential value as to the genuine nature of these experiences, subjective accounts and self-report measures, such as those used in surveys, do at least offer important directions for future empirical research. The findings from surveys can also help triangulate data from other contexts, such as that coming from psychedelically-assisted psychotherapy and from anthropologists' accounts of indigenous shamanic practices elsewhere.^[27]

Since the first ESP experiments with mescaline in Paris conducted in the 1920s, only 18 scientific papers on experimental psychedelic psi induction have been published. These comprise 23 separate experiments primarily exploring mescaline, LSD and psilocybin, with occasional investigations of ayahuasca, cannabis and the *Amanita muscaria* mushroom.^[28]

Experiments conformed to one or the other of the basic ESP testing formats: a traditional 'forced choice' task, where participants are given a limited range of symbols (such as the five Zener card images) and must intuit the target in repeated trials; or the more dynamic 'free response' format, where the target may be a location, an image, a film, or an object, and the participant is free to describe their mental imagery, which is later matched to the intended target among a pool of decoys.

Only four of ten forced choice studies were positive,^[29] although the conditions were not especially conducive, with repetitive card guessing that lasted hours in some cases, and participants who were mostly new with psychedelic experience; the need to perform boring tasks is far from ideal in a psychedelic state,^[30] and participants called it 'psychedelically immoral'.^[31]

Of the thirteen free response studies, ten returned positive findings, the best tending to be those that used psychedelically-experienced participants. However, most of these studies failed to utilize suitable decoys in order to establish exact probabilities for guessing the target. Also, in some cases, precautions against sensory leakage – the possibility of information being conveyed normally – was insufficiently reported or lacking, for instance when participants in telepathy experiments sat in the same room. However, although the experimental literature to date cannot be thought of as evidential, the findings suggest that future experiments with more robust methodology may be able to produce reliable evidence of ESP through the use of psychedelic substances in laboratory conditions.^[32]

Whether or not these exceptional psychedelic experiences can be shown to involve genuine psi, these substances should also be investigated to understand the neurochemistry of the experiences they create. Existing parapsychopharmacological theories include those concerning the role of DMT and ketamine in modeling near-death experiences.^[33] However, the neurochemical landscape first needs to be thoroughly mapped to the individual personality traits and the ensuing states, in order to understand the potential of these substances for inducing phenomena.^[34]

Sleep States

Sleep states have been studied for longer than psychedelic states both in terms of their physiological, psychological and parapsychological dimensions, and are seemingly easier to predict than psychedelic states. The standard physiological stages of the sleep cycle are also better mapped and more easily identifiable than other ASC induction techniques. Unlike other ASCs, however, sleep

is universal, extremely familiar, naturally occurring and unavoidable as an ASC, all of which means it differs greatly from other induction techniques and states.

The hypnagogic and hypnopompic states – the periods when a person enters and exits sleep, respectively – have been found to feature decreased awareness of the environment and of mental content, loss of volitional control over mentation, and decreased reality testing, along with increased internal absorption and an increase in mental imagery.^[35] Both stages – sometimes collectively termed ‘hypnagogia’ – are related to the occurrence of exceptional experiences such as ESP, OBEs, entity encounters, [past life visions](#), [mediumship](#) and apparitions.^[36]

The relatively common experience of sleep paralysis – reported by about half of respondents in surveys to have occurred at least once – has a tendency to arise during hypnagogia. Sleep paralysis is also sometimes accompanied by experiences similar to those reported in the NDE, and by experiences of psychokinesis.^[37] Few laboratory-controlled experiments have explored ESP in relation to hypnagogia, but those that have returned positive results. Some researchers consider this state to be possibly better than the dream state for producing ESP,^[38] though further research is needed.

More intensively studied have been the long periods of sleep between hypnagogia and hypnopompia. The stages have been well documented since the advent of electroencephalograph (EEG) brain activity monitoring equipment nearly a century ago. Until relatively recently, it was thought that dreams were only produced during rapid eye movement (REM) stage sleep; however, naturalistic research has shown that, although qualitatively different, non-REM sleep produces dreams almost to the same degree as REM sleep.^[39]

Data on spontaneous ESP experiences gathered by psi researchers indicates that 33% to 68% of independently-verified cases occurred whilst dreaming, with an additional 10% occurring during hypnagogia. Dreams were more prevalent in precognition cases, accounting for some 60%, but less typical in cases of telepathy, accounting for only 25%.^[40] Men were the agents (the apparent sender) of the telepathic information in 60% of cases, while women were twice as likely as men to be the receiver.

This data corresponds with survey reports, which indicate that [dream ESP](#) is a universal experience, occurring more or less evenly across large parts of the globe, and typically reported by 36% to 76% of the survey respondents.^[41] On the other hand, one review found little difference between the number of people reporting waking ESP experiences and those reporting dream-ESP experiences,^[42] although the frequencies may vary. It should also be noted that humans spend far less time dreaming than in the waking state.

The transfer of veridical information in [precognitive](#) dreams, and the fact that such dreams are frequently more intense and vivid than ordinary dreams,^[43] suggests to many that they are genuinely paranormal – not least the experiencers themselves.^[44] Against this, critics argue that the appearance of a link between dream imagery and an actual event is purely coincidental, since the law of large numbers dictates that a certain number of nightly dreams in large populations will occasionally match daily events.^[45] However, this reasoning overlooks the high incidence of precognitive dream reports by individuals who monitor their dreams nightly, and who typically report about 10% of their remembered dreams as having precognitive content relating to events in the coming days.^[46]

The critics also tend to comment only on spontaneous dream ESP reports, ignoring the mass of carefully-controlled experiments described in the research literature.^[47] This research goes back to Weserman’s partially successful attempt to induce dream images in naïve participants, published in

1819.^[48] Since that time there have been several experimental studies, of which the most systematic comprises a series of fifteen conducted by [Montague Ullman](#) and collaborators at the Maimonides Medical Centre in Brooklyn, New York, between 1962 and 1977.

The Maimonides dream ESP research technique exploited the then-recent discovery that vivid dreams occur during REM sleep, monitoring participants' brain activity by means of EEG in a purpose-built dream laboratory. Typically, a sender in a nearby room would attempt to psychically transmit an image to the person sleeping in the sleep laboratory. When instruments indicated that the sleeper was in a REM period, he or she would be woken and asked to describe their dream imagery. The following day the dreamer, or an independent judge, would view a pool of art prints that included the target image and rank them according to how closely they resembled the previous night's dream. The selections were scored in a binary manner as either a hit (ranked in the top 50%) or a miss (ranked in the bottom 50%).^[49]

Of the more than 300 trials conducted throughout the Maimonides research program,^[50] the overall combined hit rate was 63% where 50% would be expected by chance. These results are highly significant, with odds against chance of about seventy-five million to one.^[51] The Maimonides work has been positively reviewed by independent researchers,^[52] and criticisms have generally been successfully rebutted,^[53] although there is concern at the lack of direct independent replications, mainly a result of the prohibitive cost of sleep laboratory resources.

Since the closure of the dream laboratory programme, a number of conceptual replications have been made using home sleeping protocols, without EEG monitoring. These later studies also incorporated both clairvoyance and precognition designs, as well as the original telepathy approach. A review of 28 studies published since 1977 demonstrates that the dream ESP effect remains positive overall. The size of the effect is somewhat smaller than in the original Maimonides series,^[54] but this is perhaps to be expected, as the latter used specially selected participants and was able to wake sleeping participants during REM periods when dreams are easier to recall. Motivation is also thought to be greater when participants sleep in the laboratory rather than at home.^[55] That said, both laboratory and home series show a small but consistent effect of dream ESP across numerous laboratories and researchers spanning fifty years of research.

Hypnotically-Induced States

Hypnotic inductions have been reported to induce a range of parapsychological experiences,^[56] as far back as their original inception by Franz Anton Mesmer in the late 1700s (although Mesmer's methods were substantially different to modern forms of hypnosis.^[57]) The phenomena included mediumship, clairvoyance and [distant medical diagnosis](#), and were so frequently reported that, at one time, psi was considered to be a criterion of mesmeric trance.^[58] Recent surveys also relate exceptional experiences to hypnotizability^[59] and dissociative ability.^[60] The deep hypnotic trance has features in common with classic NDEs and OBEs – such as the sense of being out of one's body, bright lights and an all-pervading sense of well-being^[61] – in cases where induction is given without specific suggestions to highly hypnotizable subjects.

A number of ESP hypnosis experiments were performed throughout the twentieth century (though no methodologically-sound psychokinesis experiments). When the results of 25 ESP experiments were combined, subjects who had been hypnotically induced were found to have scored significantly above chance, whereas those in the control (non-hypnosis) condition did not.^[62] The meta-analysis findings were not negated by methodological quality differences among the experiments; however, most of the successful results were gained by two researchers who conducted multiple studies, opening the possibility of experimenter psi effects.^[63] As with other areas of ASC psi research, it also needs to be established whether the effects are due to the induction procedure or rather to a

combination of state and trait factors, such as hypnotic procedure and the hypnotizability of the participants, respectively.^[64]

Meditation

Beginning in the early 1970s, parapsychologists began to investigate the possibility of the [meditation state being conducive to psi](#). They were motivated in part by reports in Eastern mystical literature of psi phenomena occurring as a result of spiritual practice (*siddhis*),^[65] and by surveys showing that meditators are more likely to report apparitions, auras and OBEs than non-meditators.^[66] Kundalini-type experiences that arise through yoga practice are also associated with a range of reported parapsychological phenomena, according to surveys.^[67]

Parapsychologists conducted a number of experiments exploring various types of meditation: a review of sixteen psi studies conducted up to 1977 found them overall to be highly significant, with odds against chance exceeding a billion to one; nine of the sixteen were independently significant.^[68] A later review of a further six ESP studies conducted between 1978 and 1992 supported these findings.^[69] A further review looked solely at the psychokinesis experiments conducted between 1971 and 1988 and also returned positive findings,^[70] and this positive trend has continued with studies exploring the direct interaction of meditating minds with random number generators, as in those original psychokinesis studies.^[71]

However, it is unclear from those studies what the important psi-conducive factor is: the effects of meditation during the session, the participant's motivation, general meditation experience or personality, or a combination of these.^[72] Furthermore, they used a broad range of meditation practices, including karma, mantra and kundalini yoga, Zen and transcendental meditation, mandala gazing, and a variety of techniques developed by the researchers themselves. Such diverse techniques may bring about different types of ASC, or none.^[73]

A later series of studies utilized a more homogenous test paradigm, where participants meditated on assisting a meditator in another location to maintain focus on a candle, during specific random periods. The distant meditator would indicate with a button press when their attention wavered from the candle flame – a scenario termed 'the attention focusing facilitation experiment' (AFFE). Using an almost identical protocol, twelve conceptually identical studies were conducted by various researchers between 1993 and 2006. When reviewed as a whole, those returned a highly significant effect of meditator facilitation, and one that exceeded control periods. The effect was independent of methodological rigor, nor could it be attributed to any particular researcher, thereby providing a degree of confidence that the effect is genuine.^[74] On the other hand, the focus on meditation provides no certainty that participants were actually in an altered state, nor is any indication given of who was in what state or to what degree. The outcome may therefore be attributed to the participant having meditated, but not necessarily to having been in a meditative state.^[75] In addition, the AFFE paradigm utilizes a very loosely defined type of meditation that merely involves the maintenance of attention on the task.

Engaging with the subject more deeply, [Serena Roney-Dougal](#) adopted an immersive field research approach, fusing ethnography and experimentation. She spent six years living in India in yogic ashrams and Tibetan Buddhist monasteries, working with both novice and highly experienced meditators. The different meditation techniques made no apparent difference to psi scores in clairvoyance and precognition tests; however, there was a significant and consistent finding overall that years of meditation practice positively predicted ESP performance,^[76] with good psi scores becoming evident after about twenty years.^[77]

Ganzfeld Induction

Psi researchers interested in ASCs observed that a state of relaxation was common to many of them. They decided to exploit this inward-oriented awareness as a means to generate ESP, using a new sensory attenuation technique termed *ganzfeld* (whole field). The technique limits incoming sensory information through the use of a comfortable reclining chair, diffuse red light, and white noise. After a period of systematic relaxation (guided by an audio recording played through the headphones), the percipient is encouraged to verbalize the perception of their inner landscape (and recorded via a microphone). The principle is that the ‘sensory hunger’ that follows from the reduced sensory input leads to an increase in spontaneous mental imagery.^[78]

Typically, an agent or ‘sender’ views a randomly selected image or video clip, then attempts to transfer details about it psychically to the receiver, who is immersed in the *ganzfeld* in a separate location. Once the session is complete, the receiver’s mentation is blind judged (by a person not otherwise involved in the experiment) for its similarity to the actual target, which is presented to the judge in a batch of four possible targets. (In some studies, the receiver blind judges his/her own mentation against the target and decoy materials; in others, a non-sender clairvoyance design has been employed, in which the receiver simply tries to intuit what has been randomly selected as a target.)

A meta-analysis of research up to the mid-1980s indicated a compelling effect. Subsequent debate led to the creation of a computerized protocol aimed at excluding potential flaws, known as *auto-ganzfeld*. A later meta-analysis of auto-*ganzfeld* experiments also produced positive findings,^[79] but was overshadowed by a later study that found no effect.^[80] However, *ganzfeld* researchers objected^[81] that this study included several non-standard experiments that explored novel testing procedures aimed less at providing evidence of psi than in exploring the conditions in which it might be found.^[82] Independent judges were invited to rate the studies for their degree of similarity to a standard *ganzfeld* protocol, and it was found that the more standard was the study the more successful was it at producing ESP effects.^[83]

In 2010, a meta-analysis compared the *ganzfeld* technique of 29 studies carried out between 1992 and 2008 to a comparable group of sixteen non-*ganzfeld* ASC-induction free-response studies. Both sets of studies using ASCs were found to be significantly positive overall, with the *ganzfeld* being more effective than the non-*ganzfeld* ASC-induction techniques, although not significantly.^[84] However, when these experiments were compared to other free response ESP studies that did not use an ASC induction, the *ganzfeld* technique was found to be significantly better at producing ESP effects. Furthermore, the meta-analysis produced a highly significant positive finding for all 108 *ganzfeld* studies published up until 2008.^[85]

It remains unclear precisely what kind of ASC is being induced during the *ganzfeld*. Few studies monitor state-change indicators. As is also the case with other types of ASC psi research, we can only state that participants had a *ganzfeld* induction – not that they were in any specific state.

That said, it is generally assumed that the *ganzfeld* produces a hypnagogic-like state.^[86] One of the few studies to explore the psychophysiology of the *ganzfeld* state, using EEG, found that it most closely resembled the relaxed waking state, with a large degree of individual variability.^[87] However, this study was criticized for not using the standard pre-*ganzfeld* relaxation induction procedure and for failing to allow sufficient time for participants to habituate to wearing the EEG electrodes.^[88] From a phenomenological perspective the *ganzfeld* offers features that have been shown to be related to ESP effects, such as the incidence of spontaneous mental imagery and the loss of bodily awareness.^[89]

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Footnotes

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