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Can science see spirits? Anthropologist Jack Hunter examines the few attempts that have been made at neurophysiological studies of spirit mediums.

 [mediumship-taggart-square.jpg](#) ^[2]



Spirit Mediumship: A Complex Phenomenon

I. Neuroimaging Studies

by Jack Hunter

Spirit mediumship is a complex, near universal phenomenon (see *Talking With the Spirits: Ethnographies from Between the Worlds* ^[3] for a cross-cultural snapshot of just a few of the world's mediumship traditions), which, despite over 130 years of investigation from psychical research and the social sciences more generally, continues to evade scholarly attempts to pin it down and neatly explain it. Countless attempts have been made, however, from the debunkers who suggest that all mediumship is a mixture of fraud and delusion, to the social anthropologists who argue that spirit mediumship is a purely social phenomenon, performing specific social functions, and certain parapsychologists who suggest that spirit mediumship

offers proof of survival after death. And yet, none of the theories that have been put forward quite seem able to offer a fully satisfying explanation for what is going on.

In this series of short articles I would like to highlight some of the reasons why spirit mediumship is such a difficult phenomenon to get a grip on through outlining some of the research that has been conducted, and pointing out gaps in our understanding of the underlying processes. This first article will present an overview of the, really rather sparse, neuroimaging data on spirit mediumship, and will briefly discuss what it does and doesn't tell us about the phenomenon.

Background

It was long suspected that mediums might exhibit unusual neurological activity, and yet despite countless studies of the neurophysiological correlates of other forms of altered consciousness, such as meditation, very few neurophysiological studies of spirit mediumship have actually been conducted. Altered States researchers Edward F. Kelly and Rafael Locke have suggested that despite the potentially fruitful use of EEG and other physiological monitoring devices for classifying and differentiating specific altered states of consciousness and their physiological correlates, there are unfortunate technical and social difficulties associated with attempting such studies in the field. Technological difficulties include the problems associated with trying to monitor and record brain activity naturalistically in the field setting using cumbersome equipment, while social difficulties include getting spirit mediums, and other practitioners, to agree to participate in such studies. Fortunately, since Kelly & Locke first published their research prospectus in 1981, technological advances have made it possible to measure EEG in the field (see Oohashi et al. below), but other forms of neuroimaging still rely on heavy-duty equipment which is impractical for field studies. Despite these difficulties, however, a small number of studies have been successfully carried out specifically looking at the neurophysiological correlates of mediumistic states of consciousness.

Neurophysiological Speculations

Even before the advent of neuroimaging studies of mediums, American psychologist Julian Jaynes, drawing on his theory of the bicameral mind, predicted the following neurophysiological correlates of spirit possession:

We must naturally hypothesize that in possession there is some kind of disturbance of normal hemispheric dominance relations, in which the right hemisphere is somewhat more active than in the normal state. In other words, if we could have placed electrodes on the scalp of the Delphic oracle in her frenzy, would we have found a relatively faster EEG (and therefore greater activity) over her right hemisphere, correlating with her possession? And in particular over her right temporal lobe? (Jaynes, 1976, p. 342-343)

Based on neurophysiological studies of other altered states of consciousness, such as on the many varieties of meditative states, anthropologist Michael Winkelman has argued that a wide variety of trance induction techniques lead to similar neurophysiological states, specifically involving a 'parasympathetic dominance in which the frontal cortex is dominated by slow wave patterns.'

Owing to apparent similarities between trance mediumship and dissociative identity disorder (DID), psychical researchers Bryan Williams and William Roll (2007) speculated that mediumship and DID would share similar underlying neurophysiological correlates, specifically postulating the involvement of the temporal lobe. Based upon their overviews of the neurophysiological research on dissociative identity disorder, and the few EEG studies of

mediumship, offer the prediction that future fMRI studies of mediumship will reveal 'activation of the angular gyrus and the areas around the temporal-parietal junction when a medium senses the presence of his or her spirit control.'

Mesulam (1981) - Dissociative Identity Disorder and Spirit Possession

Neurologist M. Marsel Mesulam suggested that there might be common underlying neurophysiological activity in both spirit possession and DID, noting that EEG recordings taken from twelve subjects, seven with DID and five with symptoms of spirit possession, revealed unusual spikes of activity in the temporal lobe (except for in two unclear recordings), very similar to the activity associated with epileptic seizures. The implication here is that epileptic seizures in the temporal lobe are responsible for both spirit possession experiences and dissociative identity disorder.

Hughes & Melville (1990) - Channelers in Los Angeles

Anthropologist Dureen J. Hughes and Norbert T. Melville conducted an early EEG study on ten trance channelers, five male and five female, in Los Angeles. The channelers were monitored both in and out of trance, and during the trance state their possessing entities were asked a series of questions, so as to create as naturalistic a setting as possible. Based upon their EEG recordings, Hughes and Melville concluded that the channeling state is 'characterized by large, statistically significant increases in amount and percentage of beta, alpha and theta brainwave activity,' which appears to represent a distinctive psychophysiological state that can be differentiated from other altered states of consciousness (e.g. forms of meditation and hypnosis), as well as from pathological states such as temporal lobe epilepsy and schizophrenia.

Oohashi *et al.* (2002) - Possession Trance in Bali

One of the first studies to use EEG to investigate traditional spirit possession performances in the field was conducted by a team of Japanese researchers, using a newly developed portable EEG device to measure the electrical activity of the brain in an individual performing a ritual possession drama in Bali. The team found that the possessed individual exhibited enhanced power in the theta and alpha frequency bands, again suggestive that the possession trance represents a psychophysiological state distinct from pathological states such as epilepsy, dissociative identity disorder (DID), and schizophrenia.

Peres *et al.* (2012) - Psychography in Brazil

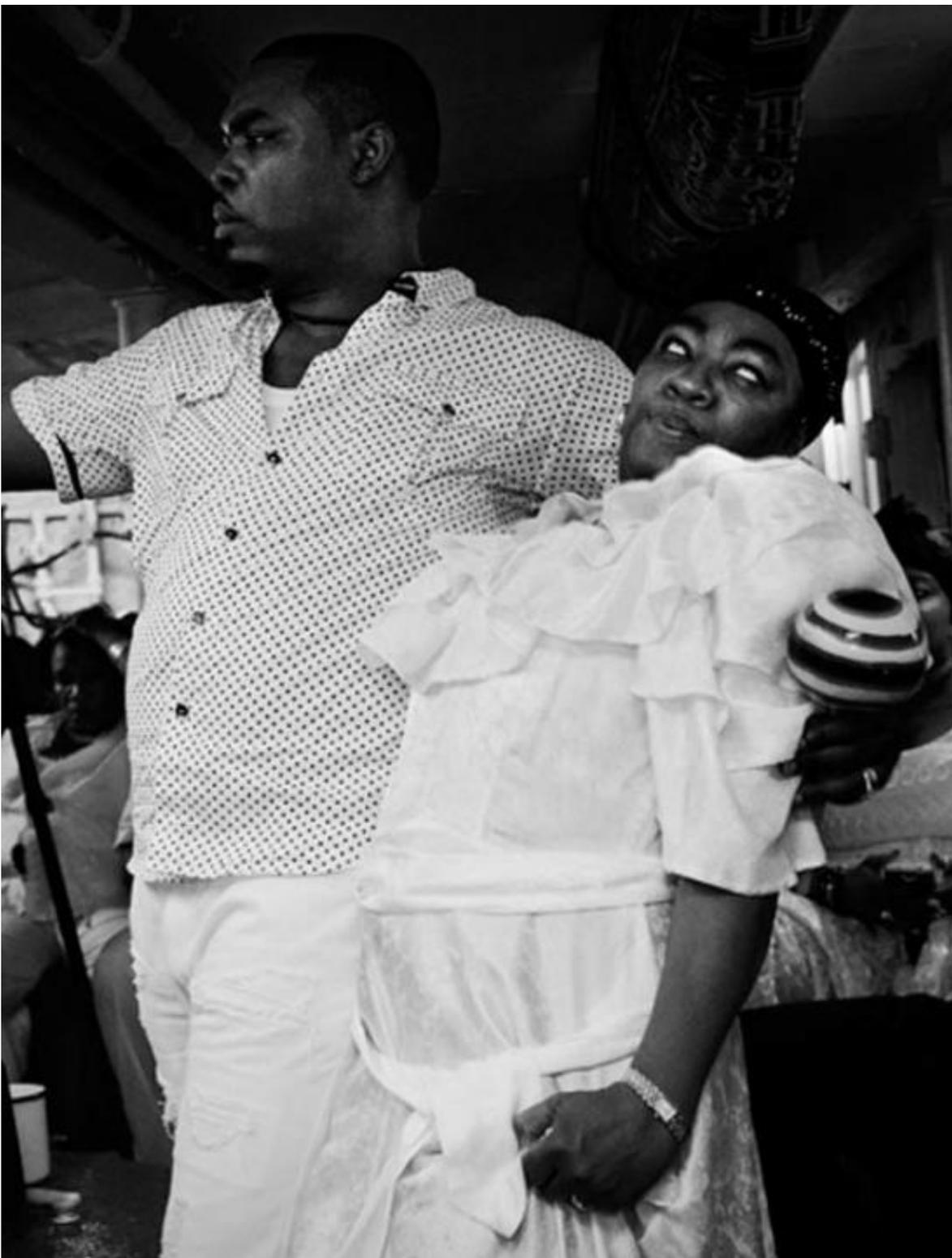
Recent neuroimaging research conducted by Julio Fernando Peres and colleagues, employed single photon emission computed tomography (SPECT) to scan the brain activity of ten automatic writers (five experienced, five less experienced), while in trance. The research findings have been summarised as follows:

The researchers found that the experienced psychographers showed lower levels of activity in the left hippocampus (limbic system), right superior temporal gyrus, and the frontal lobe regions of the left anterior cingulate and right precentral gyrus during psychography compared to their normal (non-trance) writing. The frontal lobe areas are associated with reasoning, planning, generating language, movement, and problem solving, perhaps reflecting an absence of focus, self-awareness and consciousness during psychography, the researchers hypothesize. Less expert psychographers showed just the opposite — increased levels of CBF in the same frontal areas during psychography compared to normal writing. The difference was significant compared to the experienced mediums (Thomas Jefferson University, 2012).

The implication here is that during the trance states of the experienced automatic writers, activity is reduced in the areas of the brain usually associated with reasoning, planning, language, movement and problem solving, suggesting that the medium's dissociative experience during trance is far from delusional or fraudulent. Furthermore, the researchers conducted an analysis of the complexity of the writing and found that, contrary to what would normally be expected, the complexity increased as the activity in the areas of the brain usually associated with such complex behaviours was reduced. This raises the question of how, if the brain's functioning was reduced, such complex writing was possible. The spiritist interpretation suggests that it was spirits doing the writing while the medium's consciousness was absent, and the data could indeed be read in this way. More cautiously, however, Andrew Newberg has suggested that this research 'reveals some exciting data to improve our understanding of the mind and its relationship with the brain' and calls for further research in this area.

Delorme *et al.* (2013) - Mental Mediumship in the USA

Mental mediumship differs from the types of mediumship discussed so far, which might best be labelled as forms of trance mediumship. The mediums investigated in this study did not enter into a trance state during which they surrendered the control of their bodies to discarnate entities. Instead these mediums experience communication with discarnate entities while in a waking state of consciousness. Because of this difference the results aren't directly comparable with the results of the previous studies, they are, however, still interesting. EEG recordings with mental mediums revealed a predominance of activity in the gamma frequency band, which is also characteristic of certain meditative states. Perhaps the most interesting finding from this research project was the correlation between the accuracy of the mediumship reading and specific alterations in electrocortical activity. fMRI scans revealed increased activity in the frontal areas of the brain, similar to fMRI readings for other spiritual states. Decreased frontal midline theta rhythms were also noted, and it was suggested that this might be 'consistent with a medium accessing a receptive mental state.' Again, the authors conclude that 'the experience of communicating with the deceased may be a distinct mental state that is not consistent with brain activity during ordinary thinking or imagination.'



But we still don't know what is actually going on...

At the very least, the neuroimaging work that has been conducted on mediumship appears to support the idea that there is more to mediumship than simply fraud and delusion - something, whatever that something might be, is definitely going on here. But the data are by no means *conclusive* of anything more than that. The research does seem to indicate a predominance of alpha, beta and theta waves in trance channeling and possession states, and gamma frequencies in mental mediumship. It is unclear, however, how these EEG readings relate to the findings of other studies that suggest a decrease in brain function during mediumistic trances. There is also a considerable discrepancy between studies that suggest similarities with pathological conditions such as DID and temporal lobe epilepsy, and those that seem to indicate that mediumship is a distinctive psychophysiological state.

The truth of the matter is that there are significant difficulties associated with the interpretation of any neuroimaging data. Such studies are, for example, subject to the classic problem of distinguishing between cause and correlation - are these data suggesting that the mediumship experience is caused by alterations in brain physiology, or do they show us what happens to the brain when mediumship takes place? Do they explain mediumship, or do they show us the processes of mediumship? These are important questions that only further research can resolve. Psychologist Joan Hageman and colleagues list other problems inherent in the interpretation of neuroimaging data. They warn against the following tendencies in neurophysiological research:

1. Naively [accepting] materialist monism (mind as brain product) as an obvious fact, and [rejecting] a fair consideration of other hypotheses for the mind-brain relationship.
2. [Basing] work on secondhand descriptions of original findings or writings.
3. [Focusing] only on one side of psychophysiological parallelism, i.e. changes in brain function modify mental states.
4. [Assuming] that experiences based on superficial similarities are identical.
5. [Identifying] a brain region involved with some spiritual experience and [concluding] that this region is the ultimate cause of that experience.
6. [Ignoring] the complexity of the body and [refuse] to take a holistic perspective.
7. [Focusing] studies on beginners or participants who have not had a full-blown spiritual experience (Hageman et al., 2010, pp. 87-89).

Only further careful research, taking into account the difficulties inherent in the interpretation of neurophysiological studies, will help to resolve questions about what is happening in the brain during mediumistic trance states. For the time being, however, the research indicates that something unusual is going on, whatever that something might ultimately turn out to be, which demands more attention.

Jack Hunter is the editor, with David Luke, of Talking With the Spirits: Ethnographies from Between the Worlds ^[3], a cross-cultural survey of contemporary spirit mediumship, covering everything from Spiritualist séances in the United Kingdom to self-mortification rituals in Singapore and Taiwan, from psychedelic spirit incorporation in the Amazonian rainforest, to psychic readings in online social spaces, and more.

TALKING WITH THE SPIRITS

ETHNOGRAPHIES FROM BETWEEN THE WORLDS



Edited by **Jack Hunter** and **David Luke**

[3]

Further Reading:

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