

Can distant intentionality (DI), defined as sending thoughts at a distance, actually change the brain function of the person who is said to be receiving the thoughts? In the following study, internationally recognized researcher of medicine and psychology Dr. Jeanne Achterberg and other researchers used functional magnetic resonance imaging (fMRI) to record the effects of DI by a group of healers from various spiritual traditions on a group of test subjects with whom they had close personal bonds. The results are provocative.

Evidence for Correlations Between Distant Intentionality and Brain Function in Recipients

A Functional Magnetic Resonance Imaging Analysis

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INTRODUCTION

From the beginnings of medical history, humans have held a belief in a spiritual connection to others separated from them at a distance. These beliefs have been held as the basis for the efficacy of prayer, so-called energy healing, and the ability to

heal others at a distance (“nonlocal healing”). Despite the longevity of the concept, these phenomena are largely dismissed by the advocates of the biomedical model because they do not fit the current scientific paradigm. The purpose of this study was to determine whether brain changes may be measured using fMRI in the recipients of distant intentionality. In this paper, distant intentionality (DI) is used as a phrase that subsumes prayer, energy healing, healing at a distance, spiritual healing, Therapeutic or Healing Touch, transpersonal imagery, remote mental healing, and other practices based on putative connection in the absence of mechanisms of sensory contact.¹

There is a growing interest in the scientific community to study different forms of DI. In a recent publication summarizing the current research on healing, at least 2,200 published reports on spiritual healing, prayer, energy medicine, and mental intention effects were noted, as well as other examples of distant healing intentionality (DHI) or DI.² The researchers noted the weak designs of many of the studies reviewed, concluding generally that the results merit further study using sound methodology.

The neurophysiologic aspects of mystical, meditative, or spiritual states have been studied with imaging technologies. Numerous studies of mystical or religious experiences using single photon emission computed tomographic (SPECT) scans to capture brain function have been reported.^{3,4} Several of the studies showed reduced regional brain metabolic activity in the posterior superior parietal lobe during intense or peak religious moments. Among the groups they studied were Tibetan meditators and Franciscan nuns at prayer.

In a study of five individuals who had practiced Kundalini yoga for at least four years, changes were found that occurred in many areas associated with attention and control of the autonomic nervous system (dorsolateral, prefrontal, and parietal

cortices, hippocampus, temporal lobe, and the anterior cingulate cortex).⁵ Still more relevant to the current study is the evidence of correlative activity between the brain function of two individuals separated by distance, and in the absence of sensory mechanisms of contact. What has been referred to as “extrasensory induction” has been reported in 15 pairs of monozygotic twins who were sensory-isolated from each other and in separate rooms. In two of the 15 pairs, changes in EEG alpha rhythms in one twin were observed simultaneously in the other.⁶

A series of papers⁷⁻⁹ reports several EEG studies showing that a visually evoked potential in one member of a pair of individuals who felt a close personal connection occurred at above chance rates in the nonstimulated brain of the other who was at a distance in an electromagnetically shielded room. Although these studies were highly criticized because of serious methodological issues, findings were later replicated using appropriate statistical detection methods and improved control conditions by two other independent laboratories using EEG technology.^{10,11} An additional study that employed a similar paradigm reported significantly correlated fMRI signals between distant human brains.¹²

Nineteen studies replicating an apparent effect of interconnectivity at a distance have been reported.¹³ These studies show above-chance correlations in electrodermal activity (EDA), a measure of stress and arousal, between isolated subjects. In their protocol, one subject was instructed to randomly send anxiety-provoking or relaxing images to the other subject, who was located in a distant room. EDA in the receiver subject was correlated above chance, suggesting that the mental images of senders influenced the state of arousal of receivers.

In summary, existing findings seem to suggest the positive effects of DI, the localization of brain areas activated during prayerful or meditative states, and the correlation of brain function between

pairs of individuals. These data point to the next logical step, which is to investigate the effect of DI on the brain function of the recipient. The research question investigated by this study is: “Is there evidence for correlations between distant intentionality and brain function in recipients of distant intentionality who are tested using fMRI?”

METHODS

Subjects

Twenty-two participants (11 pairs of healers and recipients of DI) were recruited on the Island of Hawaii. Healers were chosen who claimed to have the skills to communicate in some “non-local” form. In this first effort to document the effect of DI, it was important to use participants who already had training and experience in DI within their traditions. There was no attempt to document their ability to heal within the confines of this study. Often healers attempt to heal illness of a psychological and spiritual nature, and the typical medical records are of little use. To reiterate, though, the study is not about healing per se, but whether there is some correlation in the intention to connect at a distance with a person. The authors asked each healer to name someone with whom they felt a bonded or close connection.

This decision was based on research cited earlier that indicates close or bonded individuals may be more likely to show correlated physiologic effects.

Inclusion criteria for the healers included:

1. Acknowledgment within their communities for their healing abilities
2. Fulfilling cultural requirements for training, apprenticeship, and practice
3. Ability to name an individual with whom they claim a special connection, who understands the goals of the experiment and is willing to undergo an fMRI scan

4. A stated belief in their ability to turn on and off their intentions within a time frame of approximately 2 to 4 minutes

The inclusion criteria for the receivers of DI included:

1. Being selected by the healer as someone with whom they feel a close or empathic connection
2. Having the standard requirements for receiving an MRI (no implanted devices or metal objects such as pacemakers, joint pins) and no history of claustrophobia
3. Willingness to undergo an MRI scan of 34 minutes' duration and a postscan interview

Three men and eight women with an age range of 46 to 71 participated as healers. The recipients of the healing ranged in age from 44 to 61 and included three men and eight women. On average, healers had been practicing their healing traditions for 23 years.

The healers represented a variety of practices, including Healing Touch (a practice of distant healing and laying on of hands, conducted primarily by nurses trained in the method); *pule*, a traditional Hawaiian healing form that consists of prayer, chant, and song by a spiritual elder or Kahuna; Peruvian shamanic healing; Reiki (a form of energy healing that may have ancient origins and was purportedly rediscovered in the nineteenth century in Japan); vibration or sound healing; and three eclectic forms of DI that did not fit into established traditions. Additionally, three of the pairs represented a Chinese method of healing called Qigong, and all three trials were conducted by the same Qigong master.

Procedures

The study protocol was approved by the Institutional Review Board, University of Hawaii, John Burns School of Medicine.

The study was conducted in the Department of Radiology, North Hawaii Community Hospital in Waimea from August 2003 through July 2004.

Prescan. Both members of each pair signed an informed consent form and filled out a demographic questionnaire. A semistructured interview was conducted with each healer within four days before the scan to elicit information on his or her DI practices. Then the healers were given information about their role, and the On (Send) and Off (No Send) procedures were described. Standardized instructions included the information that they should try to connect with the receiver during the On condition in ways that were prescribed by their own DI practice. This was most frequently described as sending energy, prayer, or good intentions, or as thinking of the individual in the scanner and wishing for them the highest good. All of the healers claimed that they were not the cause of any healing effect, but rather were a conduit for a spiritual or cosmic source. During the Off conditions, they were instructed to take their attention away from the person in the scanner.

The recipients of DI were instructed to relax as much as possible in the scanner environment. They were provided with a call button and given instructions on using it if they were distressed, had questions, or needed to stop the procedure. However, no one used it for contact during the study trials. They were made aware that the healers would be performing DI. They were not provided with any information about the timing of the On/Off conditions. Because the healers were not informed about the timing of the On/Off signals before the trials, they could not have coached their receivers before the scan.

Experimental conditions. The healer was in the electromagnetically shielded control room and physically and optically isolated from the receiver in the scanner. The radiology technician, research nurse, and principal investigator were also in the

control room. During the course of the experiment, the healer was verbally instructed by one of the researchers with cues to start and stop the DI. The random pattern of the twelve 2-minute intervals was determined prior to the onset of the study using a coin toss. A single randomized sequence that had an equal number of on and off sessions was used for each session. The pattern was off, on, on, off, on, off, off, on, on, off, on, off, for a total of six 2-minute On periods and six 2-minute Off periods. In three instances, it should be noted that the length of the interval was 4 minutes because two of the On or Off conditions occurred back to back. This pattern remained the same for each healer. The total time the recipients of DI were in the scanner was 34 minutes, which included a 10-minute structural baseline of sagittal and transverse images. During the time in the scanner, no physical or sensory contact was made with the recipient by any member of the research team.

RESULTS

The FSL software produces a quantitative table of cluster results that includes: cluster size, probability for each cluster, z scores, $x y z$ coordinates of the cluster in Talaraich space and contrast of parameter estimates. If a cluster is significant in a group analysis it means that there were specific brain regions in which the combined subjects had enough activation to raise the z score above the noise level threshold.

In other words, if all of the subjects had random activation at different places in the brain, then there would be no group activation. One of the two clusters was highly statistically significant ($p = 0.000127$).

DISCUSSION AND CONCLUSIONS

Group analysis revealed significant activation in several areas of the brain, especially the anterior cingulate cortex, frontal

superior areas, and the precuneus. The authors' anatomic definitions are correct if the Tzourio-Mazoyer atlas is used.¹⁴ It was produced as a segmentation of the MNI atlas. This is available in MRIcro as ANALYZE files. The conventionally ascribed functions of the cingulate cortex are considered executive control, and decision making at this level determines both verbal and motor responses.

The rostral anterior cingulate cortex area has been shown to be activated during the height of opioid and placebo analgesia response.¹⁵ The frontal lobes are generally regarded as modulating information processing, judgment, and decision making. Little is known about the function of the precuneus; however, it has been recently argued that it, along with the anterior cingulate gyrus, may be a part of a neural network that is involved in resting consciousness and self-reflection.¹⁶

Overall, the results show significant activation of brain regions coincident with DI intervals. Even though the results of individual analyses and group analysis were statistically significant, the internal validity of these findings is challenged on several fronts. First, from the data accumulated it is not possible to establish causal factors for the demonstrated effects. For example, three people (the radiology technician, research nurse, and principal investigator) were in the control booth and aware of the timing of the On and Off conditions. Given these facts, it is not possible to know to what extent they influenced the findings, even though they were not deliberately sending distant intentions. Second, because the study design used a variety of healing traditions, one cannot know whether the particular modality caused the effect or it was a function of some unique and idiosyncratic interaction between members of the pair. Finally, no independent measure of the healer's abilities is available. The healing traditions represented are poorly researched, and the empiric evidence for the prowess of any given practitioner is a matter of conjecture.

Given that there are no known biological processes that can account for the significant effect of the DI protocol, the results of this study may be interpreted as consistent with the idea of entanglement in quantum mechanics theory.¹⁷ Entanglement has been confirmed to occur between photons, and many have speculated that certain highly organized macroscopic systems, including the brain, exhibit the property of entanglement with other complex systems. In a recent study, evidence was found for nonlocal connections between separated preparations of human neurons.¹⁸ These findings, plus the current study correlating brain activity in two sensory-isolated humans, do not fit the classic model of physics and can be interpreted as consistent with entanglement at the macroscopic level.

Several future research directions are suggested, such as replicating the present study using the same healers and recipients; examining the importance of empathy or close relationship by pairing healers with subjects who are unknown to them; using a similar protocol to study possible relationships between DI and healing in a sample of patients with a particular medical diagnosis; studying possible group effects of several DI practitioners on a subject in the scanner, and scanning healers during the DI protocol with the goals of identifying brain structures and functional brain changes during the DI state.

In summary, these findings support previous research on distant healing suggesting that human intentions may directly affect others in ways that are not entirely understood.

The authors express deep appreciation to the Earl and Doris Bakken Foundation, Kailua Kona, Hawaii, for the generous support of this research, and thank Steve Bauman, PhD, and Greg Hickok, PhD, for their consultations. The authors are grateful for the cooperation and facilities of North Hawaii Community Hospital and Roy Young's technical assistance.