

## eye of origin

disputes continued. Psychologist Daryl Bem was among those convinced of the reality of ESP, yet his meta-analysis relied on experiments that had already been shown to be deeply flawed or even fraudulent.

In remote viewing, one person travels to a randomly selected location while the other tries to visualize the location from the laboratory. As with ganzfeld, there were initial successes followed by much controversy. In 1995 a CIA report, covering more than 20 years of government research, concluded that although a small effect had been demonstrated in the laboratory it was not useful for intelligence purposes.

Other ESP research includes telepathy in twins, ESP in young children, the use of hypnosis, relaxation, dreams and meditation to improve ESP, the claimed ability of people to detect when they are being stared at (remote staring), and tests of psychic claimants. After more than a century of research there is no agreement on the best methods for inducing ESP; no consistent evidence that ESP correlates with age, sex, imagery ability, fantasy proneness, or any other variables; no evidence of a specific link with consciousness; and no plausible theory to explain how it works—that is, if it does.

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**eye of origin** Neural signals travel independently from the retina of each eye and remain independent until they reach the visual cortex. Thus one might expect that humans would be conscious of which eye receives a signal (the eye of origin). It is relatively easy to set up viewing conditions using either mirrors or eyeglasses with shutters so that visual stimulus come into a single eye. Experiments have shown that under a broad range of viewing conditions observers are unable to discriminate eye of origin. This phenomenon is called *utrocular viewing*. The lack of eye of origin discrimination is one of the most powerful items narrowing the locus of the neural correlates of consciousness since the first cortical

visual area, \*V<sub>1</sub>, has dramatically distinct eye of origin anatomical structures called *ocular dominance columns*. These structures consist of 1 mm wide strips of cortex that predominantly consist of bands of neurons sensitive to signals from the right eye, interleaved with 1 mm bands of neurons responding to signals from the left eye. Later visual areas and the V<sub>1</sub> output neurons do not have this distinctive alternation of ocular dominance bands. Since conscious awareness does not have access to this dramatic eye of origin, one can immediately place constraints on the locus of the neural \*correlates of awareness.

This argument is strengthened by the even more dramatic finding that eye of origin confusions have also been found in stereo-deficient and amblyopic observers (Barbeito et al. 1985) after care is taken to remove visual cues such as the blurring associated with stimuli coming into the amblyopic eye. It has been shown that neurons in the amblyopic brain are almost exclusively monocular (driven by one eye), so eye of origin confusions in these individuals provides further constraints on the locus of the neural correlates of awareness.

Even though there is no conscious awareness, there is an eye of origin cue that closely resembles \*blindsight. It has been found that subjects cannot report the direction of vertical disparity (which eye has the higher image) but vertical vergence (eye movement) responses are robust. We assume that these eye movements are based on cortical disparity processing. Subjects may see diplopia (double images), but cannot identify the eye of origin for each of the diplopic images, nor can they identify which image is higher. This finding is similar to blindsight in that the motor system knows what conscious awareness does not. Interestingly, horizontal disparity information are readily available to both perception (apparent depth) and motor response.

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