

Roger Walsh

Can Synaesthesia Be Cultivated?

Indications from Surveys of Meditators

Abstract: *Synaesthesia is considered a rare perceptual capacity, and one that is not capable of cultivation. However, meditators report the experience quite commonly, and in questionnaire surveys, respondents claimed to experience synaesthesia in 35% of meditation retreatants, in 63% of a group of regular meditators, and in 86% of advanced teachers. These rates were significantly higher than in nonmeditator controls, and displayed significant correlations with measures of amount of meditation experience. A review of ancient texts found reports suggestive of synaesthesia in advanced meditators from India and China. These findings suggest that synaesthesia may be cultivated by meditation, and that laboratory studies of meditators could be rewarding.*

Introduction

Synaesthesia is a condition in which an individual 'experiences sensations in one modality when a second modality is stimulated' (Ramachandran & Hubbard, 2001a, p. 4). For example, music might be experienced as not only sound, but also as colour, or more rarely as touch or taste. The most common form is coloured hearing, in which sounds are associated with a particular colour (Marks, 2001). Eminent synaesthetes probably included the novelist Vladimir Nabakov, composer Olivier Messiaen, painter Wassily Kandinsky, and physicist Richard Feynman (Cole, 1998; Kher, 2001). Until the 1970s it remained a rarely mentioned medical curiosity, but is now the subject of considerable interest across psychological and neuroscientific disciplines (Carpenter, 2001; Grosenbacher & Lovelace, 2001; Ramachandran & Hubbard, 2001a,b; Rich & Mattingley, 2002).

Solid data on incidence is meagre. Synaesthesia is usually thought to be a rare condition, with estimates ranging from one in 20 to 25,000, with recent studies tending to converge around one in 200 to 500 (Baron-Cohen *et al.*, 1996;

Correspondence:

Roger Walsh, M.D., Ph.D., Department of Psychiatry & Human Behavior, University of California College of Medicine, Irvine, CA 92697-1675, USA. Email: rwalsh@uci.edu

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Cytowic, 1997; Hubbard and Ramachandran, 2003). However, in one study, 23% of a population of fine arts students claimed to experience it. Synaesthesia is more frequent in women, among relatives of synaesthetes, may show an X-linked inheritance, and is sometimes associated with other unusual psychological capacities such as eidetic imagery and hypermnnesia (Dann, 1998; Luria, 1968).

Two factors may induce it temporarily. The first is psychedelics such as LSD and ayahuasca, where synaesthesia accompanies a general amplification of sensory experience (Cytowic, 1998; Grof, 2001; Klüver, 1960; Shanon, 2002; 2003; Walsh and Grob, 2004). The second is severe pathology, specifically episodes of schizophrenia, major depression, and temporal lobe epilepsy episodes (Cytowic, 2002; Harrison, 2001). Permanent synaesthesia may rarely be induced by neural damage (Harrison, 2001). The French World War II resistance leader and hero Jacques Lusseyran (1963) provides an exquisite account of his development of synaesthesia after a childhood accident left him totally blind.

A third suggested instance of induced synaesthesia is associative conditioning. For example, Ellson (1941a,b) produced what he termed 'hallucinations' by repeatedly pairing colours in close temporal association with specific tones, and associative conditioning has often been suggested as a causal mechanism accounting for synaesthesia. However, recent fMRI studies of coloured hearing synaesthetes found that words activated parts of the visual system, specifically areas V4 or V8 of the fusiform gyrus. By contrast, no such activation occurred in nonsynaesthetes after associative conditioning (Gray *et al.*, 2002; Nunn *et al.*, 2002), thereby calling the relationship between synaesthesia and associative conditioning into question.

There are clearly multiple causes and varieties of synaesthetic experiences. As described above, associated causes may range from physical to pharmacological and from psychological to neural. The condition may be transient or permanent, spontaneous or familial, and may be elicited by sensory stimuli or amodal symbolic thought (e.g. letters and numbers).

Likewise, there are multiple varieties of synaesthetic experiences. They may range across photisms (unstructured lights) and organized percepts (Jacobs *et al.*, 1981), unimodal and multimodal (Harrison, 2001), simple and complex (Klüver, 1966), positive and negative (Werner, 1961), personal and transpersonal (Hunt, 1995), basic and higher order (where certain forms of higher order symbolic cognition are interpreted as synaesthesias) (Hunt, 1995).

Not all these varieties will be detailed here. However, one obvious conclusion of these multiple causes and experiences is that the term 'synaesthesia' currently refers to a diverse family of phenomena. In short, 'synaesthesia is dizzyingly diverse' (Marks, 2002, p. 758). It is therefore important to remember that life-long, coloured hearing synaesthesia, which is currently the focus of considerable laboratory research, and for some researchers is paradigmatic of 'real' synaesthesia, may be only one form of a more complex and varied phenomenon. Consequently, it is crucial to remain open to and investigate other forms as well.