

Benny Shanon

Three Stories Concerning Synaesthesia

A commentary on Ramachandran and Hubbard

The article on synaesthesia by Ramachandran and Hubbard (2001; henceforth, R&H) is comprehensive and intellectually stimulating. In this commentary, I would like to present some empirical data not discussed in R&H and to raise some theoretical questions relating to ideas proposed in this article. My comments will be divided into three sections, or — rather — three stories, which correspond to three, independent and different, occasions in my career in which I found myself dealing with synaesthesia. Each of these stories carries a moral that adds to the picture of synaesthesia drawn in R&H.

1st Story: The Semantics of Synaesthesia

My first engagement with synaesthesia was triggered by my very first hearing of this phenomenon. This was more than 20 years ago, when two students of mine, both female, told me that they saw colours when thinking of numbers and/or letters. This sounded strange to me, and being curious, I began to investigate the phenomenon. The results of this investigation are reported in Shanon (1982). Since this work is not cited in R&H (perhaps because it was published very early, and in Europe), let me summarize its rationale and the main findings reported in it.¹

At least 200 normal adults were asked whether they associated colours with numbers, days of the week, months of the years, letters of any alphabet, musical tones, or any other linearly ordered semantic category. It appeared that most people questioned did not make any sense of the query, but some persons answered in the affirmative readily and as a matter of fact. The persons of the latter kind were further interviewed individually. Specifically, they were asked to name those semantic categories with whose members he/she associated colours. Given this information, the investigator named the members of each category specified

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[1] Another relevant early work not cited by R&H is McKellar (1957) who examined the frequency of colour associated to different semantic domains within the population.

and recorded the colours the informant gave in response. In order to verify the constancy of the associates, the check was conducted twice: first, in the regular order to the sequence of the members of the category in question; and second, in a random order. Throughout the interview additional questions were posed which probed the further phenomenological details regarding the synaesthetic patterns.

Eighteen (15 females, 3 males) informants were found who reported colour associates to linear semantic orders; the informants were native speakers of 5 languages, the most common ones being Hebrew and Russian. 16 informants associated colours to numbers and 10 to days of the week. Also reported were colour associates to letters of the alphabet and to the musical scale. (For comparison, see R&H, p. 14). In all cases, the associations were stable both in terms of the check described above and by informants' own attestation of their life histories.

Statistical analyses of the specific colour associates reported by the informants revealed that the specific colour associates encountered in synaesthesia are not random. It is not that all the informants associated the specific colours to the same numbers or characters. People may differ as to whether their number scale begins with 0 or 1, they may differ in the colour they associate with the first number on the scale (usually this colour is either black or white), and as the numbers increase, some colours of the spectrum may be skipped by some people. Yet, when the reports of colour associates are considered across informants and across semantic domains, inter-personal similarities are revealed. In particular, for each number, there is one colour that is associated more frequently with that number than any other colour is.² Summing up the statistical analyses conducted, the following orderly patterns are noted:

- (1) There is a high correlation between the patterns of colour associates given to numbers and to days of the week.
- (2) There is no significant correlation between these patterns and that of the physical colour spectrum.
- (3) There is a significant correlation between the above patterns and the order of colour names in the typology of colours proposed by Berlin and Kay (1969). This typology orders colours according to the probability of their appearances in different languages.

Together, these results indicate that the percept-like colour associates with linear orders are not arbitrary. These associates exhibit a consistent structure and high overall inter-personal similarities. Furthermore, the synaesthetic patterns highly correlate with independent linguistic and anthropological data.

2nd Story: Metaphoricity

The second time I found myself being concerned with synaesthesia was in the context of my study of metaphor. As part of a comprehensive critique of the representational-computational view of mind in contemporary cognitive science (see Shanon, 1993), I proposed that metaphor should be viewed not as the

[2] The only exception is the case of the number 5 with which the colours blue and green are associated in the same frequency. Note that in many languages the same verbal term denotes these two colours.

mapping between two given semantic fields, but rather as a cognitive mode affording a new way of looking at things. In particular, I argue that for the metaphoric relation to be established it is not necessary for the semantic features pertaining to the two fields to be given and defined; rather, these features are created by the metaphoric relation itself. Thus, metaphORIZATION is a very basic psychological feat, one that allows for novelty in cognition. Like R&H, I mark several parallels between the linguistic phenomenon of metaphor and the sensory one of synaesthesia. By way of example, let me cite the following example which is taken from Gabriel García Márquez (1988) *Love in the Time of Cholera*. This text not only presents a wonderful metaphor but also a case analogous to synaesthesia and a psychological insight regarding the nature of figurative language:

Once he tasted some chamomile tea and sent it back, saying only: 'The stuff tastes of window'. Both she and the servants were surprised because they had never heard of anyone who had drunk oiled window, but when they tried the tea in an effort to understand, they understood: it did taste of window (pp. 221–2).

As García Márquez points out, no one knows how a window tastes. Indeed, who would even have thought of associating taste with a windowpane? Yet, the metaphoric expression is meaningful. In fact, as described in the novel, it is the drawing of the metaphoric relationship that makes the individuals at hand view the world in a new way, one in which the metaphor is accepted as a proper description of reality. Thus, the metaphor makes sense even when one does not know the elementary semantic features that presumably are involved in it.

The basic nature of metaphor is appreciated in light of ontogenetic data. It appears that metaphor is especially prevalent in young children. Synaesthesia too is much more common with children than with adults (see Marks *et al.*, 1987). Indeed, children routinely exhibit cross-modal associations very early in their lives. When presented with auditory stimuli followed by visual ones, infants were found to make preferential mappings of values from one sensory modality to those of the other. For instance, after hearing a pulsing tone, infants preferred to stare at a dotted rather than an unbroken, line, and vice versa following a continuous tone (Wagner *et al.*, 1981). Similar findings were reported with respect to loud sounds and bright colours (Lewkowicz and Turkewitz, 1980).

These and other data led me to regard metaphoricity not as the product of expanded association, but rather as a cognitive mode pertaining to a state of mind or a perspective in which certain semantic distinctions are not made. Given the intrinsic cognitive link between metaphor and synaesthesia, I favour looking at synaesthesia from the same perspective, namely, as a mode of perception that disregards standard differentiation between sensory modalities. My thesis is not based on any neurological data nor is it meant to say anything about brain function. Nonetheless, I should say that logically it is distinct from the hypothesis of cross-activation proposed by R&H and conceptually it presents a cognitive view which is radically different from theirs. More on this alternative view of metaphor and on the role of metaphoricity in cognition is said in Shanon (1993 and 1992).

3rd Story: Non-ordinary States of Consciousness

Thirdly, I encountered synaesthesia in my study of non-ordinary states of mind. R&H indicate that synaesthesia is encountered in substance induced psychedelic states, and they specifically mention LSD. By and large, they consider these effects as peculiar to a small number of people and suggest that the phenomenon is related to genetically determined disposition (R&H, p. 5).

My perspective on synaesthesia in conjunction with non-ordinary states of mind induced by psychotropic substances is different. First, I shall note that in such states synaesthesia is exceedingly common. I am saying this both on the basis of a comprehensive survey of the literature associated with different substances (see, for instance, Ludwig, 1969; Masters and Houston, 1966; Watts, 1962), and on the basis of extensive empirical research I myself have conducted with one specific substance — ayahuasca (see below). Even before examining further details, I shall note that the very high occurrence of synaesthetic effects in the context of substance induced non-ordinary states of consciousness puts into question the genetic explanation of synaesthesia advocated in R&H. By contrast, my view is consistent with the theory proposed by Cytowic (1989; 1993; 1997), which associates synaesthesia with the limbic system.

Let me turn to my own work. Ayahuasca is a powerful psychotropic brew that for millennia has been used by the indigenous tribal cultures of the upper Amazonian region. The brew is famous for the non-ordinary visual effects that it induces. My study is the first systematic cognitive psychological investigation of the ayahuasca experience. It is based on the interviewing of a large number of individuals, as well as on the records of my own, extensive, firsthand experiences with the brew (a comprehensive report is presented in Shanon, 2002a).

Synaesthetic experiences are extremely common with ayahuasca. The most common synaesthetic effect are colour and form associates to music. One of the most common effects reported is the intimate relationship between music and visualization. As a rule, ayahuasca is consumed in the context of rituals; in these, music plays a pivotal role. Many informants reported to me that they felt music to guide their visions. Specifically, they indicated that the tempo and rhythm of the music was reflected in the visions. Drinkers also feel that the chanting of ayahuasqueros (shamans using ayahuasca) directs the course of the visions and determines their general flavour and colouring. I myself have experienced these effects as well. In light of a comment made in R&H (p. 26) with regard to reports of synaesthetics of experiencing colours never seen in the real world, I shall note that such reports are very common in the context of ayahuasca.

While the auditory-to-visual synaesthesias are by far the most common ones, other synaesthetic patterns occur as well. Especially to be noted is the olfactory-to-visual synaesthesia. I myself have encountered it several times when, during an ayahuasca session, I smelled incense or smoked tobacco. The smell, along with the air that passes through my nostrils and respiratory system, was perceived as waves of beautiful colours. A case of tactile-to-visual synaesthesia is the following: I was pressing my temple and I saw a bird with a beak whose shape was congruent with the movement of my hand.

All the synaesthesia effects described above are from a non-visual modality to the visual one. Can there not be synaesthesias from vision to another perceptual modality or from one non-visual modality to another? The answer to this question is, I find, somewhat unclear. Inspection of my data suggests that, indeed, full-fledged synaesthesias are to the visual mode, not from it. Other intermodal effects may be fuzzy cases for which the applicability of the epithet 'synaesthesia' might not be very clear. For instance, auditory stimulation may (literally) move one, shatter one, induce physical sensations in the inner parts of one's body. Similarly, gustatory sensations may be amplified so as to be concretely felt as (or almost as) tactile ones. Should these be regarded as instances of synaesthesia? I am not certain, but rather than attempting to split hairs, let me leave the matter with these phenomenological observations and not push it from a conceptual, theoretical point of view.

Along with synaesthesia, with ayahuasca one encounters extensive metaphoricity. First, an overall enhancement of meaningfulness is experienced whereby people find more meaning and significance in all perceptions and ideations. Things that ordinarily are taken to be mere matter of fact become, under the intoxication, richly invested with meaning. Second, non-ordinary comprehension of verbal expressions is observed, whereby people find hidden and special meanings in utterances or texts heard or read under the intoxication. Third, and most impressive, is a phenomenon I call seeing-as. A sensory percept might be seen both as it normally is and as something else. For example, trees swaying in the wind are seen as horses, while at the same time they remain what they are — trees. An analogous auditory example is that of random tappings being heard as structured music. Experientially this phenomenon is very striking, and it induces a feeling of magic and enchantment. The phenomenon also raises conceptual and philosophical issues pertaining to perception that I shall not consider here (these bring to mind the independent discussions of Wittgenstein, 1980).

In sum, I would like to propose that all the phenomena noted, along with synaesthesia and the ordinary metaphor, can be regarded as various aspects of a more fundamental relaxation of boundaries in cognition: boundaries between words, between meanings, between semantic domains, between percepts, and sensory modalities. Apparently, both primitive stages of cognition and advanced ones involve this relaxation. This is so, for it is a basic constituent of the creation of novelty. Novelty is there, by construction, for the child embarking upon the voyage of life, and novelty is there, by intent, for the artist who sets him/herself to create something new.

Let me close by noting that there are many interesting literary texts pertaining to synaesthesia. Famous examples are Rimbaud's poem *Les Voyelles* in which vowels are associated with colours (Rimbaud, 1937), Baudelaire's poem *Correspondances* (Baudelaire, 1961), Nabokov's comments on coloured hearing in his autobiography *Speak, Memory* (Nabokov, 1967) and Kandinsky's project on music and painting (Kandinsky, 1963). Associations between colours and various semantic domains, including numbers and letters, are also common in the kabbalah and other esoteric traditions (see, for instance, Crowley, 1973). Here I

would like to cite a case of synaesthesia from the bible; interestingly, this case can be interpreted to be one of a non-ordinary state of consciousness. I refer to the mental state of the Children of Israel experienced in the context of the theophany on Mount Sinai, where the Ten Commandments were given: ‘And all the people saw the thunderings, and the lightnings, and the noise of the trumpet, and the mountain smoking’ (Exodus 20.18; for further discussion, see Shanon, 2002b).³

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