

# Synesthesia and Artistic Experimentation

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ABSTRACT: Richard Cytowic has argued that synesthetic experimentation by modern artists was based on deliberate contrivances of sensory fusion and not on involuntary experiences of cross-modal association. He has placed artistic experiments with sensory fusion outside the domain of synesthesia research. Artistic experiments, though historically interesting, are considered irrelevant for the study of synesthesia. Contrary to this view I argue that at least Scriabin's and Kandinsky's artistic experiments were based on involuntary experiences of synesthesia. They were investigating perceptual and emotional mechanisms of involuntary synesthetic experiences that meet Cytowic's criteria of synesthesia. Artistic experiments are not only historically interesting, but may also contribute to present synesthesia research.

## 1. Introduction

By the mid-nineteenth century synesthesia had intrigued an art movement that sought sensory fusion, according to Cytowic (1995, section 3.7; 1993, pp. 54 ff). The union of the senses appeared more and more frequently in the writings of musicians and visual artists. Multimodal concerts of music and light became popular. Cytowic argues that "such deliberate contrivances are qualitatively different from the involuntary experiences that I am calling synesthesia in this review" (Cytowic, 1995, section 3.7). He defines

synesthesia as the involuntary physical experience of a cross-modal association. That is, the stimulation of one sensory modality reliably causes a perception in one or more different senses. He sharply distinguishes its phenomenology from "metaphor, literary tropes, sound symbolism, and deliberate artistic contrivances that sometimes employ the term 'synesthesia' to describe their multisensory joinings" (Cytowic, 1995, abstract).

Cytowic places artistic experiments with sensory fusion outside the domain of synesthesia research. He sharply distinguishes the sensory perception of synesthesia from mental cross-modal associations by non-synesthetes in metaphoric language, and in artistic aspirations to sensory fusion (Cytowic, 1995, section 3.2; 1993, pp. 54ff). Cytowic has proposed five criteria to define or diagnose synesthesia and to distinguish it from sensory fusion, sound symbolism, metaphor etc. Synesthesia is characterized by phenomena of cross-modal association that are involuntary (but elicited), projected, durable (discrete and generic), memorable, emotional (and noetic) (Cytowic, 1993).

As most of the artistic reports of sensory fusion do not meet these five criteria, Cytowic concludes that artistic experiments may be historically interesting but are not relevant to the present study of synesthesia. He lumps various deliberate multi-sensory contrivances under the term "sensory fusion", and places them outside the history of involuntary synesthesia (Cytowic, 1993).

## 2. Color Music

Cytowic sketches a nineteenth-century art movement that sought sensory fusion. As one takes a closer look at that, one can see that it was mainly a movement of inventors of color-organs (Peacock, 1988; Gage, 1993). The most elaborate experiments with sensory fusion of color and music were carried out by inventors, not by artists. One of the reasons was that the art of color-music required the use of specific instruments. After the first designs of the "clavecin oculaire" by the eighteenth century French Jesuit Castel, the nineteenth century showed a large number of attempts to develop a device that could produce music and color simultaneously on the basis of tone-color correspondence schemes. Inventors like Jameson, Kastner, Bainbridge Bishop and Rimington sought such devices. Rimington patented the name "color-organ" in 1893, and had considerable success in concert halls with his color- music performances of compositions of Wagner, Chopin, Bach and Dvorak (Peacock, 1988).

According to a report in the 'Musical Courier' (8 June 1895), Sir Arthur Sullivan improvised on the Color-Organ shortly after its completion. However, he played with his eyes closed. On 6 June 1895 Rimington presented a private lecture- demonstration in London which was attended by over 1,000 people (Peacock, 1988, p. 402).

When Scriabin and Kandinsky started their experiments with synesthesia in the first decades of the twentieth century, the performances of color-music interpretations of

classical scores on color-organs were already popular in concert halls. Scriabin and Kandinsky discovered colored hearing in their early years. Synesthesia to them was a fact, not a deliberate contrivance. Assured of his colored hearing, Scriabin even criticized the colored hearing of his friend, the composer Rimsky Korsakow, as being artificial because he reported different cross-modal associations. Scriabin told the British psychologist Myers, who examined Scriabin in his laboratory when he was on tour in England, that:

...whereas to him the key of F# major appears violet, to Rimsky Korsakow it appears green; but this deviation Scriabin attributes to an accidental association with the color of leaves and grass arising from the frequent use of this key for pastoral music (Myers, 1914, p.7).

It is important to note that Scriabin distanced himself from the practice of color-tone schemes that formed the basis of color-organs. According to Scriabin, colors were associated with tonality, not with singular notes. He told Myers (1914), that he often experienced a shift in color with the change of tonality, but not always. He reported that his synesthesia was not always of the same quality and intensity. Normally, he would have a faint "feeling" of color when listening to music. But as he got more emotionally involved in the music, the synesthetic sensations of color would become stronger, more intense, and pass over to give an "image" of color. And not every piece of music would elicit synesthetic responses in Scriabin. Beethoven's music was too intellectual and did not evoke synesthesia, according to Scriabin, while modern music, which was more psychological, i.e. more emotional, evoked much better synesthetic sensations. Scriabin explained that: "the color underlines the tonality; it makes the tonality more evident" (Myers, 1914, p.8).

Starting from the fact that his synesthesia had an emotional basis that intensified his experience of music, Scriabin explored the artistic possibilities of the simultaneous playing of colors and music (Peacock, 1985; Van Campen, 1997b). His piece Prometheus was written for two types of instruments: the musical instruments of the orchestra on the one hand, and the "tastiera per luce", a type of color-organ, on the other. He wrote a score for the tastiera per luce, that contained two elementary lines: one supporting the musical lines and one opposing them. The public was meant to hear consonance and dissonance in the movements of color and music. Scriabin's aim was to experiment with the emotional mechanisms of simultaneous auditory and visual perceptions. Unfortunately, most of the performances failed in his time, due to the deplorable state of the light instruments. It took half a century (until 1972) before the public could experience a proper music and light performance of the Prometheus (Peacock, 1988).

In his early years, Kandinsky discovered his synesthesia while attending a performance of Wagner's opera Lohengrin in Moscow:

The violins, the deep tones of the basses, and especially the wind instruments at that time embodied for me all the power of that pre-nocturnal hour. I saw all my colors in my mind; they stood before my

eyes. Wild, almost crazy lines were sketched in front of me (Kandinsky, 1913/1982, p. 364).

Like Scriabin, Kandinsky's aim was not solely focused on sensory fusion. While being already familiar with the synesthetic experiences of the consonances of color and music, he got more interested in experimentation with dissonances of color and music. Kandinsky seriously started exploring synesthetic experiences as a member of the Blaue Reiter group, which included Schoenberg and Marc among others. To evoke deeper emotions and sensations in the beholders and listeners of their art, they explored the emotional and perceptual dynamics of simultaneous presentations of color, sound and dance (Kandinsky & Marc, 1912/1982).

Kandinsky's main experiments with cross-modal sensations concerned the multi-sensory perception of movement (Hahl-Koch, 1985; Van Campen, 1997a, 1997b). He assumed that one can feel the multi-sensory consonances and dissonances in simultaneously performed color movements, musical movements and dance movements. The composer Hartmann (who wrote the musical score for Kandinsky's synesthetic play "The Yellow Sound") and the dancer Sacharoff participated in one of the experiments, which Kandinsky described as follows:

I myself had the opportunity of carrying out some small experiments abroad with a young musician and a dancer. From among several of my watercolors the musician would choose one that appeared to him to have the clearest musical form. In the absence of the dancer, he would play this watercolor. Then the dancer would appear, and having been played this musical composition, he would dance it and then find the watercolor he had danced (Kandinsky, 1921/1982, p. 474).

The experiment shows remarkable similarity with a later experiment by the psychologist Von Hornbostel (1931). The latter asked his subjects to match different stimuli. First he gave them an odor and asked them to match it to a corresponding grey card. Then he asked them to match the odor to a corresponding pitch. Finally, the subjects matched the pitch with a grey card. Comparisons of the chosen grey cards produced fits that were almost identical (Marks, 1978). Unfortunately, the results of Kandinsky's experiment are not known.

### **3. Synesthesia or Sensory Fusion?**

From Cytowic's historical perspective, these artistic experiments on sensory fusion are outside the domain of synesthesia research. He uses the term synesthesia only to refer to involuntary experiences, distinguishing it from the deliberate contrivances of sensory fusion by nineteenth-century artists (Cytowic, 1993, pp. 54ff; 1995, sections 3.2, 3.8, 3.9). But historical documents show that the experiments by Scriabin and Kandinsky were consistently based on involuntary synesthetic experiences. The contradiction may

be clarified by evaluating their artistic works by means of the five criteria Cytowic has formulated: synesthesia is 1) involuntary but elicited, 2) projected, 3) durable, discrete and generic, 4) memorable, 5) emotional and noetic (Cytowic, 1993).

Concerning the first criterion of involuntariness, it should be noted that although many experiments by the inventors of color-organs were based on deliberate correspondence schemes that partly originated from theories of physics, Scriabin and Kandinsky reported that their synesthesia was involuntary. Like most synesthetes, they reported that their synesthesia has existed as far back as they can remember. Further, Cytowic argues that involuntary synesthesia is insuppressible and cannot be conjured up at will. However, Scriabin reported that his synesthetic experiences became more intense when he was more emotionally involved in listening to music. This indicates a more gradual characteristic than the dichotomous criterion that Cytowic suggests (cf. Cytowic, 1993, p. 76).

The second criterion of projection is not as clear as Cytowic presents it. Scriabin and Kandinsky most probably experienced external photism-like experiences, but also internal mental experiences, such as Scriabin's faint feeling of color when he was more or less absent-minded when listening to music. Messiaen (1993), another synesthetic composer, explicitly stated in a interview that the colors he experienced while listening to music were sometimes internal and sometimes external.

The third criterion of durable, discrete, and generic experiences indicates three phenomena: First, the associations of an individual synesthete endure for a lifetime; second, they are discrete in the sense that the synesthete always picks one, whereas non-synesthetes pick diffusely over different available selections, and third, they are generic in the sense that they are unembellished percepts: blobs, lines, spirals, and lattice maps (Cytowic, 1993). One cannot evaluate the durability of the synesthetic associations of Scriabin and Kandinsky as there are no longitudinal records available of their synesthesia. Concerning the criterion of discreteness, the discussions between Scriabin and Rimsky Korsakow show that the choices of the former were discrete (Myers, 1914; Peacock, 1985). The characteristic of generic percepts (blobs etc.) is an interesting criterion, since Kandinsky's early abstract paintings (that he labeled with musical titles such as Composition and Improvisation) contained the sort of blobs, lines, spirals, and lattice maps that are experienced by synesthetes. These pictorial elements differ substantially from those used by other non-synesthetic modern artist like Mondrian (who used grids) and Malevitch (blocks, cones etc.). Since Kandinsky's elements cannot be traced back to earlier art forms, my conjecture is that they originate in Kandinsky's own synesthetic experiences. Scriabin never referred to blobs, spirals, lines or lattice maps in his score for the *tastiera per luce*. On the contrary, the *tastiera per luce* was chosen by Scriabin because it was supposed to flood the concert hall with light, not to present discrete visual elements on a screen as happened in most major performances (Peacock, 1985).

In so far as I have studied the biographical record for of Scriabin and Kandinsky concerning the fourth criterion of memorability of synesthesia I have found nothing

relevant to the issue. It would be an interesting subject to investigate whether these artists had special gifts of memorization. The biographies of the artists may contain valuable information concerning this phenomenon.

The fifth criterion contains two elements: first, synesthetes have an unshakable conviction that what they perceive is real (noetic); and second, synesthetic experiences are accompanied with strong emotional feelings (Cytowic, 1993). The existence of synesthesia was not open to doubt for Scriabin or Kandinsky. Scriabin hardly experienced any synesthesia at all without some emotional involvement. And Kandinsky had one ultimate goal for his synesthetic experiments: to create compositions that touch the strings of the soul (Kandinsky, 1912/1982). It is especially in this field that they tried to explore the emotional dynamics of synesthesia.

## **4. Conclusion**

On the basis of the published facts about the lives and work of Scriabin and Kandinsky, it can be concluded that their synesthetic experiments were based on involuntary experiences that met Cytowic's criteria of synesthesia in general. However, it should be noted that the criteria of involuntarity and projection were not clear enough to enable a proper evaluation.

A historical review may shed a different light on Cytowic's view that artistic experiments were historically interesting but not relevant for the present study of synesthesia. It appears that Scriabin's and Kandinsky's experiments were based on involuntary experiences of synesthesia. They investigated emotional and perceptual mechanisms of synesthesia that could help them in creating art. Their experiments with movement and dissonance are interesting explorations of aspects of synesthesia, which have been hardly studied in the current scientific research of synesthesia.

Contrary to Cytowic's view, I conclude that artistic experimentation is not only historically interesting, but can also contribute to the present synesthesia research. For instance, the experiments of Scriabin and Kandinsky have revealed important synesthetic aspects of perception. Scriabin's experimentation with color-key correspondences offer alternatives to the current research into color-letter and color-tone correspondences. Kandinsky's explorations of the consonance and dissonance of simultaneous auditory and visual stimuli offers alternatives for Gestalt experiments to the current experiments with elementary stimuli (letters, tones). And their ideas on the interplay of auditory and visual stimuli can be elaborated and tested with multimedia instruments.

In my opinion, Cytowic's sharp demarcation of science and art is not fruitful for the study of synesthesia. From a broad perspective, Cytowic considers art and science as two sides of a coin and perceives a sharp demarcation line in history between scientific study and artistic experiments (Cytowic, 1989). However, in the study of perceptual phenomena, scientists and artists have often used each others' discoveries to start new directions in

their own disciplines (Gombrich, 1960; Kemp, 1990; Gage, 1993). In this way, artistic experimentation can contribute to new directions in synesthesia research too.

## Notes

<1> Crétien van Campen Ph.D., psychologist, publishes on visual perception research at the intersection of the arts and the sciences. At present, he studies the history of artistic and scientific experimentation with synesthetic phenomena.

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