

The common triggers of synesthesia are social conventions

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The stimuli that most commonly trigger synesthesia—letters, numerals, musical notes and keys, and days of the week—share something else in common. All of them are social conventions. They were created by human beings, and they continue to exist because they have become the socially standard ways to read, count, play music, and reckon time, rather than because they exist in nature. Unlike conventions involving video formats, household voltages, or screw thread sizes, these are standard ways of *thinking*. We might call them cognitive conventions. I think it is very interesting and potentially quite useful to reflect on why this particular class of phenomena should give rise to synesthesia.

My perspective, in short, is this: The alphanumeric, calendrical, and musical systems that commonly trigger synesthesia are each made up of a set of conventional units. Learning to distinguish and interpret these units is not a universal psychodevelopmental process, but rather a product of our cognitive socialization. Assigning color tags to these units reinforces their sometimes dubious distinctiveness. And common synesthesia is only one of many ways in which we use experientially primary contrasts like color to tag socially conventional categories.

First I need to say something about what I am taking the term “synesthesia” to mean. It has been used to cover quite a diverse range of phenomena, which can be roughly sorted into four groups. The first is synesthetic metaphor, which, unlike the other three, is neither automatic nor involuntary. The second is what I will call, for lack of a better term, “major synesthesia.” This is relatively rare, and relatively dramatic; it can involve the proximate senses of smell, taste, and touch; and it has been written about widely, e.g. Luria’s Shereshevskii and Cytowic’s Michael Watson. The third group is what I will call “common synesthesia.” This typically involves alphanumeric, calendrical, or tonal triggers and a concurrent perception of color, occasionally gender; it is probably a couple orders of magnitude more common than the major synesthesias. The fourth group of phenomena is the synesthetic forms, typically number forms and calendrical forms. The major and common synesthesias are probably the core of what is usually meant by the term “synesthesia,” but it is worth noting that common synesthesias and synesthetic forms share numerals and calendars as frequent triggers.

Those who question the division between “major” and “common” synesthesia can find it

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made by many others, for example Shanon (1982:75-76) and Marks (1978:97-98). While the boundary between the two may be slightly fuzzy, it is far from being so fuzzy as to render the distinction inappropriate.

Those who question the commonness of common synesthesia vis-a-vis major synesthesia can start by tabulating the forty-two cases listed by Cytowic (1989).¹ Although the major synesthesias get more press, it is the minor ones which make up the bulk of actual cases. The commonness of common synesthesia among people in general is less well established, but certainly estimates like one in a million (Cytowic 1993) or one in 25,000 (Cytowic 1997:17; and these cover both major and common synesthesia) are much too low. It may never be possible to state frequencies with any confidence because common synesthesia is, barring brain-scanning, a purely self-reported experience and one that is quite difficult to survey. It's hard to explain what you are asking about, and it's hard to get other people in the right frame of mind to understand you and to recognize synesthesia if they do experience it. However, recent surveys by Shanon (1982) and Baron-Cohen (cited in Baron-Cohen and Harrison 1997:188) suggest that there are hundreds of thousands if not millions of common synesthetes running around the English-speaking world alone. I have had no trouble finding cases of common synesthesia in friends, classmates, and acquaintances, including some with incomplete systems in which a few letters, or a couple numbers, or just some of the days of the week have color associates.

Many theories of synesthesia (see Harrison and Baron-Cohen 1997) seem to be primarily interested in explaining the major synesthesias, even though they are less common. I will suggest a way of looking at synesthesia that focuses on the common cases and leaves the major synesthesias out of frame for the time being.

The triggers of common synesthesia—letters, numerals, tones and keys, and calendrical units—each form what lexical semanticists call a contrast set.² A contrast set is typically a group of terms which refer to different types of a single superordinate term. Phrases of the form “Xs and other Ys” are a good diagnostic for contrast sets and their superordinates. Thus it makes sense to say things like “puffins and other birds,” “H and other letters of the alphabet,” “7 and other numerals,” “Tuesday and other days of the week,” “F sharp and other notes,” or “members of the

¹ Of forty-two cases listed in Cytowic's table (pp. 28-31), twenty-seven were described as having either “colored hearing” or letter-color links. Cytowic makes a similar observation in the text (p. 26). Harrison and Baron-Cohen (1997:119-120) observe that “the vast majority” of over 900 respondents to their public programs on synesthesia “report only forms of coloured-hearing.”

² See, for example, Kay 1971:869-870.

New York Yankees and other baseball players.”

When we come across specific *instantiations* of superordinate terms in daily life (particular baseball players, birds, letters of the alphabet, days of the week, and so on), we are usually able to classify them under the name of one of the members of the subordinate contrast set (Yankees, puffins, Hs, Tuesdays). Sometimes, as in the classification of birds into sparrows, seagulls, puffins, and the rest, this involves recognizing distinctions which we are in no way responsible for. But when we classify the letters on a page into As, Bs, Cs, or Ds, or musical tones into C, C sharp, D, and E flat, it is an unmistakably social classification rather than one which is rooted in nature or in our perceptual apparatus. After all, it is purely a matter of convention that the differences between E and F, i and j, or S and 5 are regarded as more significant than those between E and e or a and *a*. Similarly, it is due to social convention that a properly tuned piano can produce a tone of 440 Hz (A above middle C) but not one of, say, 438 Hz.³ Learning to appreciate these distinctions is a difficult task which requires a lot of practice. Thus we can all imagine, or even remember, a stage in our lives when we could not tell a Tuesday from a Wednesday, a B from a D, or a 6 from a 7, and if there was a piano in front of me now on which I struck a random key, most of you would still not be able to tell me its name.

We learn to distinguish the members of some other contrast sets with the help of *both* biology and society. Color is one of these: the focal points of our color categories seem to be biologically determined, but the number of categories we recognize and the boundaries between them are not.⁴ Similarly, we arguably learn to distinguish the categories “male” and “female” based on the combined contrast of biological and socially constructed characteristics.

It is an absolutely normal thing to use more natural contrast sets to aid us in distinguishing the members of socially constructed contrast sets.⁵ In fact, it is one of the first means of tagging that occurs to us. Witness the way we use colors to mark members of different football teams on the same field; the use of flags to distinguish different countries; the different colors of the letter-shaped magnets on our refrigerators; the school which divides the nursery class into three groups called Blue, Yellow, and Red; the practice of color-coding things by floor of a building, by day of the week, and so on; or even the practice of assigning animal names to totemic kin groups or to sports teams. The common convention that north is up and south is down illustrates another way in which we root a socially constructed contrast set in a more experientially primary one. So it

³ For more discussion of “social facts” like these, see Durkheim (1982) and Zerubavel (1991).

⁴ See the discussion and references in Taylor 1995:13.

⁵ For more examples, see Lévi-Strauss 1966:104.

should be no great surprise that certain young children learning to read, learning music, or learning to reckon the days of the week build exactly this into their brains when called upon to distinguish an A from a B, or C from C sharp. In this context, common synesthesia does not seem like the mysterious phenomenon it is sometimes made out to be.

Looking at it another way, common synesthesia seems to involve our capacity for socially conventional categorization and classification. It is our ability to assign things to exclusive categories that allows us to perceive different musical notes in a continuum of pitch (Sloboda 1987:23-29, 176-178), and to consider 11 p.m. on Monday as falling on a different day than 1 a.m. on Tuesday, but the same day as 7 p.m. earlier that evening or 11 p.m. one week later (Zerubavel 1985). Similarly, when we read letters or numbers we unconsciously sort them into categories in a way which treats “a” and “a” (and “A”) as somehow equivalent while simultaneously ignoring the equally great resemblance between, for example, “h” and “k” (see Hofstadter 1982:331-32).⁶ Tagging each letter, number, day, month, or note with a color (or a gender) is a way of reinforcing the shaky walls between the graphic, temporal, and musical categories that we must learn to consider perceptually salient.

Some of the excitement over synesthesia in the past few years has been in a spirit of biological and genetic reductionism. The views presented here encourage us to balance that with some healthy attention to the fact that common synesthesia is not only shaped by culture, it is actually an *operation on* social conventions. Thinking in this way may help us give a better account of common synesthesia. For example, it is very easy to come up with a cultural rather than a biological explanation of why tone-color synesthesia is much more rarely encountered than letter-color or weekday-color synesthesia, namely that the intensive early musical exposure ordinarily required to give people an absolute pitch sense is much less common than the instruction in writing and calendrical systems that teaches us to tell whether it is Friday or Saturday or to which of our twenty-six categories a given letter belongs. It is currently much easier to appreciate the similarities between absolute pitch and common synesthesia (see Cytowic 1989:58-59) if one thinks of both as abnormal styles of cognitive classification in which people not only remember, but also tag or label the conventional categories in a perceptual domain.⁷ Looking at other ways in which we use color as a category tag leaves us better poised to answer

⁶ It is significant for students of common synesthesia that capital and lower-case forms of the same letter do not typically appear to trigger different colors.

⁷ Compare Levitin’s (1994) labeling theory of absolute pitch to Wheeler and Cutsforth’s theory of synesthesia, reviewed by Dann (1995:171-183, especially pp. 175-176).

the question of why color is “the most common concurrent in synaesthesia” (Grossenbacher 1997:155). And if we approach synesthesia from the point of view of lexical semantics, we are immediately reminded that domains such as pitch, color, time, texture, and taste vary in the degree to which they contain inherent focal points and “fault lines” which mark out different segments, subgroups, and “chunks.” Touch, smell, and taste are domains which are relatively difficult to partition into exhaustive contrast sets with disjunct, scalable, and namable members.⁸ Perhaps this explains the rarity of synesthesias triggered by these domains; it may be that the least neatly taxonomizable lexical domains are the worst candidates for synesthetic tagging.⁹

At the very least, it is important that people who write about common synesthesia know something about writing systems, musical conventions, and time reckoning. Students of synesthesia have had to spend a lot of their time demonstrating that the phenomenon is real and collecting data from far-flung subjects, and have often come from neuropsychological rather than anthropological, linguistic, or sociological backgrounds. Understandably but regrettably, their analyses have often relied on a lay knowledge of the cognitive conventions that trigger common synesthesia.

I think it is a perfectly sensible enterprise to search for genetic and physiological bases for common synesthesia. However, close study of its triggers may help us refine our search. Although an inherited predisposition may partially account for why some people develop common synesthesias and some don't, we jump to conclusions in speaking of the possibility of a specific genetic marker for “synesthesia” without defining exactly what that means. In particular, this encourages us to think of synesthesia as a unique phenomenon isolated from all the other things we do, a sort of mental sixth toe, rather than something that is potentially reducible to a peculiarity in the way we classify, categorize, and process conventional symbols. Similarly, the notion that synesthesia involves links between the five senses does help make a first approximation when one is trying to explain synesthesia to people who don't know anything about it, but it may be unwise to base a search for its physiological basis on this notion. Looking at the triggers of common synesthesia, letterform and tone are only very narrow ranges of our visual and auditory sensation respectively, letter-color synesthesia is not cross-modal,¹⁰ and there

⁸ On taste, for example, see Backhouse (1994), especially pp. 2-3, 6, 9, 12-13.

⁹ Compare Grossenbacher's (1997:153) comment about the “prevalence of linguistic tokens among synaesthetic inducers.”

¹⁰ I have mostly bypassed an important issue which is in sore need of resolution—namely, whether there is truly any difference between “colored hearing” and “letter-color synesthesia.” While the former suggests that hearing speech sounds triggers a sensation of color, and the latter suggests that seeing letters (and/or numerals) triggers a sensation of color, it is less than clear that there are really two different phenomena here. Confusing the issue is

is nothing very sensory at all about the days of the week (except, perhaps, when we see them arranged on a calendar). At the least we need to guard against taking the view of synesthesia as something “sensory” too far, as one web page does by defining it as a condition where people “have difficulty distinguishing among various sensory inputs.” Just as useful, if not more useful, than explaining common synesthesia by invoking the “unity of the senses” may be pointing out that it is a very natural and durable way of tagging the categories created by our systems of socially conventional cognitive classification.

that both terms are often used to describe a single case—witness Cytowic’s description of JM, whose synesthesia is called “colored hearing” at one point but “letters and numbers” at another (1989:29, 37), or Nabokov, who called his condition colored hearing but described it in terms of color links to letterform. Reports of color sensations linked to letters and numbers are abundant in recent literature, but reports of color sensations linked solely to speech sounds are practically absent. All of the subjects in the study by Baron-Cohen et al. (1993) turned out to have colors triggered by graphemes rather than speech sounds. Yet on the back cover of Baron-Cohen and Harrison 1997 synesthesia is illustrated thus: “For example, on hearing a sound, the person immediately sees a colour.” In my own case, I always thought of my color sensations as simply linked to the graphic form of each letter and numeral, not to my sense of hearing. Generalization is dangerous, and there is the issue of subvocalization to reckon with (see Paulesu et al. 1995), but in the majority of cases it may be better to abandon the term “colored hearing” and emphasize letter-color and numeral-color links instead.

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