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## **SYNAESTHESIA: A CROSS-CULTURAL PILOT**

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<b>Project</b>	Categories across language and cognition
<b>Task</b>	A checklist for the most common types of synaesthesia (in the Western world)
<b>Goal of task</b>	To explore the types (and incidence) of synaesthesia in different cultures
<b>Prerequisite</b>	You will need the focal colour stimuli; audio files under the folder “Synaesthesia”

### **Background**

Synaesthesia is a condition in which stimulation of one sensory modality (e.g. hearing) causes additional experiences in a second, unstimulated modality (e.g. seeing colours). It is an automatic, involuntary phenomenon, and a person’s synaesthetic experiences are stable over time, i.e. the experiences do not (qualitatively) change from childhood. The first medical reference to a case of synaesthesia is by Thomas Woodhouse, an English ophthalmologist, who around 1710 reported a blind man who had colour visions when he heard sounds.

Each synaesthete has his or her own unique synaesthetic associations, so every grapheme-colour synaesthete has a different coloured alphabet, for instance. Synaesthesia is a hereditary condition (possibly X-linked, maternal). But family members do not always share synaesthetic experiences. One member might see shapes when hearing music and another colours when they touch things.

Synaesthetes can be divided into sub-types. “Synaesthesia proper” is where one (mediated) sensory experience is linked with another (unmediated) sensory experience. For example, a person might perceive distinct colours when they smell specific odours. “Cognitive” or “category synaesthesia” is another type, where culture-specific symbols or categories become associated with (unmediated) sensory experiences. For example, in Europe, North America and Australia, letters, numbers or people’s names become associated with a sensation, such as smell, colour or flavour. In fact, the most common sorts of synaesthetic experiences in the West is to graphemes, numbers, time units, and musical notes or keys. To date—as far as we can ascertain—there has been no systematic cross-cultural investigation into synaesthesia.

The frequency of synaesthesia is estimated at about 1 in 20 or 25 people for the more common, cognitive based synaesthesias in the West, such as grapheme-colour synaesthesia or synaesthesias for time-units. Other types of synaesthesia proper such as coloured smells are much more rare (1 in 2000 or 3000 people).

In anthropology, the term synaesthesia has been used in a wider (less strictly psychological) sense to refer to cultural practices in which (a) one sensory modality is transposed into another or (b) multiple sensory modalities come into play at the same time. For example, in an Incan harvest ritual, the Incas would go before dawn to a plain outside Cuzco. As the sun began to rise they would start to sing in chorus. The higher the sun rose, the louder they would sing. Or Aymara speaking residents of the Chilean Andes use the term *kisa* for the concentrated sweetness of dried fruit, for pleasant speech, a soft tactile sensation, and for a rainbow effect in weaving.

Linguistic attention to synaesthesia has been rare apart from the occasional allusion to the phenomenon in discussions of sound symbolism. Languages with a large inventory of sound-symbolic words evocative of sensory perceptions (ideophones/expressives) may turn out to be of special interest in this regard, especially because of the frequently cross-modal nature of these words (cf. ‘Expressives’ entry in Field Manual 2007). Or focus here, however, is in identifying individuals who potentially have the clinical condition of synaesthesia. (For examples of different types of synaesthesia see section “Some examples of the synaesthetic experience” and table on page 12ff.)

### Research questions

- 1 Most broadly, how does the synaesthetic condition manifest itself in different cultural contexts?

More specific questions include:

- 2 What sorts of symbol systems become the source of synaesthetic experiences (e.g., different writing systems, other symbolic systems)
- 3 What are the categories of experience that become the basis for synaesthetic experiences? Time units, people’s names, phonemes, etc are frequent sources of synaesthesia in the West—what are other possible categories can be the basis for synaesthesia?  
**Note**—Likely cross-cultural candidates are probably high frequency categories in the cultural context. They are also likely to be found in ordered categories (numbers, days) and/or generative sequences (alphabet, phonemes).
- 4 If there is evidence (already) of differential codability of the senses in your field site, is that linked to a differential likelihood of expressing some sorts of synaesthesia over others?

### Tasks

In order to begin to address these (and other) questions, you need to begin a survey of potential synaesthetes in your field site. Synaesthesia is still commonly diagnosed by self-report. This is a first step for us too. You can ask participants if they experience various sorts of—unusual, conjoined—sensations. The phenomenon is somewhat difficult to explain in abstract, so this survey is best done by asking very specific questions.

We suggest trying the following two tasks:

### **Task 1**

Have focal colours card available (see ‘Focal colours’ entry in Field Manual 2008, p. 8-10).

Ask 20 participants: *Which colour does [DAY OF THE WEEK] cause you to see?* Participants respond by pointing to a colour. Researcher keeps note of colour.

Alternatives to [DAY OF THE WEEK] include [phonemes, numbers/orders of magnitude, musical sounds (tones or chords), months/time-units, graphemes and other abstract symbols, proper names].

You can use the tonal scales in the folder “Synaesthesia” to elicit potential colour associations. Play the tones in a fixed sequence and ask participants to point to a colour on the colour sheet. Culture-specific musical sounds may work better if available.

### **Task 2**

Have pebbles or small stones available.

Ask 20 participants: *If [NUMBER, e.g. 1] is here, where would you put [NUMBER, 2]? Where would you put [NUMBER, 3]? etc* (using pebbles held up in the air) This requires participants to spatialise numbers. The spatial arrangement can be body-oriented (hence holding the pebbles in the air).

Alternatives to [NUMBER] include [days of the week, months of the year, years/decades, other time-unit-systems, letters of the alphabet (less frequent)].

When questioning people about the spatial arrangement of the days of the week, for example, it is likely many people will report an order, the same way we in Western culture will be prone to report a left-right arrangement (or right-left for Hebrew/Arabic speakers). The trick with synaesthesia is to look for the odd ones out, e.g. the days of the week appear in a circle, or high-low, or body-oriented, etc, which does not correspond to the common trend in your fieldsite.

For additional ideas of what domains of synaesthetic experiences to prove, see pages 10-12. for frequent synaesthetic experiences found in the West.

### **Test-retest**

Should you identify a person who is a candidate synaesthete, one simple “objective” test that can be carried out in the field is a simple **test-retest**. Make a list of stimuli that the person associates with specific secondary sensations (Letter A = blue, Letter B = yellow, etc.). Test the person on the associations on Day 1 (making a note of the answers) and then simply test them again on the same items some time later (next day/week/etc.), again noting the answers. Synaesthetes score over 90% on such tests. Non-synaesthetes do not.

**Note.** People with synaesthesia usually have more than one sort of synaesthetic experience. We give common types above as a start-off point to discovering people who display this condition. But we are especially interested in discovering culture-specific synaesthetic experiences, so once a potential synaesthete is discovered, consider the culture-specific contexts that may be relevant.

Perhaps literacy plays a large role in synaesthesia, such that among illiterate people, synaesthesia is much less frequent. On the other hand, any culture uses specific symbol systems and methods of communication for which synaesthesia could occur. This survey can help try and establish the role of literacy and other cultural symbol systems on the incidence of synaesthesia. For example, drumming signals (possible question: *How do you remember this?*), or elements in kinship systems.

### Some examples of the synaesthetic experience

The most common synaesthetic experience induced is colour and it can be induced from a variety of stimuli (graphemes, smells, tastes, etc). The precise way the synaesthetic colour is experienced varies. More details are given in the examples below.

#### *Music - colour & shape*

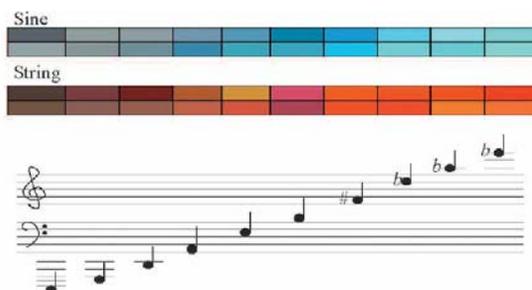
While hearing music people may have visualisations like those in Windows Media Player – quivering lines or shapes that move in time with the music. The experience can also be more like seeing mist, or blobs of colour. The synaesthetic experience is usually seen somewhere in front of the synaesthetes, floating at eye-level, or it can just be in the mind. Different instruments can have distinct shapes or colour. This can also happen with voices.



Moving lines with texture



Mist like colour blobs



Different colours for different musical instruments.  
Colour becomes brighter with higher pitch.

### Grapheme – colour synaesthesia

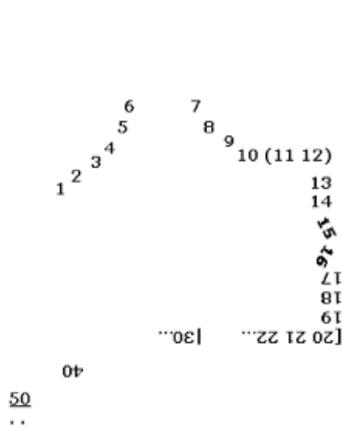


Synaesthetes experience and describe colour as a property of the grapheme; the colour *belongs* to the grapheme. This can happen in different ways. (i) Colour is seen on the letter or digit like an overlay, even though the real ‘ink’ colour of the grapheme can also be perceived without problems. (ii) Colour is a strong association ‘in the mind’s eye’. (iii) Colour is visualised on a sort of mental screen in front of the subject.

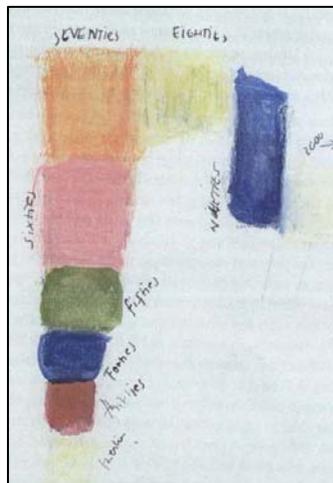
Experimental data show that if the real and synaesthetic colour of a grapheme do not match then people take longer to respond, suggesting that synaesthesia is an automatic, involuntary phenomenon.

### Time-units – colour & shape

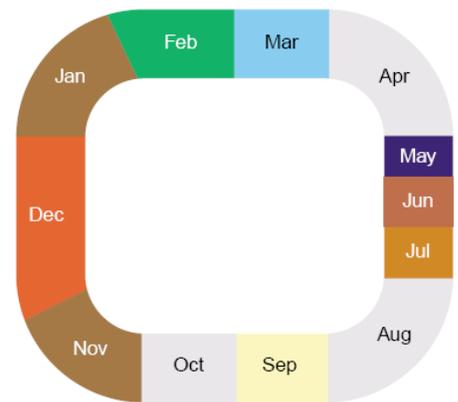
Any time unit may have an associated colour. The colour does not appear to be linked to the time-unit-word but to the concept. This is most common for days of the week (e.g., “Monday” is red while the word *Monday* can be yellow). Another common experience to time-units is a spatial one. Time-units are experienced as oriented in a (number) line, either in front of the synaesthete or around them. It is body-oriented.



Number line, body-oriented



Decades with colour and shape



Months of the year in body-oriented circle

Inducer	Synaesthesia
<p><b>Graphemes</b> : letters, digits, (linguistic) symbols, arithmetic symbols (e.g. A, b, 2, 100, %, +)</p>	<p><b>Colour</b>: can be perceived on stimulus itself, or more ‘in the mind’s eye’. More frequent and more familiar graphemes are more likely to elicit colour (e.g. vowels, high-frequent letters). Also possible for spoken graphemes.  <b>Texture, movement, gender, personalities</b>: rare, but graphemes can have any or all of these properties.</p>
<p><b>Time-units</b>: days of the week, months, years/decades, any time-unit, also digits/numbers</p>	<p><b>Colour</b>: concept of time unit elicits colour, i.e. separate from the words themselves. So Monday itself can be red while the word can be yellow because it starts with an M.  <b>Shape</b>: numbers (or weekdays) may have an orientation in space, in a body-oriented number-line. The line usually also includes years, decades, etc and can have many curves/bends. Months are often oriented in a circular shape, also body-oriented.</p>
<p><b>Music</b>: any aspect, i.e. tones, tone-intervals, keys, chords, melodies, mood/emotion of the music, instrument, voice, speed, sometimes written musical notes</p>	<p><b>Colour</b>: often associated with tones, tone-intervals, keys, chords, specific instruments, musical notes.  <b>Texture, movement</b>: induced by instruments, modulated by speed, mood, etc. Synaesthesia for music is often dynamic, e.g. purple moving strands for guitar, yellow for piano, etc.</p>
<p><b>Spoken language</b>: phonemes, words, (stressed) syllables; also voice, tone, emotion, speed</p>	<p><b>Colour</b>: words can take the colour of the first phoneme, or of the dominant vowel or syllable. Voice and manner of speech can influence the colours.  <b>Taste</b>: rare, but phonemes and/or associated words can elicit taste. Words containing the same dominant phoneme may taste (or look) the same, e.g. <i>deploy</i>, <i>parent</i> = apple (or red).</p>
<p><b>General sounds</b></p>	<p><b>Colour</b>: any familiar sound (rain, animal sounds, wood-chopping, etc) can elicit colour.  <b>Taste, touch, smell</b>: rare, but sounds can elicit taste, touch or smell.</p>
<p><b>Written language</b>: words, names</p>	<p><b>Colour</b>: words can take the colour of the first letter, or of the dominant vowel or syllable. Often only for given names (of people, places, etc).</p>
<p><b>Other</b>: smells, taste, pain, touch, personalities, emotions, weight, temperature, vision, etc, etc.</p>	<p><b>Colour</b>: most frequent synaesthesia for any stimuli.  <b>Other possible synaesthesias</b>: touch, smells, sounds, taste, shapes. I.e. cheese can taste or feel pointy, emotions can smell, etc.</p>