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The smell of sound - researchers look at phenomenon synaesthesia

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The research field has grown from grapheme-colour synaesthesia to include other forms of synaesthesia in which flavours are evoked by music or words (lexical-gustatory synaesthesia), space structures by time units, colours by music, etc.

Experts on Experimental Psychology from the University of Granada are studying this phenomenon. The results of this research have been published by the following scientific journals, among others: Cortex, Experimental Brain Research and Consciousness and Cognition.

Surprising as it may seem, there are people who can smell sounds, see smells or hear colours. Actually, all of us, at some point in our lives, have had this skill (some authors affirm that it is common in newborns). This phenomenon, called "synaesthesia" - from the Greek "syn" (with) and "aisthesis" (sensation) - consists of the pairing of two bodily senses by which the perception of a determined stimulus activates a different subjective perception with no external stimulus (in science, the evoker stimulus is called inducer and the additional experience concurrent).

In the department of Experimental Psychology and Physiology at the [University of Granada](#), a research group is carrying out pioneer work in Spain on the systematic study of synaesthesia and its relation with perception and emotions. Professor [Juan Lupiá?Castillo](#) and **Alicia Callejas Sevilla** have devoted many years to the study of this unknown but interesting phenomenon, which affects approximately one person out of every thousand. Many of these people do not even know that they are synaesthetes, as they think they perceive the world normally.

Pioneers

Callejas' doctoral thesis is one of the most detailed studies on this phenomenon at an international level, and it is probably the first doctoral thesis on this topic in Europe. Her study covers the various forms of synaesthesia focussing on the most common one: the grapheme-colour type (for people with this form of synaesthesia, letters, words and numbers evoke colours in an automatic and involuntary way).

One of the distinctive characteristics of this form of synaesthesia is the fact that people are certain about their perceptions: they feel that their way of experiencing the world is correct, and they become disappointed when they realize there is something that is not quite right. 'Therefore, when a person

with grapheme-colour synaesthesia indicates that the word table is blue, it is quite probable that if he or she ever sees the same word written in a colour other than blue, this word will appear to him or her as wrong and consider it a mistake. The synaesthete might even point out that the word is ugly or that he or she does not like it because it is not correct,' affirms Callejas. Consequently, finding the word table written in red might be unpleasant whereas seeing it in blue might be agreeable. This emotional reaction associated with how synaesthetes perceive consistent or inconsistent stimuli is an extremely interesting subject and has been studied for the first time in this doctoral thesis.

Irrepressible reactions

Some of Callejas' conclusions show that these emotional reactions occur automatically and can not be ignored. Moreover, they can affect the synaesthete to the point of slanting his or her preferences when faced with certain stimuli which correspond to his or her inner experiences. Even more important is the fact that these emotions can transform how they perceive events associated with these experiences. These events may have no emotional meaning initially but they can become more or less pleasant if they take place at the same time the synaesthete finds a word in the correct or incorrect colour.

'Then, there are people for whom time units evoke colours - explains the researcher. It is also common for a synaesthete to see colours when listening to words, sounds in general or music notes (people who can see music, for instance). There are also cases, although fewer, where people can see colours in flavours, others perceive flavours or experience touch sensations when listening to different sounds, some link flavours to touch sensations, etc.'

An permanent vision

These researchers from Granada underline that synaesthetes always experience the same vision, synaesthesia is permanent (a given stimulus always evokes the same colour for one person) and idiosyncratic (it is different for each person). Therefore, if for a synaesthete the word dog is red, every time he or she sees it, it will be perceived as red.

Even though synaesthesia has been known for a long time, its scientific study is relatively recent. Writings such as the Castel one, in which reference is made to previous studies about a synaesthesia case in a blind person, are found in the 18th century. The evolution of the study of this phenomenon has been spectacular - the number of researchers working on this topic is constantly increasing, as will be evident in the Conference which will take place in Granada - and, as the phase of proving that this phenomenon exists has been overcome, explains Alicia Callejas, 'we are starting to approach questions of major theoretical importance, and to develop adequate study strategies.' The results of her research have been published in the following prestigious scientific journals, among others: [Cortex](#), [Experimental Brain Research](#) and [Consciousness and Cognition](#).

Nowadays, the research field goes from grapheme-colour synaesthesia to other forms never studied before: flavours evoked by music or words (lexical-gustatory synaesthesia), space structures linked to time units, colours and music, etc.

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