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Auras in mysticism and synaesthesia: A comparison

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ABSTRACT

In a variety of synaesthesia, photisms result from affect-laden stimuli as emotional words, or faces of familiar people. For *R*, who participated in this study, the sight of a familiar person triggers a mental image of "a human silhouette filled with colour". Subjective descriptions of synaesthetic experiences induced by the visual perception of people's figures and faces show similarities with the reports of those who claim to possess the ability to see the aura. It has been proposed that the purported auric perception may be easily explained by the presence of a specific subtype of cross-modal perception. We analyse the subjective reports of four synaesthetes who experience colours in response to human faces and figures. These reports are compared with descriptions of alleged auric phenomena found in the literature and with claims made by experts in esoteric spheres. The discrepancies found suggest that both phenomena are phenomenologically and behaviourally dissimilar.

1. Introduction

Synaesthesia is a condition in which one type of stimulation evokes the sensation of another, as when hearing a sound leads to the perception of mental colours or photisms (Ramachandran & Hubbard, 2001). Normally the stimulus which triggers the synaesthetic experience in a given individual is termed an "inducer" and the accompanying phantom sensation is called a "concurrent". A large number of inducer–concurrent combinations have been reported in the literature (see Hochel & Milán, 2008; Rich, Bradshaw, & Mattingley, 2006), some being more common than others. For example, the letter–colour synaesthesia is probably present in more than 50% of synaesthetes (Day, 2006; Hochel & Milán, 2008; Rich et al., 2006; Simner et al., 2006).

One of the relatively infrequent varieties is the one where photisms are triggered by emotion affect-laden stimuli such as emotional words, photographs, human figures and the faces of familiar people (Cytowic, 1989; Milán et al., 2007; Ward, 2004). For instance, for *R*, a synaesthete who participated in this study, the sight of a familiar person automatically triggers a mental image of "a human silhouette filled with colour". Different people are typically associated with different colour hues, depending on *R*'s affective relationship with the person in question (e.g., he claims that he has always associated his mother with the colour blue).

Subjective descriptions of synaesthetic experiences induced by the visual perception of people's figures and faces show certain similarities with the reports of those who claim to possess the ability to see the human aura. In parapsychology and related esoteric spheres, it is believed that human beings as well as animals and objects are surrounded by a subtle field of energy (Ashby, 1972; Farrar & Farrar, 1981) or aura, which can be observed by subjects with the corresponding psychic ability. It is not surprising that aura sceptics as well as some researchers interested in synaesthesia have proposed that such

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cases of auric perception may in fact be easily explained by the presence of a specific subtype of cross-modal perception. According to Ward (2004), "rather than assuming that people give off auras or energy fields that can only be detected by rigged cameras or trained seers", we could consider "a scientific account of the phenomenon in terms of synaesthesia". Even though such an explanation of supposed psychic powers seems more than plausible, certain aspects of synaesthetes' subjective reports point to a series of differences between esoteric descriptions of the aura and synaesthesia as a neuropsychological phenomenon. In the present study, we systematically analysed the subjective phenomenological reports of four synaesthetes who experience colours in response to human faces and figures. These reports are compared to descriptions of alleged auric phenomena found in the literature of folk psychology and to claims made by experts in esoteric spheres. Our main objective is to ascertain whether the purported special ability of certain individuals to perceive human auras may or may not be attributed to and explained in terms of synaesthesia.

1.1. Aura in mysticism and New-Age belief

According to New Age claims, the aura is described as a subtle field of energy surrounding a person or an object, resembling a cocoon or halo. Traditionally, the human aura is believed to have seven layers that match the seven chakras or energy centres located at major branchings of the human nervous system (Anodea, 1996; Arraiza, 2005). According to *H.A.*, an aura expert whom we interviewed, a trained individual (or an especially gifted one) sees the aura as a halo surrounding the body of a person or an object. The different layers of the human aura are "tinted" with colours, which are determined by the character of a person, the momentary state of mind and the physical condition (Arraiza, 2005). The hues may show sudden changes reflecting alterations in the mood and emotional stance of the person. The aura cannot be perceived by examining the person's photograph, even though some aura advocates believe that by using special technology such as Kirlian photography it is possible to photograph the aura (Moss, 1979; see Duerden (2004a) and Snellgrove (1996) for scientific explanations of aura imaging techniques; in reality, the result of the photography depends on surface moisture and not on an esoteric field of energy).

It is assumed that seeing the aura does not necessarily require a special talent or a spiritual gift; rather, it is a technique that may be learnt by anybody who receives appropriate training and guidance. The best conditions for seeing the aura with the naked eye involve dim illumination, the use of peripheral vision and a relaxed, attentive state of mind. Only people who have received extensive training are able to discern clearly all the layers of the aura. The colours of these layers are attributed specific meanings, defined in esoteric literature (e.g., turquoise as the prevailing colour of an aura may be interpreted as indicating a highly energized personality, capable of projection and of influencing other people). Aura interpretations can be extremely complex, depending on the subtle shades of colour, the thickness, and the shape of the aura layers. It is often stated in esoteric books (Arraiza, 2005; Brennan, 1988) and by aura readers that different aura experts viewing the same subject normally agree on the energy field of a particular person. In esoteric and New Age traditions, a number of auric techniques are employed to diagnose and heal physical and mental problems.

1.2. Analogies between aura esoterics and person–colour synaesthesia

As stated above, some authors have sought a scientific explanation for the esoteric aura, as in defining it as a subtype of synaesthesia, person–colour synaesthesia, also called emotionally mediated synaesthesia (Cytowic, 1989, 2002; Ward, 2004). In the past, there have been scientific studies to try to demonstrate experimentally the existence of the aura perceived by psychics, but the results have been negative (Gissurarsson & Gunnarsson, 1997; Straughen, 2002; Tart, 1972). Also, there are publications that, by behavioural tests, demonstrate person–colour synaesthesia (Cytowic & Eagleman, 2009; Milán et al., 2007). These tests could be useful to demonstrate the existence of the esoteric aura. After reviewing previous research and the subjective descriptions offered by synaesthetes and psychics, or those sensitive to auras (aura readers), the main similarities between the two phenomena appear to be:

- Greater incidence in synaesthetes (Banissy & Ward, 2007; Barnett & Newell, 2008) and in aura readers (Zingrone, Alvarado, & Agee, 2009) of certain personality traits, such as greater visual imagination or infrequent psychic experiences such as lucid dreams, fantasy proneness, higher levels of empathy, etc.
- A positive correlation between synaesthesia and the reading of auras. According to Zingrone et al. (2009) and Jordan and Trimble (2008), the percentage of aura readers who presented synaesthesia was higher than the percentage of persons who hold esoteric beliefs and practices but who do not read the aura.
- The reading of auras can be taught (as in *You are Psychic* by Sanders (1990) or *See Them in Only 60 Seconds* by Smith (2002)). The genuine synaesthesia in general is considered innate or idiopathic, but person–colour synaesthesia exists at least in one case where it appears that it can be learned: the case *RF* with Asperger syndrome (Thomson, 2010: a case presented by Ramachandran and Miller at the Society for Neuroscience annual meeting in San Diego). Also, there are psychics or persons with a gift for reading the aura since their infancy.
- Even though synaesthesia is generally regarded as arbitrary associations, there is consistency among synaesthetes (Beeli, Essler, & Jäncke, 2007; Smilek, Carriere, Dixon, & Merikle, 2007). A perfect consistency is to be expected in esoteric disciplines, given that the aura is believed to emanate from the subject and should therefore be seen in the same way by different esoteric aura observers.

– Altered states of consciousness, such as meditation or hypnosis can change both experiences: Terhune and Cardeña (2010) showed that the hypnotic trance can inhibit synaesthesia; Walsh (2005) studied synaesthesia cultivated by the amount of meditation experience: advanced teachers reported multimodality synaesthesia. In Lang (2001) the intensity and width of the aura and the reported subjective descriptions of the colours of the aura were much greater in the post-trance measurement.
– Both phenomena are considered an emotional experience or that they indicate the emotional state of the person whose aura is being read (Brennan, 1988). Cytowic and Eagleman (2009) cite a case in which statues elicited no colour in contrast to live people or names of friends and relatives. For this reason, Ward coined the term of mediated emotional synaesthesia, without necessarily being any inconsistencies (between photism and real colour of the indicator) to generate displeasure, or consistencies to generate pleasure, as is usual in grapheme–colour synaesthesia (Hochel et al., 2009).

These similarities may nevertheless be questioned. In the same way as aura readers and person–colour synaesthetes coincide in certain personality traits, they diverge in others or the results of the research are contradictory. Thus, in the study by Jordan and Trimble (2008), empathy of aura readers was less than that of the control group. Also, there are contradictory results on the correlation between the two phenomena (aura reading and person–colour synaesthesia). For example, in a study by Jordan and Trimble (2008), the aura readers showed frequent cases of synaesthesia, photisms associated with numbers or days of the week but in no case presented emotion–colour or uncommon types of synaesthesia. On the other hand, the way of measuring synaesthesia in the study of Zingrone et al. (2009) is questionable, as the authors themselves recognize (fundamentally by the Synaesthesia Factor of Tellegen's Absorption Scale) and in the study of Jordan and Trimble only the online synaesthesia questionnaire was used (Eagleman, Kagan, Sagaram, & Sarma, 2007) but no behavioural test. In general, genuine synaesthesia is idiopathic and tests are designed to differentiate it from the learned type (Meier & Rothen, 2009). However, most readers of auras have learned to read the aura and are not gifted.

Below, we focus on person–colour synaesthesia or on aura readings that occur in persons with normal vision and without the aid of any devices. That is, we do not compare the reading of auras or synaesthesia produced by machines (Kirlian photography), aura readers with visual disorders or with rare cerebral damage (whether acquired or from neurological problems or disease, such as migraines, autism, or epilepsy; Ramachandran et al., 2010; Sacks, 1985; Tyler, 2005) or those that occur in altered states of consciousness (e.g. hypnotic trance or meditation).

1.3. Synaesthetic aura

To compare the characteristics of the alleged perception of auras with the phenomenon of synaesthesia, we interviewed four self-reported synaesthetes who described colours in response to seeing human faces and figures. (1) The subjects passed the Synaesthesia Battery (Eagleman et al., 2007) online questionnaire. The results were positive for all of them, revealing the

Fig. 1. Images selected from the IAPS, shown to *M* and *R*.

Table 1
Comparison of auras induced by IAPS images in *R* and *F*. Image numbers correspond to pictures represented in Fig. 1.

Image shown	Subject	Aura colour	Emotional valence	Associated impression/emotion
1	*F*	Green	Very positive	Calmness, serenity
	R	Red	Positive	Attraction
2	*F*	Pink	Positive	Intimacy
	R	Red	Positive	Attraction
3	*F*	Red	Positive	Pride
	R	Green	Negative	Disagreeable
4	*F*	Blue	Positive	Breakfast
	R	Brown	Neutral	Boring
5	*F*	Black	Very negative	Despair, violence
	R	Yellow	Negative	Pain

presence of multiple types of synaesthesia, specified below. (2) We added some questions related to the person–colour synaesthesia, such as whether or not it was learned, to describe some examples with real people. (3) To explore the synaesthetes' subjective experiences of auras, we showed them a series of photographs selected from the International Affective Picture System (Lang, Bradley, & Cuthbert, 1999) and asked them to describe the colour of photisms induced by the images. The test was repeated twice in order to measure answer reliability with two weeks between pre-test and post-test (see Fig. 1 and Table 1 for an example). Milán et al. (2007) had followed exactly the same procedure with the IASP sets 1–8, 13 and 14. (4) An in-depth interview revealed additional features of their first-person experience. It is important to mention that synaesthetes often do not know the exact nature of their person–colour synaesthesia, whether the automatic photisms are elicited by the face or the body of the person, by their emotion, or by their action. This was the case, for example, with *L*, as was discovered in the in-depth interview. (5) Finally, it should be noted that aura-like synaesthesia can influence the subject's performance in a colour-decision task, as we demonstrated in an earlier single case study with *R* (Milán et al., 2007). We ran the same task of Milán et al., 2007, the Aura-Stroop task (to indicate the colour of the screen after the presentation of an IASP picture), with the four synaesthetes in our study, adapting the colour hue associated with the pictures for each of them. Only when we found positive results on these five points was the person categorized as a person–colour synaesthete.

1.3.1. Participants

All the participants took the empathy scale TECA (López-Pérez, Fernández-Pinto, & Abad, 2008) and the CAPE scale (Stefanis et al., 2002) – Spanish version of the Community Assesment of Psychic Experiences: a self rated scale assessing three basic dimensions of the psychosis spectrum – positive, negative and depressive – in order to evaluate psychotic like experiences in the general population of Morente, Vilagra-Ruiz, Rodriguez-Hansen, Wigman, and Barrentes-Vidal (2011) – in addition to the battery of synaesthesia tests and the extensive interview. See Table 2a and b with the comparison between the two groups, person–colour synaesthetes and aura readers. No significant differences appeared in empathy, in overall score, or in the subscales, but differences did appear in the psychosis spectrum, the highest score belonging to the aura readers in all subscales. No participants from either group reported visual problems, migraines, traumatic blows to the head, epilepsy, seizures or brain tumours.

1.4. Synaesthetes

F is a 22-year-old male university student, who shows multiple modalities of cross-modal perception, namely the music–colour, smell–colour and letter–colour synaesthesias. In addition, he experiences photisms in response to familiar faces. In *F*, photism seems to be closely related to memory. For example, the photisms remain over time for his friends and for famous people but with the set of the IASP photographs, with 2 weeks between testing and re-testing, the photo-photisms and RGB-code association fell to 62%. Repeated showing of the same photos produced stable photisms (94% accuracy) when comparing old photos (viewed on five previous occasions at a frequency of once a week) with new ones.

R is a 20 year old, male student of audio–visual communication. He presents a wide variety of chromatic synaesthesias: numbers, letters, first names, surnames, people, town and city names, abstract concepts, natural sounds, and music trigger synaesthetic perception of photisms (Milán et al., 2007). In *R*, photisms seem to be closely related to emotion: to the affective valence of stimuli, and typically bring out a consistent pattern of emotional responses. See Milán et al. (2007), Tables 1 and 2.

Table 2
Comparison between aura readers and person–colour synaesthetes in empathy and schizotipia.

a. TECA empathy scale	Score for aura readers: mean and (standard deviation)	Percentile for aura readers	Score for synaesthetes	Percentile for synaesthetes
Cognitive role taking	28 (4)	55	27 (5.2)	40
Social skills	32 (3.3)	65	32 (7)	65
Negative emotions	20 (4.2)	40	24 (6.4)	45
Positive emotions	32 (5.1)	45	30 (2.3)	35
Total Score	112		113	
b. CAPE schizotipia	Mean and (standard deviation) for aura readers	Mean and (standard deviation) for synaesthetes	Maximum score possible	Delta of Cohen
Positive dimension	64 (8.8)	29.6 (11.2)	80	3.4
Negative dimension	42.8 (9.2)	31.2 (7.1)	56	1.4
Depressive dimension	21.4 (6.6)	12.5 (3.8)	28	1.7
Total score	128.2	73.3	164	

Table 3
Relationships between dance steps (inducer) and concurrent photisms for *L*.

Dance step	Elicited photism	RGB codes
Souplesse devant and cambré derrière en relevé	Blue and yellow	30–144–255 and 255–255–0
Cambré derrière at 4th devant with 45°	Green blue	46–139–87
Battement tendu	Red	255–0–0
Battement jeté; Rond de jambe en ĺair simple and double; Battement fondu; Battement frappé triple; Petit battement until retire; Développé ballotté; Fouetté en tournant (o tour fouetté) en dehors y en dedans; Battement jeté en tournant ¼ y ½ en dehors y en dedans con relevé; Pirouettes from the 5th position in dedans; Fouetté en tournant o tour fouetté	Brown	210–180–140 210–105–30 205–92–92
Battement jeté fouette	Light blue	132–112–255
Battement jeté développé and enveloppé	Green and yellow	173–255–47
Battement jeté pointé; Sissonne	Yellow	255–255–224
Grand rond de jambe en dehors en dedans	Green	85–107–47
Rond jeté en dehors en dedans; Temps lié; Entrechat; Cabriolle	Black	0–0–0
Flic-flac en dehors y en dedans	Yellow green	154–205–50
Arabesque penché; Ballonné devant y derrière	Purple	160–32–240
Renversé (Vaganova)	White	250–250–250
Grand fouetté effacé. Grand battement enveloppé. Grand battement fouetté relevé	Green, dark blue and beige	0–100–0, 72–61–139, 245–245–220
Glissade en tournant en dehors y en dedans; Chassé	Beige	245, 245, 220
Promenade	Brown with some black	165–42–42
Pirouettes from the 5th position in dehors	Dark blue	72–61–139
Grand pirouette simple en dehors y en dedans en arabesque y attitude devant y derrière	Blue (arabesque), brown (atitude devant), purple (derrière)	See components in previous boxes
Petit jeté battu; Brisé devant	Red	255–0–0
Grand jeté por degagé y por développé	Black, brown	0–0–0, 139–69–19
Piqués	Red with black	255–69–0, 0–0–0

Table 4
Multiple concurrents for IASP images in case M.

IASP image	Photism	Temperature	Number	RGB codes
0021	White	Cold	1	248–248–255
0029	Blue	Cold	0	0–0–205
0035	Grey	Cold	2	190–190–190
0292	Pink	Mild	4	255–105–180
0315	Black	Hot	6	0–0–0
0397	Green	Mild	1	0–100–0
0399	Blue	Cold	8	25–25–112
0401	Grey	Cold	5	105–105–105
0251	Red	Hot	3	255–0–0
2375	Orange	Hot	7	255–69–0
4537	White–green	Hot	9	107–142–35, 255–235–215

L is a 23-year-old female student of psychology and dancer. She also shows four varieties of inducer–concurrent pairings: taste–colour, tactile–emotion synaesthesia, and people–colour as well as people–animal synaesthesia (e.g. a person has the face of a bird or lion). In *L*, photisms seem to be closely related to action: what the actor is doing is the main determinant of her concurrent experiences. Especially dance steps (classical dance) (see Table 3).

M is a 37-year-old female university student and artist with ataxia. She is right-handed and brilliant in Maths. *M* shows grapheme colour, days-of-the-week colour, and month–colour synaesthesia; different types of number-space synaesthesia. Also she experiences visual music and can see auras: persons serve as inducers while colours, temperatures, and numbers act as concurrent experiences. For example, she related colour photisms to attitude. In her own words "there is a collage between my attitude and the attitude of the other person in our social interaction; it is a flow of cold and hot colours". Concurrent numbers from 0 to 5 means cold or distant relations. Concurrent numbers above five means friendship (6), attraction (7–8) or love (9). For *M*, phantom numbers and colours are closely related to energy and social interaction. In her case, there is no associative link between grapheme–colour synaesthesia and person–number synaesthesia: If her friend Juan is number two, the number two can be blue but Juan can be green (see Table 4). For *M*, this kind of action could be categorized in terms of emotional contagion or as with or without empathy (hot versus cold actions).

None of the above synaesthetes show esoteric beliefs and all indicate that their person–colour synaesthesia was not learnt, but rather occurred as long as they could remember. In this paper, we focus only on colour (photisms) as the concurrent experience. The interviews revealed that the photisms experienced in response to a particular IAPS photograph varied between subjects, as was expected due to the idiosyncratic nature of synaesthesia. In the case of *F*, only familiar people

(friends, famous actors in real life or in pictures or old IASP images seen five times previously) elicited photisms. According to the synaesthetes' claims, the synaesthetic colour associated with a person depends mostly on aspects such as personality, type of relationship (intimate, close, stranger, etc.) and overall impression and affective reaction associated with the person in question (see also Collins, 1929; Cytowic, 1989; Ward, 2004). Synaesthesia is experienced both when the person is physically present as well as when his/her photograph is being viewed. All subjects experience photisms in their mind's eye (following Dixon, Smilek, and Merikle (2004), they could be categorized as "associator" as opposed to "projector" synaesthetes, who perceive their photisms in the external space). "Aura" synaesthesia was typically triggered when the synaesthete was present and watched the inducer directly rather than when the latter was in the periphery of the synaesthete's interest and gaze (Brang & Ramachandran, 2009).

In addition to these general features, a series of idiosyncrasies were also noted. In *R*, the synaesthetic sensitivity to visual stimuli was extraordinarily wide. Not only people but also images and scenes that were either emotionally or aesthetically exciting led to synaesthetic responses (See Milán et al., 2007, for a single case study of *R*.). This was not observed in the other synaesthetes, who typically experienced photisms with humans only. *R* also claimed that a photism linked to a particular person never changed. On the other hand, *F* stated that the colour of the aura associated with a familiar person may sometimes be transformed when the nature of *F*'s relationship with the person is altered. Unlike *R* and *M*, *F* did not typically experience photisms for people he did not know. According to his claims, he had to "intentionally focus" his attention in order to experience synaesthesia with strangers. Finally, *M* and *L* were the subjects who told us about additional concurrent sensations in response to people: on viewing people, they sometimes also experienced smells, temperatures, numbers or concurrent animal imagery. There were no significant correlations between different concurrents. For *M*, the same photism can be related to two opposite temperatures (cold and hot) or different concurrent numbers. For *L*, the same photism could be related to different concurrent animals.

Finally, it should be noted that aura-like synaesthesia can influence the subject's performance in a colour-decision task (Milán et al., 2007). For all of them, we employed IASP pictures associated with photisms, exactly the same subset we employed in experiments five to six in Milán et al., 2007. The correlation between synaesthetes, judged with respect to the colour associated with the same IASP pictures, was clearly non-significant (0.15). We found that the mean RT for the congruent condition (842 ms.) was shorter that the mean RT for the incongruent condition (917 ms.): $F(1,3) = 17.98$, $p = .02$.

1.5. The aura readers

Four people are aura readers, two of whom learned to read the aura and had given courses to teach the technique for more than 10 years. These two are teacher and pupil. They claim not to have the gift. The pupil is a female 30 years old. The teacher, a male of 56 years old from Argentina makes a profession of giving courses on reading auras in a New Age association where courses are also available on yoga, relaxation with Tibetan bowls, the laying on of hands, Gestalt therapy, foot reflexology, etc. The other two, male, have the gift and remember having had the ability to read auras ever since they can remember. One of them belongs to a centre in the zone called the Granada Alpujarras (province of Granada, Spain) where he is known as a master of meditation. He is 49 years old. The second innate aura reader was contacted by email after searching the alternative-medicine sections of Internet. He is 38 years old and professional in alternative medicine (he does not teach aura reading but uses it for diagnoses of physical and mental health).

None of these people tested positive in the battery of synaesthesia or in the extensive interview. That is, they are not synaesthetes. They show neither frequent nor rare instances of synaesthesia. The mode of beginning the reading of the aura in both subgroups was different. Those who learned aura reading need to have the person in front of a white wall and look at them askance. The innate readers did not need any particular conditions of lighting but the same visual focus. All were projective. The number of layers of aura, the size, the quantity of colours varied in the descriptions, but the degree of detail and the speed in the description was greater in the innate readers. For all the readers, the description was complex (different layers, hues, clarity, shapes, sizes, irregularities, etc.) than for the synaesthetes (a simple photism in the mind's eye). For one of the innate readers, the spiritual guide in Granada, the colour was not relevant for reading the aura but rather the shape, the size, and the irregularities of the energy field. For the readers who had learned, the first layer was consistently white. For the gifted readers, the most frequent colour of the first layer was grey or blue. For a description of the subjective experiences of the aura reader in scientific studies, see Zingrone et al. (2009) and in esoteric books, see Brennan (1988, 1993).

2. Experiment 1: subtypes of Aura-Stroop

2.1. Method

We adapted and mixed the photograph task from Milán et al. (2007) in Experiments 5 and 6. The presentation times per trial were 5 s for each photo, followed by a black screen with 3 s to respond. The interval between trials was one second, during which a central fixation point indicated that a new trial was about to commence. We used 21 photos in a session of 84 trials and a procedure similar to that of Experiment 6 in Milán et al. (2007) with the reaction time as the dependent variable but with the colour frames of Experiment 5. We designed three variations of the task: (a) the emotional task consisted of indicating whether the emotion expressed in the photo was positive or negative by pressing the b and n keys on the

keyboard. Previously we had shown various sets of IASP photos (from 1 to 8) to check test–retest consistency after 2 weeks; this was 90% for *M* and 92% for *R*. As we said for *F* the reliability between IASP images and photisms-RGB code was lower. For *L* it was not possible to employ IASP images, because her photisms were elicited overall (but not exclusively: sports and body movements elicit photisms) and with greater intensity and strength by dance movements, then we used videos and photos showing dance steps performed by a professional dancer. Due to *F*'s inability to experience stable photisms with the IASP photos because the people were not known to him, we used old IASP photos (shown five times with a frequency of once a week before the experiment), which elicited stable photisms. (b) The memory task consisted of indicating whether the person in the photo was known or unknown (we used photos of famous actors as opposed to photos of strangers, always with a neutral expression). (c) The action task consisted of indicating whether the action expressed in the photo was violent or showed skill for *M, R* and *F* or to indicate whether the dance step (see Table 3) shown for 5 s implied a left or right movement for *L*. Sports and violent photos from the IASP set were used for *R* and *M* in the action task. For *R*, violence elicited yellow, red or green photisms depending on whether the image involved pain, excitement, or unpleasantness, respectively (Milán et al., 2007). For *M*, the skilled actions that involve expertise or flow (peak concentration and performance) are usually green or white. Skilled actions involving manual dexterity such as sculpting or painting were white; actions involving hitting or shouting were bluish; sexual acts were reddish; and, when blood appeared in the scene, the colour was grey. For *F*, we used a set of IASP photos that were related to sports or of "old" violent acts (pictures seen five times, one time per week).

Task "a" or the emotional task was designed for *R*, task "b" or the recognition task for *F* and task "c1" and "c2" or the action tasks were designed for *M* and *L* specifically. The reason for always using old photos with *F* was the goal of eliciting stable photisms even if their activation was implicit in tasks "a" and "c" (not requiring the photisms to be processed) and explicit in task "b" (the photisms for *F* actively requiring it). For *R*, perhaps all the tasks triggered his photisms in an explicit way and for *L*, in principle, only task "c2" but for *M* task "a" and "c1" could elicit her photisms.

All the photos were presented framed by a colour congruent or incongruent with the photism that it elicited in each synaesthete, as in Experiment 5 of Milán et al. (2007). All subjects completed all the tasks and we noted in which cases the Aura-Stroop interference (Milán et al., 2007) Experiment 6 occurs: longer reaction time in the trials with incongruent photism–colour of the frame against congruent photism–colour of the frame trials. In all cases the "b" and "n" keys of the keyboard had to be pressed to indicate whether the emotion was positive or negative, whether the face was known or unknown, and whether the action was violent or skilled (c1) or to indicate a left or right step (c2). Each participant indicated his/her preference in the left-key right-key correspondence with positive–negative emotion, familiar–unknown face, and the type of action, to avoid strange incongruencies that could interfere with the result.

2.2. Results

Accuracy was 97%, 100%, and 99% in all the tasks "a", "b", respectively and "c1" for *R*; 95%, 93%, and 92% for *M*; 98%, 99%, and 100% for *F*; and 100%, 100%, and 100% for *L* in "a", "b" and "c2". For *R* the Stroop-type interference occurred in tasks a, b, and c1; for *F* only in task b; and for *M* in tasks a and c1 but to different effect sizes with respect to *R*. For *L*, only in task c2 did we find the Stroop-type effect. See Tables 5A and 5B. The difference between congruent and incongruent trials proved to be medium in terms of Cohen's (1988) delta in the emotional task for *R* ($d = 0.7$) as well as in the action task ($d = 0.6$) and the recognition task ($d = 0.6$). For M, the effect size was large for the emotional task ($d = 1.1$) but small for the action task ($d = 0.4$) and null for the memory task ($d = 0.1$). In the recognition task for *F*, the difference was also considered medium ($d = 0.6$) but it was null for the action and emotional tasks ($d = 0.06$ and $d = 0.1$ respectively). The only significant effect size for *L* was

Table 5A
RT in ms. (mean and standard deviation) for Aura-Stroop tasks: the emotional (a), recognition (b) and action tasks (c1) performed by the synaesthetes *R*, *F* and *M*.

Participant Stroop	*R* Congruent	*R* Incongruent	*F* Congruent	*F* Incongruent	*M* Congruent	*M* Incongruent
Task a	748(95)	813(82)	705(301)	723(285)	936(167)	1089(107)
Task b	924(205)	1069(271)	667(88)	720(85)	931(389)	992(374)
Task c1	878(87)	935(102)	814(211)	783(169)	1371(610)	1684(739)

Table 5B
RT in ms (mean and standard deviation) for Aura-Stroop tasks: the emotional (a), recognition (b) and action tasks (c2) performed by the synaesthete *L*.

Participant Stroop	*L* Congruent	*L* Incongruent
Task a	617(115)	612(161)
Task b	689(195)	709(183)
Task c2	436(102)	524(142)

found in the action task concerning dance steps ($d = 0.7$) and null for the emotional and memory tasks ($d = 0.03$ and $d = 0.1$ respectively). We also run the t test for each task and for each participant with the following results: For R in the emotional, memory and action tasks: $t(80) = 3.2$, $p = .001$; $t(80) = 2.73$, $p = .007$; $t(80) = 2.71$, $p = .008$ respectively. For *M* in the emotional, memory and action tasks: $t(80) = 4.91$, $p = .0001$; $t(80) = 0.71$, $p = .46$; $t(80) = 2.09$, $p = .03$ respectively. For *F* in the emotional, memory and action tasks: $t(80) = 0.27$, $p = .78$; $t(80) = 2.77$, $p = .006$; $t(80) = 0.73$, $p = .44$ respectively. For *L* in the emotional, memory and action tasks: $t(80) = 0.14$, $p = .88$; $t(80) = 0.47$, $p = .63$; $t(80) = 3.13$, $p = .001$ respectively.

2.3. Discussion

The person–colour synaesthesia in *R* appeared to be a general effect, independent of the task to be performed in the emotional, memory, or action domains. In *M*'s case the synaesthesia also seemed to be general, though with greater strength in the photism–emotion relationship than in the photism–action relationship. However, in the case of *F*, the person–colour synaesthesia seemed to be specifically one of recognition. Finally, in the case of *L* the Stroop effect appeared only for the action task.

An important difference between *L* and *M* or *R* is that only for *L* were the concurrent photisms activated when she was dancing or viewing someone else dancing or also with mental images of dance from the first-person or third-person perspectives. In the case of *M* (and *R* in his own words) the actions had to be performed by any other person but not by herself (or himself) in order to elicit photisms. For *L* the photisms were only elicited by expert women performing classical dance but not by expert women performing Flamenco (*L* can dance Flamenco but she is not an expert) or by expert men performing classical dance or by non-expert women performing classical dance. For *L* the photisms were elicited by the movements not by the names of the dance steps.

It seems clear that despite the idiosyncrasy of the photisms of *R* and *M* and the different assessments they make of their synaesthesia, as associated especially with emotions or associated with actions or attitudes, the pattern of Stroop interference is similar in both cases. However, both declare that familiar people have fixed photisms associated with them. In the case of familiar people, the photisms may come from multiple inducers and generate incongruencies for them: elicited by familiarity, the name of the person, the emotion they express, and/or the action they perform. Both are multi-synaesthetes, especially *R*, who could rank his synaesthesias by importance or strength: for *R* the greatest perceptual clarity was in musical synaesthesia, followed by the colour grapheme and aura. *M* showed a smaller number of synaesthesias and inducers but while for *R* the concurrent was always a photism (colour), for *M* there were different concurrents associated with her inducers and these were interrelated (colours, numbers, temperatures, and sometimes smells) to form an opinion about someone.

In short, for our person–colour synaesthetes the inducer can be sensorial, semantic or a motor one: An emotion, an action, an attitude, facial recognition or sense of familiarity. Then we can speak of synaesthesia, ideaesthesia (Nikolic, 2009) and kinetoesthesia. Here we focus in photisms like concurrents (a sensorial experience) but other options (other sensorial or semantic concurrents) are possible (temperatures or numbers like concurrents).

3. Experiment 2: esoteric aura

The expert aura readers also performed all the specific Stroop tasks of Experiment 1 with IASP photos adapted to them, without significant results in any case. Again we found no Stroop interference in any of the Aura-Stroop tasks: global RT in milliseconds 1543 for congruent and 1537 for incongruent trials: $F(1,3) = 1.26$, $p = .34$. However, for our four experts in esoteric disciplines, we also ran a second test, but with real people instead of photographs. The participants were asked to observe and inform us about the dominant colour of the aura in a set of 40 people seen in a previous session under appropriate lighting conditions and without time limitations. The degree of agreement between judgements was considerable but far from perfect with respect to the main colour of the aura, with a non-significant correlation of 0.36. The main colours reported were white, blue, grey and yellow. The experts had to carry out a Stroop-type test: look at the person, see the aura, then press the space bar so that a coloured screen congruent or incongruent with the colour of the person's aura, already established a month earlier, appeared on the computer screen. The subjects were 20 psychology students who entered the room one by one in an order established by the experimenters and positioned themselves standing against a white background wall under natural lighting conditions chosen by the experts in esotericism. The task consisted of indicating the colour of the screen as in Experiment 6 of Milán et al. (2007). Each student was evaluated twice by each aura expert–practitioner but in a different order each time. We found no Stroop interference: RT in milliseconds 1098 for congruent and 1135 for incongruent trials: $F(1,3) = 1.81$, $p = .27$. The mean RT (and Standard Deviation) for congruent and incongruent trials and *t* test for each participant in the second task were respectively: Participant 1: 1205(375), 1184(412); $t(38) = 0.16$, $p = .86$. Participant 2: 1108(210), 1090(285); $t(38) = 0.22$, $p = .82$. Participant 3: 1132(314), 1240(307); $t(38) = 1.09$, $p = .27$. Participant 4: 946(321), 1027(356); $t(38) = 0.75$, $p = .45$. These results mean that the Stroop effect is not significant at individual and group levels.

4. General discussion: aura versus synaesthesia

The study of the four accounts of people–colour synaesthesia and the aura readers reported here added to the cases mentioned in earlier studies (Collins, 1929; Cytowic, 1989; Jordan & Trimble, 2008; Milán et al., 2007; Ramachandran et al., 2010;

Riggs & Karwoski, 1934; Ward, 2004) enabled us to compare the phenomenon of synaesthetic auras with the claims made in parapsychology and esoteric literature. Contrary to the hypothesis put forward by Ward (2004), we found a number of notable discrepancies, suggesting that the two phenomena are not alike. Table 6 offers a summary of the differential characteristics of people–colour synaesthesia and the auric experience.

First, the photisms experienced by synaesthetes are idiosyncratic, i.e. the same inducer triggers dissimilar concurrents in different subjects. On the other hand, aura-sensitive people typically agree (or claim to agree) on the colour of the aura observed in a given person. For synaesthetes, auras possess subjective significance, normally linked to the impression or emotion experienced while observing the individual who induces the aura (Cytowic, 1989; Milán et al., 2007; Ward, 2004), i.e. a first-person perspective. According to new age claims, the observation of an aura has a diagnostic value, reflecting the psychological and physical condition of the individual being examined, i.e. a third-person perspective. Consequently, the aura of a person cannot be appreciated for most of the aura readers in a photograph since it supposedly arises from the vital energy of the person. By contrast, for synaesthetes, a photographic portrait normally triggers photisms similar to those induced in the person's presence (Milán et al., 2007). For aura readers, the inducer is the vital energy of the person but for synaesthetes the inducer can be emotions, actions or attitudes elicited by the person in the observer. Finally, auric vision, unlike synaesthesia, is a technique which may be learnt by following appropriate training techniques.

In summary, synaesthetes' phenomenological experience seems to be qualitatively different from that of sensitives and clairvoyants. Claims made by people claiming to be psychic, or aura readers, can be alternatively explained by proven science. Duerden (2004b) shows how phenomena which arise as a consequence of the normal functioning of the human visual system can explain the purported direct experience of the aura. For instance, the complementary colour effect, which results from a temporary "exhaustion" of the colour-sensitive cells in the retina, could account for the presence of auric colours seen by a sensitive viewer when staring at a person. Staring at a darker object (a human figure) against a bright background may induce the perception of a bright "halo" around the object. This is due to a contrast amplification mechanism "built-in" to the human visual system, which allows for an efficient detection of edges. (See the original paper by Duerden, 2004b, for a detailed description of this and other optical illusions.) In any case, regardless of the plausibility of these scientific explanations of the aura, it seems clear that synaesthesia and the (esoteric) aura are phenomenologically and behaviourally dissimilar phenomena which plausibly have different neurocognitive backgrounds.

The list of differences between the esoteric aura and person–colour synaesthesia can be expanded. Person–colour synaesthetes are all multi-synaesthetes (Cytowic, 2002), but in addition show very frequent synaesthesias (grapheme–colour), other less-frequent synaesthesias associated with touch or temperature, and in most cases show more of a concurrent for the inducer (temperature and colour, numbers and colour, etc.). The heterogeneity within each group appears greater for the synaesthetes, although all passed the general Aura-Stroop behavioural test (Milán et al., 2007). Also, there is variability in the group of aura readers in terms of natural or learnt capacity, number of layers of aura, importance of colour, interpretation of the colours, the dominant colour, lack of agreement in the description of the aura, etc. Person–colour synaesthesia is considered a rare synaesthesia and, as we have seen, there are multiple subtypes, some of which are not associated emotions but rather with action or recognition. On the other hand, the score in empathy was no higher than that of aura readers and it is for both groups about the mean of general population (percentile 50). Therefore, the term emotionally mediated synaesthesia for the person–colour synaesthesia does not seem appropriate. It could be used in a vague way if we included under the emotional tag, in addition to emotions (in the case of *R*), the sensation of familiarity (in the case of *F*) and feedback of execution quality provided by photism (in the case of *L*).

Table 6
Differential characteristics of people–colour synaesthesia and the auric experience.

Aura synaesthesia	Auric vision
Different observers (synaesthetes) report seeing different aura colours for the same inducer (person)	Clairvoyants and sensitives typically agree on the colours present in the aura of a given person
Synaesthetic experience can be induced by a photograph	The aura cannot be seen in a photograph; it is supposed to reflect the vital force that emanates from the subject per se
Aura photisms are usually linked to emotions and subjective impressions experienced by the synaesthete (Cytowic, 1989; Milán et al., 2007; Ward, 2004). Colour–emotion associations are idiosyncratic	Specific colours are believed to reflect the character of a person being observed, his/her momentary state of mind and physical condition. The colours of the aura are interpreted following a system defined in esoteric and New Age literature
People–colour synaesthesia involves seeing a photism in one's mind's eye (the three cases reported here) or a photism projected externally (Riggs & Karwoski, 1934; Ward, 2004)	The aura is seen by the clairvoyant as a silhouette or a halo around the person being observed
Synaesthetic "aura" usually contains a single colour hue	The human aura is believed to have seven layers; typically several colours are present
Synaesthesia is a life-long condition which is most probably congenital (e.g., Barnett et al., in press)	It is a technique that may be learnt by anybody who receives appropriate training and guidance
Synaesthesia is triggered automatically and does not require conscious intention in order to be experienced (e.g., see Hochel & Milán, in press)	Typically requires some degree of concentration and appropriate conditions (e.g., dim lightning)
Synaesthesia is most easily triggered when the inducer is in the centre of the visual field (Ramachandran & Hubbard, 2001)	The use of peripheral vision facilitates seeing the aura

However you can find mixed cases, like a very religious grapheme–colour synaesthete or an aura reader with some subtypes of synaesthesia. This is the case of Esteban "The Faith Healer from Baza", a famous clairboyant of the south of Spain (he wrote the book of life (2009): Life, miracles and message of Esteban from Baza. Arcopres) with mirror-touch synaesthesia (Banissy & Ward, 2007) – from our point of view, Mirror-touch synaesthesia is the real emotionally mediated synaesthesia. He obtained a very high score in empathy (percentile 95 with TECA) and a score of 72 in the positive dimension of CAPE. Actually we test his synaesthesia (not related to colour like concurrent experience) in our laboratory. His main method of therapy is lying on of hands. Probably Estebańs powers are related to his mirror-touch synaesthesia and high empathy and the high score in the positive dimension of CAPE is related to the interpretative frame of his synaesthesia like a power.

Also, it appears that we should differentiate many subtypes of synaesthesia, as it is a highly heterogeneous category. Even within person–colour synaesthesia, we can differentiate synaesthesias according to the inducer, (emotional expression, body movement, or face recognition and identification) and of the concurrent experience (colours, temperatures, numbers, animals, etc.). It is quite possible that even some of these subtypes are not synaesthesias in strict terms, as in the case of *L*, a kineto-chromia. In the near future, we will conduct studies of cerebral images in the case of *L* to determine whether it is in fact synaesthesia (sensorial crossing), ideaesthesia (crossed activation of perception and conceptual; Nikolic, 2009), or more specifically a synkinesia (crossed activation between perception and action).

With respect to aura readers, given the multiplicity of colours in their readings and the differences in the behavioural tests, it is difficult to draw a firm conclusion from a null result, even on the appropriateness of the Aura-Stroop behavioural test as an empirical assay for aura reading. Nevertheless, we can conclude that the result in these Stroop-type tasks differs for synaesthetes (positive results) with respect to aura readers (negative results).

In the future, in addition to Stroop-type tasks that serve, as our data indicate, to differentiate between subtypes of person–colour synaesthesia and between synaesthesia and aura readers, but given that Stroop testing reflects conceptual knowledge as opposed to validity of the synaesthetic experience (Meier & Rothen, 2009), it would be useful to look for more specific behavioural proof for idiopathic person–colour synaesthesia and aura readers, based perhaps on the Perky effect (1910), where the aura radiated or the photism elicited by the person observed is affected by the projection of a colour patch (congruent or incongruent with the aura) of an appropriate size and shape and just above the normal threshold of visibility, back projected in soft focus onto the screen.

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