

Selective Attention and Awareness on Concurrents: Overcoming Inattentive Blindness of Synaesthesia

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Abstract. Within this paper it is hypothesized that the perceptibility of synaesthetic experiences requires selective attention and awareness on both the inducer and the concurrent. A considerable, but unknown percentage of synaesthetes appears to be inattentively blind of synaesthesia. Such synaesthetes do not necessarily identify with being synaesthetes. It is possible that they perform poorly in consistency tests when not supported in overcoming inattentive blindness, leading to increased false negative diagnoses in prevalence studies. Clarifying the prevalence of synaesthesia and the proof of its benefits in learning tasks could be incentives in creating tools and services for synaesthetes.

Keywords: synaesthesia, selective attention, awareness, inattentive blindness, learning

1. DIFFERENCES IN *SYNAESTHETIC AWARENESS* BETWEEN INDIVIDUALS

Synaesthesia is a condition in which stimulation of one sensory modality or activation of a concept (inducer) automatically co-activates additional experiences (concurrents). In case of a sensory inducer we can talk about synaesthesia and in case of a conceptual inducer about ideasthesia (NIKOLIĆ, 2009). Not all genuine synaesthetes recognize that they have synaesthesia and not all perceive it to the same extent. Some are aware of synaesthetic experiences but consider it to be normal. Others experienced to be different to their peers and may feel alienated. I hypothesize that even though synaesthetic experiences occur automatically and involuntarily, there are genuine synaesthetes that do not perceive synaesthesia consciously or are only partially aware. This paper aims to combine the current state of research on synaesthesia in aspect of selective attention, diagnosing and benefits of it with my personal expertise gained through the engagement with synaesthetes.

1.1 *Inattentive blindness of synaesthesia*

Synaesthesia seems to be strongly modulated by selective attention (RICH, MATTINGLEY, 2013). It has been shown that selective attention directed towards the inducer as well as the awareness thereof is required to bind the concurrent to the inducer (MATTINGLEY *et al.*, 2006; RICH, MATTINGLEY, 2003; SAGIV *et al.*, 2006). However, no study to date has been conducted to examine the role of selective attention directed to and consequent awareness of synaesthetic concurrents. The type of synaesthesia elicited by a given inducer such as a sound may either result in sound → colour or sound → taste synaesthesia, depending the concurrent to which the selective attention has shifted. I hypothesize that

without selective attention and explicit awareness of both the inducer and the concurrent, synaesthetic experiences may be masked. This is a form of inattentive blindness similar to that introduced by MACK and ROCK (1998). Genuine synaesthetes may fail to notice the fully-visible as well as unexpected concurrent because their selective attention was engaged elsewhere. The concurrent is perceivable only when selective attention is directed towards it, and the perception occurs immediately. We may be biased in our current view on synaesthesia. We encounter mainly synaesthetes in labs, congresses, associations or media. These are preselected as being *aware synaesthetes*. A significant but unknown percentage of synaesthetes could be completely or partially inattentively blind (IB) to their synaesthesia. The degree of *synaesthetic awareness* may differ among individual synaesthetes and may depend on an attentional state. Awareness of one's synaesthesia can be increased with practice in directing attention towards synaesthetic experiences in daily life.

1.2 *Identification and social exchange*

A considerable number of synaesthetes may not realize they are synaesthetes. Identification with synaesthesia, a *synaesthetic coming out*, is not necessarily intuitive. *Inattentively blind synaesthetes* tend to neglect to have synaesthesia, especially when there are *aware synaesthetes* among their peers or in their family. *IB synaesthetes* either construct false ideas about what synaesthesia is or they are too modest, insecure, or sceptical to identify with their synaesthetic perception. The media contributes by either glorifying synaesthetes or stigmatising it as an illness (DAILYMAIL.CO.UK, 2008; SEABERG, 2012). Regardless of having passed a synaesthesia test successfully, numerous *IB synaesthetes* continue to deny it. Either the reliability

of the test is doubted or explanations other than synaesthesia for their not learned colour experiences are given. Sharing and discussing synaesthesia with others is a valuable opportunity to discover, train and integrate *synaesthetic awareness*. Nevertheless, many *aware synaesthetes* seem to feel lonely with their neurological gift and develop the desire to foster a community (SIMNER, HUBBARD, 2013; ZEDLER, REHME, 2013). Some travel long distances to meet other synaesthetes at meetings. There may be the possibility of a higher prevalence of synaesthetes in society. The social dynamics could be transformed by *aware synaesthetes* starting to seek other synaesthetes among family and social environments. *Aware synaesthetes* should disregard the concept of having a unique condition and begin to ask others about synaesthetic experiences. To enable a simple and clear explanation of synaesthesia the scientific community needs to provide balanced and refined information. Finally the community ought to encourage the media to celebrate synaesthesia and not synaesthetes.

1.3 *Synaesthetic induction and practise.*

Synaesthetic induction is a spoken technique to overcome inattentive blindness of synaesthesia. Simply asking for the occurrence of synaesthetic experiences may fall short. *IB synaesthetes* are more perceptive to synaesthesia having their eyes closed and being brought into a relaxed state or caught in a moment of surprise. In such state, the selective attention can be shifted intuitively towards inducer and concurrent and eventually synaesthesia is perceived automatically and involuntarily. It should be taken into account that explaining synaesthesia beforehand may have a distracting and alienating effect.

Practises may consist simply in the shifting of attention to different inducer – concurrent pairings. It is likely that most synaesthetes have not yet perceived the entire range of their synaesthetics. Some types of synaesthesia are more subtle and hence becoming aware of them is more difficult. As an adult, the tasks of daily life keep the mind busy and distracted. Steady practise and expression of synaesthetic perceptions with words and drawings may provide fruitful opportunities to raise the attentional *synaesthetic awareness*, to integrate it in daily life and may mitigate synaesthesia attrition proposed by MEIER *et al.* (2014) in older ages.

2. IMPLICATIONS OF SYNAESTHETIC AWARENESS

2.1 *Prevalence and consistency tests.*

Diagnosing synaesthesia is challenging. The question regarding the prevalence of synaesthesia is not answered yet. The most accepted prevalence estimation of around 4 % by SIMNER *et al.* (2006) is most likely a lower boundary. The consistency test,

also known as the test of genuineness (TOG), is established as the gold standard in diagnosing synaesthesia (JOHNSON *et al.*, 2013). Yet it seems challenging to find an adequate trade-off between obtaining false positive and false negative outcomes. In order to be conservative, participants with high consistency scores who do not respond to statements in a typical synaesthetic manner or do not believe themselves to be synaesthetes are usually classified as being non-synaesthetes (ROTHEN, MEIER, 2010, SIMNER *et al.*, 2006). Such a procedure may also lead to an increased false negative outcome considering participants may not be aware of their synaesthesia and hesitate to identify, especially when informed beforehand about synaesthesia. Therefore self-report questionnaires may provide only limited insights about the synaesthetic abilities of study participants.

I hypothesize that during consistency tests *IB synaesthetes* may not show the same inducer – concurrent consistency than *aware synaesthetes* resulting in false negatives diagnoses. Furthermore the existence of a clear cut-off line between synaesthetes and non-synaesthesia appears unlikely. Though the mean TOG scores of synaesthetes and non-synaesthetes do not overlap (JOHNSON *et al.*, 2013), the curves do overlap (ROTHEN *et al.*, 2013). The establishment of an *unclear range* in diagnosing synaesthesia could serve as a buffer and might provide insights about the ratio between false negative and false positive results of the TOG. Simply asking participants to ‘find the best colour for a token’ might not be enough for a synaesthete to overcome inattentive blindness. The involvement of a spoken synaesthetic induction in the beginning of a consistency test could contribute to more precise diagnoses. Furthermore the inclusion of synaesthetic Stroop tests in studies as an additional measurement could lead to more accurate prevalence estimations, although its ‘results have to be interpreted cautiously’ (JOHNSON *et al.*, 2013).

2.2 *Benefiting of synaesthesia*

It is discussed that involving synaesthesia in learning processes could be an advantage (SAGIV *et al.*, 2006; YARO, WARD, 2007; SIMNER, HUBBARD, 2013). However, research into synaesthesia and memory is still in its infancy (MEIER, ROTHEN, 2013). Although no studies were done in real learning environments such as schools, there are indicators that being born with synaesthesia combined with training possibly leads to an exceptional memory and a cognitive advantage (SIMNER, HUBBARD, 2013). Assigning colours to concepts such as letters can accelerate mental manipulations such as recalling vocabulary quicker and more accurately (MROZKO-WASOWICZ, NIKOLIC, 2014). Additionally the acquisition of a new scripture such as Hebrew can be facilitated due to cross linguistic transfer (MROZKO-WASOWICZ, NIKOLIC, 2013). However synaesthetic children and their parents are responsible for ‘educate the educators’, and are required to discover independently how to apply synaesthesia (SIMNER,

HUBBARD, 2013). Providing support to synaesthetic children in the acquisition of *synaesthetic awareness* and learning techniques may be beneficial for their learning abilities and their personal development.

3. CONCLUSIONS

Is the scientific community inattentionally blind to inattentionally blind synaesthetes? Synaesthesia in society may occur more frequent than assumed. Perhaps it's time to dedicate to such questions and adjust the perspective on synaesthesia. Future research would need to shed light on the effect of selective attention on the concurrent, test the hypothesis of the existence of *IB synaesthetes*, quantifying them. The effect of synaesthetic induction and its influence on the outcome of consistency tests could be studied to improve and adjust diagnosis procedures in order to avoid distortions of studies by falsely negative classified synaesthetes in control groups.

A significant percentage of human beings could be inattentionally blind to synaesthesia and overlook the beauty and the benefits of it. Perceiving synaesthesia consciously may not only be helpful in memorizing but may also be useful in daily life tasks and intensify the perceptual world. Synaesthesia might provide similar benefits as meditation, such as alleviation of stress and increased concentration during work or sport. Modernized synaesthesia tests and practise and learning apps could be developed to support synaesthetes in raising *synaesthetic awareness* and in benefiting of it. This would also be supportive for synaesthetes, parents and teachers in detecting synaesthetes in their social circle, among their children or students. Ideally our school system would educate teachers about synaesthesia, establish mechanisms to identify synaesthetes in class rooms and offer synaesthetic learning tools and services. Scientific clarification of the synaesthetic prevalence and its success on learning is required. These findings may act as incentives for key players such as policy makers, school principals, educators, app-developers, entrepreneurs and business investors to take next steps forward.

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