



Uk Synaesthesia Association NEWSLETTER

WELCOME

Hello and welcome to the second issue of the year!

To everyone who came along to the AGM, I hope you enjoyed the variety of discussions – inside and out of the lecture theatre!

Like several of the talks at the AGM, this issue we are looking at whether having synaesthesia can be an advantage, and also how it can cause problems for some 'sufferers'.

Personally, I find it very difficult to say whether having syn is an advantage or not as I find it impossible to imagine how I would read, spell and remember dates, phone numbers and pins without it! But, whether it makes me better at these tasks is another thing, and as many non-synaesthetes are able to do these things perfectly well, I guess I would manage! As my synaesthesia doesn't interfere too much with 'real life' I find there aren't many disadvantages – other than occasionally mixing up 'A' and '4' (which are both red and similar shapes!).

For many synaesthetes, their experiences may seem at best an extra tool to help them remember things or an additional source of creativity, but perhaps more often than not, it is just 'the only way they know'. But several studies have looked into whether, at an almost unconscious level, synaesthesia is helping people perform 'better' than non-synaesthetes.

Ed Hubbard and Carolin Yaro present their individual research studies into synaesthesia and memory, while Marcia Smilack explains how synaesthesia helps her profession as a photographer and artist. From a personal perspective, James Wannerton tells us about the ups and downs of living with a strong variety of synaesthesia, and you share your comments on the topic in 'My Synaesthesia' on the back page.

I hope you enjoy the issue!

Best wishes,
Victoria

Victoria Edmonds, Editor

Synaesthesia and Memory



Is having synaesthesia an advantage or a disadvantage?

Whether synaesthesia is an advantage or a disadvantage might be as variable as the people who experience synaesthesia, and may even differ within the same individual depending on circumstances. However, numerous studies suggest that synaesthesia may be important in helping some people achieve remarkable powers of memory. The Russian neurologist, A.R. Luria (1968), wrote perhaps the most famous report of a memory savant, referred to as S., in whom all five of the senses were connected. Luria reports that *"there was no limit either to the capacity of S.'s memory or to the durability of the traces he retained"* (p. 11, italics original). For example, Luria presented S. with a matrix of 50 digits for three minutes and reports that S. was able to recall this matrix perfectly, even many years later. S. also experienced synaesthesia to a very rare degree. When Luria presented S with a 2000 Hz tone, S. said *"It looks something like fireworks tinged with a pink-red hue. The strip of colour feels rough and unpleasant, and it has an ugly taste—rather like that of a briny pickle... You could hurt your hand on this."* (p. 23).

Recent studies have used experimental manipulations to directly test whether synaesthesia may play a direct role in some synaesthete's memory abilities. Dan Smilek, Mike Dixon and Phil Merikle (2002) in Waterloo, Canada demonstrated that digit-colour synaesthesia can play a role in memory performance. Smilek and colleagues presented "C." with 3 different matrices of 50 digits, and gave her 3 minutes to memorize each of the matrices. For one matrix, each digit was black (neutral), for another each digit was coloured in the "wrong" colour for C (incongruent), and for the third each was in the "right" colours for C. (congruent). In the neutral and congruent conditions, C.'s memory performance was much better than that of non-synaesthetes. However, for the incongruent display, she remembered very few of the items (indeed, she went from best to worst). When she was tested 48 hours later C. had not forgotten the displays, although the non-synaesthetes had.

Recently, Shai Azoulay, V.S. Ramachandran and I were fortunate to test a synesthete, "Arithmos" who currently holds the European record for memorizing the digits of pi (22,515 digits). Arithmos can perform large calculations (e.g., 37 to the power of 4, or 13 divided by 97) in his head and when asked to divide 13 by 97 he outdid the computer! Arithmos is also a wiz at

languages. He speaks nine languages, two of which he created himself, and was able to learn Icelandic in just one week well enough to converse on national TV while the cameras were rolling. Arithmos reports that his memory is aided by his unusual form of synesthesia, in which each number has an elaborate three-dimensional shape that incorporates size, colour, texture, and sometimes movement or sound. For example, 58 is a yellow three-pronged wedge shape, and 810 is a white kidney-bean shape. The most important aspect of these number-shapes for Arithmos' memory is their size; digits 0 - 9 have different sizes, ranging from smallest (6) to largest (9).

To test whether Arithmos' synesthesia contributes to his feats of memory, we tested him on an adaptation of the experiment described above. As in the other studies, we tested Arithmos' memory after giving him three minutes to memorize matrices of random digits to in each of three conditions: neutral, congruent, or incongruent. In our case, however, we used 100 digits, and instead of presenting the numbers in the right or wrong colour, we presented the digits in the right or wrong size. For example, in the congruent matrix, 6 would be small and 9 very large, while in the incongruent matrix, 6 would be large and 9 very small. Arithmos performed well in both the neutral and congruent conditions (recalling more than 50 digits) and poorly in the discordant condition (recalling only 16 digits). Non-synaesthetes, by comparison, remembered about 7-10 digits. He reported that looking at the incongruent matrix was like "reading Punjabi, except you don't speak Punjabi." In two surprise retests 24 and 72 hours later, Arithmos continued to demonstrate his superior memory. Unlike non-synaesthetes, he did not forget any of the digits in the neutral and congruent condition, but forgot almost all of them in the incongruent condition.

Thus, it seems that we have found a modern counterpart to Luria's famous mnemonist and we have used an experimental manipulation to show that his synaesthesia really does play an important role in his ability to memorize sets of digits. However, S., C., and Arithmos all came to the attention of investigators because of their memory abilities, rather than their synaesthesia. It remains to be seen to what extent these enhanced memory abilities are true of synaesthetes in general. More

research is clearly required, but these studies demonstrate that, under certain circumstances, for certain synaesthetes, synaesthesia may be a useful memory tool, which can be used to boost not only their immediate memory, but also long-term recall.

7	4	2	5	7	9	4	1	4	8
7	2	3	8	7	1	3	5	7	9
5	1	4	2	4	7	2	9	3	
4	3	8	5	1	5	8	3		
7	2	7	1	1	2	2			
2	3	8	1	4	3	3			
1	8	4	4	7	8	9	1	4	
1	3	8	7	1	3	8	7	4	8
5	8	2	7	3	8	8	1	7	2
4	7	3	8	1	2	9	3	9	4

Life with Synaesthesia *By James Wannerton*



For as long as I can remember, words, word sounds and certain musical instruments have produced an involuntary burst of taste on my tongue. Texture and temperature also feature in this experience which affects more than one in three words that I hear, read, or articulate through inner speech. Although predominant during my formative years, I never considered these experiences to be abnormal. Tasting words seemed as natural as breathing. As I got older and more involved in the wider world, I found my word / taste associations having an increasing impact on my everyday decision making processes. By my late teens, I'd broached the subject with a few people close to me but soon realised that not everyone shared my perceptions. Then, in April 1980 I caught an American TV programme called "What On Earth" in which a woman described seeing colours while listening to music. I instantly recognised similarities between her perceptions and mine and so began the search for more information. Many years and very many tests later I came to proudly possess a set of perception-confirming fMRI scans and a new, grand sounding name for the condition: Lexical-Gustatory Synaesthesia.

My path towards discovery and enlightenment has been a tangled one and there's been many occasions when it has seemed as though I've had a mischievous monkey sitting on my shoulder. On balance, my synaesthesia errs on the side of hindrance although I would never consider the option of being "cured", if ever such a thing were offered, although it would interest me to find out how my perceptions would be altered if I "lost" it for a day. What is beyond doubt is that it's a fundamental part of who I am and has most certainly helped shape my concepts and personality.

Everyday tasks such as meeting people, general conversation, driving, shopping, or reading a newspaper, often pose an extra challenge. I have concentration issues if the person I am listening to speaks slowly and has clear diction. I vividly remember listening to lectures at college where very little of what was being said actually progressed beyond my taste "screen". When I write, I use my own "synthesaurus" in order to provide pleasant, tasty alternatives to strongly flavoured words. Negotiating the taste of road sign information at the same time as processing the multifarious flavours of my surroundings often causes confusion and usually ends with me feeling hot and bothered in Burnley when I should have been in a cake shop in Eccles. Eating out can be a surreal experience, especially if the menus are in a language other than English. My choice of car is dictated by the taste of the makers name and I once took up a job offer in Southgate over another in Loughton because one came with a nice taste of bacon and the other a rather flaccid, cold fried egg flavour. And, I've often wanted to know why the most neurotic and troublesome girls always seem to have the nicest tasting names!

Thankfully, there is a plus side to all this. My synaesthesia does aid my memory recall. If I see a face I can't immediately identify my mind goes through a process of using taste recollections to effectively apply a name to the face. And music has a very pleasant added dimension.

My Synaesthesia has provided me the opportunity to make lots of new friends from Runcorn to Reunion Island and, above all else the condition graphically demonstrates the fascinating diversity of the human mind, giving me a greater tolerance and empathy towards others and their differing viewpoints. And that can't be a bad thing!

Straddling Layers of Consciousness *By Marcia R. Smilack*

I sometimes like to type to music but I'm very particular about what kind and where. If it's in the same room, I can't concentrate, so I play it in an adjacent room, just loud enough to waft under the door. My goal is to be virtually unaware of the music except to borrow its rhythm and color as an accompaniment for my writing voice. Writing itself consists largely of pulling down pictures from the walls of my mind and converting them into words.

On this night, the music had the perfect rhythm for my subject. I still recall what it looked like as I typed away. I saw it projected on my right, higher than the desk, in peripheral vision: squares of beige with brown lines running vertically in squiggly configurations, while soft textures produced by subtle drums and brushes, travelled left to right in hues of white. I never looked over at the music as it presented itself in visual form because that isn't how it works. I am able to see sound as long as I am not looking for it on purpose.

When I finished writing, I went into the other room to find the name of the CD but I discovered the player wasn't on. I knew the music was real, but what was the source? Puzzled and a little spooked, I determined to solve the mystery. I began to retrace my steps, when suddenly, I knew. I had been grooving to the sound of the dishwasher, which in my writer's trance, I had mistaken for music. On subsequent nights, I played the dishwasher on purpose because I like the tune. I enjoy typing to the jazzy sound of water splashing against china and glass, but it raises the question of how I could make such a mistake. Is it related to my synesthesia? I consulted my friend Debby who has known me all my life. Our rule of thumb is that if she cannot even imagine what I am describing, it is probably my synesthesia talking.

"I might have mistaken the dishwasher for music for a couple of seconds,"

she said, *"But then I would have known."*

"How?" I asked, genuinely curious.

"Because it would have been obvious."

I looked up "obvious" in the dictionary. I hoped that by deconstructing the familiar word, I could rediscover its original meaning beneath centuries of overuse. From the Latin, it translates as "standing in the way" or "in front of" -- in other words, the obvious is the layer closest to conscious awareness. I understood my mistake.



It breaks down like this. First, I saw the pictures in my mind that were my thoughts; second, I saw the music projected on my right; and third, I took in details of my physical environment (that constitute the obvious). The problem lay with where I put the obvious. For while other people keep the obvious in front of them where it belongs, I had pushed my obvious all the way to the back, where I had inadvertently concealed it behind two layers of abstract thought. Enthralled inside the action of writing, I forgot to put the obvious back.

I live my life in metaphor. Seeing sound is merely one example. The disadvantage is how embarrassed I feel when I find myself speaking from the wrong layer of consciousness, as with dishwasher music. The advantage is that I enjoy the way I see. I am accustomed to perceiving double and triple layers of meaning in multidimensional space. I use synesthesia to take photographs as well. I shoot when I hear a chord of color, feel texture on my skin or experience motion based on what I see. Photography and synesthesia is a whole other story, but thanks to it, I can show you a picture of what the sound of dishwasher music looks like.



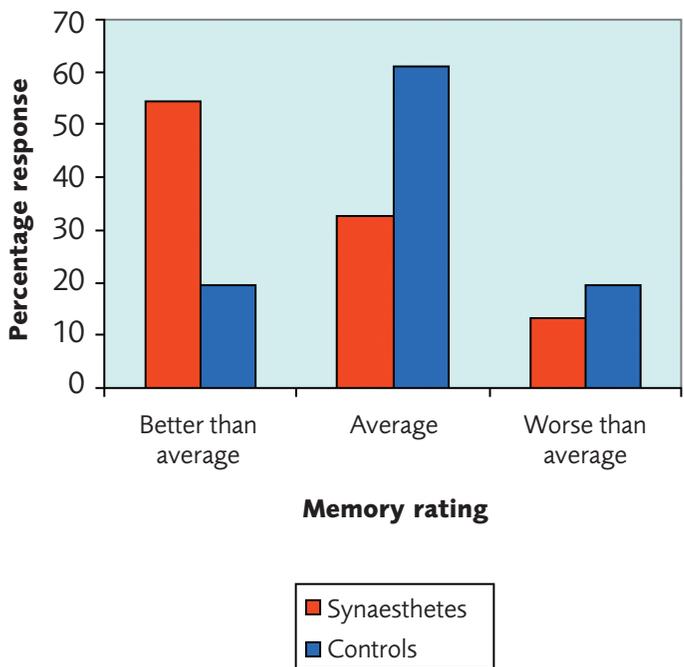
for more information on Marcia's photography visit: www.marciasmilack.com

What is Superior about the Memory of Synaesthetes?

It has often been stated that synaesthetes may demonstrate superior memory. This is sometimes accredited to the additional information provided by synaesthetic experiences. Extra sensations of colour may provide clues that help synaesthetes to remember items that may otherwise have been forgotten.

One of the most remarkable cases of superior memory on record is that of the synaesthete Shereshevskii (S), featured in Luria's (1968) popular book "The Mind of Mnemonist". Luria's work with Shereshevskii spanned over 30 years and, during this period, Luria came to the conclusion that his memory "had no distinct limits...there was no limit either to the capacity of S's memory or the durability of the traces retained". Shereshevskii was able to remember complex, meaningless mathematical formulae and matrices of 50 digits after only a few minutes inspection, and was able to recall them when retested 15 or 16 years later. Luria believed that the additional information furnished by the wealth of S's synaesthetic experiences could provide the cues that would guarantee accurate recall, and explain S's impressive memory.

As part of my recent Master's dissertation at University College London I carried out a study comparing the memory of a group of grapheme-colour synaesthetes to a group of age- and sex-matched non-synaesthetes. A questionnaire was used to see whether synaesthetes believed their memory to be superior and to see whether they believed their synaesthetic experiences to be helpful for remembering information. Additionally, a number of different tests were used to find out if synaesthetes' memory was indeed superior, and to assess in what way their memory of was different from that of the general population.



A number of striking differences between the synaesthete and the non-synaesthete groups were discovered. Over 50% of synaesthetes reported that they believed their memory to be better than average, while only about 20% of non-synaesthetes made a similar claim. Many believed their synaesthesia to be advantageous for remembering things (over 65%), and just under 20% stated that it could interfere with their memory.

In well-established tests to assess the verbal and visual memory, synaesthetes were found to be better at memorizing and remembering word lists, but demonstrated no advantage when remembering an abstract line drawing. The synaesthetes' superior performance in word list task suggested that their memory was improved if information had the potential

to elicit a synaesthetic experiences. While lists of words were likely to elicit the experience of colour in the synaesthetes tested, the abstract line drawing was not.



A novel finding of my research, was that synaesthetes have better memory for colour as well as better memory for words. This occurs even though colours do not trigger synaesthetic sensations in the majority of people. In one task, the synaesthetes were shown a grid in which different colours were placed in different parts of the grid. Their ability to remember which colour went in which location was better than other people after a delay of 1 hour. They were also better at remembering which of three precise hues they had previously been shown.

When considering why synaesthetes demonstrate enhanced memory, it is difficult to say with conviction that this is simply due to extra information provided by their synaesthetic experiences. Synaesthetes demonstrate enhanced memory where synaesthetic experiences are not generated, in particular when coloured information is presented. Synaesthetes' have a more extensive experience of colour, encountering colour where it is not usually seen. This may produce an advantage in colour memory.

However, while synaesthesia does provide an advantage in terms of memory performance, it by no means guarantees perfect memory and flawless recall. The synaesthetic group demonstrated a wide range of ability, spanning from very good memory to poorer memory. It seems that while synaesthesia does in general promote memory, it does not ensure the perfect memory found in previous case studies. It is well known that Shereshevskii was a professional mnemonist, using a number of well documented memorizing techniques to maximize his memory, and carrying out great feats of memory in order to earn a living. Perhaps synaesthesia combined with sufficient practice provides the key to superior memory, and maybe with enough practice and dedication all synaesthetes may also be able to reach the heights of unlimited memory.

Many thanks to Jamie Ward for all his help and to our kind participants who made this research possible!

NEWS

Synesthete.org

Synesthete.org is a free website of online questionnaires and software tests for synesthesia.

This website is designed to be used by individual synesthetes and the whole community of synesthesia researchers.

Upon logging in, synesthetes can choose to share their data with a researcher; if they do, the researcher is automatically emailed and can log on to examine the results. Performance on the tests is automatically quantified with a scoring system.

The battery was developed by Dr. David Eagleman and his research team at the University of Texas.

For more information, or to take the tests, go to: www.synesthete.org

The Synesthesia Battery



'My Synaesthesia'

Is having synaesthesia an advantage?

Charlotte Hanson, Oxfordshire

"Obviously I am unable to directly compare life with and without synaesthesia; however, in my opinion, having synaesthesia is an advantage, if only because it enriches life and makes it colourful! I think life must be very dull if letters and numbers are monochrome and are not spatially related to other letters and numbers. I also feel that grapheme-colour synaesthesia can aid memory e.g. in learning languages or remembering dates, times, people's names etc"

Zanna Vaysey, Bucks

"For me, my synaesthesia brings both advantages and disadvantages. It can, for example, help when trying to memorise facts or numbers and helps accurate spelling. However, I do think it makes me a slower reader as I'm having to process colours as well as the text, and it can be a real hinderance if I'm trying to memorise colours that are incongruent – like transition metal ions for A Level Chemistry! Like most synaesthetes, I wouldn't be without it though."

Julie Roxburgh

"It seems it can be both. When describing various sound/colour perceptions to non-synaesthetes they have the impression that life is constantly enhanced for me, like being hallucinatory drug. I wouldn't know, never having tried any, but if so it is certainly cheaper! It also helps my mental arithmetic. However, the world is not really designed for synaesthetes – e.g. the amount of noise we experience – music etc. Going into some shops can be a nightmare because there is so much muddle to get through. I have the same problem trying to drive. Too much is going on visually and sonically to be able to cope. Because sound creates colour and shape I need peace, quiet and lots of space in order to be comfortable. But if the world is as grey as I suppose, I wouldn't be without synaesthesia."

Helena Bergmann, Germany

"With the help of my coloured hearing, it is easier for me to learn telephone numbers, dates etc. I can remember a lot of dates, in past and in future – my other half says I'm a kind of strolling calendar. This may have to do with my coloured months, days, years, and the way they are arranged in front of me. I play the piano, guitar and flute and I see the notes coloured. That's an advantage because it's easier to learn new songs.

A disadvantage is that it's difficult for me to remember things I've only heard - because colours are more vivid when I see things written down (projective). I don't mind if a word is "wrong coloured" on a poster – I can distinguish between the printed colour and my projected colour easily - what disturbs me are names with an initial letter that has no nice colour. It's not very nice to have friends whose names have a brownish colour, but I can't do anything about it. All in all, I see more advantages than disadvantages in my synaesthesia, but I can only speak for myself"

Kat Murphy

"I would suggest that it is mildly advantageous, though not enormously useful. My colour related synaesthesia allows me to narrow down an item that I am trying to remember to a colour category, but not normally any further. What's interesting about this is that I'm rarely wrong about the colour I see when trying to recall a name or birthday, but the exact details can have completely vanished from my mind. Why this is I'm not sure - perhaps due to the fact that my synaesthesia is always present in my mind and is applied automatically to new information? So perhaps I automatically colour-categorise new information, but then the exact information contained within that category is lost. For example, a non-synaesthete could meet a blonde woman in a shop, and for some time afterwards be able to categorise the person they had met as falling into "woman" and "blonde", but perhaps be unable to recall her facial features."

Moyra Sonley

"I'm not very good at remembering numbers so I keep a note of my pin numbers in colour, as no-one else can understand them, not even another synaesthete. I also use my synaesthesia to help me recall people's names. I can't really think of any disadvantages in having synaesthesia, though I sometimes cringe when I see someone wearing a colour that clashes badly with their name. It can also be irritating to see words, in adverts for example, written in the 'wrong' colour."

Gwen Owen, Seattle USA

"On good days, my synaesthesia is a great advantage, helping me to focus, memorise details, and process my thoughts better. But there are bad days when it's like a wet blanket dragging me down. Sometimes I'll find I can't seem to get through a single sentence because the onslaught of activity in my brain is hindering me. I recently discovered that I have a very small capacity for retaining number values, and I think this is due to my synaesthetic tendencies to see individual digits in a sequence instead of the number as a whole, as a value."

Amy

"One thing I keep thinking is that different types of synesthesia should be more or less helpful for different sorts of tasks. Various folks have made this point with regards to, e.g., synesthesia being correlated with eideticism or perfect pitch, but I wonder if there are more fine-grained differences in the advantages/disadvantages of different kinds of synesthesia.

For instance, my synesthesia involves spatial forms for most abstract sequences, i.e., days of the week, hours, alphabet, months, number lines of different sorts, music notes, etc. My subjective experience is that this sort of synesthesia has helped me a great deal, especially in math: I feel like I can remember things (numbers, my weekly schedule, etc) much better than I would be able to otherwise, and it also feels a lot like it helps me in calculating and in conceptualizing some abstract ideas.

Moving beyond just spatial-form synesthesia, maybe only people with sound-to-X or X-to-sound synesthesia have perfect pitch. Or perhaps the eideticism only applies in the domain in which synesthesia is a factor. I'm certainly not saying that any type of synesthesia is better than others, but the advantages and disadvantages of each might be very specific to the type and the domain."

Thanks to everyone for their contributions, sorry we were not able to include them all!

In the next issue – Does synaesthesia run in your family?

Please submit your answers to: Newsletter.UKSA@hotmail.co.uk

NEXT ISSUE

If you would like to contribute to our next newsletter, the deadline is 1st September 2006.

We welcome comments, queries, letters, short articles (two pages of A4 max.) and artwork.

In the next issue we'll be looking at whether synaesthesia is inherited and how it can vary across family members.

Please submit your contributions by post to: UKSA, PO Box 6258, Leighton Buzzard, LU7 0WP

or by email to: Newsletter.UKSA@hotmail.co.uk

Please note: If you are sending artwork in by post please include a stamped addressed envelope if you would like it to be returned.

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