



June's edition of the newsletter investigated decision making and what makes us decision-make effectively. In this month's edition of the newsletter we explore imagination, and the absence of imagination and how this might affect thinking.

## Dual Coding Theory

In previous newsletters we have discussed your inner voice and its importance in cognition and thinking skills. However, it is not just verbal processes that are important in thinking. Non-verbal thought processes also play an important role. This is evident in the Dual Coding theory which distinguishes between verbal and non-verbal thought processes with mental imagery been stated as the main form of non-verbal representation. This theory states that information in our brains is stored in two different ways, verbally and visually, these being independent of one another. The skills can be used individually but are also able to interact to enhance our learning and memory recall.



### MENTAL IMAGERY

Mental imagery plays an important role in acquiring literacy skills, memory, understanding patterns with numbers, creating mental representations, creativity and many other important processes. A growing amount of evidence shows that mental imagery can improve performance at many different skills and accelerate learning. For example, athletes mentally rehearsing the movements of a technique is just as effective as physical training. Although for most people mental imagery is vital for memory and imagination, some people lack this ability. Aphantasia is the name given that refers to the inability to form mental imag-

es. This is a poorly recognised phenomenon that it is thought to affect only 2.1-2.7% of the population. One such individual affected by Aphantasia, Firefox co-creator Blake Ross, believed 'counting sheep' to be a metaphor as he had the inability to voluntarily imagine those images. However it does seem that for some Aphantasics, they still experience some visual imagery, it is only voluntary visual imagery affected, for example some can still experience visual imagery when they dream. Research suggests that Aphantasia can be congenital but can also occur due to brain damage- an individual may have fully functioning mental imagery before brain damage occurred. When we imagine large networks of brain areas are involved. It is thought that whether Aphantasia is congenital or due to brain damage, it occurs due to over activation of some brain regions involved in mental imagery and under activation of others.



**B:** Blake Ross, Co-creator of Mozilla Firefox in 2004, has Aphantasia, early this year on the subject he wrote: "I have never visualized anything in my entire life. I can't "see" my father's face or a bouncing blue ball, my childhood bedroom or the run I went on ten minutes ago. I thought "counting sheep" was a metaphor. I'm 30 years old and I never knew a human could do any of this."

### HOW DOES APHANTASIA AFFECT OUR THINKING?

Although Aphantasia is a newly coined term, the idea of 'blind imagination' has been around for hundreds of years, but little research has been undertaken. But due to mental imagery having a vital role in some aspects of thinking skills, such as creativity and memory, the absence of mental imagery suggests that there would be difficulties learning especially when acquiring literacy skills. However, at this time there isn't any evidence showing that Aphantasia is directly linked to learning disabilities.

## SO WHAT DOES THIS ALL MEAN?

Mental imagery is very important for thinking skills not just verbal thought processes like your inner voice. There is much more research that needs to be undertaken about mental imagery, our imagination and the effect of its absence, as well as how these processes affect and play a role in our thinking and behaviour. Understanding mental imagery and Aphantasia is important, research in this area will help provide clarity into what we mean by "thinking" and different forms of thinking, non-conscious and conscious, plus provide insight into how language, cognition and consciousness interact. What helps you learn and think, do you find imagining outcomes or scenarios helps you to remember and acquire new skills? Or like Blake Ross, 'counting sheep' is just a metaphor to you?

## REFERENCES

Vito, S. and Bartolomeo, P. (2016) Refusing to imagine? On the possibility of psychogenic aphantasia. A commentary on Zeman et al. *Cortex*. 74:334-335

Zeman, A., Dewar, M. and Della Sala, S. (2015) Lives without imagery – Congenital aphantasia. *Cortex* 73:378-380

Zeman, A et al. (2010) Loss of imagery phenomenology with intact visuo-spatial task performance: A case of 'blind imagination'. *Neuropsychologia*. 48:145-155

Zeman, A., Dewar, M. and Della Sala, S. (2016) Reflections on aphantasia. *Cortex*. 74:336-337

Costandi, M. (2016) If you can't imagine things, how can you learn? *Education*. 1-3

A: Wade, M. (2008) Thinking. Available at: [https://commons.wikimedia.org/wiki/File:Thinking\\_\(2808468566\).jpg](https://commons.wikimedia.org/wiki/File:Thinking_(2808468566).jpg)

B: Griffiths, J. (2005) Blake Ross. Available at: [https://commons.wikimedia.org/wiki/File:Blake\\_Ross.jpg](https://commons.wikimedia.org/wiki/File:Blake_Ross.jpg)

## GOOD LINKS TO LOOK AT:

Want to find out more about the Thinking Skills Programme and previous newsletters visit: <https://vle.cds.cranfield.ac.uk/>

To be able to access information about the programme as well as eBooklets visit the above website then click on 'Getting started for students', you will have to log in, but you can do so as a guest if you accept the terms and conditions. To find the Defence Thinking Skills Programme, there is a link on the side menu to Thinking Skills, then click the link to the Defence Thinking Skills Programme pages.

A repository, [Think! Evidence](https://evidence.thinkportal.org/), is available with access to literature of interest to Thinking skills. To take a look visit: <https://evidence.thinkportal.org/>

If you found Blake Ross's story interesting and would like to find out more about what is like to have Aphantasia, find his account on the subject - Aphantasia how it feels to be blind in your mind - here: <https://www.facebook.com/notes/blake-ross/aphantasia-how-it-feels-to-be-blind-in-your-mind/10156834777480504/>



Aphantasia: How It Feels To Be Blind In Your Mind

BLAKE ROSS · FRIDAY, 22 APRIL 2016

## TEASER SECTION:

## ANSWER TO JUNE'S TEASER

You're standing in a hallway with three light switches on the wall, each of which turns on a different lamp inside a closed room. You can't see inside the room, and you can't open the door except to enter the room. You can enter the room only once, and when you do, all the lamps must be turned off. How can you tell which switch turns on which lamp?

**Answer:** Turn on the right switch and leave it on for two minutes. After two minutes, turn on the middle switch and leave it on for one minute. When that minute is up, turn off both switches and enter the room. One light bulb will be hot (1st switch) and one will be warm (2nd switch). The cold bulb will correspond to the switch you didn't turn on.

## THIS MONTH'S TEASER

On each row place two letters that can be attached to the beginning of the words to the right to give a longer word in each case. When completed the eight added letters will give a word reading downwards. What is it?

\_\_ OUNCE  
 \_\_ OTHER  
 \_\_ ASHES  
 \_\_ LEGAL

## Find the solution in next month's edition

### CONTACT US:

If you've enjoyed reading this and wish to be added to the mailing list or have any general feedback, please feel free to contact us ([defac-tsp-admin@defenceacademy.mod.uk](mailto:defac-tsp-admin@defenceacademy.mod.uk))