

# Synesthesia, Learning Disorders and AD/HD



# What is a Synesthesia?



“This is a rare condition that is not unique to people with Asperger’s Syndrome (LD and/or AD/HD-sic). The person experiences sensation in one sensory system and as result experiences a sensation in another modality. The most common expression is seeing colors every time the person hears a particular sound. This is called colored hearing” (p. 138).

Attwood, T. (1998). Asperger Syndrome: A Guide for Parents and Professionals. Philadelphia, P.A.: Jessica Kingsley.

# Synesthesia



“This cross-modal sensation is reproducible in a given individual during their lifetime, so that a given sound or word always leads to perception of the same color. Because of its curious phenomenology and its failure, usually to lead to significant problems in daily living, its existence has appeared hidden from medicine, including neuroscience, for the latter part of the century” (p. X).

Cole (1993). Forward. In R. Cytowic (Author), The Man Who Tasted Shapes: A Bizarre Medical Mystery Offers Revolutionary Insights Into Reasoning, Emotion, and Consciousness. New York, NY: Putman.

# Synesthesia



“‘Oh Dear’, he said (Michael), slurping a spoonful, ‘there aren’t enough points on the chicken’”(p.3). Michael continued, “‘You’re a neurologist, maybe it will make sense to you I know it sounds crazy, but I have this thing, see, where I taste by shape’”(p.4). Cytowic (1993) replied, “‘Where do you feel these shapes?’” To which Michael replied, “‘All over...but mostly I feel things rubbed against my face or sitting in my hands’”(p. 4).

Cytowic, R. (1993). The Man Who Tasted Shape: A Bizarre Medical Mystery Offers Revolutionary insights Into Reasoning, Emotion, and Consciousness. New York, NY: Puttman.

# Synesthesia



- “The latest scientific studies have found that as many as one in 100 people is synaesthetic” (p. 2 of 3).
- Often they score in the Superior range on I.Q.
- They often are left handed, have left -right confusion, and are Dyscalculic.
- High rates of Dyslexia and Autism in relatives

Author (June 2008). Derek tastes of Earwax. BBC Science & Nature: TV and Radio Follow-up. From: [http://www.bbc.co.uk/tvradio/programs/horizon/derek\\_ga.shtml](http://www.bbc.co.uk/tvradio/programs/horizon/derek_ga.shtml)

Carpenter, B. (March, 2001). Everyday Fantasia: The World of Synesthesia. Monitor On Psychology, 32 (3), pp. 26-29.

Cytowic, R. (1993). The Man Who Tasted Shape: A Bizzare Medical Mystery Offers Revolutionary insights Into Reasoning, Emotion, and Consciousness. New York, NY: Puttman.

# Synesthesia



- They are probably inherited by one gene.
- There appears to be 6 women to every man who has one.

Cole, (1993) Forward. In Cytowic, R. (Author) R. The Man Who Tasted Shape: A Bizzare Medical Mystery Offers Revolutionary insights Into Reasoning, Emotion, and Consciousness. New York, NY: Puttman.

# Synesthesia



- People with Synesthesias tend to be more creative than the general population:
  - They appear to have an exceptional ability to use metaphor.
  - Their brains seem to be set up to connect unrelated cognitions.

Ramachandran, V.S., and Hubbard, E. (May, 2003). Hearing Colors, Tasting Shapes: People With Synesthesia—Whose Senses Blend Together—Are Providing Important Clues to Understanding the Organization and Functions of the Human Brain. Scientific American.com. From website: [www.sciam.com/article.cfm?articleID=00030114B-9D06-1E8FA5809EFC5880000](http://www.sciam.com/article.cfm?articleID=00030114B-9D06-1E8FA5809EFC5880000).

# Synesthesia



“Using positron-emission tomography and functional magnetic imaging researchers have found that in synesthetes who report colored hearing, the visual area of the brain shows increased activation in response to sound. That isn’t the case with nonsynesthetes. Other studies have demonstrated that synesthetic perception occurs involuntarily and interferes with ordinary perception” (p. 27).

Carpenter, B. (March, 2001). Everyday Fantasia: The World of Synesthesia. Monitor On Psychology, 32 (3), pp. 26-29.



# Synesthesia



- “Studies have confirmed that the phenomena is biological and apparently unlearned, distinct from hallucination and metaphor” (. 27).

Carpenter, B. (March, 2001). Everyday Fantasia: The World of Synesthesia. Monitor On Psychology, 32 (3), pp. 26-29.

- “Cross wiring” in the fusiform gyrus and angular gyrus appear to be related to synesthesia.

Ramachandran, V.S., and Hubbard, E. (May, 2003). Hearing Coulr, Tasting Shapes: People With Synesthesia—Whose Senses Blend Together—Are Providing Important Cluesto Understanding the Organization and Functions of the Human Brain. Scientific American.com. From website: [www.sciam.com/article.cfm?articleID=00030114B-9D06-1E8FA5809EFC5880000](http://www.sciam.com/article.cfm?articleID=00030114B-9D06-1E8FA5809EFC5880000).

# Types of Synesthesia

- Colored hearing
- Phonism-other senses being heard
- Conceptual Synesthesia-Seeing time as symbol
- Synesthesialgia- Painful synesthesia: Deaf man who hears what he sees (Cytowic, 1993).
- LSD Induced
- Photographic memory
- Sensory deprivation induced



# Types of Synesthesia

- Temporal lobe epilepsy induced
- There may be as many as 50 types of synesthesias

Ramachandran, V.S., and Hubbard, E.M., (April 14, 2003). Hearing Colors, Tasting Shapes: Common Questions, [Scientific American.com](http://www.sciam.com), from website:

[www.sciam.com/article.cfm?articleID=000C2CEC-A4FE-1E8F-8EA5809EC5880000](http://www.sciam.com/article.cfm?articleID=000C2CEC-A4FE-1E8F-8EA5809EC5880000) .



# *Not all Students Who get the Correct Math Answer but Cannot Show Their Work Are Cheating*

- Some synaesthetes (60%) calculate by seeing numbers in space around them often in a number line.
- The correct answer just appears to them; they cannot explain why, or how it does. It just does.
- They are not cheating. Test and proctor them by themselves.

Author (June, 2008). Derek Tastes of Earwax. BBC-Home. Science and Nature Follow-up:  
[http://www.bbc.co.uk/sn/tvradio/programmes/horizon/derek\\_ga.shtml](http://www.bbc.co.uk/sn/tvradio/programmes/horizon/derek_ga.shtml)

# Synesthesia



- Because most humans engage in metaphoric thought and communication we all may have some synesthetic ability. Diagnosed synesthesias have an extreme form of this condition.

Ramachandran, V.S., and Hubbard, E. (May, 2003). Hearing Colors, Tasting Shapes: People With Synesthesia—Whose Senses Blend Together—Are Providing Important Clues to Understanding the Organization and Functions of the Human Brain. Scientific American.com. From website: [www.sciam.com/article.cfm?articleID=00030114B-9D06-1E8FA5809EFC5880000](http://www.sciam.com/article.cfm?articleID=00030114B-9D06-1E8FA5809EFC5880000).

# Diagnosing Synesthesias



- Synesthesia is involuntary, but must be elicited. External stimulus sets it off.
- Synesthesia is projected “The parallel sense that is triggering is usually outside the body rather ‘in the mind’s eye’s’. If visual, synesthesia is experienced close to the face” (p. 76).
- Synesthetic perceptions are durable, discrete, and generic.

# Diagnosing Synesthesias (Cytowic)



- Synesthesia is Memorable. “The parallel sensations are vividly remembered, often in preference to the stimulus that triggered them” (p. 79).
- Synesthesia is emotional and noetic. “ Synesthetes have an unshakable conviction that what they perceive is real (p. 77).

Cytowic, R. (1993). The Man Who Tasted Shape: A Bizarre Medical Mystery Offers Revolutionary insights Into Reasoning, Emotion, and Consciousness. New York, NY: Puttman.

# Treating Synesthesias



- Most synesthetes would not like to have their synesthesias removed.
- “At a practical level, many researchers observe, research on synesthesia will help raise the condition’s visibility, reducing the risk that clinicians might make it a sign of mental illness.

Carpenter, B. (March, 2001). Everyday Fantasia: The World of Synesthesia. Monitor On Psychology, 32 (3), pp. 26-29.



# Treating Synesthesia

- A Referral to a **Behavioral Neurologist/Neuropsychiatrist** is recommended:
  - They specialize in the behavioral aspects of dementia and memory disorders, neurobiological disorders (i.e., dyslexia, AD/HD, etc.), how to use medications with such populations, as well as some neuropsychology and psychiatry.



[www.anpaonline.org](http://www.anpaonline.org)

# Treating Synesthesia



- Caring for the emotional overlay:
  - American Psychiatric Association:  
[www.apa@psych.org](http://www.apa@psych.org)
  - American Psychological Association: [www.apa.org](http://www.apa.org)
  - National Association of Social Workers:  
[www.nasdc.org](http://www.nasdc.org)
  - National Board of Certified Counselors:  
[www.nbcc@nbcc.org](http://www.nbcc@nbcc.org)

# Treating Synesthesia

- Seek out a world class pain control clinic:
- American Pain Society:  
[www.info@ampainsoc.org](mailto:www.info@ampainsoc.org)



# Treating Synesthesia



- American Synesthesia Association:  
[www.web.mit.edu/synesthesia/www/synesthesia.html](http://www.web.mit.edu/synesthesia/www/synesthesia.html)
- International Synesthesia Association:  
[www.psychiatry.cam.ac.uk/isa/](http://www.psychiatry.cam.ac.uk/isa/)
- [www.mixsig.net](http://www.mixsig.net)
- The Synesthetic Experience:  
[www.web.mit.edu/synesthesia/www/](http://www.web.mit.edu/synesthesia/www/)