“An investigation into the interconnected nature of aesthetics, sensory perception and sensory phenomena”

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Introduction

“To provide more than a general definition of the subject of aesthetics is immensely difficult” (Munro and Scrunton, 2017). Aesthetics can be described as “the branch of philosophy concerned with the nature and appreciation of art, beauty and good taste. It has also been defined as "critical reflection on art, culture and nature”” (Mastin, 2008). The word "aesthetics" derives from the Greek "aisthetikos", meaning "of sense perception”” (Mastin, 2008). Munro and Scrunton (2017) describe aesthetics as a “puzzling realm of experience: the realm of the beautiful, the ugly, the sublime, and the elegant; of taste, criticism and fine art; and of contemplation, sensuous enjoyment and charm” and highlight that “in all these phenomena we believe that similar principles are operative”.

The term phenomenon is defined by Collins (2018a) as “anything that can be perceived as an occurrence or fact by the senses”, “any remarkable occurrence or person” and “the object of perception, experience, etc”. By looking at the definitions of both aesthetics and phenomenon we can see that sense perception is vital to our individual ideas of what is good, bad, ugly or beautiful. As biological beings we are interconnected, meaning that “all [our] constituent parts [are] linked or connected” (Oxford University Press, 2018a). Our senses are vital to our ability to function physically, mentally, spiritually and socially. The connection between aesthetics and our senses is so profound that one could not exist without the other. It is my intention with this paper to discuss and highlight the cause and effect of aesthetics and phenomena in people who process sensory information in an atypical manner.

Aesthetic phenomena play a large part in how we perceive and think about art, design and music and also play a key role in highlighting how we perceive and view our everyday world. The Golden Rectangle remains a phenomena to this day that encourages people to use a natural framework for aesthetic design principles. I will show that by investigating this particular phenomena, a deeper

understanding of our functioning as human beings can be reached and how this understanding could be developed to provide possible solutions to issues arising with sensory processing difficulties.

The Golden Rectangle is a phenomena shrouded in doubt and uncertainty. Claimed to be a specific source of aesthetic appeal which "creates aesthetic and visual harmony in any branch of the design arts" (Meisner, 2014), this phenomena is also shrouded with the question of "why"? (McVeigh, 2009).

That question of why is the root cause of any phenomena gaining momentum. I will show that in the case of The Golden Rectangle, the answer to this phenomena is biological as well as emotional, mental and cultural and not only typically 'aesthetic', its' meaning is deeper than terms such as beautiful or ugly. I will explain how The Golden Rectangle is closely linked to Eye Movement Desensitisation Reprocessing (EMDR), a therapeutic phenomenon mainly used to treat suffered of Post Traumatic Stress Disorder and how this relates to other social and cultural phenomena such as Autonomous Sensory Meridian Response or ASMR. ASMR is a relatively new phenomenon which in part owes its success to its' rapidly growing YouTube community.

Barrat and Davis (2015) define ASMR as the following:

> Autonomous Sensory Meridian Response (ASMR) is a previously unstudied sensory phenomenon, in which individuals experience a tingling, static-like sensation across the scalp, back of the neck and at times further areas in response to specific triggering audio and visual stimuli. This sensation is widely reported to be accompanied by feelings of relaxation and well-being.

Fredborg, Clark and Smith (2017) highlight that "There are several factors that distinguish ASMR from other atypical sensory experiences, such as *frisson*—the pleasurable tingling sensations that occur during an emotional response to music", known as "chills" (Del Campo and Kehle, 2016,).

Although Frisson and ASMR as phenomena have similarities, Del Campo and Kehle (2016) explain that “the two phenomena differ in that the tingles associated with frisson tend to spread rapidly throughout the body, whereas ASMR-associated tingles may last upwards of several minutes” and suggest that “The fact that ASMR has phenomenological characteristics that differentiate it from experiences such as frisson and synesthesia suggests that this condition is a valid topic of scientific inquiry”.

The effects of ASMR are not tangible, meaning they cannot be directly measured. As a result, its validity is disputed by some. Not everyone experiences ASMR, in fact some of the stimuli that triggers ASMR in some, can trigger an opposite reaction in others, a condition known as Misophonia (Young and Blansert, 2015, p13-14).

ASMR remains a largely unstudied phenomenon, allowing even more room for skepticism of its’ existence. There are clear connections between ASMR and other phenomena such as Synaesthesia, a condition in which sensory information is processed differently, resulting in seemingly unrelated sensory associations. ASMR, Misophonia and Synaesthesia rely on a persons’ ability to process sensory information in a certain way. By looking at what connects phenomena rather than what causes a phenomena we can find the answers to ‘why’.

Young and Blansett (2015, p5) state that “Early on, ASMR skeptics and critics considered the ASMR phenomenon to be nothing short of New Age Hookum with a clinical sounding name”. As the existence of ASMR is disputed and the results cannot be directly measured, it has quickly earned phenomenon status.

I intend to show that aesthetic phenomena like The Golden Rectangle is inherently linked to phenomena such as EDMR and ASMR and how this can then be linked to other phenomena such as synaesthesia and misophonia, the impact that these phenomena can have on our biological processes and how this relates to areas such as brain functioning. The interconnected nature of our sensory processing, coupled with the interconnected nature of these phenomena, in my opinion, is

an area worthy of further study in order to provide routes of therapy to those with atypical sensory associations and processes.

ASMR: Autonomous Sensory Meridian Response

ASMR stand for Autonomous Sensory Meridian Response. Oxford University Press describe each element as; Autonomous: 'Having the freedom to act independently' (2018b), Sensory: 'Relating to sensation or the physical senses; transmitted or perceived by the senses' (2018c), Meridian: 'each of a set of pathways in the body along which vital energy is said to flow' (2018d), Response: 'A reaction to something' (2018e). Dictionary.com (2017) defines ASMR as:

> a calming, pleasurable feeling often accompanied by a tingling sensation. This tingle is said to originate in a person's head and spread to the spine (and sometimes the limbs) in response to stimulation. The stimuli that trigger *ASMR* vary from person to person.

Esposito (2016) describes ASMR as:

> a euphoric experience characterized by a static-like or tingling sensation on the skin that typically begins on the scalp and moves down the back of the neck and upper spine, precipitating relaxation.

In a study of 475 people who self reported as experiencing ASMR, Barrat and Davis (2015) explain the reasons why people use ASMR media; "ASMR as an opportunity for relaxation, with 98% of individuals agreeing, or agreeing strongly with this statement", "82% agreed that they used ASMR to help them sleep", "and 70% used ASMR to deal with stress". This suggests that the majority of people who consume ASMR media are doing so therapeutically. Blain (2013) explains that during ASMR "There is sometimes a trance-like state involved, and it's often coupled with an intense feeling of relaxation". The trance-like state has an important impact on brain wave states and states of consciousness.

ASMR as a known phenomenon has only been active in the online community. The feeling is said to be first mentioned in an online message board on www.steadyhealth.com in 2007, in which a user

created a post discussing “weird head sensations’. The post was filed under “nervous systems disorders and diseases” (Young and Blansert, 2015, p78). Young and Blansert (2015, p5) highlight that this “prompted a number of responses from those who reported a similar feeling whenever people spoke slowly and carefully or made deliberate gestures with their hands”. It is important to note that soft sounds and deliberate hand gestures are important stimulus for inducing ASMR and one of the first to be discussed and commented on in a public forum, highlighting their significance as ASMR stimuli. Prior to this there is no known mention of ASMR in the context that it currently exists. Novella (cited in Young and Blansert, 2015 p5) suggests that the ASMR is similar in concept to a migraine headache, “Because it is a sensation that can’t be seen and is felt and reported only by some , it falls into a scientific blindspot similar to other conditions thought to be myth until someone develops a way to measure them”.

The ASMR YouTube community has grown rapidly. Abbruzzese (2015) notes that in 2015 a YouTube search for ‘asmr’ returned 1, 500,000 videos, compared to 11, 100,000 in February 2018 (YouTube, 2018).

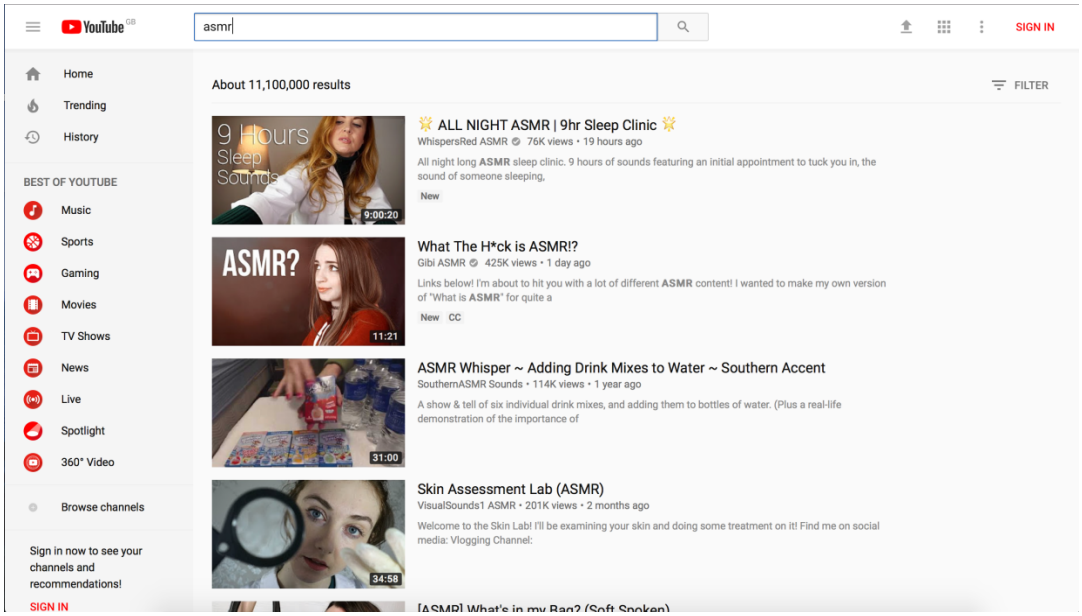


Figure 1: YouTube; ‘asmr’ (2018)

ASMR boasts a wide range of content material, from “nail painting & chatting about psychotherapy” (GreenbeautyASMR, 2017) and “slow hands slow whisper ASMR” (Gentlewhispers, 2017) to “The Relaxation of Ethan Pineapple [ASMR]” (Ephemeralrift, 2015). Although the subject matter is hugely varied there are various constants that remain, mainly, slow harmonious movements and soft speaking/mouth sounds.

This not only highlights the scope of ASMR as a phenomenon but also reinforces that the production of sensory inducing stimulus is both popular and in requirement.

Abbruzzese (2015) with reference to a video on YouTube by ASMRrequests (youtube, 2017) states:

> I’ve watched the entire thing and videos like it hundreds of times, almost every day, for years.
>
> I do this because I have autonomous sensory meridian response (ASMR).
>
> Only, I have no real idea what it is, and neither does anybody else. The only thing I really know about it is that until a few years ago, I thought I was the only one. It is clear, however, that I am not alone.

This highlights that the ASMR phenomenon is not purely a result of YouTube. The stimulus responsible for ASMR is intertwined with our senses and our sensory perception. It could perhaps be argued that it took the ability for someone to question it out of the context of their everyday life (in an online platform) without fear of being ridiculed. The internet has given the phenomenon momentum, but ASMR itself was very much a part of some lives prior to the internet, we just didn’t speak about it, highlighting that the ASMR experience is interconnected with our biology, physiology and evolution but required certain technological advances to become socially apparent.

Barratt and Davis (2105) explain that:

> Many ASMR videos show individuals in highly focused states (e.g., performing medical exams) or engaged in repetitive tasks (e.g., folding towels). The behaviour of performers during these types of videos often

> resembles that of someone in flow state—confidently and accurately executing precise tasks. It may be that ASMR is brought about by obtaining a flow-like state, which is in part facilitated by witnessing others in such a state.

Young and Blansert (2015, p6) explain that "While there is much we don't know about ASMR, we do know that there are two types of ASMR episodes that occur among those who experience the sensation":

> Type A: These are spontaneous episodes caused by the experiencer without the help of external stimuli.
>
> Type B: These are *triggered* by external stimuli and are affected by one or more of the senses, as well as the thought patterns connected to the triggering event.

ASMR employs what is known as bilateral stimulation to trigger the ASMR experience in viewers. Young and Blansert (2015, p118) describe this as:

> [A] technique that many ASMRtists employ in order to help their fans get the most out of their listening experience… Bilateral stimulation is a process in which someone uses visual, auditory, or tactile stimuli in a rhythmic side-to-side pattern…content creators often move their hands from side to side in order to have viewers follow their movements with their eyes and use binaural microphones to trigger one ear and then the other.

Young and Blansert (2015 p119) state that bilateral stimulation "is a direct sensory stimulation of the nervous system" and advise that conditions such as "brain injuries, migraine sufferers, complex PTSD and dissociative identity disorder - often result in hypersensitivity to sensory stimuli" and so medical advice should be sought prior to using any bilateral ASMR content. This highlights the

strong connection that both ASMR and bilateral eye movements and audio stimulation have to our sensory processing.

Young and Blansert (2015, p119) state that:

> Sound is at the core of the human existence. Not only is it the only sense you use prior to birth and the sense responsible for your first memories, but we also know that human beings have used it for thousands of years to reach deeper states of consciousness…It only stands to reason that it can still be used today.

Often in AMSR media sound is recorded using binaural microphones which create a three dimensional sound recording. Lawlani (2015) explains that:

> Binaural recording systems are unique because they emulate the workings of the human head. The architecture of our anatomy dictates how we understand the sounds we hear: with an ear on either side of a thick skull and spongy brain, we hear sounds enter our left and right ears at different times…In addition, sound waves interact with the physical constitution of the listener — the pinna (or outer ear), the head, and the torso — and the surrounding space, creating listener-specific variations otherwise known as head-related transfer function.

Choueiri (cited in Lawlani, 2015) states that binaural recording "puts you in the exact sound field as originally intended" and "You can hear a bird flying over your head. You'll hear a whisper in one ear. And if you record a band, you'll hear it exactly as the band was positioned when playing". This highlights the vast elements that comprise the ASMR experience and also reinforces that whilst ASMR can be a natural, spontaneous reaction from external stimuli, it is also an experience that through technology, can be produced and manipulated in order to create the optimum sensory experience. As a phenomenon which is largely made possible by individual content creators

working independently at home, this again highlights the potential for ASMR to be applied as a therapy in more acute/clinical settings, pending further more multi-disciplinary research.

With regards to ASMR as an aesthetic experience, Gallagher (2016) suggests that :

> [if] ASMR videos are "about" anything, they are about how noise can become moving and meaningful, as experiences of aesthetic plenitude emerge from sensory flux.

Gallagher also highlights that:

> ASMRtists' starkly audible gulps, lip-smackings and jaw clickings might be understood as passports to a kind of Barthesian "bliss" that involves skirting that borderline where sounds verge on meaning, where hearing mingles with haptics, where mediated bodies "touch" ours across spatiotemporal gulfs. And as with Barthes' "readerly" texts of bliss, ASMR videos transport some listeners even as they strike others as dull, strangely repellent or oppressively claustrophobic.

Regardless of the perceived purpose behind ASMR, it is providing therapeutic release to an innumerable amount of people. ASMR is a phenomenon worthy of further research, both as insight into our biological functioning and as insight into our artistic, personal, social, emotional and cultural functioning and the use of technology in meeting these functions.

THE GOLDEN RECTANGLE

The Golden Rectangle is a shape, with a length/height ratio of roughly 3/2 (Bejan, 2009). Known by the art and design community as a tool to “create aesthetics and visual harmony” (Meisner, 2014). The Golden Rectangle can be constructed using what is known as The Divine Proportion (Elam, 2001, p20) or The Golden Ratio (mathsisfun, 2015).

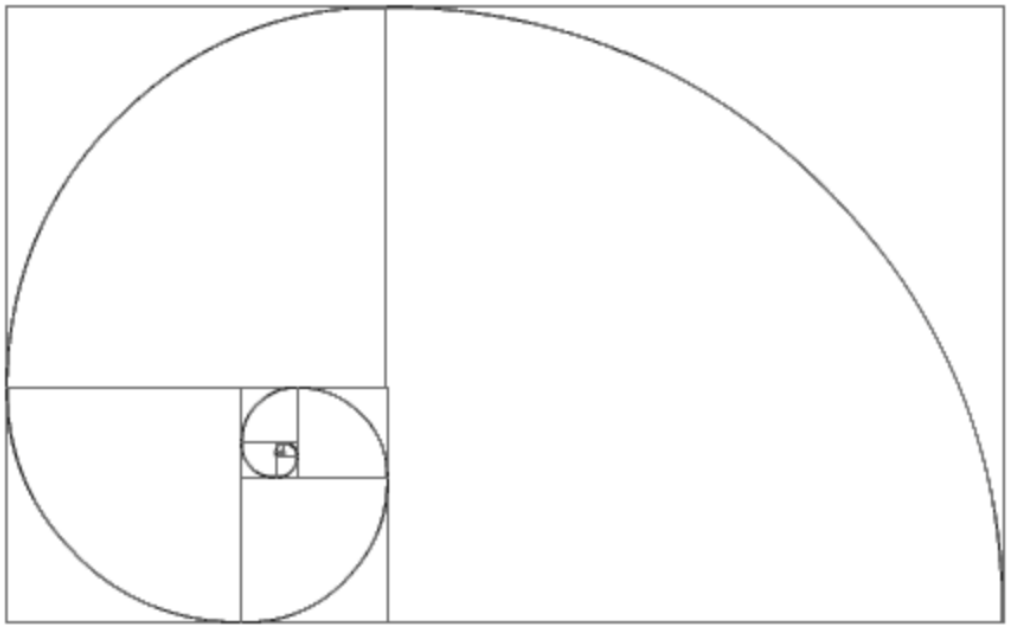
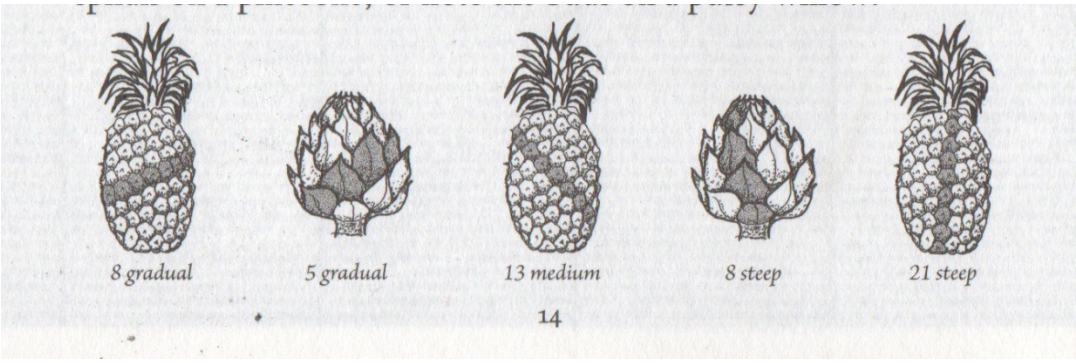


Figure 2: The Golden Rectangle (Meisner, 2014)

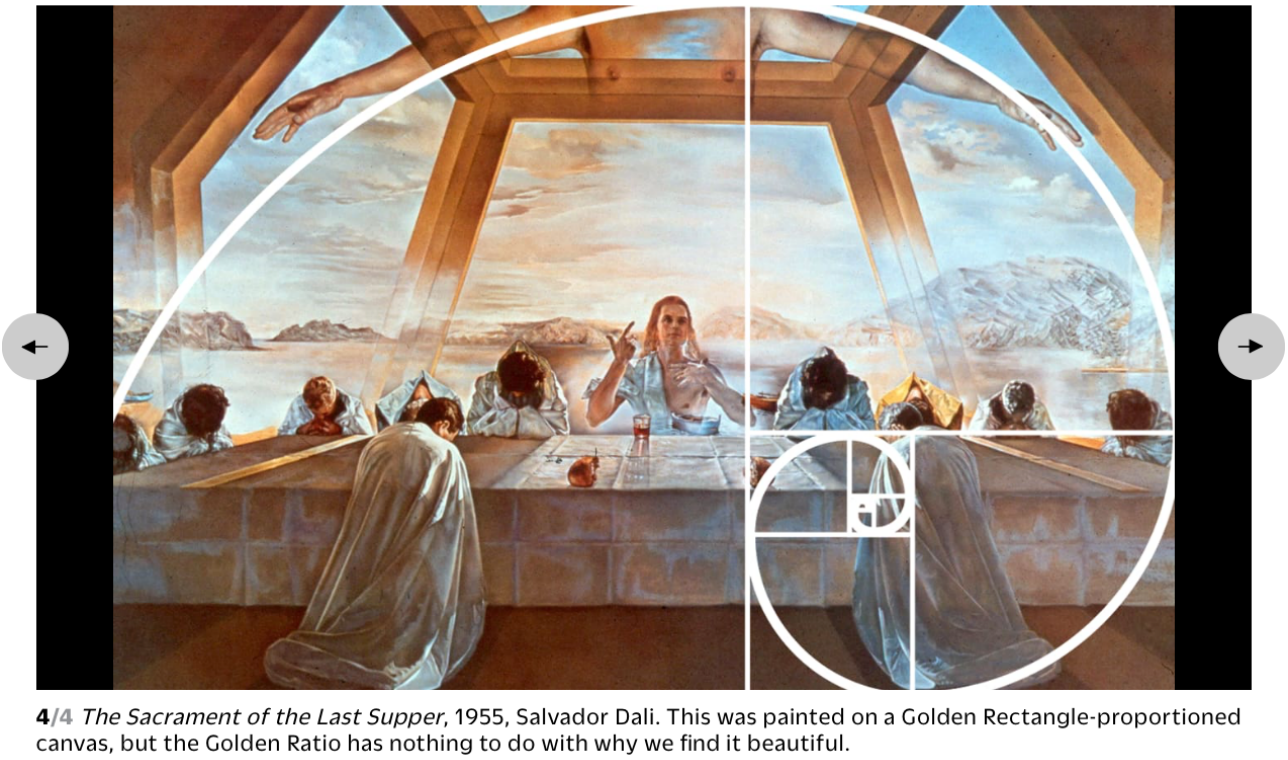
The Golden Ratio is represented by the greek letter Φ, pronounced “Phi”, and the number 1.6180339887… (Meisner, 2012a). The Golden Rectangle has been linked to the construction of buildings such as The Parthenon in Greece (Huntly, 1970, p63) and was used in artwork and design by prominent artists such as Dali’s ‘The Sacrament of The Last Supper” (Brownlee, 2015. See Figure 4) and Le Corbusier in his “modular” human proportion system (Livio, 2003, p171-175). The Golden Rectangle can be constructed using the Fibonacci sequence, which can also be found in

the phyllotaxis (leaf arrangement) on plants such as sunflowers and in the segment arrangement on



pineapples (Olsen, 2009), reinforcing the interconnected nature of this phenomenon.

Figure 3: Phyllotaxis (Olsen, 2009)



4/4 *The Sacrament of the Last Supper*, 1955, Salvador Dali. This was painted on a Golden Rectangle-proportioned canvas, but the Golden Ratio has nothing to do with why we find it beautiful.

Figure 4: The Sacrament Of The Last Supper (Brownlee, 2015)

The Golden Ratio, from which The Golden Rectangle is constructed, is an example of an irrational number. The American Heritage Science Dictionary (cited in dictionary.com, 2002) defines an irrational number as:

> A number that cannot be expressed as a ratio between two integers and is not an imaginary number. If written in decimal notation, an irrational number

> would have an infinite number of digits to the right of the decimal point, without repetition.

Lundy (2012, p24) states that "no other proportion behaves so elegantly around unity. For instance, 1 ÷ 1.618 is 0.618 and 1.618 x 1.618 = 2.618. So one over Φ is Φ minus 1 and Φ x Φ is one plus Φ!". Symmetry and balance are key aspects of harmony and so for anyone who appreciates these factors The Golden Section and Rectangle will definitely stand out.

Ashton (2005, p4), Huntley (1970, p23-24) and Livio (2003, p29-31) all concur that Pythagoras is credited with the discovery of The Golden Rectangles significance in music and that musical harmony exists when notes are produced that form ratios given by small, whole numbers. Livio (2003, p28) explains that:

> harmonious and pleasing (consonant) intervals occur when a string is divided by consecutive whole numbers and harsh (dissonant) sounds occur when arbitrary notes are made to sound together.

Gibson (unknown) breaks this down to explain that two strings of equal tension and thickness will make the same sound, but by dividing the strings by the ratios discovered by Pythagoras, consonance occurs. Livio (2003, p29) tells us that:

> Unison is obtained when the strings are of equal length (a 1:1 ratio): the octave is obtained by a 1:2 ratio of string lengths: the fifth by 2:3 and the fourth by 3:4……Similarly 6/5 of a C-string gives the note A, 4/3 of it gives G, 3/2 of it gives F, and so on.

This reinforces that by manipulating the way two or more things work together, we can create a harmonious sensory experience and the wrong kind of manipulation can lead to an unpleasing and harsh experience and highlights the interconnected nature of aesthetics and our senses.

Although The Golden Rectangle is said to be found throughout nature (Bezaire, 2016), Devlin (cited in Brownlee, 2015) highlights that "Strictly speaking, it's impossible for anything in the real-

world to fall into the golden ratio, because it's an irrational number". Meaning that, because The Golden Ratio is an infinite number, any likeness to it will only ever be an approximation, leading to things that closely resemble The Golden Ratio but are not exact representations. The Golden Rectangle is a framework for design (both natural and manmade) and not an explanation for design as such. This highlights that interconnected phenomena need to be understood with regard to the individual elements that comprise them and how they are connected and not by just looking at the phenomena as a phenomena, but more at what it represents.

Bejan (2009) highlights that "shapes with length/height ratios (L/H) of 3/2 are everywhere and give the impression they are being 'designed' to match the golden ratio", giving examples such as 35mm film, television and printing paper as shapes which approximate but do not match The Golden Rectangle. With so many shapes around us mimicking The Golden Rectangle it is easy to see how it develops the misrepresented label of being the most aesthetically pleasing shape.

Bejan goes on to explain that "the race to 'discover PHI' is misdirected because the physics phenomenon is not PHI itself……the physics phenomenon is the emergence of shapes that resemble PHI", providing further explanation for The Golden Rectangle as a phenomenon.

Bejan also informs us:

> the eye must scan the rectangular area HxL, and it must do it with the greatest ease i.e in the shortest time….to scan is to sweep the image completely, horizontally and vertically.

Bejan highlights that we live in a horizontal world and that "our supply of images reflect the orientation of the landscape" and that the "horizontal orientation of the eye-eye axis is the most facile for the flow of information from our horizontal environment to the brain". This is an important and key factor in Eye Movement Desensitisation Reprocessing therapy, which I will discuss later. Bejan also points out that scanning information on a vertical axis "triggers the urge to tip the head" which does not coincide with the much easier action of scanning horizontally. Bejan

explains that “we scan a long dimension faster than a short in such a way that to scan long and fast (L,Vl) takes the same time as to scan short and slow (H,Vh)” which is the “best flowing configuration for images from plane to brain”. This in Bejan's view “manifests in human made objects that give the impression they were ‘designed’ according to the golden ratio”.

Bejan points out that the emergence of designs with PHI like proportions is a “natural phenomenon”. His explanation of how information flows to the brain explains both how designs with PHI like proportions could appear be to be more pleasing than others and it also explains how many shapes are retrospectively superimposed onto The Golden Rectangle and then claimed to fit.

There is a clear link between how we biologically process sensory information and as a result of this, what we find aesthetically pleasing.

The Golden Rectangle is not simply a shape that has been observed (either in part or whole) throughout nature, history and design to provide architecture and proportion that are thought to be the most pleasing to the eye, but rather it is a shape which can be applied over and will closely resemble shapes and proportions that human beings find the easiest and therefore the most pleasing to process. This same principle can be applied to providing therapy to those with sensory processing difficulties, allowing for a change in the in the way that information flows, or is delivered to the content user.

With regard to The Golden Rectangle, Mize (2009) states “We know that by creating images based on this rectangle our art will be more likely to appeal to the human eye, but we don’t know why”. It is this phenomenon of “why”? that has paved the way for The Golden Rectangles reputation and drives the desire for phenomena to be understood better.

In the context mentioned above, The Golden Rectangle can be thought of as an example of bilateral stimulation. The direction of eye movements is vital in how we view and perceive the world. Bejan points out that horizontal viewing is the easiest for us to process, and therefore the most pleasant in results. We read on a horizontal axis, we look on a horizontal axis and so The Golden

Rectangle is intrinsically linked to eye movements and bilateral stimulation. Bilateral stimulation is an integral part of The Golden Rectangle, ASMR and Eye Movement Desensitisation Reprocessing. People with difficulties like autism and Sensory Processing Disorder can experience sensory stimulation in a different way and so we must find new ways of adapting stimulus to suit these requirements and to provide relief and or support. In order to do this we have to understand every aspect of how we process sensory information, including the areas which at first glance seem unconnected.

EMDR: EYE MOVEMENT DESENSITISATION REPROCESSING AND EYE MOVEMENTS

As we have seen, bilateral stimulation and eye movements are vital factors in both The Golden Rectangle and ASMR, in the context of phenomena and as tools to aid sensory processing. Another example of bilateral stimulation aiding sensory processing is Eye Movement Desensitisation Reprocessing or EMDR (see Figure 5). EMDR is a therapy developed by Francine Shapiro. Emdr.com (2018) explains that Shapiro:

> hypothesizes that EMDR therapy facilitates the accessing of the traumatic memory network, so that information processing is enhanced, with new associations forged between the traumatic memory and more adaptive memories or information. These new associations are thought to result in complete information processing, new learning, elimination of emotional distress, and development of cognitive insights.

Kashdan (2014) explains that EMDR is an 8 phase therapy, during which the:

> Therapist encourages the client to recall the physiological and traumatic aspects of the past experience while privately repeating a negative statement that the client has come to associate with the bad memory.
>
> After reg memory has been evoked, the client will engage in a process of dual stimulation, which entails having the therapist shift a finger left and right for an extended period of time while the client follows the finger with their eyes (other dual stimuli may also be used). After the client has finished following the therapists' finger with their eyes they are then instructed to blank the traumatic scene from the mind and to take a deep breath. The process is then repeated until significant reductions in anxiety are documented.

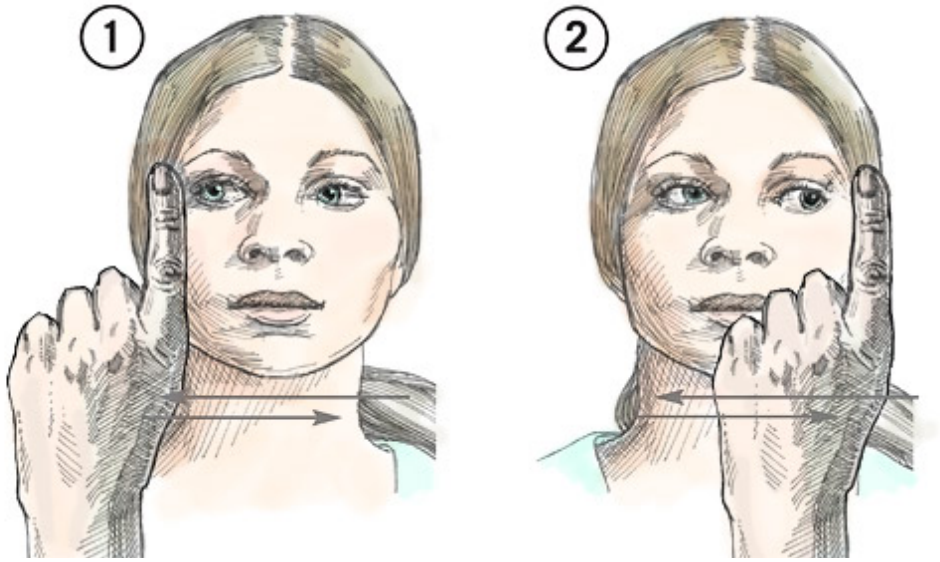


Figure 5: What is EMDR and what is it useful for? (Waldruff, 2018)

Kashdan states that during EMDR:

> clients are being exposed to their most feared thoughts, feelings, and memories about their trauma in a slow, systematic manner. This is not new, this is exposure therapy, a central element of cognitive-behavioral therapies for trauma and other anxiety conditions. EMDR works by recalling aversive memories and over time, these memories are no longer as threatening, destabilizing, and disruptive toward daily living and the pursuit of satisfying and meaningful life goals. Eye movements, the new part that EMDR brings, are unnecessary and do not contribute anything to the health and well-being of clients.

Kashdan goes on to suggest that:

> In a 2001 meta-analysis of 34 studies and a 2013 meta-analysis of 7 studies specific to veterans suffering from combat-related post-traumatic stress disorder, EMDR does not fare better than exposure therapy. This is important because the big controversy about whether EMDR is useful

> hinges on whether you require a trauma survivor to recall a terrifying memory in detail while simultaneously moving their eyes back and forth while for instance, following a bright light bouncing from one side of the room to the other. If these odd eye movement exercises are not important, then what you have is exposure therapy with a useless add-on.

As we have seen, EMDR has many similarities to both ASMR and the viewing properties of The Golden Rectangle. Whilst the effects of EMDR are both praised and disputed, it is important to make the observation that perhaps those people who experience a therapeutic effect from EDMR, are actually experiencing and altered state of consciousness as a result of ASMR. It is also possible that EMDR and the eye movement process does help to access the traumatic memory network, which in turn shows a clear link to ASMRs use as a means of self therapy for anxiety and depression. This reinforces the need for ASMR and EMDR to be understood further as connected phenomena.

This does not impact of EMDR's ability to be an effective therapy, but does suggest a clear link between eye movements and traumatic memories which in turn can develop into issues of anxiety, depression, insomnia and post traumatic stress disorder, to name a few, as well physiological issues with sensory perception.

Hyer and Brandsma (1997, p519) suggest that "During the processing itself (EMs), the client may be in a "trance" (a state shorthandedly characterized as "alpha") when the rhythm of the saccades proceeds". A saccade is defined as "the movement of the eye when it makes a sudden change of fixation" (Collins, 2018b). Scientific American (1997) highlight that:

> there are four brainwave states that range from…delta to…beta. These brainwave states range from deep dreamless sleep to high arousal… [and] are common to the human species. Men, women and children of all ages experience the same characteristic brainwaves.

Gabriel (2011) explains that:

> Alpha is the brain wave associated with relaxed, daydreaming states of mind; it's a state of relaxed, detached awareness. Many people are "in alpha" while watching TV. Alpha is often called a "hypnogogic" state because you may experience spontaneous mental imagery.

From between the ages of 5 and 9, humans operate mainly in an alpha brainwave state. Brain wave states are an important factor in understanding the effects of phenomena such as ASMR and EDMR.

Although the efficacy of EMDR is disputed there are clear and direct correlations between aesthetics, eye movements, ASMR and EMDR. I propose that the bilateral eye movements involved in The Golden Rectangle and the bilateral stimulation of ASMR and EMDR aid access to altered states of consciousness allowing the flow of sensory information in a new and therapeutic manner.

BRAIN WAVE STATES, HYPNOSIS AND RAPID EYE MOVEMENT SLEEP

The horizontal viewing mechanisms of our biology is what, in part, has allowed The Golden Rectangle to become the phenomena that it is, suggesting a clear link between aesthetics and eye movements/bilateral stimulation. This is also seen as an important factor in other phenomena such as ASMR and EMDR. The eye movement element of EMDR therapy is closely linked physiologically to the Rapid Eye Movement or REM portion of the human sleep cycle, furthering the connection between eye movements and our biological functioning.

As Bejan (2009) points out, The Golden Rectangle provides the best shape for the easiest flow of information to our brain, which in turn creates the most pleasant experience. Something which is reliant on other factors such as biology, evolution and our landscape. This can be linked to the state of Rapid Eye Movement (REM), which is believed to be connected to both dreaming (Purves et al, 2001) and our memory functions (Rasch and Born, 2013).

Oxford University Press (2018f) highlights that during sleep "consciousness [is] practically suspended". Young and Blansert (2015 p 18) also reinforce this by explaining that during sleep people "allow themselves to transcend into an altered state of consciousness". This is an important factor, as we have already seen, ASMR has been described as involving a "trance like state" (Blain, 2013). Griffin (2007a) explains that "A trance is a focused state of attention, a state of utter absorption. And the most absorbing type of trance state we ever enter is a dream".

Griffin (2007b) states that many of the dream theories developed during the 20th century are divided into two main categories, psychological and biological. Griffin also explains that "for any theory to account for the full complexity of human dreaming, there was clearly a need to integrate its biological and psychological aspects".

This is similar to the requirement for ASMR to be considered as both a biological and psychological phenomenon, emphasising the need for researchers from both disciplines to work together in order to further understand ASMR and its' potential applications.

Griffin explains what is known as "The Expectation Fulfilment" theory of dreams (2007c) which closely links eye movements to neurological processes such as dreaming and trance states and suggests a connection between rapid eye movement and illnesses such as depression and schizophrenia.

Rapid Eye Movement was first described in a paper by Aserinsky and Kreitman (1953) as "a different type of eye movement-rapid, jerky and binocularly symmetrical", is one of two major phases of our sleep pattern, the other being "Slow wave or nonrapid eye movement (NREM)" (Young and Blansert, 2015 p 18). Griffin (2007b) explains that REM is a "special brain arousal state".

Griffin (2007c) suggests that:

> all dreams are expressed in the form of sensory metaphors and the reason for this is found in the biology of the rapid eye movement (REM) state, a special brain activation that all mammals go into.

Smith (2016) highlights that:

> Throughout the night, sleep begins with stage 1 NREM sleep and progresses through stage 2 and stage 3 to reach REM sleep approximately 90 minutes after falling asleep. Once REM sleep stage concludes, the brain activity slips back to stage 2 sleep, then stage 3 sleep before returning to REM sleep. This cycle usually repeats about four to five times each night.

Smith (2016) also points out that during stage 1 sleep "The brain activity exhibits alpha and theta waves", "The slowing of brain waves with intermittent bursts of rapid brain waves, known as sleep

spindles, characterizes stage 2 NREM sleep" and that "Stage 3 NREM sleep, also known as deep sleep or delta sleep, is marked by very slow delta brainwaves". Hall (1998) explains that "during REM sleep a sleepers brain waves demonstrate characteristics that are similar to waking sleep, a combination of alpha, beta, and desynchronous waves".

Gabriel (2011) explains the four basic brainwave frequencies:

Beta Waves: 13-30 Hz

> Your brain is producing beta waves as you are reading this. A predominance of beta waves is associated with being alert, active, and whenever you concentrate on learning something or doing an activity that requires focus.

Alpha Waves: 8-13 Hz

> Alpha is the brain wave associated with…a state of relaxed, detached awareness. You produce alpha waves when you relax to guided imagery…[and] just before you drift off to sleep and just before you wake up.

Theta Waves: 4-8 Hz

> Theta waves are often associated with deep states of meditation, peak spiritual experiences, and higher states of consciousness…[and] with drowsiness or arousal in adults and older children. Young children are in theta most of the time.
>
> Some people consider the theta state to be synonymous with the subconscious mind wherein reside suppressed emotions, as well as a storehouse of creativity. Theta is associated with REM (rapid eye movement) sleep where dreams occur.

Delta: up to 4 Hz

> Delta waves occur in adults during deep, or "slow wave" sleep. Delta states sometimes occur during continuous attention tasks.
>
> Delta is considered by some to be the bridge to what Carl Jung described as the "collective unconscious." Babies are in delta much of the time.

Young and Blansert (2015, p63-64) explain that because "ASMR is an experience that can be triggered by a variety of cues, can be entered into involuntarily as well as on purpose, probably operates on the same brain waves as hypnosis or meditation, and may also rely on oxytocin". Young and Blansert (2015, p58-59) also explain that Oxytocin is "the hormone which plays a huge role in relaxation, trust and the bonding process". During the ages of 0-4, people operate in the theta brainwave state and then transition into the alpha brain wave state which they stay in for about four or five years before producing "their beta waves". They suggest that the ASMR experience may be linked to childhood memories, therefore connecting ASMR and our personal, social and cultural upbringing.

As we have seen, ASMR can be linked to hypnosis, via the similarities in brainwave states and also through the suggestion of an altered state of consciousness. Young and Blansert (2015, p59) go on to suggest that "during the hypnotic state, peoples oxytocin levels are stimulated, which enables them to relax and connect with the therapist. It is during these deep moments of trust that they re-engage with the past and open themselves up to suggestibility". This coincides with the therapeutic elements of EMDR, which is primarily used to treat people who suffer from Post Traumatic Stress Disorder, in which trust and the ability to open up are essential factors. The close correlation of the hypnotic state (Griffin, 2007a) with eye movements, brain wave states, sleep, hypnosis, ASMR and EMDR is further suggestive of the extent that these phenomena are interconnected and in requirement of further study.

Griffin explains that the expectation fulfilment theory of dreams is based on the emotional arousal and de-arousal process and that REM sleeping and dreaming is when our systems naturally de-

arouse through dreaming metaphors. Griffin highlights that the dreams will reflect the unmet expectations of the day before and suggests that this is in relation to our evolution. Although this theory cannot be proved, it does highlight the potential importance of REM sleep, eye movements and our biological processes.

BRAIN DEFAULT MODE NETWORK AND SYNAESTHESIA

Fredborg et al (2016) published the results of an experiment in which the brains off 22 people, 11 of which experience and ASMR and 11 who don't, were scanned using an fMRI machine and the brains "default mode network (DNM)" was contrasted between the two groups, at a resting state. Chein (2009) explains that "fMRI stands for functional Magnetic Resonance Imaging. The term "functional" indicates that this type of MRI is concerned with brain *function* during a specific experimental time".

Neuroscientificallychallenged.com (2015) explains that:

> the default mode network is a group of brain regions that seem to show lower levels of activity when we are engaged in a particular task like paying attention, but higher levels of activity when we are awake and not involved in any specific mental exercise….recent research has begun to detect links between activity in the default mode network and mental disorders like depression, anxiety, and schizophrenia.

With regard to the default mode network observed in those who experience ASMR Copeland (2017) explains that the results by Smith et al found that:

> The areas that typically work together weren't firing together as much. Instead, other areas of the brain were getting more involved than usual—areas related to a visual network, for instance (see Figure 6).

Smith, (cited in Copeland, 2017) when discussing the brains of those who experience ASMR that he studied, explains:

> that instead of having distinct brain networks the way you or I would, there was more of a blending of these networks.

It does make intuitive sense that a condition associated with atypical sensory association and atypical emotional association would have different wiring in the brain.

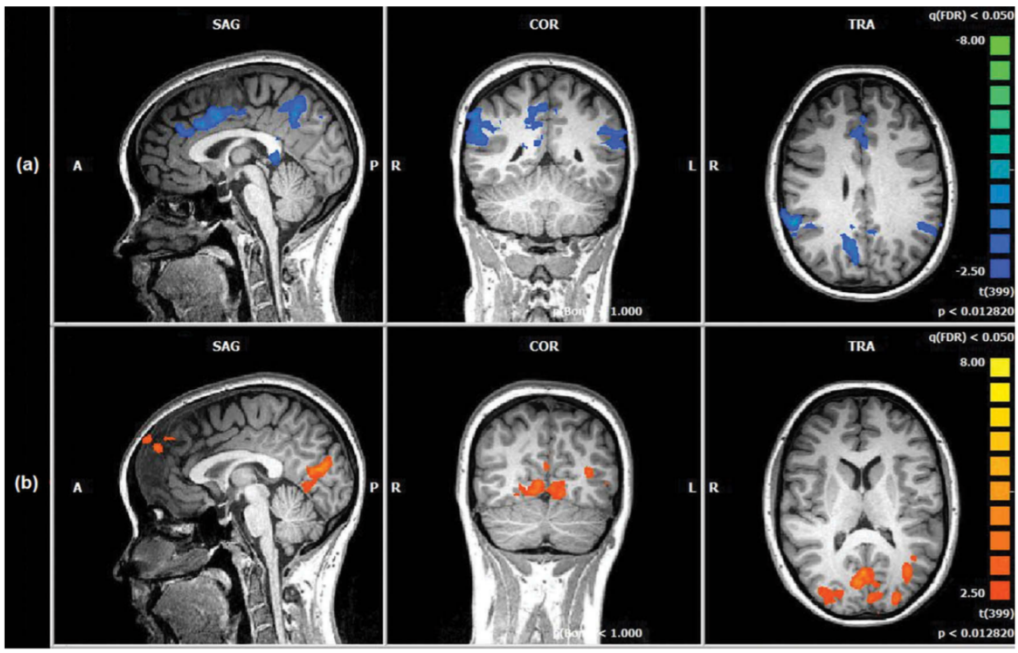


Figure 1. A comparison of functional connectivity in the default mode networks of individuals with ASMR and matched controls (minimum cluster size = 20 voxels; $p < 0.013$, false discovery rate (FDR) corrected for multiple comparisons). (a) Brain regions in which individuals with ASMR show *less* functional connectivity are depicted with blue voxels. (b) Brain regions in which individuals with ASMR show *greater* functional connectivity are depicted with orange voxels.

Figure 6: A comparison of functional connectivity in the default mode networks of individuals with ASMR and matched controls (Fredborg et al, 2016).

The Default Mode Network is also thought to be associated with Autism Spectrum Disorder (ASD). Padmanabhan et al (2017) suggest "that altered functional and structural organization of the DMN, and its atypical developmental trajectory, are prominent neurobiological features of ASD". Yerys at al (2015) suggest that:

> Functional pathology of the default mode network is posited to be central to social-cognitive impairment in autism spectrum disorders (ASD).

> Altered functional connectivity of the default mode network's midline core may be a potential endophenotype for social deficits in ASD.

Smith (cited in Copeland, 2017) suggests that ASMR may be similar to Synaesthesia. Smith explains that "there have been some studies that show there's slightly atypical wiring in the brain [in those with synaesthesia] that leads to slightly different sensory associations, and I think that may be the same thing we have here".

In response to the study conducted by Smith (Fredborg et al, 2015), Ro (cited in Copeland, 2017) reinforces that because the experiment was done on such a small number of people, and because the experiment was observing people during a resting state, and not while experiencing ASMR, the study "is unfortunately not as revealing or informative as it could have been". Ro suggests that the differences in the subjects resting state could be down to other psychological and/or biological factors but goes on to explain that he does think "ASMR may be a form of synesthesia".

Wannerton (Unknown) explains that Synaesthesia:

> is best described as a "union of the senses" whereby two or more of the five senses that are normally experienced separately are involuntarily and automatically joined together. Some synaesthetes experience colour when they hear sounds or read words. Others experience tastes, smells, shapes or touches in almost any combination. These sensations are automatic and cannot be turned on or off.

Smith has been involved in other experiments relating to ASMR such as "An Examination of Personality Traits Associated with Autonomous Sensory Meridian Response (ASMR)" (Smith et al, 2017), suggesting potential links between personality traits and ASMR, allowing for ASMR to be further understood as a cultural phenomenon.

There are examples of published articles relating to ASMR as a flow like mental state (Barrat and Davis, 2015), and other research experiments which focus on the stimuli that triggers ASMR and

how these can further be understood but little research has been done to understand the neurological implications of ASMR and how this relates to other interconnected phenomena and how this understanding can be pushed further to provide the tools needed to give therapeutic support to those who experience sensory processing difficulties from the entire spectrum. The essence of people who experience different sensory associations whether it be through Synaesthesia, ASMR or sensory processing difficulties through certain aspects of autism remains the same. The function of how one set of sensory stimuli is perceived by one person versus another with different sensory processing abilities is most definitely worth further research and study. Although as Ro (cited in Copeland, 2017) suggests, the experiment using fMRI scans does not reveal as much as was hoped, the suggestion that those who experience ASMR may have atypical neurological functions against a condition that evades scientific explanation is grounds for further investigation.

ASMR and synaesthesia are similar in that both suggest an atypical wiring of sensory information or an atypical processing of sensory information. Dutton (2015) explains briefly about synaesthesia:

> There are over 60 known types of synaesthesia… lexical-gustatory form leads words to be experienced as strong tastes. One of the most common types is grapheme-colour synaesthesia, which is when letters and numbers are tinged with colour. Letters can represent different tones of colour, as can whole words. Chromaesthesia…involves the association of sound with colour.

Barbara Ryan (cited in Dutton, 2015) has used synaesthetic techniques in order to help people with various difficulties:

> I worked with a person who could no longer use a telephone – she had to wait for everyone to phone her. Although she was losing the ability to

> read language, replacing people's names with colours or characters helped her remember what names matched with what numbers.

She takes this further in relation to conditions such as Dyslexia:

> Synaesthetic techniques could be used to help with disorders like dyslexia…[and] can be used as a learning aid in some cases. A friend of mine is dyslexic and has trouble with certain letters, so I asked him what letters he had problems with. I then asked him what kind of associations he had with those letters…I then formatted the text so that the letters he had trouble with were now in colour, and straight away he could read it in a way he couldn't before. They became recognisable. Recognition is a lot quicker with synaesthesia, as you have more than one mode of stimulation coming in.

Dutton (2015) explains that Ian Jordan, an optician from Ayr, Scotland "employs synaesthetic methods to try to reduce the effects of different multi-sensory disorders, such as autism, dyslexia and ADHD". Jordan (cited in Dutton, 2015) explains this further by saying:

> We use and monitor synaesthesia in a lot of interventions…Sensory processing disorders are often synonymous with synaesthesia. We think that tinnitus in some ways is a synaesthetic condition. If you change the visual input significantly, you can tune the sound out in the hearing for around 60 per cent of people. It's a synaesthetic effect that probably hasn't been recognised as one

Jordan stresses the importance of a multidisciplinary approach to understanding conditions like synaesthesia:

> Professionals need to be more aware of synaesthesia…They need to be trained to understand and work with it. Many opticians haven't even

> heard of it. We need to have opticians, occupational psychologists and therapists working together as a minimum.

The potential application that understanding conditions like synaesthesia can have could provide much needed support and assistance to people with sensory processing disorders. As Jordan states, the relevant professionals need to be working together in order to understand these conditions and how to manage them in the future. The same can be said for the necessity to research interconnected phenomena that closely relate to and could have an impact on other such phenomena/conditions.

Rothen (cited in Dutton, 2015) reinforces the importance of further study by suggesting that:

> In the last decade, people were concerned about showing that synaesthesia was a real phenomenon, but now, people are looking into what the effects of synaesthesia are on higher cognitive functions. What are the advantages and disadvantages of synaesthesia? Is it linked to conditions like schizophrenia or autism? Clearly, we still have a lot to learn.

The suggestion that synaesthesia could be connected to conditions like autism and schizophrenia, alongside the possible connections to similar conditions and REM sleep, coupled with the knowledge that synaesthesia, ASMR, EMDR and eye movements could all be connected is again reinforcement that these sensory phenomena need to be understood further as collaborative elements in how human beings function.

INTER-PERSONAL BONDING

The connection between the biological aspects of ASMR and the physical effects can be understood in Dr Craig Richards' Origin Theory of ASMR 2.0. Richard is the founder of ASMRuniversity.com, a website devoted to providing information on the ASMR phenomena and promoting the research of ASMR. In his Origin Theory, Dr Richard explains that he feels that ASMR may be activating the same neurological pathways as interpersonal bonding. Dr Richard suggests that "Examples of inter-personal bonding include parent and infant bonding, family member bonding, friendship bonding, and romantic partner bonding" (2014) and suggests that:

> ASMR and bonding behaviors share similar triggers like gentle touches and soft voices between individuals that trust each other, and also have similar responses like feeling comforted, feeling relaxed, and feeling secure. Some of the basic biology of bonding is well established and this involves specific behaviors which stimulate the release of endorphins, dopamine, oxytocin, and serotonin. These bonding behaviors and molecules may provide a good explanation for most of the triggers and responses associated with ASMR.

Dr Richard explains the purpose of endorphins, dopamine, oxytocin and serotonin within interpersonal bonding and suggests that the molecules central to bonding are also central to the ASMR experience:

Endorphins:

According to Dr Richard, endorphin neurotransmitters are released when a parent and child are brought together, this also happens however in "other closely-bonded individuals like best friends and romantic partners, as well as, during grooming behaviors of other animals". Endorphins are also probably the main cause of the "tingles" and "slight euphoria in ASMR" (Richard, 2014). Dr

Richard (2014) also highlights that endorphins also stimulate dopamine, "a neurotransmitter associated with desire and motivation":

> Dopamine helps you to recall, recognize, and focus on those things in your life that trigger endorphins…[and] is probably the primary molecule that reminds an individual which ASMR videos are best at triggering endorphins, and then keeps that individual focused and watching a seemingly uninteresting video for 30 minutes or more.

Oxytocin is a "neurotransmitter and hormone that is stimulated by endorphins" and is sometimes referred to as the "bonding hormone" (Richard, 2014). Dr Richard also suggests that oxytocin is "likely to be the primary cause of the comfort, relaxation and decreased stress of ASMR" and also suggests that oxytocin may contribute to ASMR tingles "as it increases the sensitivity of endorphin receptors". "oxytocin is also a strong stimulator of the neurotransmitter serotonin" (Richard, 2014).

"Serotonin is likely to be the primary cause of the elevated mood felt by some individuals who experience ASMR. Additionally, serotonin is probably a strong contributor to the feelings of comfort, relaxation, and decreased stress which are initiated by oxytocin and endorphins".

Dr Richard highlights that because a lot of the triggers that stimulate inter personal bonding also stimulate ASMR, it is a strong possibility that the "the biology behind the responses to those triggers is also similar".

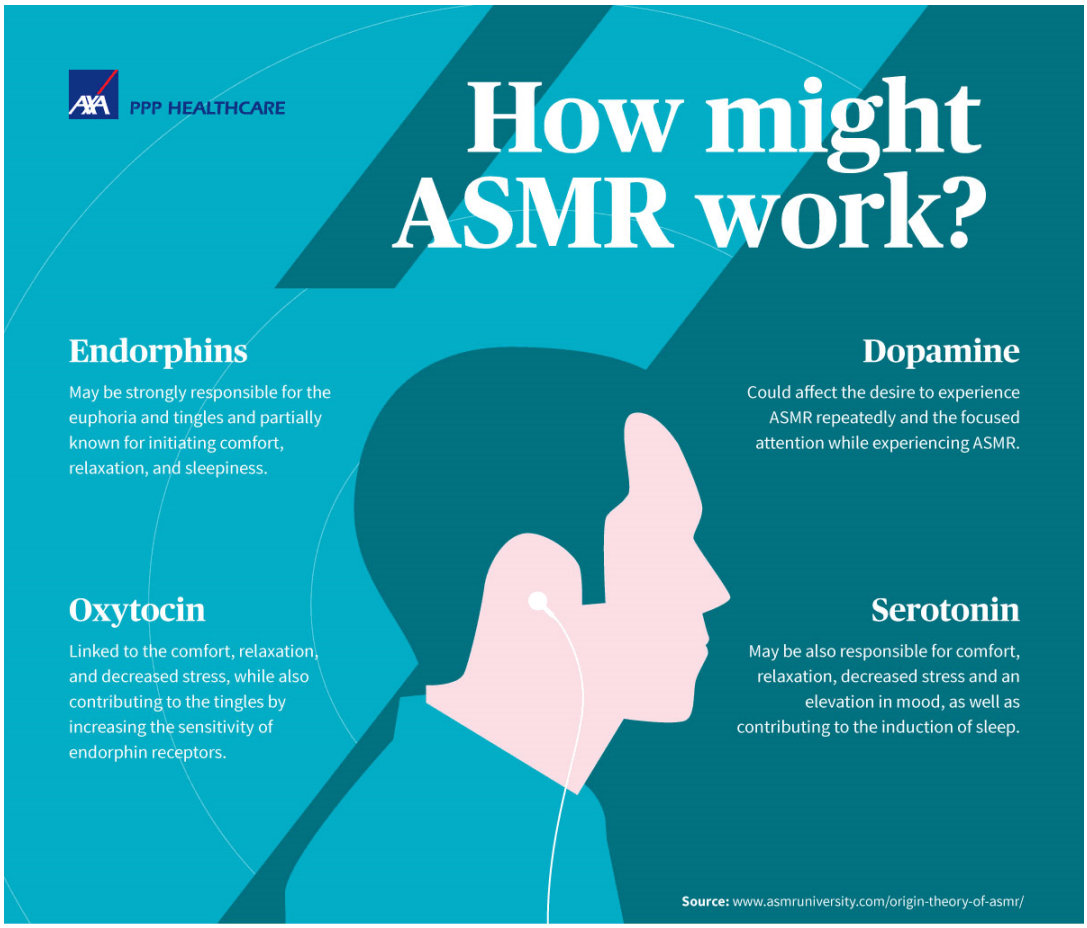
In response to questions as to why some people experience ASMR and others do not, DR Richard (2014) believes that may be due to an individuals biological make up; "I believe that everyone (except for some very rare exceptions) produces endorphins, dopamine, oxytocin, and serotonin. But the ability to feel those molecules in response to a "strange" stimulus may differ between individuals". DR Richard takes this further by highlighting that:

> There is a variety to how much endorphin we produce and a variety to how sensitive our endorphin receptors are. So individuals that create high amounts of endorphins easily and/or have endorphin receptors that are very sensitive may be more likely to feel the euphoria from a small trigger. And this same concept of molecule production and receptor sensitivities applies to all the other molecules involved in bonding and ASMR. Some of these molecular and receptor traits could be passed on through genetics.

Dr Richard does reinforce that in addition to genetics, these molecules and receptors could be influenced by other factors such as "environment, diet, disorders, toxins, drugs, and even childhood experiences and cultural norms".

The suggestion that those who experience ASMR have the ability to create high amounts of endorphins, and have endorphin receptors that are more sensitive to typical people is suggestive that ASMR is in merit of further research as those who experience ASMR have biological, chemical and neurological differences from those who do not. As ASMR can be connected to biological and psychological processes, the need for ASMR to also be researched and understood further from an artistic, psychiatric, psychosocial, social and scientific perspective is imperative in order to understand how these areas interconnect.

The importance of these molecules as factors of ASMR can also be seen in a recent sleep health campaign launched by AXA PPP Healthcare (2017a), in conjunction with the ASMRtist WhispersRed . In the campaign, AXA PPP Healthcare (2017b) provide an infographic on the potential importance that endorphins, oxytocin, dopamine and serotonin may have on both ASMR and sleep and provide an ASMR video created with WhispersRed in order to help people get to sleep, both promoting good sleep and ASMR as a therapeutic tool. This suggests that ASMR is generating more credibility within the healthcare profession.



ASMR (Autonomous sensory meridian response) is a response that is commonly described as having a narrow range of specific sensations and feelings - tingles, chills, and/or waves in the head.

Feelings can include euphoria, happiness, comfort, calmness, peacefulness, relaxation, restfulness, and/or sleepiness.

Figure 7: How might ASMR work? (AXA PPP Healthcare, 2017)

Further research will allow the therapeutic elements of ASMR to be highlighted further, and allow the phenomenon as a therapeutic concept to gain more momentum.

SENSES, SENSORY PROCESSING DISORDER AND AUTISM

Our senses are vital to how we process and perceive the information around us. Draper (2017) explains that perception is not limited to one sense, but rather all the senses working together create our perception and suggests that humans could have as much as 21 or 33 senses. Although some of these are disputed as senses, it does highlight the scale of sensory information that allows us to typically operate and draws attention to the variety of sensory processing issues that can arise from such a large number of sensory processes.

Griswold (2016) Explains that "Many children with autism have a lot of anxiety as well as extreme sensitivities to light and sound". Brout (2017) take this further by highlighting the differences and connections between autism and sensory processing disorder:

> Children whose Sensory Processing Disorder conforms to the under-responsivity subtype typically require a great deal of stimulation in order to become alert and active, a behavior often seen in children with autistic spectrum disorders. Meanwhile, other children with ASD have symptoms more similar to the over-responsive subtype of SPD. Because autism and SPD both have over-responding and under-responding categories, autism and SPD are sometimes mistaken for one another.

Brout also makes sure to emphasise that "at least three-quarters of children with autistic spectrum disorders have significant symptoms of Sensory Processing Disorder….*However, the reverse is not true.* Most children with SPD do not have an autistic spectrum disorder!". Brout also explains that with regard to the connection between sensory processing disorder and attention deficit disorder

(ADHD) that "an estimated 40% in the typical population and 60% in clinical samples of the children with one disorder also have symptoms of the other" (Ahn et al, 2004, cited in Brout, 2017). Collison-Ris provides a graphic detailing some of the symptoms of sensory processing disorder:

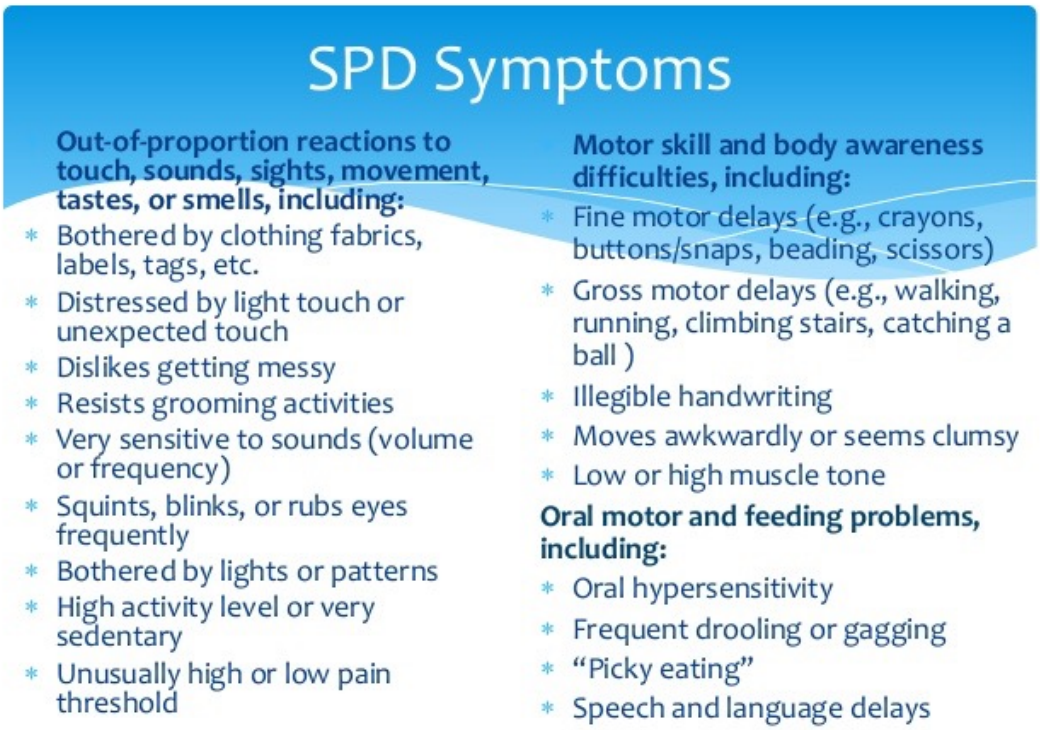


Figure 8: SPD Symptoms (Collison-Ris, 2015)

Brout (2017) also draws attention to Misophonia and its connection to Sensory Processing Disorder. Bout describes Misophonia as the following:

> Misophonia describes a neurologically based disorder in which auditory stimuli (and sometimes visual) is misinterpreted within the central nervous system. Individuals with misophonia are set off or "triggered" by very specific patterned sounds, such as chewing, coughing, pencil tapping, sneezing etc. Pawel and Jastreboff termed the disorder in 2001, in an effort to distinguish it from hyperacusis.
>
> Hyperacusis and Misophonia are both disorders related to "decreased sound tolerance." However, hyperacusis is a condition in which auditory

> information is unbearably loud. In Misophonia, it is repeating (or patterned sounds) that are intolerable.

The Jastreboff's (2001) originally hypothesized that in Misophonia pattern-based noises trigger an over reaction in the limbic system (where emotions are mediated in the brain). Therefore, auditory stimuli leads to an emotional response that causes the sufferer to feel anger, fear, disgust, or a generally "out of control". While the Jastreboff's distinguished between hyperacusis and misophonia via their symptoms, the confusion between the two disorders is far from resolved. The etiology of both disorders is also not clear (Brout, 2017)

This highlights the interconnected nature of many disorders, all of which require a specific processing of sensory information and the interconnected nature of conditions like ASMR, Misophonia, Synaesthesia, Sensory Processing Disorder and autism and the need for these areas to be researched in a holistic manner.

Snetha (Cited in Richard, 2016), has a child with microcephaly. She describes microcephaly as "a rare condition affecting the head whereby it is smaller than normal. It can also cause problems within the brain in a mild, moderate, or severe way. Everyone differs with the challenges they have". Snetha describes the specific difficulties that her son faces with microcephaly and other brain issues:

> He is moderately affected. From what I understand he has "holes" in the central areas of the brain. This is the likely reason he has several issues such as; developmental delays, behavioral problems, autistic traits, proprioception problems, poor coordination, nonverbal challenges, learning difficulties, causing harm to self or others, sleep issues, sensory processing issues, double incontinence and much more I still have not discovered.

The issues that Snethas' son faces reinforces the interconnected nature that sensory processing difficulties can bring and the need for research to be conducted across this entire spectrum of issues. This would allow professionals from medical, psychiatric, social, behavioural, therapeutic, occupational and care/support settings to fully appreciate the spectrum of difficulties and better ways to provide care, support and therapy to the individuals living with these difficulties.

Snetha notices a marked reduction in her sons symptoms as a result of him viewing ASMR content. Although there is possibility that the ASMR experience can only be experienced by some, allowing for the coincidence that he does experience ASMR and this is the reason behind any therapeutic release, there is also possibility that ASMR media is working in conjunction with his difficulties in order to provide relief.

CONCLUSION

By researching, debating and understanding The Golden Rectangle, we eventually start to fully understand its' reaches and appreciate that it does not only represent an aesthetic phenomenon, it also represents our biology and how we function and the way in which we process information. What at one time served a mathematical and/or artistic expression, is also a biological and neurological representation. It is my opinion that the same can be said for ASMR.

ASMR is intrinsically linked to sound and eye movements. Our visual and auditory sense perception are so interconnected with conditions like synaesthesia, misophonia and autism that we must view these conditions not only as stand alone difficulties but also how they interact with one another as phenomena. By understanding these interactions better, we are more equipped to be able to provide support to individuals dealing with separate issues, or a meshing of several issues such as in the case of Snethas' son.

ASMR is connected to several other phenomenon including hypnosis, EMDR, eye movements, brain wave states, the bonding process, syneasthesia and misophina as well as conditions such as sensory processing disorder and autism. The feelings of relaxation and well-being associated with ASMR when contrasted against the feelings associated with overwhelming sensory stimulus appear to provide a perfectly balanced solution to people living with these difficulties. The understanding of sensory processing that can be gained from researching conditions like ASMR, syneasthesia and misophonia as interconnected phenomena can possibly help to provide the information necessary to provide support to people living with conditions such as sensory processing disorder and autism, and also allow for a deeper understanding of those affected by conditions such as Misophonia and Hyperacusis.

The impact that auditory and visual information can have on our brainwaves is not yet fully understood, however if it is possible that such therapy could be used in order to provide relief to people facing variety of issues then further research should be warranted.

Aesthetics should not only be something to be appreciated by those who can create, enter a flow state, or simply by picking up a phone. Aesthetics should be able to be enjoyed by everyone regardless of their sensory abilities. Due to the vast nature of our sensory processing capabilities and as a result, the vast number of conditions and interconnected conditions that can arise from these processes, it is of absolute importance that we better understand aesthetics and aesthetic conditions like ASMR, Synaesthesia and misophonia in order to better understand the psychological, biological, chemical and neurological processes that take place during these phenomena, in order to be able to provide support and/or relief to people affected by related independent and interconnected sensory processing difficulties.

There is still much we need to learn about or senses and our sensory perception. It is my hope that by highlighting the interconnected nature of phenomena and sensory perception, new research will begin to unfold which will allow the various conditions and difficulties I have mentioned, to be considered as part of a holistic system with the ability and tools required to provide new areas of support to those who need it.

Although ASMR may not be something that all people experience, whether they have sensory processing difficulties or not, a deeper understanding of the underlying sensory processes that encompass ASMR and related phenomena, of which there is many, may provide therapeutic solutions to some of these difficulties.

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