

An investigation into how audio influences perception, attention and memory and affects visual hierarchy in design.

**Tim Burnett**

Master of Design

2013

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Faculty of Design  
Monash University

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## Abstract

This exegesis will investigate the influence of audio stimuli and its relationship with visual perception, attention and hierarchical flow within visual communication – utilising a heuristic form of inquiry. New terminology of *black* and *white* thoughts will also be explored to analyse logical and lateral thinking when applied to problem solving.

By utilising visual abstraction, cross-modal perception and iconic-coupling techniques I wish to explore how one can create stronger engaging experiences. This supports the research of Menon and Levitin (2005) and Ramachandran and Hirstein (1999) in the way the brain responds and rewards when resolving problems and when listening to music.

By offering more rewards, we can create an environment that encourages stronger engagement. When an artificial synaesthetic experience is generated by iconic-coupling and cross-modal binding processes, a deeper correlation between auditory and visual elements may result.

Integration of specific iconic-coupling within the design process of the following two works - 'Inner sense' and 'Elements' - creates an environment that would support active engagement with the spectator; increasing the chances of visual influence and memory retention.

By utilising the powerful emotive feelings generated by music, a more personal emotive-memory connection is formed when combined with vision. This artificial synaesthetic experience allows for a deeper cross-modal connection drawing from a lifetime's worth of experiences that shape our understanding and stimulate our imagination.

## Statement

This documentation contains no material which has been accepted for the award of any other degree or diploma in any university or other institution and, to the best of my knowledge, contains no material previously published or written by another person, except where due reference is made in the text of the documentation.

Timothy John Burnett

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**Jeff Janet**

Coordinator Masters by Coursework Degrees (Department of Design)

Department of Design

Faculty of Art, Design & Architecture

Monash University

Caulfield VIC 3800

**Cameron Rose**

Lecturer Communication Design

Department of Design

Faculty of Art, Design & Architecture

Monash University

Caulfield VIC 3800

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## Introduction and overview

Sound was pivotal to human evolution in greatly influencing the way we think and remember. A wild predator's roar, a subtle coo from a potential mate or a crying baby; these sounds have had a million years to become deeply wired into the conscious and unconscious minds. (Ramachandran 2011), (Mithen 2006)

Looking at the origins of sound; though not going back quite as far as the big bang - *which I'm guessing was the first sound ever made*; but to the first sounds uttered by the primates begins the journey that sound took in shaping the musical brain. The insight given by Mithen (2006), Ramachandran and Hirstein (2001) again helped shape why sound has played an important role in the evolutionary and linguistic journey of man. While this information has been invaluable in creating a greater insight, much of the neuroscience and anthropology is beyond the scope of this exegesis. What will be discussed is how audio stimuli can be better utilised when coupled with visual perception.

Visual Perception will also be investigated in how understanding what we see and how we transfer this information into what we know assists our memory. Illusions and visual puzzles will also be analysed as ways to engage. Within the construction of 'Inner sense' & 'Elements' specific attention has been given to the way that the design principles can already influence a spectator. Much care and planning has been done to try to limit these influences, allowing the music to be the main hierarchical principle. This has been done to create a stronger connection with both audio and visual stimuli, forming an artificial synaesthetic experience. This experience can also assist in creating stronger connections with what we see and what we remember.

We have learnt that sound can direct our focus or attention, (*like a car alarm*) but can it also help influence our visual perception and attention? Can sound help hold our interest, attention or focus on one image or illusion until the next piece of music changes our perception? Like the reward sounds from a pokies machine, to the use of sound effects in computer games, we use audio to alert, engage and reward.

The power of a good reward goes deeper than a pat on the back. Work by Menon & Levitin (2005) also explain the association between dopamine being released from the brain when listening to '*pleasant*' music. Levitin uses the word '*pleasant*' - *music that one would define as more pleasing to listen to*, in his experiments when tracking subject responses, while testing the reward processing structures in the brain. Their evidence helps explain why we are moved by music. Connecting '*pleasant*' music by offering a number of possible audio-visual combined moments, I wish to explore the notion that sound can assist with memory and attention while encouraging deeper engagement. Once we get our first dopamine reward, we naturally want more. Fortunately the chemical also assists with attention and memory.

## Black & White Thoughts

Within my own understanding of my mind – I have two brains, made up of the left and right hemispheres – controlling the way I think, live and remember. We could include the third section, being the cerebral cortex, where much of our almost instinctive responses trigger with our spinal cord. This generates reflexive responses and our general functionality but for this purpose I am staying with the two parts that I have some control.

Thinking is often labelled as convergent and divergent. (Hegeman 2008) Where reason and logic - the left brain, is pitted against intuition and imagination - the right; but I purpose the analogy of '*Black and White*' thoughts. In this paradigm, *black* or *white* is not locked into one side or the other. At first, one might think of a *black* thought as a dark, bad or even evil; though in economics being 'in the black' has a much more positive spin. I see my '*black*' thoughts as my habitual thoughts – my experience. A pool of knowledge that I draw from and constantly enjoy filling and as a designer it is important that I have a pool that is both deep and wide to play in. This is my grounding. This is where my '*white*' thoughts splash; like skimming stones. No rules, no boundaries and where everything is new an exciting. I am a child again — I mean still. I can imagine with a freedom, without fear or control. This is my figure. The two states that constantly wish to dance between ones focus or thought. The harder you focus on one, the more distant, the other. The more you think *black* thoughts, the more you yearn to play with *white*. The harder you think about playing, the more you find yourself being logical and grounded. My own little ying-yang cycle working-playing for attention. In my experience, the longer you can allow this process to stay fluid, the more likely you are to find a creative design solution.

The creation of '*Inner sense*' & '*Elements*' happens to be made using only black and white. This has nothing to do with the '*black & white*' thoughts but with the importance of having strong contrast. Also while I define my grounding as a '*black*' thought, this doesn't mean that anything black in the artwork is logical. '*Inner sense*' also doesn't easily give you any sense of a horizon; though your logical brain will find a couple to help satisfy its own interpretation of the scene.

Using '*black and white*' thoughts as an analogy when defining your thinking, I purposes that it assists in giving an immediate mental visual of your state of thought, assisting with your approach to problem solving; without polarising to one side of the brain or the other.



## Principles of design

The Principles of design gives the designer a basic framework to help explain how certain positioning and flow might assist in visually communicating a desired message. By helping guide the spectator through the material in a way that can assist with understanding, memory retention and visual perception, the principles assist each other and the brain to find less taxing ways to process the visual experience.

Through practise and patience we construct alignments to form grids, creating visual boundaries, allowing uniformity and balance. We structure with the use of hierarchy and if you throw in a little white space – allowing our proximity groupings to assist emphasis, which finally helps shape the hierarchical flow. At the end of this process we have ourselves a framework that we pin the loose title of ‘good design.’

Below is each of the Principles with a short description. I will discuss their relationship to my practise in Chapter 3.0

**Proximity:** *Refers to the distance between objects and when elements are placed closer together creates a perceived group.*

**Hierarchy:** *Refers to the way parts of a design might draw one’s attention to move through the composition according to the visual structure. Using various techniques like scale, position, size or colour one can create a structural relationship between the elements.*

**Balance:** *A visual weight that deals with symmetry to create a stability by organising the elements in combinations which might balance the composition.*

**Repetition:** *Used to add consistency and continuity which can enhance information, assisting with identifying elements in how they might be grouped, creating a stronger visual interest.*

**Unity:** *Refers to the combination of all elements working together, as when nothing distracts from the whole you have a sense of harmony in the design.*

**Contrast:** *Refers to how one might differentiate between elements and its surroundings. Effective in directing the eye and creating emphasis and focus in a composition.*

**Dynamics:** *Refers to either the use of movement or illusion of movement. It can greatly influence the spectator in how or when one might be drawn to the visual element and can assist in shaping the overall emotive feel of a composition.*

**Emphasis:** *Refers to having a focal point or the centre of interest of the composition.*

**Space:** *Often defined through the ‘figure-ground’ principle of the Gestalt, is critical in assisting the other principles to have space to be able to work. White, Positive or negative, each add the key ingredients to allow the other principles to effectively communicate the desired visual direction.*

**Alignment:** *Often referred to as the grid structure, creating a stability and framework across a composition. Can guide the spectator by creating cohesion and building unity in the composition, which assists with a cleaner, stronger connection with other graphic elements.*

## The Deception of perception

We **see** but we have also learnt to fake it. Strong evidence in what and how one might see is revealing that not much visual information – about a fingernails worth of visual space at any one time is being observed; anymore input would overload the brain. (Wooding 2002) The rest is a combination of memory, emotion, logic, experience, knowledge or any other snippet of data that could assist in completing the synthesis of what makes up our visual experience. (O'Regan 2000) Through rapid eye movement one quickly pulls together our interpretation of what we have confronted, confident that it holds to our understanding of what is possible.

What our brain is not very good at is when it has been tricked. When something outside our visual understanding – like an illusion or magic, forces the spectator to re-evaluate what one might have missed. (Rensink 2008, 2010) It also does not help that no two people will view an image in the same way based on their own experiences. As an example, the dice illusion (Fig. 1) forces the spectator to continually reevaluate what is in front of them.

So what do we actually see? How do we see and what is it we actually perceive to see? Do other processes like 'attention' and our own experience influence our perception before we even apply another sensory input? Does this multilayered approach add or hinder our response? Cray's (2000) exploration of the work of Seurat's 'Parade de Cirque' (Fig. 2) in describing perception and attention in the way one oscillates one's view, blends nicely into the Gestalt 'figure and ground theory'. Both the study and theory have helped shape the visual work presented. (Ehrenfels 1932), (Behrens 1998) A classic example of this oscillation is the 'Figure-ground vase.' (Fig. 3) Do you see the faces or the vase or both as you continually oscillate between?

Exploring how one might approach a piece of artwork that could exploit the oscillation of the figure-ground, was the first visual challenge. By breaking down the perceived information into almost abstract elements, I am attempting to simulate the synthesis of the shapes to form more recognisable visual elements, influenced by the emotive connection of music. Some combination of elements immediately will create a visual understanding, but with the added layer of sound, this study is exploring the influence on the spectator in what they also might see as well as when an illusion might be realised. Facilitating a more creative experience when being exposed to new visual information, allowing for a deeper engagement. Especially when the connection to sound and image induces a number of perceptual binding moments. Ramachandran and Hirstein (1999,2001) also describe this moment as "a pleasant 'aha' sensation." In Figure 4, we see the splotches and then the Dalmatian is found.

The creation of the Fedex wordmark (Fig. 5), by Lindon Leader in 1994 created one of the most awarded and recognised identities of all time. The type itself works well, colour and overall design is strong but it is the hidden arrow, the subtle negative space that generates 'the aha' sensation. The binding reinforces the mental impression, making it nearly impossible not see the arrow once discovered.



Fig 1: Visual Illusion



Fig 2: Parade de cirque  
Georges Seurat (1888)



Fig 3: Figure-ground Vase  
Edger Rubin (1915)



Fig 4: The Dalmatian



Fig 5: FedEx Wordmark  
Linden Leader (1994)

## The Deception of perception cont.

So how does the oscillation help our thinking? When seeing the illusion, we also need to be able to recognise when our brain has been tricked. I would like to explore this process and propose how the use of our 'black & white' thoughts can assist in problem solving. While there is no immediate visual, we can still perceive this problem.

*A man was found dead in a cabin in the woods. How did he die?*

As much as we love to problem solve we also find ourselves preferring a simple and easy answer or response; preferably one that involves less work and less thought. It is not that our brain is lazy, it is because if it processed everything, even the most basic situations would be too complex for our brains to compute; this includes what we take in visually and what we might read. Our 'black' thoughts often takes the lead, assuming control and relying on a life-times worth of experience to back it up.

*No it wasn't a bear or fire, or a bear on fire.*

How much work do we put on ourselves when viewing something new? Do we critically pull apart each and every stroke or impression, striving for meaning under every rock; connecting crumbs that create our own unique understanding and reaching fulfilment? Or do we simply acknowledge its existence lulled into our own inattention? Perception is more than just becoming 'aware' of something; Am I aware of of this sentence? Am I aware that the last sentence had an extra 'of' in it? Was I engaged completely with the reading or allowing my own automatic brain process to passively move through the simple effort of reading. (Johnson, 2011) Allowing for my higher level, active consciousness to be connecting thousands of little snippets of a knowledge to help build up ones own understanding to the task at hand. Am I now looking for other little tricks or still thinking about "the woods."

Have you worked out the problem? If I was to describe the first image that came to your mind, would it have been a little wood cabin, deep in a lush forest? Perhaps a rock fire place and a rustic inner living space, now looking a little frightening with a dead man in it.

Here in lies the problem. Our 'black' thoughts has seen the two words, cabin and woods and stuck them together; not allowing for a possible option outside of its scope. Choices are not always consciously calculated with many decisions being made in the depth of the subconscious mind. (Douglas, 2011) Was I aware that I immediately went to the subconscious and for most, a logical connection? Can you name or think of other types of cabins? The answer is a plane crash. A classic example of the *Einstellung effect*, when finding that once an idea comes to mind, alternatives are often not considered.

Would you have come up with this answer if you were asked at an airport, or if their was audio of a plane playing? The sound in our environment can influence what we might think and see as demonstrated by Shams, Kamitani and Shimojo (2001) with their flashing and beep experiments. The sound of the beep influenced the number of flashes one would see overriding the actual visual. Proving that sound can alter the perception of a visual to create an illusion.

## The Deception of perception cont.

While our brain is great at finding patterns and discarding non-relevant information, we can learn from the flash and beep experiment that the shortcuts and filtering out - when audio stimuli is introduced, doesn't always give us the appropriate answer required. What we think we see is not always what we see. By exposing this major flaw in our ability to perceive, it is important that one can find ways to either rectify this problem or manipulate it to our advantage. When you introduce a visual that has recognisable audio association you are utilising iconic-coupling. (Haverkamp 2009) The use of sound can then be affirmed that when combined with visual stimuli creates a supportive reinforcement to the multisensory connection that might avoid possible confusion or misinterpretation.

Recognising what we actually visually absorb requires attention, as if we have not created a connection, the brain discards the information. We have perceived the visual but only on a very shallow, non-taxing awareness level. The creation of the visual illusion forces further engagement giving our focus a greater possibility to form a memory.

The scope of this work is to explore how sound influences what we see. So it is important that the spectator is in a good 'state of mind' or zone that might best hold their attention – increasing the chance of recognition to the visual perception. The introduction of the visual illusion to create engagement is one option. Another is by creating artwork that encourages the oscillating of figure and ground or intertwined elements forcing the spectator to be more actively engaged, to resolve the visual elements.

As Crary (2000) discusses the work of Seurat, the rhythm of shifting back and forth between these poles challenge the viewer in their ability to fixate on the whole image or the pointillist style technique of the painting. Crary then poses the comment that:

"Perception is something that can be prior to or fully outside of a visual organisation of figure and ground." Crary (2000 p. 160)

It is this uncertainty that I wanted to create visually; to create a piece that might challenge and engage our attention and the way we perceive. The design has gone further with abstraction and the relationship between subjects within the studio work while all connected – is not immediately apparent.

Colin Ware (2012) discusses visual thinking with the approach of cognitive productivity. Ware's work in 'Information Visualisation' brings together how we interact with information and in particular how data might be delivered visually in the most effective and efficient manner. Most of the time we simply do not register what is going on in our environment unless we are looking for it. We see what we want to see. And as any magician would tell you, it is very easy to trick what you see with what you should see. (Rensink, 2008)

## To see or not to see

To support how we can be tricked comes back to how little information we actually take in. Also how many logical decisions are made based on the task at hand. When we are not expecting something to happen while engaged on a high-level attentive mission our visual perception is incredibly limited. This phenomenon is called Perceptual or Inattentional blindness. (Noë & O'Regan 2000)

So, can music assist inattentional blindness? Inattentional blindness is when one does not notice or register a visual that is in plain sight. A perfect example of this blindness is the Gorilla Test. (Simons and Chabris 1999) In this experiment you have two teams of three people; one group in black, the other in white and each team has their own basketball. You are asked to do the simple task to count the number of times one of the teams passes the basketball. You are so focused on the task at hand that you might easily miss the gorilla enter the stage, stand in the middle then leave. Yes we have been tricked. Or what is more easily defined in that our very limited perception has been given a specific focus and at the same time another element has been introduced effectively working against our visual limits. Introduce a gorilla sound effect as the man in the gorilla suit walks into view and our ears will come to the rescue. While the concept of applying an alert sound is not new to catch our attention, or redirect our focus to a specific event, the illusion is broken. In the 2010 version, (Fig. 5) the illusion was expanded. While we might be looking out for the gorilla we still might have missed the shifting colour change of the curtain and one of the players leaving early.

Here we can clearly see the difference between high and low level focus. If I was less interested in the exercise of following the basketball and counting the passes, I would have more likely noticed the gorilla. But when I'm fully concentrating, logic would say that I should not miss such a simple trick. It comes back to the *Einstellungseffekt* again, not only are alternative ideas not considered, we are not open to expect something outside of our normal, logical, visual world that we have mapped inside our heads forming the very picture of our understanding.

"Visual attention is perhaps the aspect of vision most closely associated with conscious visual experience, that is, the 'picture' we receive of our surroundings." Rensink (2000 p. 70)

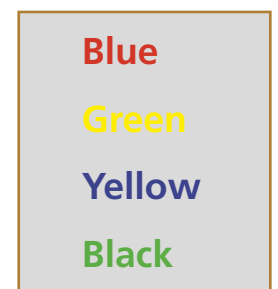
The intent of our goal or focus drives us to what we wish to see and not what is actually there. And the more I focus logically, the more I narrow down my possible chances imagination and intuition might assist.

"Logic will get you from A to B. Imagination will take you everywhere."  
Albert Einstein

The '*black*' thought connection is important as we use it to assist in many almost automatic processes – like reading. You almost do not need to focus on many words as their very shape is easily recognisable. Our reaction time to respond to the challenge of connecting a shape to a visual meaning, is then reduced. To show how hard-wired our shape recognition is, the Stroop Effect (Fig. 6) where one needs to say the colour of the ink is a great example. The brain really wants to just say the printed word before we can stop ourselves.



**Fig 5: Gorilla Test**  
Simons & Chabris (1999/2010)



**Fig 6: The Stroop Effect**  
John Ridley Stroop (1935)

## To see or not to see cont.

What is interesting is that the test is easier to do when the words are all in capitals, as we do not draw on our automatic shape memory of the word. When all presented in capital letters, it brings the words onto a more even playing field. Like the word 'the'. We hardly need to even see or register the word. We don't need to sound it out, the very shape over many years of practise gives us an automotive response allowing for more attention to be given to the actual texts meaning.

Without the combination of sound, the active visual attention triggers a more logical visual response. By utilising appropriate audio stimuli, we are more likely to keep open our creative mind, our '*white*' thoughts encouraging the internal oscillation. Attention can then pass from a static '*black*' state to a flexible, '*white*' state as:

"only with continuity between these states that vision can be unhinged from the coordinates of its social determinants."(Crary 2000 p. 127)

In this state, which we could use the sporting term of 'in the zone' - where the sensation of time slows and the mind is fully engaged, we have created an environment which will greatly help us reach our 'eureka or aha moment'.

From this we can draw the conclusion that not only do we not see very well, we also are easily tricked and to finish us off, we do not even notice major visual changes when we are doing something else that is requiring our concentration. It is also important to recognise that:

"attention is necessary for visual experience." (Rensink 2000 p. 70)

One might argue that attention was being used when counting the basketball in the gorilla experiment – yet most still miss the gorilla, the person leaving early or the coloured curtain change. It seems that I can perceive, be attentive and still miss information. This is where audio stimuli can assist by multisensory coupling. Sound can trigger and alert, remind us to reengage with the whole scene, like searching for the predator after hearing a roar.

## Influence of sound

Over the past ten years I have used music in my design classes. One creative exercise is where I select 5-7 pieces of music ranging from the works of *Holst* through to *Vangelis* or *Glass*. I then finish with my composition of *Druids Prayer*. After each piece I ask the students to write / draw what they feel and see. The students are not synaesthetes but the focus on the audio to stimulate a visual takes us beyond just finding a visual metaphor. In some case there is an immediate iconic connection. In that the crash of the cymbals could sound like waves smashing on a boat or the rhythm of music could be replicating our racing heart before an event or battle. We draw on sounds that connect to our emotive states and we find ourselves acting out roles as we immerse ourselves to the music, all without any visual. To close their eyes and see what image might form. The exercise is effective on many levels. It encourages students to communicate, it offers other avenues for a creative response but the over-riding response is that of surprise. They are genuinely surprised that many see the same or similar images - or a story or plot playing out in their minds. Many feel the same emotion or are drawn to similar life experiences. In most cases the music has not been heard before, but there are themes, rhythms or sounds that shape and direct their individual responses.

Levitin's (2007, 2008) work on music and the brain explain the relationship that humans have with song. By defining six categories of songs which include love, knowledge, religion, friendship, comfort and joy that are found in almost all cultures - past and present, put forward compelling arguments when connected to human evolution and the importance of sound. He also goes deeper in explaining why we connect information, melody and rhythm together to form stronger binding memory. As an example, knowledge songs might have helped remember which plants were edible or where to look for water. Through the inclusion of rhythm and melody we find the information easier to be memorised when put to song; like the simple tune used to teach the alphabet. One interesting experiment involved the musician Sting, explored in the Dr. Levitin's documentary 'The Musical Brain'. This is where Sting is put under an M.R.I machine and they track the parts of his brain in how it responds to sound and music creation. Through other experiments Dr. Levitin explores how Dopamine is released and how certain parts of the brain fire in sync creating a stronger musical memory.

While it out of my scope to fully explain the mechanics of the eye and ear, the ear can respond to minute variations of pressure offering a large range of audible frequencies and directional focus. So when hearing occurs, the audible sound enters into the ear structure; via the pinna and auditory canal. This causes the vibrating of the tympanic membrane which then transfers energy through the ossicles to the inner ear; which in turn sends electrical impulses through the auditory nerve to the auditory region of the brain. Within this process it uses the outer ear as a preamp for sensitive quite sounds with also protective mechanisms against the dangers of loud sounds. Also within this process we can perceive pitch, loudness, timbre and in many cases direction. All which can happen in an extremely short period of time.

## Influence of sound cont.

The body also responds physically to sound. From dance to simple foot tapping, we like to physically feel the rhythm of the music. But what about our mind? Does our brain respond to sound? The obvious answer is yes; we hear words, music and sounds and through years of understanding connect these snippets, we respond. We also find it can affect our moods – our emotions.

A more formal scientific study in this field is *psychoacoustics* in that of sound perception. *Psychoacoustics* integrates the ear-brain system with the whole hearing process. This area of study has helped develop complex systems – like music compression, and why certain frequencies can be removed without audible perception. By also researching horizontal sound positioning, spacial sound positioning perception and how it rendered in the brain, technologies like surround sound, speaker design and compression have been able to be better understood. Effects like binaural beats – when two sounds are subtly different when played simultaneously, generates a frequency or beat that can influence particular brainwaves. This also connects to why chant and other meditative musical instruments like the harmonic bowls trigger brainwave entrainment. Taken commercially but worth noting is the hemispheric synchronization or *Hemi-Sync* audio technology developed by Robert Monroe. Exploring the concept that if both hemispheres are in symmetry and are functioning in harmony – by the use of specific music, can result in a more focussed brain.

With a better understanding of *psychoacoustics* and being exposed to the concept of binaural beats helped connect that sound can be used to not only alter our emotive states but also assist in influencing particular brainwaves. So the leap from this point to my abstract is not big but I feel important. As sound can influence and assist in creating greater brain-wave activity especially across both hemispheres, then sound can influence what we see based on what we hear.

In the movie 'Jaws' we can picture a shark and water – which makes sense, in their natural environment. If we heard a scream or the splashing of water, we would be making an iconic connection but introduce a sound that has no immediate iconic connection to that of a shark and we are still able to draw on deep, emotive feelings from the movie. For many they have made the sound of those two notes an iconic connection to the actual shark, creating an artificial synaesthetic experience. I say artificial as the two notes are not what a shark sounds like when it is about to attack - though it would be helpful if they did. We have used long-term memory to connect to the movie, and an even longer-term memory of that of perceived danger from our primitive beginnings. We might not have even seen the movie, yet we connect this sound with a sense of danger.



## Influence of sound cont.

The iconic coupling of a specific visual and sound helps produce a positive result. As the sound from 'Jaws' has such a strong emotive feeling of danger, the brain's ability to find an answer will also assist the spectator in making the cross-sensory connection, which provides the base on which iconic coupling can be established. (Haverkamp 2009)

In this moment we have created a heightened sense of 'alertness'. The brain wants to make sense of what it is dealing with - like the anthropomorphic forming of faces out of random visuals. The brain also has preference for simplicity over complexity, pattern over randomness and to form a visual hierarchy and balance. The use of auditory hierarchy can then be achieved when supporting sequences of iconic-coupling events that are integrated into both the music and visual composition. The coupling or fusion of these mediums gives the spectator multiple ways to stimulate imagination and to form stronger cross-modal / cross-sensory, artificial synaesthetic experiences. This encourages the release of one's dopamine reward which in turn helps form a stronger binding memory.

By using music to assist with the selectivity of attention, we can add another layer of assistance in trying to reach a clearer outcome than just relying on our visual perception. As we respond to sound much faster and across more parts of the brain, we can use sound as another pathway to join the resulted vision, allowing for better absorption and connection into memory. (Rensink, 2000).

Sound. In a sense, it is the sense that makes sense to use as no matter what language, age or profession we can all respond more similarly. In the major work 'Inner sense' I have therefore used iconic-coupling to create strong binding connections. I have also used specific audio pieces that also have meditative qualities and the use of harmonics, all which help with brainwave entrainment. More specific elements of audio in regards to the studio work will be discussed further in Chapter 3.0

## Audio perception within contemporary design

Audio perception is used in contemporary design including multimedia pieces, installations, film, computer games and interface design. Currently the use of sound does not play a large part in web design and much of online advertising as it is distracting yet we will quite happily have music of our own playing. Many computer games even have specific musical scores written to complete the overall experience, heighten our emotions, direct our attention; reward and give warning. A classic game example is that of 'Mario Kart.' The introduction music prepares the player and creates an overall positive state. The count-down and supporting music builds anticipation and focuses attention. Reward sounds are given throughout the game play including when picking up special abilities or causing damage to others. The final lap has a different audio track which also builds the tension as the race reaches towards its climax. Throughout, the characters themselves chirp out little comments - some random which adds to the overall appeal.

### 2.1.1

In the interaction that happens between the visual and the spectator or player; sound adds another dimension to what we see. Whether it be film, television, commercials or a walk in the bush, all help shape the connection to our overall experience, assisting in the direction the artist, or director might wish you to go, feel and remember.

What happens when we deliberately combine the two? Sound and image. In the example of the Resurrection Symphony by Gustav Mahler, a new interpretation in 2006 was performed. It was combined with 3D abstract visuals by Johannes Deutsch blending a different interpretation that focused on the visual emotion portrayed by the music. Objects represented emotive feelings that correlated with the different movements adding another dimension to the already strong visuals that the music itself conjures. It is a powerful work in which I was fortunate enough to have participated in the performances, singing with the Melbourne Chorale back in 1989 with the Melbourne Symphony Orchestra at the Melbourne Concert Hall.

Further examples of audio perception is that of Callum Morton's work 'Habitat' which connects sound to our imagination from our own life experience and that of the family home or house sharing. The sounds connect to our reality, our environment and bring forth its own visual. Morton's work, by limiting the visual experience also forces the spectator to rely on other senses and by the very nature of the more voyeuristic approach allows for a greater ease to one's imagination.

Many films have powerful, emotive soundtracks that are well composed to support the visual. Cases like *Jaws*, *Psycho* or the breathing of Darth Vader connects to a specific sound event which helps form a memory (*real or not*), or an image (*from the movie or not*) which is imprinted with incredible clarity and recall. In another exercise from Dr. Levitin which highlights recall was done by playing just a single cord from songs to test people's ability to connect. One example was the first piano cord from Elton John's '*Benny and the Jets*.'

## Attention and memory

What happens when a creative '*white*' thought triggers a memory, an image, a sound or a shape? Does that shift the current state back to ones own '*black*' thoughts? Does one allow the distraction or process, potentially diluting the current experience? Does one even notice the shift in attention? Applying one's own predefined concepts and understandings to what has been experienced has merit but not if it was not the goal when trying to stay attentive to the task at hand. Like having a phone message pop up while you are in a meeting. The very sound and flash has distracted your attention. Freud's approach when analysing patients was to stay immersed, trying to keep everything in a low-level focus without imposing personal inclinations and assumptions, allowing an almost deliberate suppression of thoughts before being perceived.

While thinking occurs on many levels, the final pipeline to what becomes an active thought feels singular. In one's mind it seems to want to hold only one thought at any one time; while juggling the many other fleeting snippets of information and stimuli. Imagine what is happening with 'packet switching' of data down a single cable. The information might contain many threads or snippets of data but only when fully downloaded does it become complete and real. But underneath there was many different messages building up, but only one at a time being completed.

When approaching problem solving, the encouragement of intuition should take the lead when dealing with '*black*' and '*white*' thoughts. On the '*black*', I draw on the past. I connect, I recall, I process based on my learning, education and experience. This habitual process leaving a logical answer efficiently and without breaking the fabric of my own world reality. This dominant player for many people is why we struggle to see 'the plane crash' from the log cabin. The lateral - creative brain or '*white*' thoughts allows me to play. There are no rules, the structures – if any, are not consciously forced, allowing for the joy of the experience to be the focus of my attention. Here I '*make it my own*' without judgement or scepticism, like a child's imagination that hasn't been institutionalised.

The phrase '*make it my own*' is important when connection information to memory. Rather than just learning through being told, or by mindless repetition, the ability to self-discover again connects to the 'aha moment.' To work something out for oneself, greatly assists the positive reinforcement in the brain and the resolution of a problem. That is not to say as an Educator that we leave students to their own devices; but create environments that facilitate and guide students to self-discovery, making the newly introduced information, relevant, and your own.

## Space

Attention can also be assisted by the way one engages with an artwork through the design and layout of the actual space. Most spaces for entertainment, sport or music have been specifically designed to bring you closer to the action, or to assist with engagement.

Richard Wagner's designing of the Bayreuth to hold some of his Opera's is a great example. Bayreuth space supported attentiveness through the specialised construction of the stage. Its depth, the proscenium arch and orchestra pit all helped to create illusions which have formed the bases for the modern stage theatre today. Wagner realised that to maintain attention one needed to be engaged. From the stage to the design of museums, the very space itself needed to help create a connection.

Museums and specialised exhibition spaces are also exploring the use of sound to create more immersive experiences. The Experience Music Project E.M.P (Bruce 2008), even drops the museum title to try to shift from the preconceived model of that of a museum. Many utilising audio tapes or more modern devices giving in-depth information. Projects like EMP and ec(h)o (Hatala 2004) have taken this further; with tracking the spectator and modifying the audio content and general information based on the time one spent around a certain artefact or installation, even connecting information from other museums. Projects like SHAPE (Ferris & Bannon 2005) also looked at the actual space to try to create environments that encouraged interaction. By creating copies or artefacts that could be handled and spaces that could feel more comfortable, encouraged exploration and better connections to the spectator; making them more active in their learning. When one is more engaged, one is more attentive, less easily distracted and more likely to be in a better head-space to take on new information and *'make it their own.'*

## The prequel to 'Inner sense'

The journey of my Master's project needs a little background which became the first thread of my heuristic inquiry. While the past four years is a culmination of new reading and investigations, the main idea actually started from a single piece of music. Created out of a recording session back in 1998 at the sound laboratories of R.M.I.T, a song later titled '*Druids Prayer*' was born. Performed by seven singers of '*The Eternal Choir*' with myself leading the improvisation. The musical style incorporates the Tibetan or Tuvan throat singing technique, also known as '*harmonic singing*' which has a beautiful yet haunting sound, accentuating the harmonic frequencies that give colour or timbre to sound.

It was during this recording that I become deeply aware of the power of sound and how one might draw a visual responses from music. In particular how people could envisage or see certain visuals when listening to music; basically creating the vision for your own internal cinematic experience using your own imagination and connectedness to the moment.

What was most exciting that the two strong visual and emotive feelings I had while singing this piece - *which I need to emphasis was an improvisation*, were visually similar to what the rest of the group saw and felt. Allowing the recording to ebb and flow through the improvisation as if we were all reading from the same score. This is not a genuine synaesthetic experience in the way some people can see colour and shape, it relies on one's own imagination when combining cross-modal interactions in visual perception. (Ramachandran and Hirstein 2001), (Haverkamp 2009)

After many musical performances, members of the audience would talk about seeing certain images, or being moved to tears. It seemed the simple, harmonic, meditative sounds could greatly influence a spectators experience and connectedness to the music. I was fascinated and wanted to better understand why? A part from the body being made of about 70% water, which is a pretty good resonator I had little explanation to the power of sound.

While not intensionally going out to design an '*artificial or acquired synaesthetic*' experience in my studio work, the fact that I am using similar stimulations of more than one sense, creating a cross-modal coupling of audio and visual stimuli has strong parallels. In the process of using sound as both an emotive trigger and as a guide I wished to explore how sound might influence a hierarchal structure in my design. This coupling also has the potential to stimulate more areas of the brain and in turn assist with a clearer design outcome, by creating an environment that encourages attention. (Whitelaw 2008).

## The inner workings of 'Inner sense'

My starting point in the creative process was listening to a large quantity of music that I thought might favour a specific emotion or image; this included the pieces I used in my creative music exercise over the past decade. The conclusion drawn from these exercises was that nearly all students could use their imagination to form visuals when listening to specific music. What also emerged from these classes was that in many cases the same or similar visions and feelings were formed. By combining a few of these images became the bases of the first studio work, titled 'Inner sense.'

I then started building on a more complex medley, weaving new tracks together. This process was very fluid, each time feeding new images that I would add to the major work. Artwork went through many stages of abstraction as well as refinement, slowly breaking down some of the more recognisable elements. Most of the final pieces had been sketched manually first which gave me more control of the positive and negative space and where I might be able to overlay new images. As this process progressed, research was being explored in many different fields – each adding another insight and possible direction. Works from Jung's *'Man and his Symbols'* (1964) and Hofstadter's *'Gödel, Escher, Bach and the Eternal Golden Braid'* (1979) opened my mind to the way we think. Exploring the work of Levitin also assisted greatly in giving me the confidence in what I was thinking in regards to the use of music; which was that sound was more deeply connected to the way we think, create and remember. This led me to Sacks, Ramachandran and Mithen in their work on the brain and the use of sound. I was also exploring synaesthesia and the connection with colour as well as harmonics in the timbre of music and their similarities.

As the artwork became more abstract and after some montage experimentation in Photoshop – which assisted in the balance of the composition, I felt that I could push the process further if I removed colour. This was done after reading works from Rensink which got me thinking about perception, magic and puzzles. I'd long been a fan of Edward de Bono so he got another look in which helped bring in the creative and lateral thinking process. This also helped confirm that I was on the right path in staying black and white and the relationship with the 'Gestalt' and 'Design Principles' helped give me a framework for the design.

Another useful direction was the reading of Crary and his dissection of Seurat's paintings and the artist's own approach to pointillism. The connection of the spectator and their attention was also important. Looking at how we see, engage, focus and remember all relating back to what we see and how much we see. And through all of this the simple question of whether sound influences what we see remained.



**Fig 7 A-D: Inner sense**  
Concept sketches



**Fig 8: Inner sense**  
Photomontage concept

## The inner workings of 'Inner sense' cont.

Within the studio work however, I have also tried to limit the design principles that intentionally direct the spectator. It could have been quite straight forward to make an element move - drawing a dynamic emphasis to any point of the work. Objects could have been coloured – to influence the eye to a particular event, so I have tried to keep the artwork as neutral as possible; by staying black and white. By stripping out a logical flow and not deliberately creating a hierarchy or using proximity to connect elements, I have attempted to see if music could help in influence your perceptual awareness. Which is why it has been so important to keep the work static and also have the design as abstract as possible. In this way I am exploring how we respond to quite an overwhelming visual experience. In that I mean, by its scale, puzzles and the construction of visually abstract elements, generating the 'sticky factor' utilised in computer game designs. Rewarding the player both with little challenges and goals which creates a longer engagement and when finding resolution. It all comes back to attention and how we understand what new information we are extracting from visual perception and then '*making it our own.*'

While the spectator might try to group certain elements together - using our proximity principle to form more visually recognisable shapes, many are used to build more than one. This has been done to force the viewer to re-evaluate and oscillate their perceptual experience rather than just allowing for the natural grouping that we do when looking for patterns.

The final page structure for '*Inner sense*' has been built around two golden rectangles and while the eye or circle is symmetrically centred, the remaining elements create a non-symmetrical balance. Each side has been set to be visually neutral; not forcing either side to have dominance over the other.

In the breaking down of many of the objects – or the visual to its lowest level, could be seen as an almost repeating pattern of small, insignificant shapes. Each element is different and each has been created to follow the flow of the desired parent object or objects. While it could be argued that the eye in the middle of the work is the centre of interest when there is no music, I have tried to limit any particular piece to claim the overall focal point.

I have deliberately utilised white space, exploring the relationship between the figure and the ground. Right across the exhibition pieces, I have used this principle to both challenge the mind in what you might be engaged with and also – depending on where and when you might be viewing, having the elements shift between the planes; like the classic Gestalt vase. In this figure-ground space, I found that one could create a visual interest much stronger than just working with more photo-realistic artwork, forcing the viewer to work harder, oscillating between high and low attention to the visual challenge ahead. The brain, wanting to find simple solutions - groups, collates and searches for meaning – looking for avenues to find closure and understanding. The mental process involves much more than a simple peripheral glance, which might have given almost no visual or mental impression but through the use of music each stimuli is helping to create a stronger bond to their memory.

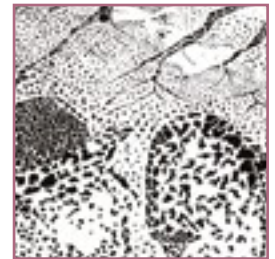
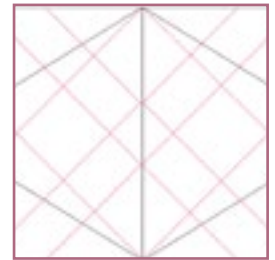


Fig 9 A-E: Inner sense  
Development

## The inner workings of 'Inner sense' cont.

While the canvas size is exactly double the width of a golden rectangle in the final version of *'Inner sense,'* I have tried not to create dominate visual structures that also might adversely influence the viewer. Similar to the dynamic lines, the composition has been crafted to visually connect but also not to intensionally direct. By distinguishing dark-light edges, one creates an invisible connection to the scattered elements. The visual might then trigger off a possible reactivate recognition from existing knowledge or simulate an artificial experience based on one's life experience; efficiently and logically finding resolution within the visual. While the eye will move from one element to another based on the natural direction that the work might undergo, the music again is the key to see how it might influence the spectator.

One of the key iconic-couplings explored within *'Inner sense'* is the use of the shark fin. While this is not the fin from the movie *'Jaws'*, the sound that is associated with *'Jaws'* is introduced within the music composition. At this point the shark fin has been in view for two minutes and this sound works well as an alert sound. We know (*from the movie*) that this means shark. We can also guess for those who have not seen the movie, from the emotive tones generated, that this is scary and there is danger. From the connection of the shark we look towards the bottom of the screen. Why? Logic would say that water would more likely be below the horizon line and if we had seen a ship or recognised water we would have our best chance to find our immediate task. If the fin had already been discovered, you are also drawn back to this space as we want to connect the two, the sound and image, to complete the puzzle.

Within the final version of *'Inner sense'* there is over 40,000 unique elements that help form over twenty different images stretched over the 5,265mm x 1,600mm artwork. The final also uses fifteen different musical tracks woven into the 6:20 composition with another thirty different tracks that had been used through the development process. Just as many images also didn't make the final, including the constellation, clouds and the path of the sun over one year.

One of the hardest components to the construction of the work was in the arranging of the music. *'Druid's Prayer'* was used as the basic starting point as I then introduced some of the strong emotive music used from class exercises. One of the strongest audio pieces was *'Mars the Bringer of War'* by Holst. When combining certain extremes of music, with different key signatures, rhythms and styles, the ability to create smooth flow that still held the integrity of each piece could be easily broken. In some cases like the Parisian carnival sounds had to be used to tie back to the Seurat crowd situated in the work. Others were able to be adapted, edited or swapped as the artwork evolved. The music has also been designed so it is a seamless loop to further explore one's focus and attention.

The development of the second work – while smaller, has evolved from the digital proto-type of *'Inner sense'* that was shown and scaled to work on a computer screen at a Staff Exhibition at the Australian Academy of Design in August 2012. During feedback, discussions about male and female energy was raised and it was from this that *'Elements'* grew.

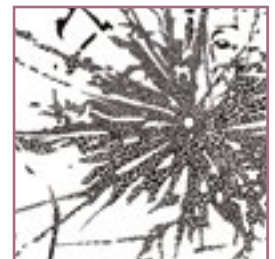


Fig 10 A-B: Inner sense  
Development

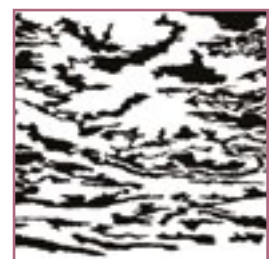


Fig 11 A-B: Inner sense  
Discarded Elements



## The sequel to 'Inner sense'

I wanted 'Elements' to have a stronger feminine feel with also an emphasis on beauty; both in the physical and in the beauty of the music chosen. I wanted to explore the emotions and feelings this time which was less extreme - more subtle. As I connected the works, the tree of life, became a strong symbol to help hold the work together - mother nature; and to the four seasons, which then brought me to the five elements – in this I include *thought* as the 5th element. The final dimension of this work sits at 1,100 x 1,100mm and the composition length of 7:23 minutes. Twenty different tracks were used in the final composition and eighteen unique images.

With the construction of the interactive exercise, I wanted to showcase how powerful and effective our musical brain is – in regards to its ability to not only remember sounds, but also guess its emotive feeling or meaning; whether or not we have heard it before. From simple alert sounds through to snippets of sound from the creative music pieces used in class. As part of this on going exercise I have experimented with the use of simple shapes and four different musical tunes – each with their own theme, but each has the potential to relate back to the simple shape shown. In the case of (Fig. 13-F) the shape is a simple triangle – with four possible options – to four selected but randomly played tunes. Egyptian music, theme from Harry Potter, Jaws theme and that of fire. Once the music has completed, the four options of pyramid, witches hat, shark fin and fire is shown.

This exercise wishes to show that our visual perception can be influenced, and that sound is more accurate, more dominate and more subtle; assisting the spectator when engaging with new information.

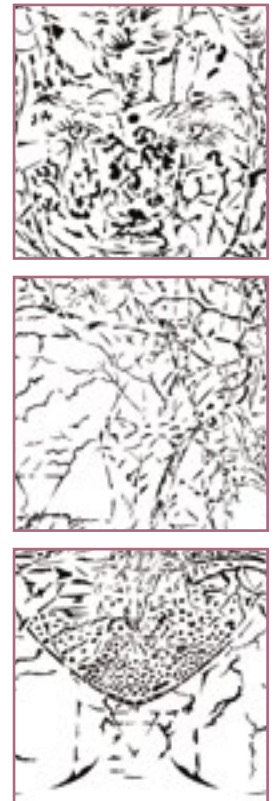


Fig 12 A-C: Elements Development

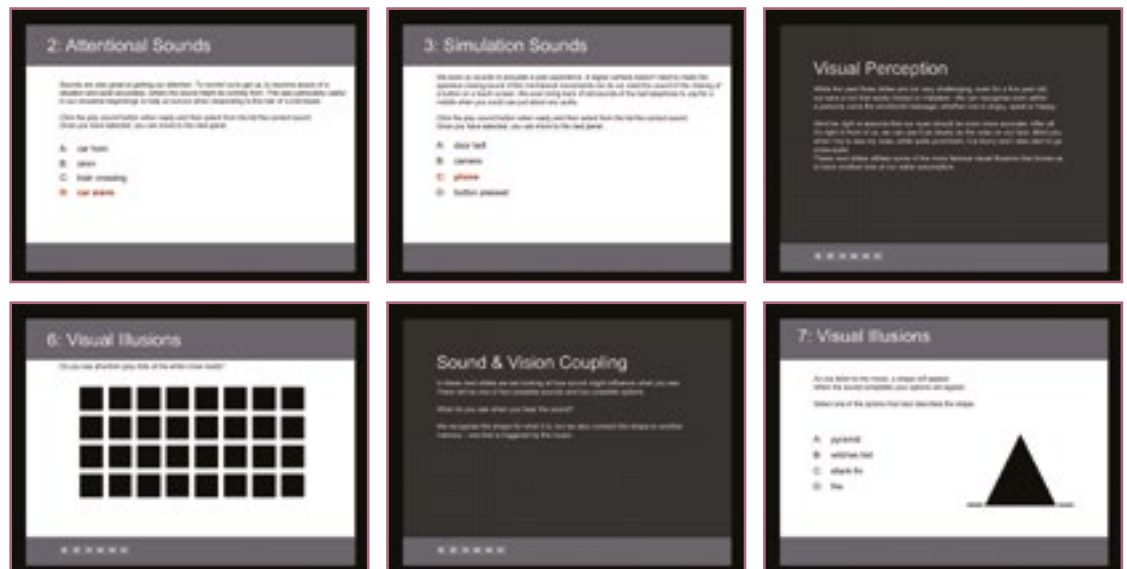


Fig 13: Interactive Exercise Flash

## Conclusion

In order to solve a problem one needs to create engagement. With the addition of music, further stimulation is made to more parts of the brain. The simulation generated through artificial synaesthesia influences our visual perception. This is done by creating correlations between auditory and visual elements, forming deeper cross-modal correlations which rewards the spectator through the release of dopamine; which in turn assists attention, focus and memory retention.

Utilising the methodology of heuristics as a form of inquiry, has assisted in a more flexible design process – in the generation of ideas and discovery of supporting research. As further understanding and awareness of new knowledge and opinions was introduced, connections and supporting arguments were able to be formed. While the concept was to always involve the use of sound – and to explore its influence over what and when we might perceive, the use of visual puzzles and illusions created another avenue to engage attention.

Combining music, puzzles or visual illusions helps create attention. Once the problem has been resolved or the discovery of something new has materialised, the reward of recognition creates an even stronger lasting experience; as discussed with the examples of the Fedex wordmark and the dalmatian image.

Sound, used as a way to assist and guide through '*black*' thoughts connects to one's own pool of knowledge, forming the bases of a plausible logical solution. Running parallel is imagination. It is within this fluid state which offers both the designer and the spectator an opportunity to explore more diverse solutions.

In this exegesis I have asserted that even a static piece of artwork, when designed appropriately, can utilise music to assist as a hierarchical guide, creating a greater connection with the spectator. This is not to say that there is only one hierarchical path to follow in the interaction of these studio works, as each person's journey is unique. The sound is a guide, to offer, suggest and at times influence or force a response; creating connections with the spectator's own experiences and imagination.

With better understanding of the way we learn, and the way we approach the creative process, one can design more personally engaged design and interactive experiences. With the growing attention around user-experience in the fields of digital media, further exploration to the importance of audio stimuli in design and design education is needed. Which leads us to the very essence of how we listen, think and '*make our own.*'

## Appendix 1: Music Reference

### Music Explored: Inner Sense

While I could have listed thousands of pieces, I have narrowed the supplied list to music that was at some stage used in either the class experimentations or tracks that had been used at some stage during the development of the final piece. Also included are the final tracks used for 'Inner sense.'

Classroom [C]	Development - not use [D]	Final [F]	
Mars, the Bringer of War	The Planets	Holst	[C] [D]
The Journey	1492	Vangelis	[C] [F]
Chariots of Fire	Chariots of Fire	Vangelis	[C] [D]
Gabriel's Oboe	The Mission	Morricone	[F]
The Unanswered Question	Universe Symphony	Ives	[F]
Concerto In E Minor	The Double life of Veronika	Kieslowski	[C] [F]
Koyaanisqatsi	Koyaanisqatsi	Glass	[C] [D]
Oxygene Part II, IV	Oxygene	Jarre	[D]
Part I + II	Tubular Bells	Oldfield	[D]
Countrywide	Dare to be Different	Emmanuel	[C]
Druids Prayer	Cusp	Eternal Choir	[C] [D]
The Wheat	Gladiator	Lyndhurst Orchestra	[C] [D]
The Battle	Gladiator	Lyndhurst Orchestra	[C] [D]
Mercy in Darkness	Archangel	Two Steps from Hell	[F]
Atlantis	Archangel	Two Steps from Hell	[F]
Heart of Courage	Invincible	Two Steps from Hell	[F]
Infinite Legends	Invincible	Two Steps from Hell	[D]
Master of Shadows	Invincible	Two Steps from Hell	[F]
Invincible	Invincible	Two Steps from Hell	[F]
<3	<3	Bergerson	[D]
Age of Gods	Illusions	Bergerson	[D]
Illusions	Illusions	Bergerson	[D]
Adagio, Allegro moloto	Symphony No.9	Dvorak	[D]
O Fortuna	Carmina Burana	Orff	[D]
The Eve of War	War of the Worlds	Wayne	[D]
Kumbalawé	Saltimbanco	Dupéré	[D]
Lament	Riverdance	Whelan	[F]
Jaws Theme	Jaws	Williams	[F]
Main Title	Aliens	Horner	[F]
Darth Varder	Star Wars	Williams	[F]
Des Oragees Pour La Nuit	Betty Blue	Matin	[D]
Humecter la Monture	Betty Blue	Matin	[D]
Maudits Maneges	Betty Blue	Matin	[F]
Astronomy Domine	Pulse	Pink Floyd	[D]
Until the Last Moment	Yanni	Yanni	[D]

### Other Important Works

Bach's Mass in B Minor  
 Earth to the Unknown Power - David Hykes  
 Tuva - Voices from Center of Asia  
 Antartica - Nigel Westlake  
 Mozart's Requim

Du Fay's Chants & Motets  
 Peaces, Bliss, Cusp: The Eternal Choir  
 Archangel & Invincible  
 Faure's Requiem  
 Carmina Burana

## Appendix 1: Music Reference

### Music Explored: Elements

As this work and concept has evolved in a much shorter timeframe, less were used in the development phase. With a clearer theme of the elements and with a stronger focus on the female energy and beauty helped with shaping the music for possible use.

Classroom [C]	Development - not use [D]	Final [F]	
Send in the Clowns	Dreaming	André Rieu	[F]
Greensleeves	Dreaming	André Rieu	[F]
Romeo & Juliet	Dreaming	André Rieu	[D]
Aria from Madam Butterfly	Dreaming	André Rieu	[D]
Adagio in G Minor		Albinoni - Giazotto	[F]
Air on a G String		J.S. Bach	[F]
Storm	Southern Dreaming	Simon Lewis	[F]
Any Other Name	American Beauty	Thomas Newman	[F]
Hymn 573	Rafael Perez Arroyo	Age of the Pyramids	[F]
Ocean Princess	Illusions	Thomas Bergeren	[D]
Femme Fatale	Illusions	Thomas Bergersen	[D]
<3	<3	Thomas Bergersen	[F]
Love & Loss	Archangel	Two Steps from Hell	[F]
Annie's Song	Greatest Hits	James Galway	[F]
Lucia di Lammermoor	5th Element	Eric Serra	[D]
The Diva Dance	5th Element	Eric Serra	[D]
The Lonely Shepherd	The Lonely Shepherd	Gheorghe Zamfir	[F]
Interlude	Cusp	The Eternal Choir	[D]
Lakmé, Flower Duet	Opera 2011	Joan Sutherland	[F]
Nocturne	Secret Garden	Secret Garden	[F]
The Rose	Simple Gifts	Bryn Terfel	[D]
Amazing Grace	Simple Gifts	Bryn Terfel	[D]
Gaia	Ancient Greek Music	Conrad Steinmann	[D]
Raindrop	Life is Beautiful	Frédéric Chopin	[D]
Lohengrin	Opera Choruses	Richard Wagner	[D]
Initiation	Initiation	Phil Thornton	[F]
Storm	Southern Dreaming	Simon Lewis	[F]
Fiery Nights	Lord of the Dance	Ronan Hardiman	[F]
Gypsy	Lord of the Dance	Ronan Hardiman	[F]
Celtic Dream	Lord of the Dance	Ronan Hardiman	[F]

### Other Important Works

Berlioz: Symphonie Fantastique	Cirque Du Soleil: Saltimbanco	Enya: BBC Recordings
Mahler: Resurrection Symphony	Loreena McKennitt: The Mask & Mirror	Clannad: Lore
Bach: Musical Offerings	Riverdance: Bill Whelan	Nyman: The Piano
Double life of Veronika: Krzysztof Kieslowski		
Dead Can Dance: Into the Labyrinth		

	2012: Sem 1 14 Students	2012: Sem 1 13 Students	2011: Sem 1 15 Students	2011: Sem 1 15 Students	2011: Sem 1 9 Students	2011: Sem 1 9 Students	2011: Sem 1 10 Students
song 1	6 Space 5 Battle 2 Battle in Space 1 Lord of Rings	7 Space 5 Battle 1 Pirates	14 Battle 1 Space	13 Battle 1 Star Wars	7 Battle 2 Star Wars	7 Battle 2 Star Wars	5 Battle 4 Star Wars 1 Flying
song 2	6 Voyage 5 Water 2 Going to war 1 Other	4 Voyage 3 Water 2 Titanic 1 Preemptive attack	10 Adventure 3 Ship 2 Other	8 Journey 2 Water 5 Other	6 Voyage 2 Romance 1 Brad Pitt	6 Voyage 2 Romance 1 Brad Pitt	2 Journey 2 Pirates 2 Mountain climb 1 On a boat
song 3	14 Death - Monks	12 Death - Sacrifice 1 Temple of Doom	11 Death - Cult 1 Religious Exp. 3 Other	15 Death - Sacrifice	9 Death - Evil	9 Death - Evil	6 Death 1 Death of Pope 3 Other
song 4	14 Sadness - loss	13 Sadness - finding peace	7 Sadness 2 Lord-Rings - Child 6 Other	10 Sad - Emotional 5 Other	6 Crying 2 Death 1 Seeing self hurt	6 Crying 2 Death 1 Seeing self hurt	
song 5	5 Pain - Loss 4 Long Journey 3 Ancient forest 2 Priest - Monk	6 Pain - Loss 3 Journey 2 Mist 2 Monk - Druid	4 Alone 2 Loss 1 Pain but hope 1 Religious	4 Journey 3 Wizard dying 2 Train wreck in - slow-motion 1 Religious	2 Loss 2 Man on a beach 2 Lost and hurt 3 Other	2 Loss 2 Man on a beach 2 Lost and hurt 3 Other	4 Buddhist Monks

Music Used	
song 1	<b>Mars, the Bringer of War:</b> album: 'The Planets' Gustav Holst
song 2	<b>Journey:</b> film: '1492' Vangelis
song 3	<b>Koyaanisqatsi:</b> film: 'Koyaanisqatsi' Philip Glass
song 4	<b>Van den Budenmayer:</b> film: 'The Double life of Veronika' Zbigniew Preisner
song 5	<b>Druid's Prayer:</b> album: 'Cusp' The Eternal Choir
song 6	<b>Countrywide</b> album: Dare to be Different Tommy Emmanuel

	2010: Sem 1 13 Students	2010: Sem 1 10 Students	2009: Sem 1 12 Students	2009: Sem 1 14 Students	2008: Sem 1 16 Students	2008: Sem 1 17 Students
song 1	6 Space 6 Battle 1 Other	7 Star Wars 3 Gladiator	6 Battle 4 Battle in Space 1 Star Wars 1 Other	10 War 4 Star Wars	7 Gladiator 5 War in Space 4 Other	8 Battle 6 Star Wars 3 Other
song 2	4 Journey 2 Pirates 2 Adventure 5 Other	4 Travel 3 Water 3 Other	7 Journey 3 Titanic 2 Other	8 Adventure 2 Big Boat 4 Other	10 Pirates 2 Titanic 4 Other	8 Journey 2 Pirates 7 Other
song 3	12 Death - Monks 1 Impending Doom	9 Death - Sacrifice 1 Old Church	12 Death - Cult	13 Death - Cult 1 Trapped in Chains	8 Lead to Death 4 Temple of Doom	14 Death 3 Other
song 6	10 Western	9 Mexican	7 Fun, Happy 3 Western 2 Other	9 Country-Western 5 Other	6 Outback 3 Mexican 7 Other	5 Western 2 Camp Fire 10 Other
song 5	2 Incredibly sad 2 Journey 2 Loss 1 Religious 6 Other	3 Pain - Sadness 2 Death 2 Buddhist Monks 3 Other	4 Crying 2 Prayer 6 Other	4 Monks chant 3 Loss of loved one 7 Other	8 Sadness -Loss 1 Before Dawn 7 Other	4 Lost 1 Yearning 1 Monk praying 9 Other

The data collected is from the time frame of 2008-2012. Data from between 2001 - 2007 was not able to be used as written information was not kept.

Songs 1-3 and 5 was used throughout all exercises over the past twelve years.

The music exercise has been delivered to both under-graduate and post-graduate design students at Monash University and Swinburne University.

Data shown in the tables represents the classes held at The Australian Academy of Design.

Students did not get to see the name of the song at any stage.

Students were encouraged to draw - write what they saw and felt. They were also strictly told not to communicate with each other in which they might distract or influence.

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## Appendix: Design of Research - Heuristic Rules

### Four Basic Rules to Optimise the Chance for Discovery

- Rule 1:** The research person should be open to new concepts and change is/her preconceptions if the data are not in agreement with them.
- Rule 2:** The topic of research is preliminary and may change during the research process.
- Rule 3:** Data should be collected under the paradigm of maximum structural variation of perspectives.
- Rule 4:** The analysis is directed toward discovery of similarities.

Extracted from:

The Qualitative Heuristic Approach:

A Methodology for Discovery in Psychology and the Social Sciences.

Rediscovering the Method of Introspection as an Example

*Gerhard Kleining & Harald Witt*

FQS Forum: Qualitative Social Research

Volume 1, No. , Art. 13 Jan 2000

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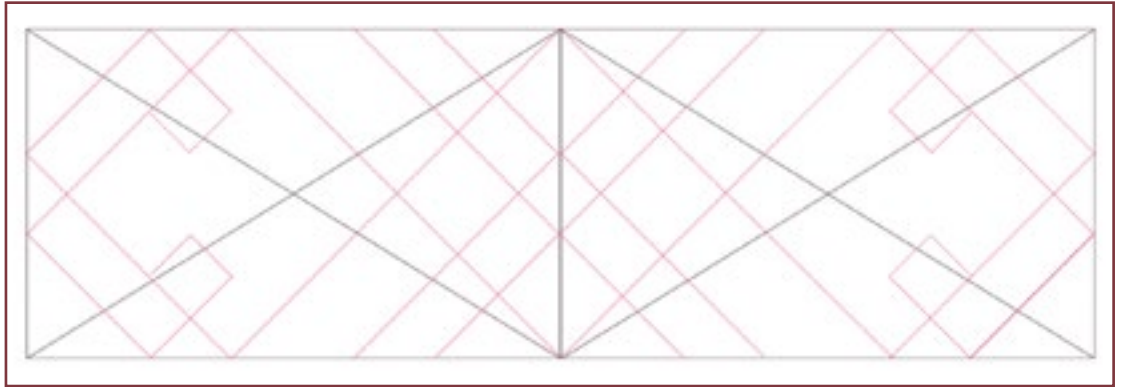


Fig.1 *Grid Structure Planning*

Illustrator

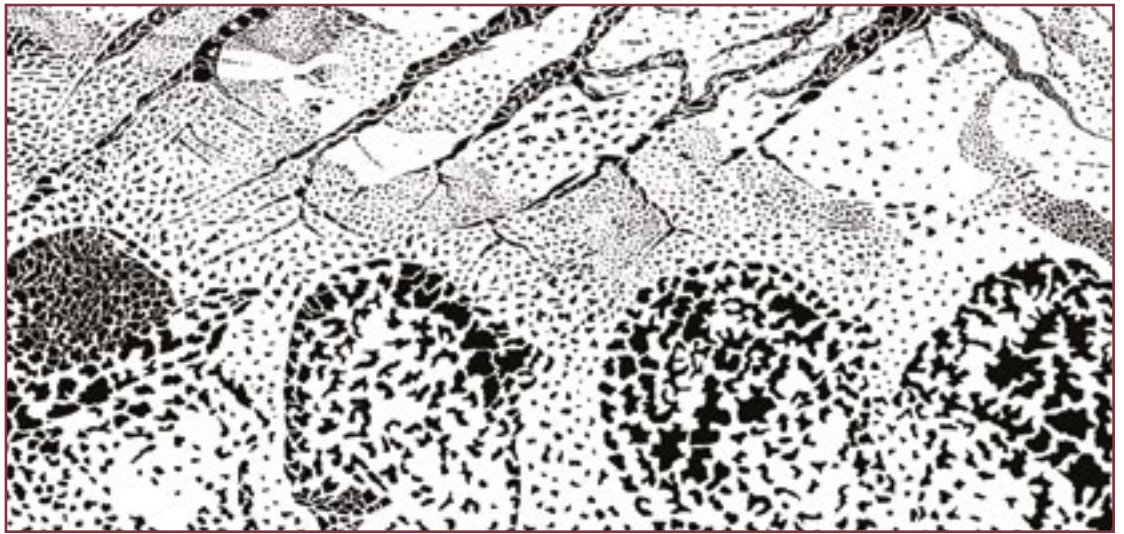


Fig.2 *Development of Pointillist style blending Seurat's crowd*

Illustrator



Fig.3 *Development of Castle*

Illustrator

## List of Figures cont.



Fig.4 *Development Composition*

Photoshop



Fig.5 *Development of Positive - Negative Space: Ninja and Ship*

Illustrator



Fig.6 *Development of Positive - Negative Space: Eye*

Illustrator

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Fig.7 Sketch of Adam - based from the 'The Creation of Adam' - Sistine Chapel by Michelangelo

Pencil & Ink

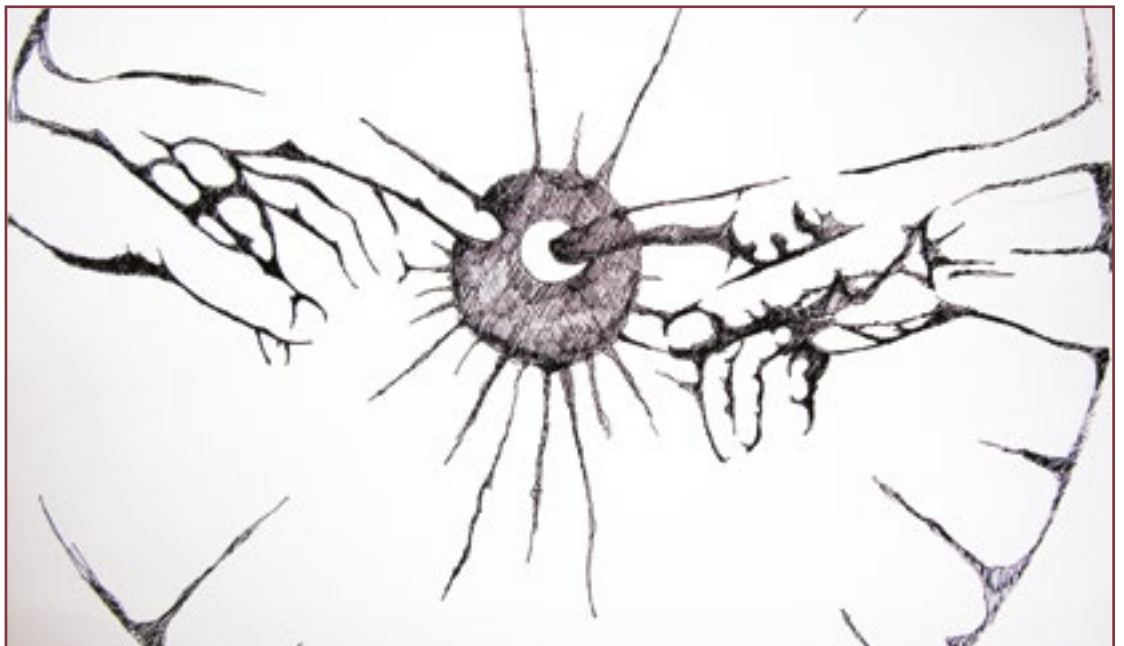


Fig.8 Sketch of Hands - based from the 'The Creation of Adam' - Sistine Chapel by Michelangelo

Pencil & Ink

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Fig.9 *Sketch of Horses*

Pencil & Ink

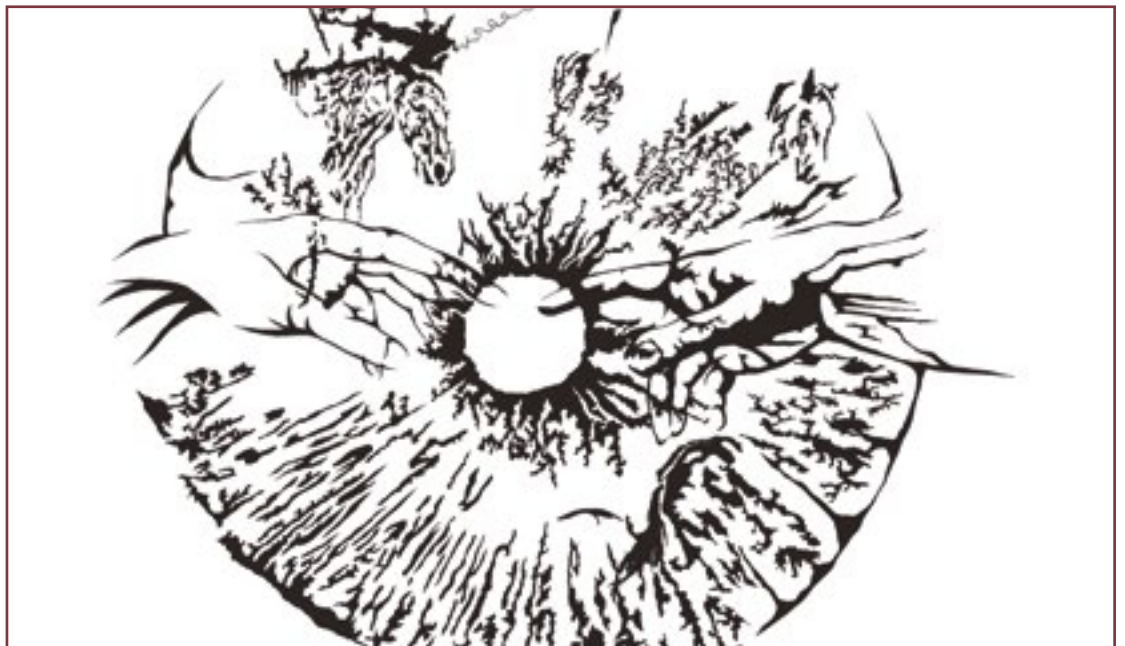


Fig.10 *Development of the Eye*

Ink and Illustrator

## List of Figures cont.

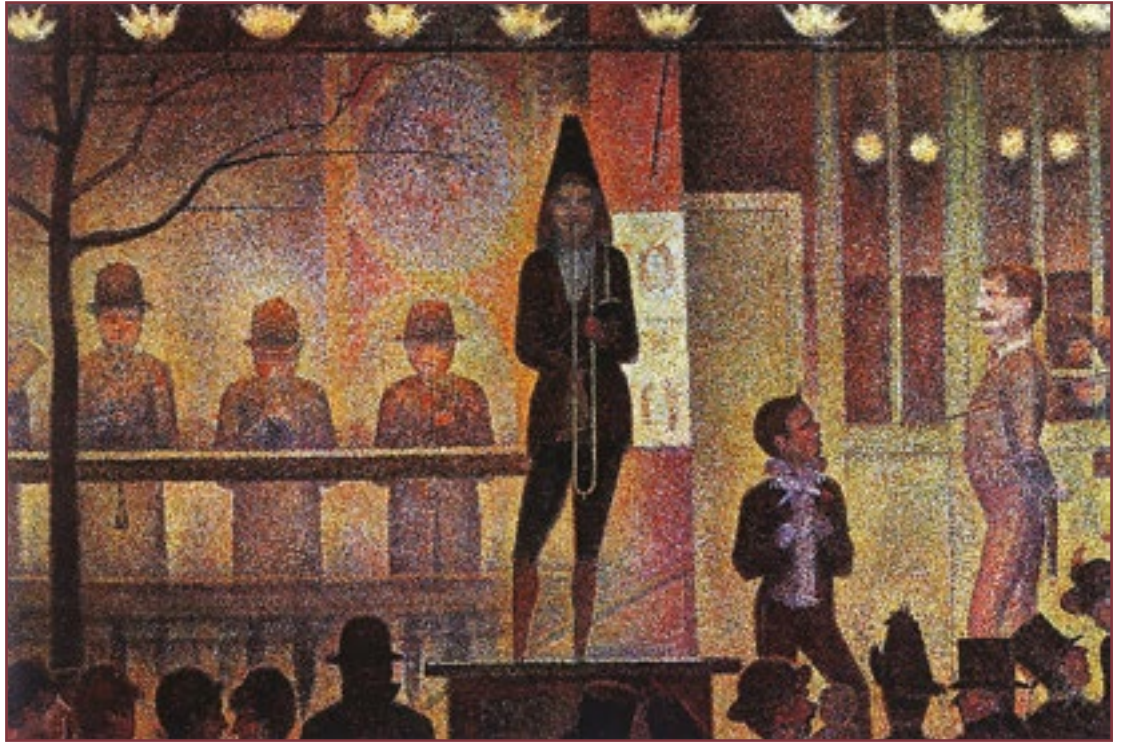


Fig.11 Georges Seurat

Parade de cirque, 1888



Fig.12 Dalmatian Visual Illusion