Evaluating ideasthesia as a creative tool in compositional practice: A personal reflection on coloured hearing synesthesia

Suzanne Kosowitz
Edith Cowan University

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Evaluating Ideasthesia as a Creative Tool in Compositional Practice: A Personal
Reflection on Coloured Hearing Synesthesia

Suzanne Kosowitz

Thesis submitted in partial fulfilment of the requirements of the degree of
Bachelor of Music (Honours)

Western Australia Academy of Performing Arts
Edith Cowan University
2022
Abstract

This research presents an evaluation of my compositional process with regard to synesthesia as a creative tool. Traditionally, the phenomenon of synesthesia has been discussed in perceptual terms, such as something that is seen visually elicits an additional experience in another sensory domain, such as sound. However, recent research has identified that there is an additional process involved in creating the secondary sensory experience, which is a semantic representation of concepts (ideasthesia). Specifically, my research considers ideasthesia in combination with a personal reflection on coloured hearing to provide a retrospective analysis of one of my compositions, Dance in Defiance (2012) which was inspired by a novel.

The aim of my research was to gain a deeper understanding of my practice, as well as articulating a process that is often challenging to describe. I focus on five specific passages of text that demonstrate the variety of musical parameters informed by the meaning I derived from the excerpt. I used the “Input – Process – Output” model, which allowed me to deconstruct my creative process into three phases. This model provided a framework to evaluate ideasthesia as a creative tool, as it charts the process of textual inspiration to musical material. Secondly, I reflected on the nature of my coloured hearing synesthesia. Three visual aspects are discussed, namely colour, shape and movement. I devised a “hearing-visual dictionary” based on my own practice, providing a broader understanding of coloured hearing, as the literature primarily focuses on the visual aspect of colour and the musical parameters of pitch and timbre.

My research adds to knowledge about the role of synesthesia in musical composition, specifically highlighting shape and movement. It has also enhanced my understanding of my compositional practice and therefore offers other composers an additional paradigm to consider.
Declaration

I certify that this thesis does not, to the best of my knowledge and belief:

i. incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education;

ii. contain any material previously published or written by another person except where due reference is made in the text of this thesis; or

iii. contain any defamatory material;

Signed: [signature]

Date: 07 July, 2022
Acknowledgments

I would like to acknowledge that this thesis was written on Whadjuk Noongar land, I pay my respect to their Elders, past and present.

I would like to extend my sincerest gratitude to my supervisors Dr. Lindsay Vickery and Dr. Yitzhak Yedid for their support and guidance throughout the course of the writing of this thesis and composition folio respectively. Their encouragement gave me the confidence to pursue topics I hold dear to my heart and were instrumental in my personal growth as a composer and researcher.

I would also like to thank Dr. Matt Styles, Dr Jo McFarlane, Prof. Ken Lampl, SOAR Peer Advisor Tiffany Carpenter and Claire Bowen for their mentorship throughout my research project. Writing a thesis can oftentimes be daunting and overwhelming, and there is no way I would have been able to complete my research without their support and encouragement to persevere through stressful times.

Special thanks also go to Jesse J. Fleay, who recommended I return to WAAPA and finish my Honours degree. When the COVID-19 pandemic took hold back in 2020, the future of the music industry was bleak and rife with uncertainty. Your encouragement gave me something to focus on and the results fill me with great pride. To that, I thank you.

Additional thanks go to the ECU Student Village staff and residents, who provided me with a calm and joyful atmosphere as I completed my thesis. Thank you for all the events that gave me much needed breaks (and bread!) and someone to talk to any hour of the day.

Finally, I would like to thank my family and my friends (and my cat) who have all been very supportive of this endeavour throughout the year.
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## Glossary

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<thead>
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<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>synesthesia</td>
<td>A neurological phenomenon in which one sensory domain (inducer) activates a response in another sensory domain (concurrent).</td>
</tr>
<tr>
<td>ideasthesia</td>
<td>An alternative view of synesthesia that includes semantic representation (concepts) as inducers.</td>
</tr>
<tr>
<td>coloured hearing</td>
<td>A form of synesthesia where sounds elicit visual responses.</td>
</tr>
<tr>
<td>inducer</td>
<td>The primary concept or sense that activates a synesthetic experience.</td>
</tr>
<tr>
<td>concurrent</td>
<td>The additional sensory experience brought on by the inducer.</td>
</tr>
<tr>
<td>photism</td>
<td>The visual sensation observed by a synesthete, either in the mind’s eye or projected in front of their vision.</td>
</tr>
</tbody>
</table>
Chapter 1: Introduction

Synesthesia is traditionally viewed as a neurological phenomenon in which one sensory domain (inducer) activates a response in another sensory domain (concurrent) (Cytowic, 1997). It is a phenomenon that I believe I have experienced since a young age\(^1\). While there are many types of synesthesia, the most pertinent form I experience is known as *coloured hearing*, where sound-based inducers elicit visual concurrents involving colour, shape and movement (Cytowic & Eagleman, 2009). This first became apparent to me viewing films such as Walt Disney’s *Fantasia* (1941) that demonstrated how closely the two sensory domains of sight and hearing could be integrated to create a new whole and more enriching experience. It had a profound influence on my understanding of music, and I often thought about the movement of colours and shapes when I listened to music on its own. If the animators could see visual potential in the musical works chosen for *Fantasia*, what could I see on my own? What would pieces not included in the film *look* like?

This thesis is an autoethnic exploration of my experiences as a synesthetic composer. Specifically, analytical autoethnography was used to produce a retrospective analysis of my composition folio. My analysis aims to articulate processes that involve both inducers and concurrents, the two tenets of synesthesia, in my practice. Research was undertaken in both cognitive sciences and musicological discourse. The former aided in understanding the working mechanisms of such experiences, and the latter assessed what has already been discussed in terms of musical composition, and equally what has been left unexamined. For the purpose of this thesis, *Dance in Defiance* (2012) was chosen from my

\(^1\) While there are no clinical tests to confirm the condition of synesthesia, a Synesthesia Battery was developed to provide some stochastic indications of synesthetic experiences. People who score less than 1 are considered genuine synesthetes (Carmichael et al., 2015; Eagleman et al., 2007). I scored 0.81 for the Piano Scale Colour Picker and 0.91 for the Instrument Colour Test (see Appendix A).
folio to provide examples of my process, as it was inspired by an excerpt from an extramusical source, the novel *11/22/63* (2011) by Stephen King (b. 1947).

**Towards Ideasthesia: Broadening the Scope of Synesthesia**

The traditional view of synesthesia is derived from the Greek terms “syn” + “aisthesis”, meaning “unified” or “intermixed” senses (Nikolić, 2009). For example, a sound-based inducer such as musical pitch, could activate the experience of a visual concurrent such as colour. However, recent research suggests that inducers can also stem from a “semantic level of representation” (Nikolić, 2009). Cognitive scientist Danko Nikolić cites experiments conducted with grapheme-colour synesthetes (who experience a colour when viewing a letter or numerical digit) that found the subjects interpreted any given figure based on the meaning they derived from it.

When studying the range of inducers eliciting synesthesia in participants, researchers often use several unusual formats for portraying alphanumeric characters (Dixon et al., 2006). In one such experiment, large characters were created out of small characters, such as a 5 which is made out of several small 2s (see Fig. 1; Palmeri et al., 2002). When participants attended to the global form, they reported the synesthetic colour of the global form (e.g., light green for a 5), but when asked to instead attend to the local forms, they reported that the synesthetic colour suddenly switched to that of the local forms (e.g., orange for the 2s).
**Figure 1**  
*An illustration of synesthesia elicited by local/global forms* (Palmeri et al., 2002)

An alternate version of the experiment is “THE CAT” (see Fig. 2; Ramachandran & Hubbard, 2001), in which an ambiguous character is used to simulate both an H and an A. When participants were asked to view the stimuli, they reported that they see the “correct” colour for the ‘H’ and the ‘A’ immediately, even though the two forms are identical. Hence, although the visual form is necessary for the perception of the colours, the way in which it is induced is important in determining which colour is evoked.

**Figure 2**  
*Ambiguous stimuli demonstrating further top-down influences in synesthesia* (Ramachandran & Hubbard, 2001)

An alternate version of the experiment is “THE CAT” (see Fig. 2; Ramachandran & Hubbard, 2001), in which an ambiguous character is used to simulate both an H and an A. When participants were asked to view the stimuli, they reported that they see the “correct” colour for the ‘H’ and the ‘A’ immediately, even though the two forms are identical. Hence, although the visual form is necessary for the perception of the colours, the way in which it is induced is important in determining which colour is evoked.

If the driving force for concurrent experiences stems from the individuals’ semantic understanding of the inducer, it could be argued that any abstract concept could activate a sensory experience. This notion resonated with me because it embodies the heart of the Jewish tradition that I grew up with, which is replete with multisensory rituals and customs.

One example of a multisensory ritual occurs at the Passover *Seder*. Symbolic foods are not merely eaten, they are questioned for their significance and what they represent. For
instance, near the beginning of the *Seder*, a sprig of a green vegetable is dipped in salt water. The green vegetable symbolises the Springtime in two ways, first to mark the season in which the Israelites were delivered out of Egypt, and secondly to represent the notion of freedom from slavery. The salt water represents the bitter tears shed during their time in bondage. By combining the two components, the two abstract ideas of freedom and slavery are seen and tasted together. This multisensory ritual can be seen as analogous to the notions of ideasthesia.

Ideasthesia could also explain the subjective nature of synesthesia from one individual to another, especially with regard to music. Further studies imply coloured hearing synesthesia “occurs at a conceptual level, rather than through perceptual processing of stimuli” (van Leeuwen et al., 2015). Hence, the semantic nature of inducers could explain why some composers would gravitate towards certain colours for certain key signatures. This is not an attempt to define a causation of visual concurrents, it merely speaks to the often subconscious, unknowable and ineffable aspects of synesthetic experiences. Figure 3, compiled by Fred Collopy (2009), illustrates the wide variety of seemingly arbitrary colour-to-note associations over three centuries:

![Figure 3: Three centuries of colour scales (Collopy, 2009)](image-url)

It could also be argued that art itself is an output of ideasthesia, as artists are often inspired by abstract concepts and transform them through their chosen medium. In Nikolić’s
article *Ideasthesis and Art* (2016), he comments that after speaking to a number of artists from diverse fields of visual art, music and performance, there was an overwhelming consensus that ideasthesia could somehow account for the “very process by which they created art”. However, he does not provide the names of these artists nor examples of their works to support this claim. Nikolić goes on to suggest a theory of art based on ideasthesia called “Ideasthesia balance theory”:

Ideasthesia balance theory states a particular relationship between the depth of meaning and the intensity of sensation: A creation that we are likely to judge as art is one in which the meaningfulness and the strength of sensation are well-correlated. In an art piece, the moments (the components) that carry the most meaning are also those that induce the strongest sensations. If there is an event in a story, a sequence of notes in a melody, or a form in a sculpture that induces the strongest sensations, this same event, musical sequence and form must also be the one that carries the most meaning. (Nikolić, 2016)

Nikolić provides a caveat for his theory as being articulated by a cognitive scientist and not an arts historian, and hence acknowledges that the theory is limited in scope and simplistic. While he postulates that the theory should “apply to both the actual act of creating art and the consumption of art”, his article only considers the latter, with the view to understand how an individual may conclude that a body of work is worthy of being defined as art.

This gap in the literature calls for artists to reflect on their own process and how ideasthesia would fit into their own practice. While authors, visual and multimedia artists have reflected on ideasthesia in their practice\(^2\), there appears to have been no discussion of it in terms of music. I will address this with regard to my own compositional practice for *Dance in Defiance* in Chapter 2.

Ideasthesia ultimately broadens the scope of what can be considered as an inducer, and as the research has expanded over the past decade, more and more types of synesthesia have been

---

\(^2\) Live lighting technician Frank Brentschneider (Hermes, 2021), painting (Xiong, 2018) and authors (Prendergast, 2019; O’Carroll, 2020).
found, expanding from eighty types (Day, 2015) to over a hundred (The Synesthesia Tree, 2021). It presents a better framework to consider how my composition *Dance in Defiance* was composed, as it was informed by my synesthetic responses to a literary excerpt. In this case, ideasthesia accounts for the role inducers play in formulating a work based on an extramusical source taken from literature.

The second tenet of synesthesia refers to the concurrents, specifically the nature of synesthetic experiences. Visual concurrents in coloured hearing are described as elementary, akin to “fireworks because the coloured shapes are said to appear, scintillate, and move around, then fade away only to be replaced by a kaleidoscopic montage of coloured photisms\(^3\) so long as the varying sound stimulus continues” (Cytowic & Eagleman, 2009). This definition broadly encapsulates the nature of my experience of coloured hearing. However, it appears to be less evident in the literature regarding Western Art Music composers. The following review considers the synesthetic experiences of coloured hearing as documented by composers, prioritising first-hand accounts.

**Coloured Hearing in Music Composition**

There have been a few first-hand accounts of synesthetic composers and musicians\(^4\), with additional anecdotes of coloured hearing by non-musicians described in *Wednesday is Indigo Blue* (Cytowic & Eagleman, 2009). It has been well documented in the Western Art Music tradition from the late 1800s onwards. However, there is an overwhelmingly predominant focus on pitch and/or timbre eliciting colour. As such, the other parameters of music (duration, dynamics, timbre, texture and form) are left somewhat unexamined, alongside other visual parameters such as shape and movement. The following anecdotes illustrate the persistent nature of this discussion in composers’ works since the Romantic Era to the present day.

---

\(^3\) See Glossary for definition of photism.

\(^4\) Most comprehensively listed on [http://www.daysyn.com/Famous-synesthetes.html](http://www.daysyn.com/Famous-synesthetes.html)
Franz Liszt (1811-1886) reportedly remarked “Please gentlemen, a little bluer if you please. This key demands it” (Seaberg, 2011) to an orchestra he was conducting. American composer and pianist Amy Beach (1867-1944) was said to have had pitch-to-colour synesthesia for key centres. Walter S. Jenkins cites that Beach’s mother encouraged her to “relate melodies” to colours. This led to Beach’s colour palette to major keys which remained consistent throughout her life; “C was white, F-sharp black, E yellow, G red, A green, A-flat blue, D-flat violet or purple, and E-flat pink” (Jenkins, 1994).

It should be noted that Alexander Scriabin (1871-1915) is a controversial figure amongst composer-synesthetes (Day, 2016). His colour palette for key signatures followed the same sequence utilised by both Russian mystic, Helena P. Blavatsky (see Fig. 4; Day, 2016) and Sir Isaac Newton. Both sequences align the diatonic major scale to the seven colours of the rainbow (see Fig. 3; Callopy, 2004). In order to include the five remaining tones of the chromatic scale, Scriabin sets the sequence of seven colours to the cycle of fifths instead, adding additional in-between colours to complete the set (see Fig. 5; Day, 2016).
As multimedia technologies advanced over time, many composers aimed to include lighting in the performance of their works to externalise their tone-colour associations. These
include Scriabin’s use of the colour organ in *Prometheus: The Poem of Fire, Op. 60* (1910), and an opera by Arnold Schoenberg (1874-1951) called *Die glückliche Hand, op. 18* (1910-1913), where he also designed the sets, costumes and lighting (Mattis, 2005). Schoenberg devised a “colour crescendo” which aided the lighting instructions to align with the musical material in real time. Figure 6 provides an example of Schoenberg’s handwritten notes for the third scene of *Die glückliche Hand*.

**Figure 6**
*Schoenberg’s “colour crescendo” in Die glückliche Hand* (Mattis, 2005)
First-hand accounts in dissertations by contemporary composers maintain the traditional discussion of synesthesia in terms of pitch and timbre prompting colour, without mentioning any other parameters of music, nor other aspects of visual concurrents (Desloges, 2011; Harper, 2012; Palmqvist, 2021). It is possible that these composers are only experiencing colour in their synesthetic experiences of pitch, but it could also be that these composers have not considered whether visual aspects of shape and movement could be linked to other musical parameters.

Two composers who have considered the other musical parameters and additional visual aspects are Schoenberg and Olivier Messiaen (1908-1992). *Farben* (Colours), the third movement of Schoenberg’s *Five Pieces for Orchestra, op. 16* (1909) point towards the consideration of other musical parameters beyond pitch and rhythm. Schoenberg’s performance notes instruct that “The change of chords in this piece has to be executed with the greatest subtlety, avoiding the accentuation of entering instruments, so that the only difference in colour becomes noticeable” (1909). This suggests that he may have been aware that other musical parameters such as articulation and dynamics could distort the colours he intended to be experienced. This movement is notable for its timbral consistency, supported by an overall blend of *ppp* dynamics, use of mutes on some, but not all instruments, and overlapping entries of varied note values (see Fig. 7).
Es ist nicht Aufgabe des Dirigenten, einzelne ihn (thematisch) wichtig scheiende Stimmen in diesem Stück zum Hervortreten aufzufordern, oder scheinbar unausgeglichen klingende Mischungen abzutönen. Wo eine Stimme mehr hervortreten soll, als die anderen, ist sie entsprechend instrumentiert und die Klänge wollen nicht abgetönt werden. Dagegen ist es seine Aufgabe darüber zu wachen, daß jedes Instrument genau den Stärkegrad spielt, der vorgeschrieben ist; genau subjektiv seinem Instrument entsprechend und nicht (objektiv) sich dem Gesamtklang unterordnend.

*) Der Wechsel der Akkorde hat so sacht zu geschehen, daß gar keine Betonung der einsetzenden Instrumente sich bemerkbar macht, so daß er lediglich durch die andere Farbe auffällt.

Edition Peters.
If, as the movement’s name suggests, the primary focus should be on colour, it makes sense that Schoenberg considered the other musical parameters as secondary to pitch and timbre, and as I posit, visual aspects of shape and movement.

Messiaen describes chords as “sound complexes” (Dukes, 1998) which create “colours that move with the music” (Ishiguro, 2010). According to him, pitch alone does not elicit a colour, but rather harmony, particularly chords that stem from the limited modes of transposition. Here, we begin to see much more dynamic and vibrant accounts of coloured hearing. Leslie Dianne Dukes compiles a table of colour (see Fig. 8) and shape combinations from an interview Messiaen had with Claude Samuel in 1967.

**Figure 8**

*Colour and Shapes of Messiaen’s modes* (Davies, 1998)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Transposition</th>
<th>Dominant Colors</th>
<th>Additional Colors</th>
<th>Shapes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode 2</td>
<td>First</td>
<td>Blue-violet</td>
<td>Gray, cobalt blue, deep Prussian blue, violet-purple, gold, red, ruby, mauve, black, white.</td>
<td>Blue-violet rocks speckled with little gray cubes; Stars of mauve, black, and white.</td>
</tr>
<tr>
<td>Mode 2</td>
<td>Second</td>
<td>Gold and Brown</td>
<td>Gold, silver, brown, ruby-red.</td>
<td>Gold and silver spirals; Background of brown and ruby-red vertical stripes.</td>
</tr>
<tr>
<td>Mode 2</td>
<td>Third</td>
<td>Green</td>
<td>Light green, prairie green, blue, silver, reddish orange.</td>
<td>Green foliage with specks of blue, silver, and reddish orange.</td>
</tr>
<tr>
<td>Mode 3</td>
<td>First</td>
<td>Orange</td>
<td>Orange, red, green, gold, milky white with iridescent, opaline reflections.</td>
<td>Horizontally layered stripes; flaming gold letters (script unknown); little red or blue arcs, very thin, very fine, hardly visible.</td>
</tr>
<tr>
<td>Mode 3</td>
<td>Second</td>
<td>Gray and mauve</td>
<td>Dark gray, mauve, light gray, white, pale yellow, flaming gold, red, blue.</td>
<td></td>
</tr>
</tbody>
</table>

---

Putting the colours aside, the first transposition of Mode 2 elicited shapes of speckled rocks, little cubes and stars. The second transposition produced spirals and vertical stripes positioned in the background, while the third transposition took the shape of speckled foliage. In this case, pitch is still the most salient parameter when coming to understand Messiaen’s colours. Though this is expanded upon in his 1963 work *Couleurs de la cité celeste (Colours of the Celestial City)*. Messiaen provides the following performance notes, expressing that all parameters in the music are devised to express colour:

The form of this work depends entirely on colours. The melodic and rhythmic themes, the complexes of sounds and timbres, evolve in the same way as the colours. Within their perpetually renewing variations, one can find (by analogy) colours cold and warm, complimentary colours that influence their neighbours, colour gradations moving towards white and others receding into black. These transformations can also be compared to characters acting within superimposed scenes, simultaneously developing several different stories. Alleluias of plainchant, Hindu and Grecian rhythms, permutations of duration, birdsongs of different countries: all these accumulated materials serve colour and the combination of sounds which create and name it. (Messiaen, 1963)

Messiaen’s shapes are consistent with Cytowic and Eagleman’s photisms, which tend to be primitive shapes void of definitive representational imagery. I will address the nature of my photisms in Chapter 3, providing examples from *Dance in Defiance*.

This thesis seeks to explore my subjective experience of synesthesia, through both inducers and concurrents, and the roles they played in the process of composing my work *Dance in Defiance*. Two methods were employed to devise means to contextualise my findings through score analysis. The first method is known as an Input – Process – Output (IPO) model for “knowledge integration” (Crowley & Hubbs, 2020). It is a system that is divided into three phases to visualise a means in which information is integrated in order to produce new understandings:

i. an initial stage (INPUTS), in which there are things to be combined, from

ii. an intermediate stage (PROCESS) in which combining occurs, from

iii. a final stage (OUTPUTS) in which there are new whole(s) to be identified and described. (Crowley & Hubbs, 2020)
This model was applicable to my compositional practice as it charts the integration of inducers (INPUT) through semantic meaning (PROCESS) to musical concurrents (OUTPUT), culminating in a proposed framework for ideasthesia. Five passages from King’s novel are investigated in Chapter 2 and were chosen to demonstrate a variety of musical parameter transformations.

The second method takes the form of a “Hearing-Visual” dictionary, first devised by researcher Bulat M. Galeyev (see Table 1). His dictionary is notable for the inclusion of a wider set of musical parameters and their corresponding visual aspects. Galeyev’s dictionary summarises the most general comparisons of coloured hearing based on analysis of “lexical, poetical and musical synesthetes” and not a personal reflection. Nevertheless, it is an ideal tool to address the less examined components of coloured hearing and forms basis for my findings in regard to my piece Dance in Defiance in Chapter 3.
Table 1

<table>
<thead>
<tr>
<th>Hearing aspects</th>
<th>Visual aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamics of musical soundings</td>
<td>dynamics of gesture (spatial movement and/or change in brightness)</td>
</tr>
<tr>
<td>Tempo</td>
<td>speed of movement or any other transformation of visual elements</td>
</tr>
<tr>
<td>Meter and rhythm</td>
<td>accents in the dynamics of visual plasticity</td>
</tr>
<tr>
<td>Shift into another register</td>
<td>change in weight, size, and corresponding light intensity</td>
</tr>
<tr>
<td>Timbre, instrumentation</td>
<td>colour pattern of drawing and plasticity</td>
</tr>
<tr>
<td>Tonality</td>
<td>colouring of the whole picture (or its separate parts, in the case of polytonality)</td>
</tr>
<tr>
<td>Modal attraction</td>
<td>terrestrial gravity (in which field all weighty bodies move)</td>
</tr>
<tr>
<td>(in which field melody development takes place)</td>
<td></td>
</tr>
<tr>
<td>Harmony, chords, music vertical</td>
<td>qualitative features of the image (including colour and light)</td>
</tr>
<tr>
<td>Change of mode</td>
<td>general lighting of the picture (dark to light)</td>
</tr>
<tr>
<td>(minor to major)</td>
<td></td>
</tr>
</tbody>
</table>

Galeyev’s use of the term *dictionary* in his article *The Nature and Functions of Synesthesia in Music* (2007) is itself an excellent metaphor to describe the nature of coloured hearing, at least as I experience it. If one thinks of a bilingual dictionary, such as an English – Hebrew dictionary, two different languages are presented with two different scripts and two different alphabetical orders. The former reads left to right and the latter reads right to left. Inherent in bilingual dictionaries is a sense of bidirectional discourse. While one word from English, and another from Hebrew, will mean the same thing, the dictionary will indicate the diverging etymological roots for the two terms. This speaks to the intertwined nature of such dictionaries, made by people with a keenly developed appreciation and understanding of both languages.
One can think of a hearing-visual dictionary in the same way. In my experience of coloured hearing synesthesia, aspects of vision (colour, shape and movement) and sound (musical parameters) do not exist in separate domains. Instead, they are deeply intertwined within any given composition, and hence difficult to unpick and separate. Nevertheless, we can begin to see which parameters of music align with visual concurrents of colour, shape and movement.

The aim of this thesis is twofold, first I aim to deepen my awareness of my own compositional practice as a synesthete, and second, to give voice to a synesthetic process that has remained largely tacit in the literature. I aim to evaluate ideasthesia as an effective tool in my creative process by applying additional models to my score analysis, as well as broadening the understanding of coloured hearing in music composition. It is likely that this thesis will initiate a conversation amongst composers about the source of their creative sense, posing fundamental questions about the source of their creativity, impulses and understandings.
Chapter 2: Score Analysis of *Dance in Defiance* (2012)

**About the Composition**

*Dance in Defiance* was commissioned by Atlantic Music Festival (AMF) held at Colby College, Maine USA in 2012. This commission was for the Composers’ Ensemble and revolved around their given instrumentation: flute, clarinet, percussion, piano, violin and cello. I chose to write for the whole ensemble as it resembles a classical version of a jazz ensemble with a front line (flute, clarinet and violin) and rhythm section (percussion, piano and cello).

*Dance in Defiance* is inspired by a text, which can be seen below. To bring a sense of defiance in the musical language, I use two contrasting textures, one of stillness and one of action. By framing the active dance sections with sections of stillness, the defiant nature of the dances is elevated.

*Dance in Defiance* has gone through many revisions since its premiere in 2012 and the accompanying score and recording features the American Modern Ensemble (AME), recorded at the Mostly Modern Festival, New York USA in 2018. AME features flautist Sato Moughalian, clarinetist Tasha Warren, percussionist Matthew Ward, pianist Blair McMillen, violinist Esther Noh, and cellist Dave Eggar. It was conducted by Mexican conductor Francisco Hernández Bolaños.

**Textual Inspiration for *Dance in Defiance***

*Dance in Defiance* was inspired by an excerpt from the famous author Stephen King. As AMF 2012 was held in Maine, I wanted to make a connection to the local audience and region. This led me to King who resides in Bangor, Maine. At the time, his latest release was *11/22/63* about a time-traveller Jake Epping sent back to 1963 to stop the assassination of President John F. Kennedy. Dance and music feature heavily throughout the novel, with King even using the term “harmonics” to suggest that the historical timeline is trying to reassert itself as Epping travels through alternative realities (Stobbart and Gregory-Fox, 2019). This provided me with
the idea of two opposing sound worlds in my composition. King presents Epping’s worldview with the following excerpt:

For a moment everything was clear, and when that happens you see that the world is barely there at all. Don’t we all secretly know this? It’s a perfectly balanced mechanism of shouts and echoes pretending to be wheels and cogs, a dreamclock chiming beneath a mystery-glass we call life. Behind it? Below it and around it? Chaos, storms. Men with hammers, men with knives, men with guns. Women who twist what they cannot dominate and belittle what they cannot understand. A universe of horror and loss surrounding a single lighted stage where mortals dance in defiance of the dark. (King, 2011)

Evaluating Ideasthesia as a Creative Tool

This chapter focuses on the first tenet of synesthetic experience, known as inducers. According to Nikolić’s “semantic hypothesis” (2009), inducers extend beyond the traditional view of perceptual stimuli to include abstract concepts. He goes further saying inducers “evoke synesthetic associations from the higher-semantic levels of representation” (Nikolić, 2009). As such, the synesthetic experience begins to formulate only once the meaning of the inducer has been activated.

As a composer, I found the hypothesis of ideasthesia particularly interesting as I am often inspired by extramusical sources, be it from literature or visual arts. While this is hardly new in the Western Art music tradition, as evident by the Romantic Era program music composers such as Liszt and Richard Strauss right through to Kay Gardner (1941-2002) and Michael Torke (b. 1961), it provided a potential scientific context with which to consider my practice beyond idiosyncratic compositional methods or personal aesthetic preferences.

To evaluate ideasthesia as a creative tool, I have reflected on my own compositional practice through an Input – Process - Output (IPO) framework. It outlines three phases of ideasthesia that I gathered from Nikolić’s hypothesis:

Input → Process → Output
Inducer → Semantic representation → Sensory-like experience

In my practice, I first consider concepts of interest in extramusical sources. In the case of Dance in Defiance, the source was the excerpt stated above from King’s novel 11/22/63. I then considered the meaning I derived from those concepts, which resulted in heard-like experiences of musical material. An essential component to hear the material for Dance in Defiance was provided by the instrumentation set by the commissioning body. My compositional framework thus resulted in the following IPO framework:

Passage from excerpt → Meaning → Heard experience

The following table summarises a proposed ideasthetic framework for Dance in Defiance. The Output column categorises the heard experiences by their most salient musical parameters. Five examples from King's excerpt are presented along with their corresponding musical transformations Dance in Defiance, followed by an in-depth analysis for each example. All musical examples are written at concert pitch.
Table 2
Proposed Ideasthetic Framework

<table>
<thead>
<tr>
<th>INPUT Passage from Excerpt:</th>
<th>PROCESS Meaning:</th>
<th>OUTPUT Heard Experiences through Music Parameter(s):</th>
<th>Example in Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>“dance in defiance of the dark”</td>
<td>Two opposing forces; light and dark; movement and stillness</td>
<td>Form; Contrasting parameters</td>
<td>See listening guide (see Fig. 9)</td>
</tr>
<tr>
<td>“perfectly balanced mechanism of shouts and echoes…”</td>
<td>Loud sounds repeating periodically but under strain</td>
<td>Melody and countermelodies</td>
<td>Melody instruments: clarinet, flute and violin (see Fig. 10)</td>
</tr>
<tr>
<td>“…pretending to be wheels and cogs”</td>
<td>Mechanical parts moving periodically but under strain</td>
<td>Rhythm – Ostinato</td>
<td>Rhythm section - perc, piano, cello (see Fig. 11)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rhythm – Asynchronous 3-note motif</td>
<td>Flute and violin (see Fig. 12)</td>
</tr>
<tr>
<td>“dreamclock chiming beneath…”</td>
<td>Grandfather clock bobbing up and down…</td>
<td>Harmony; Timbre</td>
<td>Quartal chords – piano (see Fig. 13) Pitch bend – vibraphone (see Fig. 14)</td>
</tr>
<tr>
<td>“…a mystery-glass we call life.”</td>
<td>… in a cold, frozen lake, a thin surface with hairline cracks. It could fall apart at any moment</td>
<td>Timbre; Articulation</td>
<td>Sul tasto to sul pont - violin and cello (see Fig. 15)</td>
</tr>
</tbody>
</table>
Examples of Ideasthesia in *Dance in Defiance*

“Dance in defiance of the dark”

The overall structure of the piece can be summed up by the final line from the novel’s excerpt, “where mortals dance in defiance of the dark”. In this phrase, ‘dance’ can be seen as the oppositional term to ‘dark’, instead of the literal antonym of light. Likewise, ‘dark’ can be seen as the oppositional term to ‘dance’, instead of the literal antonym of ‘stillness’. My sensory-like experiences blend the four terms together to allow for greater contrast in musical material. On the one hand, ‘dark’ and ‘light’ arguably lend themselves to musical parameters of pitch and timbre, while ‘dance’ and ‘stillness’ lend themselves to rhythm and tempo. By relating these abstract concepts to different musical parameters, I was able to integrate all four terms at the same time.

The ‘dark’ and the ‘dance’ sections are in stark contrast of each other, as shown in Figure 9, which outlines the key juxtaposing parameters. The two transition sections were pivotal in creating “defiance” in an audible and tangible manner. I imagine the first dance as a failed attempt to defy the darkness, and the second dance as a successful attempt.
Figure 9
Listening guide for Dance in Defiance

Articulation: tone changes over sustained notes
Timbre: soft, muted, blurred
Dynamics: piano < forte → cut off
Pitch: "A" tonal centre, octaves, fifths, major seconds, brief tonal centre on "E"
Pulse: slow-moving

Articulation: short, detached
Accompaniment under sliding, legato clarinet melody
Dynamics: forte
Pitch: D freigsh scale
Pulse: fast-moving

Articulation: tone changes over sustained notes
Dynamics: piano < forte → cut off
Pitch: "A" tonal centre, octaves, quartal harmony, minor sevenths (inversions of pitches in "The Darkness")
Pulse: fast-moving

Articulation: short, detached
Accompaniment under sliding, legato clarinet melody
Dynamics: forte
Pitch: C freigsh scale, C aeolian
Pulse: fast-moving, cross rhythm

Articulation: sustained notes, no tone change
Timbre: soft, muted
Dynamics: decrescendo
Pitch: "A" tonal centre, octaves, fifths, seconds
Pulse: slow-moving

Articulation: short, detached
Timbre: bright, crisp
Dynamics: mezzo-forte > piano
Pitch: "D" tonal centre, octaves, fifths, minor seconds, tritones
Pulse: stop-and-start

Articulation: short, detached
Timbre: bright, crisp
Dynamics: forte
Pitch: "A" and "D" tonal centre, octaves, fifths, minor seconds, tritones
Pulse: fast-moving

Articulation: short, detached
Timbre: bright, crisp
Dynamics: mezzo-forte > piano
Pitch: "D" tonal centre, octaves, fifths, minor seconds, tritones
Pulse: stop-and-start
Figure 9 shows a breakdown of the structure of the piece. The two sound worlds are highlighted in green and red\(^6\). Green denotes sections of stillness and darkness and red denotes sections of dance. The transitions are shown by a blend of the colours to denote integrating elements from the two opposing sound worlds. Below each section is a summary of key parameters (articulation, dynamics timbre and pitch) employed to convey the two sonic landscapes.

“Shouts and echoes” and “wheels and cogs.”

The two clauses in this phrase also present contrast to the idea of a machine it describes. The term ‘Perfectly balanced’ suggests a working mechanism, but the term ‘pretending’ destabilises that notion. As such, the sensory-like experience of this phrase was seeing a machine operating under strain that could break at any moment. The ‘wheels and cogs’ are first introduced in bar 53 by the repeating accompaniment figure in the cello and piano parts accentuated by the bongos.

**Figure 10**
Kosowitz, *Dance in Defiance*, bars 53-54

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\(^6\) These colours are also my synesthetic colours for the primary tonal centres and will be discussed in Chapter 3.
The clarinet, flute and violin represent the “shouts and echoes” above the accompaniment section of the ensemble. The clarinet launches into a glissando figure commonly used by improvising klezmer musicians followed by a melody using the D phrygian-dominant mode. The melody is short and echoed with slight variation in the flute and violin in bar 55 and 56 respectively.

**Figure 11**
Kosowitz, *Dance in Defiance*, bars 55-57

The melodies are all replaced by repetitive motifs from bar 62. It is as if the shouts and echoes have now found their way into the mechanical machine itself. From bar 64, the clarinet maintains its ‘shouts’ while the flute and violin play a similar three-note counter-lines that are intentionally asynchronous, which acts to destabilise the accompaniment figure in the cello and piano parts.

**Figure 12**
Kosowitz, *Dance in Defiance*, bars 64-65
The “Dreamclock” and “Mystery-glass”

Two terms stood out in this section of King’s excerpt, the “dreamclock” and the “mystery glass”. The idea of “mystery-glass” presented itself as a cold, frozen lake with a reflective yet thin surface with hairline cracks. The “dreamclock” presented as a grandfather clock bobbing up and down in this lake. The parameters of timbre and harmony were employed to capture this imagery in the piece. The piano part at bars 72-85 uses quartal harmony with heavy use of sustain pedal. This combination produces an ‘underwater’ sound of chiming bells often associated with clocks and makes the motif sound like chiming bells.

Figure 13
Kosowitz, Dance in Defiance, bars 72-77

Additionally, the vibraphone is instructed to pitch bend the final note of their phrases from bars 82-92.

Figure 14
Kosowitz, Dance in Defiance, bars 81-82

This produces a sound similar to metal being struck and dipped into water, which audibly alludes to both the frozen lake imagery and mechanical part of the grandfather clock.
Finally, the strings provide a glassy texture by alternating between sul tastō and sul ponticello, producing a “rough” tone over a sustained note. This articulation is employed to reflect the thin and precarious nature of the frozen lake’s surface.

**Figure 15**

Kosowitz, *Dance in Defiance*, bars 70-74

Ideasthesia proves to be a useful creative tool for music composition, as theorised by Nikolić. By considering the piece *Dance in Defiance*, one can see clear indications of how semantic representation of abstract concepts informed the development of musical material. The structure of the composition follows the stream-of-consciousness style of King’s excerpt, as well as musical transformations of evocative and surreal imagery.
Chapter 3: Findings and Discussion of Coloured Hearing

A summary of the current state of research shows that coloured hearing synesthesia prioritises the visual aspect of colour first and foremost, along with the musical parameters of pitch and timbre. My research adds to that body of literature by the inclusion of shape and movement, the two additional visual aspects considered significant by Cytowic and Eagleman. I will provide an overview of the visual nature of my coloured hearing, followed by how these three aspects informed the organisation of musical material in *Dance in Defiance*. I will then present three of the most interesting findings from *Dance in Defiance*, with preference given to the visual aspects of shape and movement, as they are most lacking in the literature. The chapter will conclude with the beginning of a hearing-visual dictionary based on my own practice.

Visual Aspects of Coloured Hearing

Overview of Photisms

My visual concurrents, also known as photisms, take the form of a visual plane akin to a 2-D animation. Before any material is developed, I start with a black screen as opposed to a blank canvas (usually associated with white). The sum result of musical parameters with create coloured shapes that sit on top of the black background. The shapes tend to be primitive in nature, such as circles, ovals, bands of lines and unique shapes with angular or bulbous outlines. The shapes move in both vertical and horizontal planes. The vertical space aligns with pitch and timbre, with lighter colours oriented at the top of the screen and darker colours at the bottom. The horizontal plane follows changes in articulation and dynamics, which moves from left to right, and combine to define the shape’s sound envelope. The sound envelope plots the four stages of a sound event: attack, decay, sustain, and release. Articulation predominantly indicates the outline of a shape, which can be smooth or jagged. Dynamics denote the breadth of the shape (softer passages create thin shapes and louder passages create thick shapes). When
a sound event has ended, its shape and colour fade back into the black background. Melodies create moving lines that follow the contour of pitch material. Rhythmically repetitive accompanying figures create rotating circular lines moving in a clockwise direction.

This overview provides me with a means to discuss how the musical material was organised in Dance in Defiance through visual aspects of colour, shape, and movement.

**Visual Aspects of Dance in Defiance**

**Colour**

In my compositional process, sections are delineated in terms of tonal centres were chosen based on opposite colours commonly used in the colour wheel (Anas, 2020). I picked the colours green and red, which led to the two original tonal centres A and D respectively (see Appendix A for my Synesthesia Battery results), the former for the first ‘dark’ section (bars 1-44) and the latter for first dance section (bars 53-67). Subsequent sections deviate slightly to give a sense of shift in colour, but still remain close to pitches as they pertain to the colour wheel. The “Dreamclock” section (bars 68-101) begins with a long drone on A, followed by drones on Bb, B and Ab (greens and blues). The second dance section (bars 127-149) explores two modes with a tonal centre of C (lighter red), the first being phrygian-dominant mode and the second being the aeolian mode. The piece concludes with a return to the ‘dark’ section’s tonal centre of A, and consequent colour of green, that gradually fades into the black background. This is achieved by a diluting effect, where higher ranges of the ensemble gradually descend down to their lowest possible notes before falling silent. This leaves the bass drum on its own in the final bar to conclude the piece with the same colour as from its very beginning.

**Shape**

The next visual aspect considered was shape. As stated before, shapes emerge from an amalgamation of articulation and dynamics, or sound envelope. Such shapes tend to relate to
shorter musical phrases or even single notes. In the ‘dark sections’ passages maintain soft and muted timbres, with an interest in changing articulations across a sustained tone. The colours are opaque, blurred shapes with thin outlines. In contrast, the ‘dance sections’ are dotted with detached staccato accompaniments and sliding melodies at forte. The shapes are bright in colour with well defined outlines, overlapping each other as individual voices come into focus at the centre of the screen. The black background is nowhere to be seen as all parts in the ensemble are activated across its wide range.

**Movement**

The final visual aspect of movement has already been discussed in terms of vertical and horizontal changes in position. It also reflects the parsing of material with ‘dark’ sections following a slow pace and ‘dance’ sections following a fast pace. The relationship between tempo, meter and rhythmic subdivisions were carefully considered to allow the aspect of movement to evolve in complexity over time. Due to the limits of this thesis, these additional parameters will not be discussed in this paper.

Having discussed these aspects in isolation I will now provide examples from *Dance in Defiance* that show how these aspects work together to create a unified sound world. Three examples were chosen from the first section of *Dance in Defiance*, referred to as “The Darkness” in the score. These examples were chosen to illustrate the morphology of photisms I experience in my coloured hearing synesthesia. As with the examples provided in the Literature Review, I will address musical parameters of pitch and timbre with regard to colour, while adding additional findings pertaining to shape and movement. The parameters of articulation and dynamics provided the most salient findings in “The Darkness” section, and hence broadens the possibilities of visual concurrents in coloured hearing synesthesia.
Pitch and Timbre: Colour, Shape and Movement

The chamber sextet employed for Dance in Defiance provides a wide diversity of timbres to explore, be it to contrast or blend. Bars 4 and 5 respectively introduce a succession of bowed glockenspiel notes and violin harmonics (see Fig. 16). These two instruments were chosen in an effort to blend timbres as they occupy the same register. Despite their closeness in pitch, their shapes are entirely different. This is due to their differing sound envelopes. The bowed glockenspiel notes emerge as thin and tall pastel-coloured oval shapes that expand outwards from their centres until the notes reaches their loudest moment. The oval then fades away in place, following motion of the notes’ decay, becoming more opaque like a firework, before finally blending back into the black background.

The violin harmonics, on the other hand, produce horizontal, thin bands of colour, following the contour of its musical phrase. The C# in bar 5 emits a thin and pale, florescent yellow band. Its sound envelope has little to no decay, so it the band disappears instantly once a rest is reached.

Figure 16
Kosowitz, Dance in Defiance, bars 4-7

This example demonstrates that timbral blending of two instruments produces disparate profiles in terms of what I hear and what I see in my music. While I am hearing pitches from the glockenspiel and violin close to each other in register and tone quality, I am seeing unique shapes; the former as expanding ovals and the latter, as previously mentioned, as a thin, horizontal band. One perhaps could argue that within the context of a musical excerpt, the
sound envelope charts the change in timbral qualities over time. In this sense, timbre as well as pitch may have a limitless quality in isolation due to the lack of temporal constraints set by live performance, and hence only referred to as colour in the literature. Once contextualised by live performance, I find that the parameters that align to temporal markers appear more pertinent when inducing synesthetic experiences, such as articulation and dynamics.

Articulation and Dynamics: Colour, Shape and Movement

There are a number of occurrences in Dance in Defiance where a phrase is shaped by its change in articulation and dynamics. These mostly occur in the ‘dark’ sections, where pitch material is stripped back to single notes. In bars 7-10, the flute is instructed to sustain an E, while changing from ordinario to growl tone (see Fig. 17). Similar to the violin phrase discussed above, the note emits a thin band of colour, blue on this occasion, with a smooth and rounded outline. The shape first changes in breadth with the crescendo beginning on beat 1 of bar 8, followed by a change in its outline, now becoming jagged. The shape expands with the crescendo at bar 9 before being suddenly cut off. I wanted to elicit the fading nature achieved by the bowed glockenspiel’s sound envelope, and so after this crescendo I wanted to suggest the flute’s note of E would fade by sustaining the note an octave below in the clarinet part. By the careful design of articulation and dynamics across two instruments, I was able to suggest the shape and movement of another instrument.

Figure 17
Kosowitz, Dance in Defiance, bars 7-10
This relationship between articulation and dynamics is seen again in the clarinet part at bar 38 (see Fig. 18). This time, the additional instrument is the cello, which continues the visual trajectory of the sound envelope fading with lower registered instruments. During the clarinet’s *ordinario* to growl tone, the cello slides down from D to C# performed with tremolo. Like before, both parts see their shapes expand with jagged outlines through a crescendo, when suddenly the cello seamlessly changes articulation to pizzicato on the low C in bar 39.

**Figure 18**
Kosowitz, *Dance in Defiance*, bars 37-40

![Figure 18](image)

This transition between articulation sees the shapes transform to a small dot, the movement akin to being quickly sucked into a vacuum. It is followed by another pizzicato low C, now at piano, and then two short Cs an octave above at pianissimo. When listening to this brief passage, I see a small dot bouncing up and down like a ball with relative rhythmic periodicity, before losing energy as it comes to a rest after the last note.

These examples show in very diverse ways how shapes evolving over time in step with the music, with a particular interest in sound envelope. It could be said that articulation and dynamics play a more important role in organising musical material in *Dance in Defiance* than either pitch or rhythm. It also suggests that, in order to bring focus to one visual aspect over others, one needs to simplify components in other parameters, such as maintaining a sustained tone, either through one instrumental part or through a combination of two. This aligns with
Schoenberg’s performance notes in *Farben*, which calls to avoid “the accentuation of entering instruments”, perhaps to avoid the chords taking shape based on the different sound envelopes of each instrument. As *Dance in Defiance* is more concerned with variety in articulation and dynamics, I can see how shape would become more of a feature in my visual concurrents than colour.

This analysis of my coloured hearing synesthetic experiences has allowed me to begin developing a hearing-visual dictionary based on my own practice employed in *Dance in Defiance*. The table below summarises my findings with regard to the musical parameters of pitch, timbre, articulation, and dynamics, and visual aspects of colour, shape, and movement. It provides me a framework to consider the bidirectionality of my coloured hearing synesthesia and a deeper understanding of my creative process as a composer.

**Table 3**

*My Hearing-Visual Dictionary*

<table>
<thead>
<tr>
<th>Music Parameter</th>
<th>Visual Aspect</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitch</td>
<td>Colour</td>
<td>Tonal centre provides primary colour</td>
</tr>
<tr>
<td></td>
<td>Movement</td>
<td>Vertical</td>
</tr>
<tr>
<td>Timbre</td>
<td>Colour</td>
<td>Light or Dark hues</td>
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<tr>
<td></td>
<td>Movement</td>
<td>Vertical</td>
</tr>
<tr>
<td>Dynamics</td>
<td>Shape</td>
<td>Breadth of musical phrase i.e. thin lines with piano markings and thick lines with forte markings</td>
</tr>
<tr>
<td></td>
<td>Movement</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Articulation</td>
<td>Shape</td>
<td>Outline of musical phrase i.e. smooth or jagged</td>
</tr>
<tr>
<td></td>
<td>Movement</td>
<td>Horizontal</td>
</tr>
</tbody>
</table>
Chapter 4: Conclusion

Evaluating ideasthesia as a compositional tool facilitated me gaining a deeper understanding of my own practice. The term ideasthesia provided me a broader framework to discuss the two key tenets of synesthesia, the nature of inducers and concurrents and how they relate to my personal synesthetic experience. In this view, inducers are not limited to sensory perceptions of the outside world, they can also come in the form of abstract concepts. By reflecting on my process in composing Dance in Defiance, I can see how abstract concepts in King’s excerpt provided me with a highly evocative and rich palette in which to extract semantic meaning and inform musical decision-making in an instrumental work.

Ideasthesia could also shed light on communication styles of conductors and music producers, who often call on abstract concepts and synesthetic metaphors to translate the intended interpretation of a work to their performers. Future research could survey the choice of language used in these contexts, to assess the efficacy of sensory-based instructions.

The second tenet of synesthetic experience resides in the nature of concurrents. Like a number of composers before me, I experience coloured hearing when listening to music. This thesis broadened the understanding of coloured hearing by including a deeper discussion of shape, and movement, which have been predominantly overlooked in the literature in favour of colour and pitch. The key findings I observed in Dance in Defiance were:

1. Colours were expressed through pitch and timbre, which moved in a vertical fashion.
2. Shapes were expressed through sound envelopes, i.e. articulation and dynamics, which moved in a horizontal fashion.

These findings provide me with an ample framework for new works, while future research could expand upon the visual aspects of other parameters such as rhythm and texture to expand my hearing-visual dictionary. Like Schoenberg and Scriabin, I am interested in externalising my synesthetic experiences of my compositions through multimedia collaboration.
Further research could survey whether the omission of shape and movement is due to the limits of synesthetic experiences reported by composers, or a tendency to analyse music in terms of pitch, harmony and melody, as is often the case in the Western Art Music tradition.

In addition to this, as all parameters are present in any form of musical excerpt, future research could also be undertaken to see if changing of focus from global to local aspects in music altered synesthetic perception. As someone who has colour relationships to both pitches and timbres, it could investigate whether a change in focus would result in shifting visual experiences of the same excerpt. Perhaps this could determine if semantic representation can be found in music-based synesthesia, as well as grapheme-colour synesthesia.

The evaluation also forced me to articulate aspects of my practice that had primarily remained tacit. Given the idiosyncratic nature of synesthetic experiences, many synesthetes find it difficult to verbally describe the nature of their concurrents. By reflecting on my personal experiences, I have expanded the scope of coloured hearing, and pave the way for others to expand their own understandings. The hearing-visual dictionary could be seen as a reverse-engineering of ideasthesia itself, as it calls for the composer-synesthete to semantically describe their experiences as they pertain to musical parameters. This could be useful to non-synesthetes as well, as it provides a context and terminology that may assist others in understanding their own idiosyncratic relationship with music.
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IDEASTHESIA AND COMPOSITIONAL PRACTICE


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Appendices

Appendix A: My Synaesthesia Battery Results

Piano Scale Color Picker

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**Instrument Color Test**

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SYNESTHESIA AND LANGUAGE:
A COMPOSITIONAL PROCESS

Composition Workshop Presentation
Thursday 7th April 2022

Suzanne Kosowitz
WAAPA, Edith Cowan University
Bachelor of Music (Honours)
WHAT IS SYNESTHESIA?

“The experience of a cross-modal association... the stimulation of one sensory modality causes a perception in one or more different sensory modalities” (Cytowic, 1997).

Source Domain  

Target Domain  

Pinks and Blues  

F# major underneath E major
WHAT IS SYNESTHESIA?

“Synesthesia can be understood as an unusual type of a “semantic” association... [wiring] concepts to sensory activations.” (Nicolić, 2009).

→ New term: Ideasthesia (sensing concepts)

Source Domain  

![Pinks and Blues at a beach](image)

→ calming

Target Domain  

![F# major underneath E major](image)

→ gentle and soft dynamics/timbre
Applications of Synesthesia

Musical Parameters

Non-musical sources (or outputs):
painting, literature, film etc.

Synesthetic transfers in *Dance in Defiance*

Communicating abstract ideas with collaborators
<table>
<thead>
<tr>
<th>Parameter (Music)</th>
<th>Association (Painting)</th>
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<tbody>
<tr>
<td>Dynamics of sound/changing of music</td>
<td>Dynamics of “gesture” (movement of depth and change in brightness)</td>
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<td>loudness</td>
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<td>Melodic development</td>
<td>Dynamics of plastics/of picture</td>
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<td>Tempo</td>
<td>Speed of motion/transformation of visual images</td>
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<td>Timbre development</td>
<td>Colour development of plastics</td>
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<tr>
<td>Changing of tonality</td>
<td>Development of colouring of the whole picture or of colour planes (during polytonality)</td>
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<tr>
<td>Shear on registers</td>
<td>Changing of size and lightness of the drawing</td>
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<tr>
<td>Changing of modes (major, minor)</td>
<td>Changing of lightness of the whole picture</td>
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</table>
Non-Musical Sources for Dance in Defiance (2012)

“For a moment everything was clear, and when that happens you see that the world is barely there at all. Don't we all secretly know this? It's a perfectly balanced mechanism of shouts and echoes pretending to be wheels and cogs, a dreamclock chiming beneath a mystery-glass we call life. Behind it? Below it and around it? Chaos, storms. Men with hammers, men with knives, men with guns. Women who twist what they cannot dominate and belittle what they cannot understand. A universe of horror and loss surrounding a single lighted stage where mortals dance in defiance of the dark.”

- 11/22/63 (Stephen King, 2011)
Listenig Guide

Dance in Defiance (2012)

Sections:
- The Darkness: “For a moment everything was clear...barely there at all”
- Transition
- Dance in Defiance No. 1: “chiming beneath a mystery-glass we call life”
- Transition
- Dance in Defiance No. 2
- A single lighted stage (in the dark)

Articulation:
-1.44: tone changes over sustained notes
- Timbre: soft, muted, blurred
- Dynamics: piano < forte ⇒ cut off
- Pitch: “A” tonal centre, octaves, fifths, major seconds, brief tonal centre on “E”
- Pulse: slow-moving

2:11: short, detached accompaniment under sliding, legato clarinet melody
- Dynamics: forte
- Pitch: D freigish scale
- Pulse: fast-moving

3:11: tone changes over sustained notes
- Dynamics: piano < forte ⇒ cut off
- Pitch: “A” tonal centre, octaves, quartal harmony, minor sevenths (inversions of pitches in “The Darkness”)
- Pulse: slow-moving

5:16: short, detached accompaniment under sliding, legato clarinet melody
- Dynamics: forte
- Pitch: C freigish scale, C aeolian
- Pulse: fast-moving, cross rhythm

5:54: sustained notes, no tone change
- Timbre: soft, muted
- Dynamics: decrescendo
- Pitch: “A” tonal centre, octaves, fifths, seconds
- Pulse: slow-moving

6:49: short, detached
- Timbre: bright, crisp
- Dynamics: forte
- Pitch: “A” and “D” tonal centre, octaves, fifths, minor seconds, tritones
- Pulse: fast-moving

7:24: short, detached
- Timbre: bright, crisp
- Dynamics: forte
- Pitch: “A” and “D” tonal centre, octaves, fifths, minor seconds, tritones
- Pulse: fast-moving
## Synesthetic Transfers:
**Dance in Defiance (2012)**

<table>
<thead>
<tr>
<th>Phrase from Excerpt</th>
<th>Source Domain(s)</th>
<th>Descriptor</th>
<th>Music Parameter(s)</th>
<th>Example in score</th>
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<tbody>
<tr>
<td>“dance in defiance of the dark”</td>
<td>SIGHT and TOUCH</td>
<td>Two opposing forces; light and dark; movement and stillness</td>
<td>Structure; Contrasting parameters</td>
<td>See listening guide</td>
</tr>
<tr>
<td>“a perfectly balanced mechanism...wheels and cogs”</td>
<td>SIGHT and TOUCH</td>
<td>Mechanical parts moving periodically but under strain</td>
<td>Poly-metric ostinato; Tempo</td>
<td>Rhythm section - perc, piano, cello</td>
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<td>“dreamclock chiming beneath...”</td>
<td>SIGHT and SOUND</td>
<td>Grandfather clock bobbing up and down...</td>
<td>Harmony; Texture</td>
<td>Quartal chords – piano Pitch bend - vibraphone</td>
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<td>“…a mystery-glass we call life.”</td>
<td>SIGHT and TOUCH</td>
<td>… in a cold, frozen lake, a thin surface with hairline cracks. It could fall apart at any moment</td>
<td>Textured drone; Harmony</td>
<td>Sul tasto ↔ sul pont - violin and cello</td>
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Dance in Defiance (2012)
Performed by American Modern Ensemble (2018)

Video Link: https://www.youtube.com/watch?v=Er0tcd_rUgg (Mostly Modern Projects, 2018)
## Communicating Abstract Ideas with Collaborators

<table>
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<tr>
<th>Idea</th>
<th>Source Domain</th>
<th>Target Domain</th>
<th>Example</th>
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<tbody>
<tr>
<td>Soft</td>
<td>TOUCH</td>
<td>SIGHT</td>
<td>Shading, Texture, Colour</td>
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<td></td>
<td>TOUCH</td>
<td>SOUND</td>
<td>Quiet, Smooth articulation, EQ settings</td>
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<tr>
<td>Noisy</td>
<td>SOUND</td>
<td>SIGHT</td>
<td>Messy, high concentration of disparate patterns</td>
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<td>Velvet</td>
<td>TOUCH</td>
<td>TASTE</td>
<td>Rich; chocolate</td>
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<td>TOUCH</td>
<td>SOUND</td>
<td>Resonant mid-low frequencies; cello</td>
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SYNESTHESIA AND LANGUAGE: A COMPOSITIONAL PROCESS

Q & A
Appendix C: *Dance in Defiance* (2012) Score

**Transposed Score**

*Dance in Defiance*

Suzanne Kosowitz

*for chamber sextet*
Dance in Defiance
(2012)

Revised 2022

Orchestration

Flute
Clarinet in Bb/Bass Clarinet in Bb
Percussion: Bass Drum/Bongos/Suspended Cymbal/Glockenspiel/Vibraphone
Violin
Violoncello
Piano

Duration
ca. 7:24 mins

First Performance:
Lorimer Chapel, Colby College, Waterville, Maine, USA, 21st July 2012

This piece was commissioned by the 2012 Atlantic Music Festival for the AMF Contemporary Ensemble.

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Program Notes

"For a moment everything was clear, and when that happens you see that the world is barely there at all. Don't we all secretly know this? It's a perfectly balanced mechanism of shouts and echoes pretending to be wheels and cogs, a dreamclock chiming beneath a mystery-glass we call life. Behind it? Below it and around it? Chaos, storms. Men with hammers, men with knives, men with guns. Women who twist what they cannot dominate and belittle what they cannot understand. A universe of horror and loss surrounding a single lighted stage where mortals dance in defiance of the dark."


When people find themselves encircled by darkness, they must nevertheless continue on their personal journey and “dance in defiance” of their surroundings.
Commissioned for Atlantic Music Festival's Composers' Ensemble

Dance in Defiance
for chamber sextet

Transposed Score

4/4 Intense stillness / “The Darkness” ~ ca. 72

Flute

Clarinet in Bb

Percussion

Piano

Violin

Violoncello

B.D.
To Glock.
Glockenspiel
Bowed

pp

p

pp

p

p

mf

mp

p

ord.

growl

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b. 1991

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IDEASTHESIA AND COMPOSITIONAL PRACTICE

Fl. flutter tongue
B. Cl. p f p
Perc. To Vib.
Pno. m f
Vln. sul tasto sul pont.
Vc. sul tasto sul pont.
IDEASTHESIA AND COMPOSITIONAL PRACTICE

With Clarity / "A Single lighted stage" \( \text{f} \) = ca. 88