

Musical Communication: Exploring the Relationship Between Native Language, Emotion and Visual Mental Imagery in Shared Group Experiences

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ABSTRACT

When listening to a piece of music in a group, you may often find that everyone is experiencing similar emotions and visual mental images, despite none being identical. This experiment brings a scientific approach to these shared human experiences while investigating the relationship between the familiarity of a sung language and the range of emotions and visual mental images experienced. I predicted that the further away from the native language of the listener, the broader the mental and emotional experiences recorded. Twenty-one participants listened to three extracts - one sung in English, one in Norwegian and a tone-poem - and were asked to note any emotions and visual mental images they felt during the piece. Each extract displayed an overall emotion that was felt by most participants, and projected similar visual mental images. The tone-poem gave the most unanimous results with the English song close behind and the Norwegian song showing the most ambiguity. Most participants were also able to correctly guess the theme that linked the three extracts together. These results imply that language plays a less integral role in the formation of visual mental images than expected and that it is not essential to the projection of emotion.

1. INTRODUCTION

Visual mental imagery is a phenomenon which can be described as seeing in the absence of a sensory stimulus. The role of visual mental imagery within music is still a largely unexplored area with most of the data being provided anecdotally, though a small number of music psychology studies have been published on the topic. In 2019, Taruffi and Küssner published a review of existing literature on the relation between music-evoked emotions and images. In the paper, they defined that within music, visual mental imagery “refers to the mechanism whereby music stimulates internal images in the listener consisting of pictorial representations... embodied image-schemata... or complex visual narratives” (Taruffi and Küssner 2019, p. 6). They also noted that existing studies by Küssner and Eerola (2019) and Vuoskoski and Eerola (2015) showed that over half of participants within those studies experienced visual mental images while listening to music. Studies by Martarelli et al., (2016) and Taruffi et al., (2017) also showed that emotional processes during listening are integrally connected to the visual mental images produced. Seeing visual mental images and experiencing emotions when listening to music is a proven occurrence. In this study, I aim to investigate if these experiences are unique to each listener or if shared visual mental images and emotions can be consistently experienced within a group.

In 2019, Day and Thompson aimed to examine the relationship between visual imagery and emotional responses to music by considering the time it takes to perceive an emotional connotation, experience an emotional state, and experience

visual imagery. They ran three experiments, the first focusing purely on responses to 30 short musical extracts, the second varying the familiarity of the extracts and a third varying the fluency of the music. For each study, the participant listened to the tests on a computer, pressing the space bar when they *recognized* an emotion, pressed again when they *experienced* an emotion and pressed a final time when they experienced visual mental imagery – being presented with a scale from which to choose the most suitable answer to their experience each time. The first time, the scale ranged from pleasant to calm, the second from no feeling to extremely feeling, and the final time from no image to a clear impression. This method allowed the participant to convey the valence and tone of their emotions without having to choose their specific emotion from a set list. The study concluded that the formation of an emotional state precedes the formation of visual mental imagery. The main strength of this experiment was that the options given to the candidates to choose suitable answers from were ambiguous enough to not subconsciously influence results while still able to give clear, concise data. However, by using a multiple-choice response, an in-depth study into the exact emotions perceived by each listener and the range of emotions felt for one excerpt across all the candidates was not possible. The extracts were also all around 20 seconds long, leaving not a lot of time for emotions and visual mental images to be formed and processed.

Studies into the use of visual mental imagery to process language have also taken place. In 2018, Carston investigated the role of visual mental imagery in processing metaphors. She concluded that visual mental imagery was not an essential component in the comprehension of language but was often automatically activated as a by-product of the participants linguistic and pragmatic processes. An image may be associated with a certain word or phrase when learning a language but is not necessary once learnt. In a similar way, I speculated if emotions expressed in music (through use of musical metaphor) could stir up similar images, allowing a group to have a shared visual mental image experience without lyrics.

In this experiment, I aimed to further the research into emotion and visual mental imagery experienced within music by investigating the importance of native language on shared group experiences. By comparing the emotions and visual mental images experienced by the participants, I sought to not only consolidate previous studies on the connection between the two, but also to explore the potential for shared experiences between listeners and if recognisable language bears any weight in this relationship. For this experiment, I compared the emotions and visual mental images of a group of subjects in response to three pieces: a song in English, a song in a less-

known language (Norwegian) and a tone-poem, each lasting around two minutes in length. The Grove Music Online article on the symphonic poem (also known as a tone-poem) defines it as “an orchestral form in which a poem or programme provides a narrative or illustrative basis” and I was interested to see if such a narrative could be felt without prior knowledge of the subject (Macdonald, 2001).

The three pieces I chose were all connected by the theme of Spring and I ran a secondary experiment to see if this theme could be detected by the participants, despite the lack of language and differing moods of the pieces. I predicted that the further away from recognisable language, the broader the mental and emotional experiences of the listeners. I expected the lyrics of the English song to greatly influence the visual mental images of the participants, culminating in the largest uniformity between responses. However, as there was a singer interpreting the text, expressing human emotions in their voice, I predicted that the Norwegian song would also show similar images and emotions, just not to the extent of the English song, with the tone-poem showing the broadest range of answers. I also predicted there would be a wide range of linking themes guessed.

2. METHOD

Participants. Twenty-one participants (15 females, 6 males; aged 18-60+) took part in the study. All spoke fluent English with two participants speaking Cantonese as their first language, and ten speaking multiple languages. Fifteen participants considered themselves musicians, however, the level of musical literacy was not necessary to this study. Candidates were recruited to take the online survey through social media and circulation among undergraduates.

Musical Stimuli. The three pieces chosen were all linked through the theme of Spring: Hubert Parry’s *A Spring Song “It was a Lover and his Lass” Op. 21, No. 2* (Meridian Records 2009 ‘Pale Hands I Loved’ performed by Henry Wickham (baritone) and Susie Allan (piano)), Edvard Grieg’s *To Springtime My Song I’m Singing Op. 21, No. 3* (Naxos 1997 8.553781 ‘Grieg: Songs’ performed by Bodil Arnesen (soprano) and Erling R. Eriksen (piano)), and Frederick Delius’ *3 Tone Poems: No. 3 Spring Morning* (Naxos 2004 8.557143 ‘Delius: On Hearing the First Cuckoo in Spring’ performed by the Royal Scottish National Orchestra). To reduce variables, the pieces chosen were written with a 20-year bracket (1870-1890), the songs were only accompanied by a piano and the Delius was reduced to a 1’54 excerpt so it would be of a similar length to the songs. The Delius was cut using *Audacity* from 5’30 to the end (7’24), the starting point chosen as it sounds like the beginning of a section.

Grieg’s *To Springtime My Song I’m Singing* was chosen as Norwegian is not a commonly sung language (unlike French, German, Italian, Spanish) and its linguistic roots are distant from the more widely taught romance languages.

Task. The participants completed an online survey hosted by *Qualtrics* (www.qualtrics.com) and were first asked to fill in a

short questionnaire regarding their age, gender, their first language, any other spoken languages and if they considered themselves a musician. Before listening to any extract, they were told that the three pieces were linked by one theme and to consider this as they went through each part. The survey then took them through each piece (labelled as Test 1, Test 2 etc. so they would not be influenced by the title of each piece), presenting a semi-structured answer page for each extract with space to write down any emotions felt, and visual mental images conjured while listening. The pieces were presented in the same order for all participants - Parry, Grieg, Delius. The participants listened to each extract a minimum of twice (but could listen more times if wanted) and were told to close their eyes each time. At the end, they were asked if they recognised any of the extracts and if they did, to mark them down.

3. ANALYSIS

I chose to not use multiple choice for the emotions felt and instead, requested each participant to write down any emotions and visual mental images they felt for each extract. This was done so that responses were not subconsciously influenced by any ‘potential’ answers. A copy of the answer sheet presented to the participants can be found in the appendix at the end of this paper (page 6). To create comparable data, I was inspired by Hevner’s 1936 study which grouped emotions into eight categories and had participants tick which emotions they experienced when listening to a piece of music (Hevner 1936, p. 249). I used and extended these emotion categories to sort my participants answers into groups after submission (Figure 1). Each category contains emotions of similar mood, valence, and intensity.

For the visual mental images, I sorted them into general categories which slightly differed from piece to piece. For the Parry, these categories were pastoral images (fields, trees, birds, flowers etc.), human images (young couples, dancing, singing etc.), buildings and other. The Grieg and Delius had the same categories of outdoor images (valleys, mountains, seasons, weather), human images, other and no images. I also did the same for the different theme speculations, sorting them into the broad categories of Spring, love, nostalgia, written in the same era and other.

I scored each participant’s answers for both emotions, visual mental images, and themes out of 1. Each response was split equally between the number of items mentioned. For example, if one emotion was listed then that emotion would score 1, whereas, if six images were listed, each image was worth 1/6 (0.16). I then added up the scores for each emotion and image category and made these into percentages of the total experiences.

4. RESULTS

Emotions Experienced. The following figures show the total percentage of emotions in each category experienced during every test - in all cases there is a clear overall emotion. Figure 2 shows the emotions felt during Test 1 (the English song). Emotions within category 6, positive emotions of a fairly high

mental images experienced during Test 1 were pastoral in nature, (75.53%) with the most reported image being of fields (9/21). Five participants also reported seeing a young couple (a human image) which fits in with the lyrics of the song - the full lyrics (and translation) of both songs can be found in the appendix on page 7. All the images reported were pictorial representations, with one participant seeing a man singing and another visualising a concert hall – a performance of the piece rather than a scene.

Figure 6 shows more ambiguity in the reported images. While there were ultimately more outdoor images experienced (44.13%) which are expressed in the text (see appendix), there were also nearly as many human images seen during Test 2. The most reported image seen was someone performing (8/21) ranging from an opera to a girl communicating a story to an audience. The lack of understandable language seems to correlate with less imaginative scenes and more performative representations. One participant reported seeing abstract notes (embodied image-schemata) and three reported seeing no images. One participant even went so far as to note in their response that “it was an unfamiliar language and there were no word clues” as the reason for their lack of images. Interestingly, the one participant who felt no emotion at all during the piece did see a visual mental image. Day and Thompson (2019) reported that an emotional state is required to create a psychological environment for visual mental imagery to occur. However, this participant did not need such a state to visualise the music.

The graph of visual mental images experienced during Test 3 is very similar to Figure 5 with outdoor imagery (72.99%) vastly outweighing all other images. The scope of images within this category is the largest (ranging from meadow to mountains to the sea) with the most mentioned image being the countryside (6/21). No one reported seeing performative scenes with a majority of the images being pictorial, although two participants did see embodied image-schemata in the form of abstract scores and notes. One participant did not see any visual mental imagery and they also did not during Test 2 either. Notably, the participant who claimed that the reason they did not see any images in Test 2 was due to there being no word clues did experience visual mental imagery during Test 3.

Theme recognition. Figure 8 displays the various speculations on the theme that linked the three pieces together. The correct theme category of Spring occurred in 50% of estimates with 6/21 participants putting the word ‘spring’ in their answer. Also included in the Spring category was the countryside, nature, beauty, and hope (often associated with the time of year alongside the renewal life). Love was the second most reported theme with three participants guessing both. This result proved my hypothesis wrong as, despite the varying moods and lack of language, the correct theme was the predominant estimate and the range of ideas was fairly small.

The Effects of being Multilingual: Two of the participants spoke Cantonese as their first language with English as their second and some interesting trends can be seen in their answers.

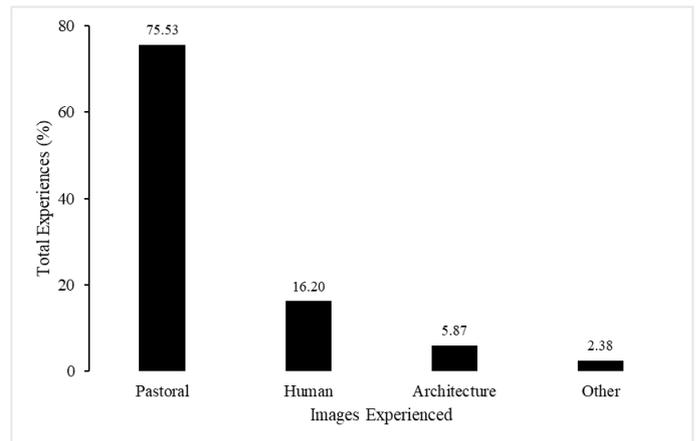


Figure 5. Images Experienced During Test 1

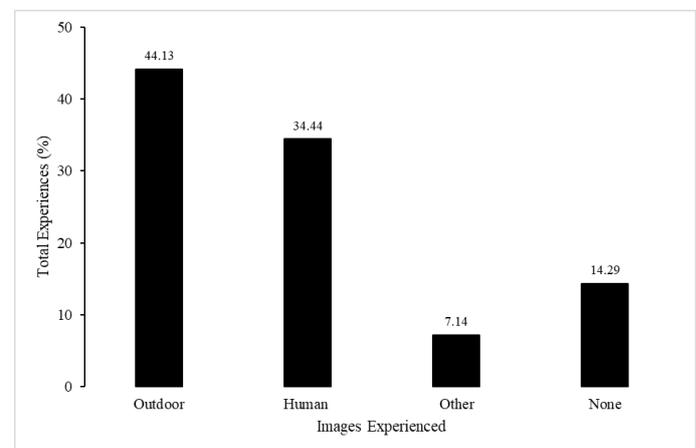


Figure 6. Images Experienced During Test 2

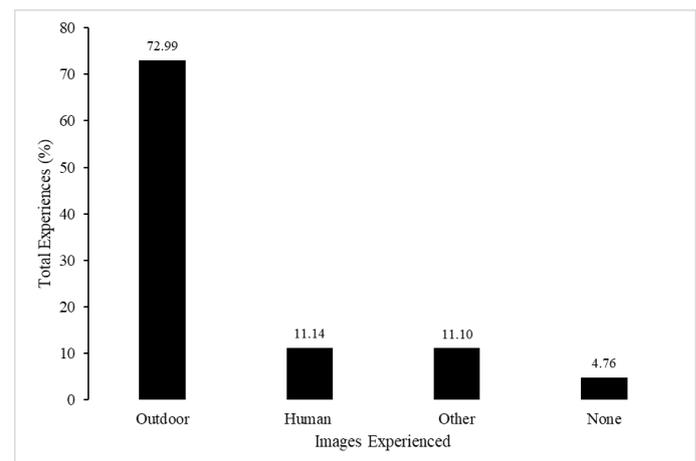


Figure 7. Images Experienced During Test 3

In Test 1, they were the only two participants to see performative scenes with one actively seeing a singing man and the other visualising a concert hall. During Tests 2 and 3, one of them saw no images (being the only one not to see anything

in Test 3) and the other only saw abstract images. Another participant did speak a little Norwegian (although not fluently), however, their visual mental images for Test 2 bear no resemblance to the sung text.

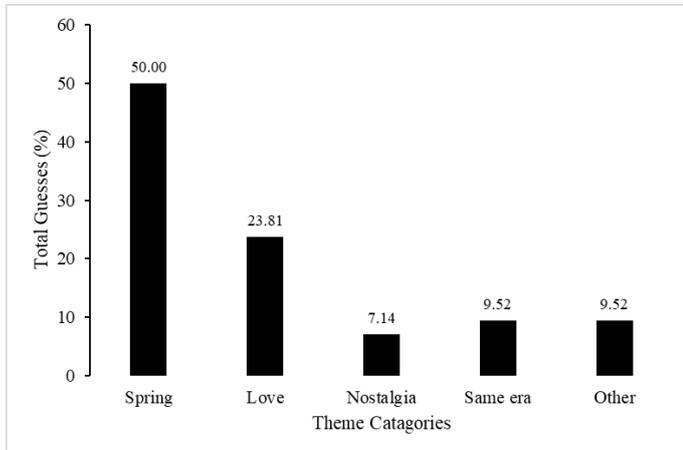


Figure 8. Estimates of the Linking Theme

Musicians vs non-musicians. At the beginning of the survey, participants were asked if they considered themselves musicians or not with 15/21 saying they did. I compared the results of these two groups to see if being a musician (and perhaps possessing a deeper understanding of the processes that were happening within the music) would change their perception of the works. However, the results showed no discernible difference in the experiences of the two groups.

Familiarity with extracts. Six participants noted that they recognised the first extract, motivating me to compare their results to see if the images they saw were closer to the sung text. The participants only saw pastoral and human images with most of the images reported as birds, fields and young couples which corresponds with the repeating refrain: “*when birds do sing... sweet lovers love the spring*”. Within this group there was a range of emotions related, although no emotions from categories 2 (sad) or 8 (resolute) were relayed. All except one reported an emotion from category 6 (happy) with the other participant feeling nostalgic; this is likely to be influenced by memories associated to the piece. One participant from this group also recognised the other extracts, however, they saw no images in Test 2 and an abstract score in Test 3. They were also unable to identify the correct theme, speculating love instead.

5. DISCUSSION

The results of this experiment do not fully support my hypothesis; when listeners were presented with a song in an unfamiliar language, the scope of emotions and visual mental images was greater and more varied than when listening to a song in their first (or second) language. However, the results were the most unanimous when listening to a piece without words. It is evident from my results that language does play a role in the formation of visual mental images, but it is also clear from the tone poem that there are more musical and nuanced

factors at play than simply language. My results are congruent with previous studies in that they showed that all the participants experienced emotion while listening to music and all experienced visual mental imagery at least once during the experiment.

When listening to the Norwegian song, some participants noted that by not understanding the text they feared that the emotions they were experiencing purely through the music were not the ‘true’ emotions the piece should be conveying, and another stated that they saw no images as “there were no word clues”. Yet, all three of these participants had no issues visualising or concerns when it came to the tone-poem, the lack of any language not posing any difficulty. Day and Thompson (2019) suggested that when a participant was less familiar with a piece, visual mental images took longer to form. In the case of Test 2, it could be said that the unfamiliarity of the language was not conducive to the formation of visual mental images for some of the participants. It appears that language in music, when understood, is a tool in shared visual mental imagery. However, the results suggest that the presence of an unknown language is unsettling and takes most of the energy of the listener, the panic of not understanding the text overriding the pure musical expression. This is also reflected in the rise of performative visual mental images between Test 1 and Test 2.

The cohesive results of the tone-poem extract suggest that a narrative can be perceived without prior knowledge of the subject. The shared group experience, despite the lack of text in this piece, implies that musical metaphor and rhetoric can trigger the same processes in the brain as linguistic metaphor, creating a visual mental image. Carston (2018) concluded that these images were not necessary for the comprehension of the language, however, I would suggest that in the case of music, without knowing the subject matter, this musical metaphor is vital towards the understanding of the piece. The lack of text allows the programmatic nature of the music to come to fruition, surrounding the listener in a musical soundscape dedicated to bringing the concept of ‘Spring Morning’ to life.

The Grove Music Online article on programme music defines it as “music of a narrative or descriptive kind... music that attempts to represent extra-musical concepts without resort to sung words” (Scruton 2001). The orchestral tone-poem, in which the form is based around a set narrative, is then perhaps the purest example of such music. Musicologists have claimed that programme music cannot be separated completely from the absolute with Wallace (1898) arguing that the more successful a programmatic composer is at representing his inspiration, the more the music becomes absolute as there is less room for interpretation. However, how does this argument stand when the subject matter is portrayed successfully to a large proportion of listeners without the title being revealed beforehand? Surely the music in question is truly programmatic, successfully abandoning the need for words. As Hanslick said, “music is a language we speak and understand yet are unable to translate” (Hanslick 1988, p. 20-21). No two visual mental images reported for Test 3 were identical - there is no perfect translation - and yet the core message was still conveyed.

Music having language capabilities is not a new concept but is certainly highlighted by these results. Participants who were multilingual had no more advantage than the English-only speakers in this experiment, in the same way that being a musician did not give any deeper insight into the pieces over the non-musician. The trends seen in the visual mental images of the two Cantonese speakers could be affected by cultural backgrounds; as Taruffi and Küssner (2019) noted, there has been little exploration into this area. However, as these participants are a small minority with the sample size, no assumptions can be made from these results.

Being familiar with the extracts did not appear to drastically change the perceptions of the piece heard. The six participants who recognised Test 1 only reported pastoral and human images which leaned towards imagery portrayed in the refrain, however, they were not the only participants to note down these specific images. The emotions reported also fell mostly within category 6, in line with the overall results, suggesting that being familiar with a piece does not provide a distinct difference in experience.

The participants' estimates of the linking theme were perhaps the most surprising results of the whole study. It is likely that the words of the first song influenced the starting point of the estimates for many of the participants – the repeated refrain highlighting both the season of Spring and young love: “*In the spring time, the only pretty ring time, When birds do sing, hey ding a ding a ding; Sweet lovers love the spring*”. The moods of the three pieces are quite different with Test 1 being predominately ‘happy’, Test 2 being ‘sad’ and Test 3 characterized as ‘peaceful’. Day and Thompson (2019) concluded that emotional states are an integral part of the psychological environment necessary for visual mental imagery. However, all three of these pieces conjured similar outdoor/pastoral images and ultimately suggested a uniting theme despite the radically different moods. A further study could be done into the importance of affect and emotion on the coherence of a group of pieces with a connecting theme.

The main shortcoming of this experiment is the small sample size which potentially limits its accuracy. However, the diversity of the participants (including the large age range, mix of musicians and non-musicians and range of languages spoken) established that my data had sufficient range to not be biased towards one demographic. Further studies could explore how semi-familiar languages effect shared experiences, and another could explore if an in-depth musical study of the extracts beforehand affected how they were perceived. Through scrutinising shared visual mental images and emotions, it is evident that understanding text plays only a small part of our musical experience, and that the universal language of music itself is far more explicit.

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APPENDIX

PARTICIPANT INSTRUCTIONS

Each piece was presented on a separate webpage with an imbedded audio link after each instruction and a text box below.

Close your eyes and listen to this piece of music. After it has finished, write down any emotions that you experience:

Close your eyes again and listen for a second time. Afterwards, describe any visual mental images that come to mind:

This was repeated for each piece before the participants were presented with a final webpage which inquired:

What theme do you think links these three pieces?

LYRICS AND TRANSLATIONS OF THE SONGS

Hubert Parry: A Garland of Shakespearean and other Old-Fashioned songs.

No. 2 A Spring Song "It was a Lover and his Lass"

It was a lover and his lass,
With a hey, and a ho, and a hey nonino
That o'er the green corn-field did pass.
In the spring time, the only pretty ring time,
When birds do sing, hey ding a ding a ding;
Sweet lovers love the spring.

Between the acres of the rye,
With a hey, and a ho, and a hey nonino,
These pretty country folks would lie,
In the spring time, the only pretty ring time,
When birds do sing, hey ding a ding a ding;
Sweet lovers love the spring.

This carol they began that hour,
With a hey, and a ho, and a hey nonino,
How that life was but a flower
In the spring time, the only pretty ring time,
When birds do sing, hey ding a ding a ding;
Sweet lovers love the spring.

And therefore take the present time
With a hey, and a ho, and a hey nonino,
For love is crownéd with the prime
In the spring time, the only pretty ring time,
When birds do sing, hey ding a ding a ding;
Sweet lovers love the spring.

William Shakespeare (1564-1616) from As You Like It

These lyrics are taken from:

<https://www.oxfordlieder.co.uk/song/3281>

Edvard Grieg: Fire Dikte fra "Friskerjenter".

No. 3 Jeg giver nuit digt til váren

Jeg giver mit Digt til Vaaren,
skjøndt endnu den ej er baaren,
jeg giver mit Digt til Vaaren
som Længsler til Længsler lagt.
Saa slutter de to en Pagt --:
at lokke paa Sol med Liste,
saa Vinteren Nød maa friste,
at slippe et Kor af Bække,
saa Sangen ham maa forskrække,
at jage ham ud af Luften
med idelig Blomsterduften, --
jeg giver mit Digt til Vaaren!

Bjørnstjerne Bjørnson (1832 - 1910)

Four Poems from The Fisher Maiden.

No. 3 To Springtime My Song I'm Singing

*To Springtime my song I utter,
that back to us he may flutter,
both laden with fancies sweet
in friendly affection meet.
They smile and the sun is brightened;
old winter is scared and frightened;
to join them the brook comes bubbling,
his spirit the song is troubling,
and, chased from their secret bowers,
light winds bring the breath of flowers.
To Springtime my song I utter!*

This translation is a singable version taken from:
https://www.lieder.net/lieder/get_text.html?TextId=23104