# Experiment Proposal: The Connection Between Emotional Induction, Structural Consciousness, and Musical Preference

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## Introduction

The scientific study of musical preference has proven to be rather elusive, though the field of music cognition seems to at least recognize this research area as a question worth hypothesizing and studying. In the broader research area of understanding music and emotion, scholars have worked to create models that attempt to show the processes involved of how specific emotional induction leads to one's value judgement of music. One such model comes from scholar Patrik Juslin (2013), who hypothesized a model based on seven different categories of emotional mechanisms, drawing from the "basic emotion" theory to attempt to explain the different types of possible emotions induced from music.

Other work in music and emotion takes a more "constructionist" approach, such as the work of Cespedes-Guevara & Eerola (2018), who argue that music does not necessarily convey a category of pre-determined emotions, but rather that the listener perceives affects based on a more dimensional measurement of "arousal" and "valence". Barrett (2011) makes the analogy that perceiving music is akin to perceiving color, in that even though we are generally able to categorize colors correctly and understand the divide between certain colors, there are many unique shades of colors that ultimately make up the experience of seeing in color, and that these shades are typically crucial in determining the aesthetic value one makes for, say, a work of art. Both the basic emotions and constructionist approach has some attempt to explain the origins of musical preference, though the work seems to generally revolve more around explaining where

emotions come from and how to define "emotions" in the first place. I sense another direction that could be taken with this research, one that is not so focused on necessarily defining emotion, but rather the direct role that emotional induction plays in the process of aesthetic judgement and musical preference.

The experiment that I am proposing combines this particular direction of music and emotion studies with another popular research area within music cognition, that being musical expertise. In the world of music cognition, studies on musical expertise have measured the cognitive, neural, and developmental effects that musical performance (Brown 2015), musical practice (Hambrick 2014), and general musical training have had on humans, measured through some sort of performance-based test. Regarding the question of the science of musical preference, this experiment aims to measure the effect that musical expertise, specifically university-level music education, may have on the importance of certain emotional mechanisms over others when determining one's aesthetic judgement.

My central question for this experiment is thus: "are there categories of emotional mechanisms, if any, that are more consequential to certain listeners when forming an aesthetic judgement?". From there, data will be sorted based on particular level of music eduction per participant, and a follow-up question will be examined: "to what extent does conscious understanding of musical structure impact the consequence of such emotional mechanisms, and therefore musical preference?". Drawing from Juslin's (2013) BRECVEM model of emotional mechanisms, as well as Cespedes-Guevara & Eerola's (2018) dimensional "core affect" model of arousal-valence, I intend to test the existence and prevalence of such mechanisms in listener

experience, measuring how much they may correlate with musical preference between different levels of musical expertise.

A significant intention for conducting this experiment is to potentially get closer to understanding one's emotional "preference rules" in their musical experience, and therefore the potential for improving upon current methods of anticipating listener preference that streaming services, radio DJs, and others within the music industry use. Today, those methods seem to revolve almost exclusively around a listener's past listening habits and their age. While anticipating preference through those facts alone can be sufficient to a degree, including a deeper, more cognitively rooted apparatus such as emotional mechanism activation could prove to return better results. This experiment may also work to debunk the myth that certain music requires an element of higher understanding to be enjoyed, potentially showing that the preferences between musicians and non-musicians are not just rooted in expertise level.

**Methods**

As it is conceptualized now, this experiment will involve a participant group made up of musicians and non-musicians between the ages of 18-65 who will listen to a corpus of 43 real musical examples and answer a short questionnaire for each example. In response to Elizabeth Margulis's (2008) warning about defining what constitutes a musician and a non-musician as accurately and as beneficial as possible for experiments such as this one, I wish to make these two groups very clear. For this experiment, a "musician" will be those who hold, or are currently working toward, a bachelor's degree in music from an accredited university, and a non-musician will be anyone otherwise. I recognize that the labels "musician" and "non-musician" are not

very accurate in this context, as there may be participants with lots of musical background and experience who have not received any higher education in music. Therefore, I will instead label these groups "academic musicians" (AM) and "non-academic musicians" (NAM).

The corpus consists of 43 musical examples with a wide variety in genre and era. Taking after the study by Tzanetakis & Cook (2002) on musical genre classification, I have included a mix these 14 genres in the corpus: Pop, Rock, Heavy Metal, Hip-Hop, R&B, EDM, Jazz, Country, Musical, Opera, Symphony, String Quartet, Piano Solo, and Choral. These examples are also varied in amount of cultural relevance and existence of a consistent audible pulse, which specifically impact two of Juslin's emotional mechanisms. Participants will first be asked a series of background questions before they begin listening:

1. What is your age?
2. Do you hold, or are currently working toward, a bachelor's degree in music from an accredited university?
3. Approximately how many hours per week are you engaged in practicing, creating, or actively listening to music?
4. On a scale of 1-4, rate the amount of exposure to had to each genre (the 14 aforementioned genres) as an adolescent
5. How are you feeling today?

These questions are not only meant to shape the AM and NAM groups, but as argued by Cespedes-Guevara & Eerola (2018) as essential elements in measuring music's emotional impact, also provides context on the participant's cultural upbringing and accounts for their current mood as a potential effect on their responses.

42 of the 43 examples are relatively short in length (between 2-8 minutes), and will be accompanied by the following 8 questions for participants to answer:

1. On a scale of 1-10, rate this song
2. On a scale of 1-4, rate how familiar you are with this song

3. On a scale of 1-7, rate how clearly the singer is expressing a specific emotion
4. On a scale of 1-7, rate how clearly the song conjures specific imagery or a new environment
5. On a scale of 1-7, rate how clearly you feel a strong rhythmic pulse
6. On a scale of 1-7, rate the amount of surprise you feel from the song
7. On a scale of 1-7, rate how aroused the song makes you feel
8. On a scale of 1-7, rate how positive the song makes you feel

Question 1 is the all-important value judgment, which will be the response that all other responses are measured against. Questions 2-6 are meant to reflect specific emotional mechanisms within Juslin's (2013) BRECVEM model; *Episodic memory, Contagion, Visual imagery, Rhythmic entrainment,* and *Musical expectancy*, respectively. Questions 7 and 8 ask the listener to essentially plot their feelings of arousal and valance, in accordance with the constructionist approach.

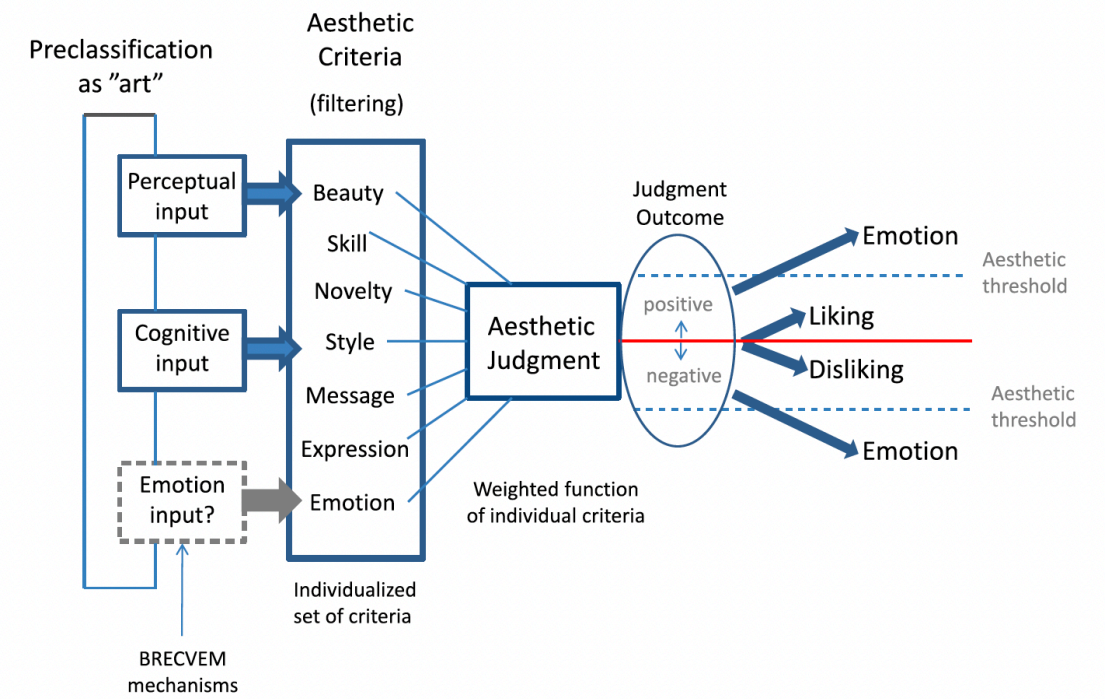
One example from the corpus, my own composition "A Balance", will be used to test another one of Juslin's emotional mechanisms, *Evaluative conditioning.* Measuring this mechanism requires a significant amount of repetition and/or motivic development over time, as this tactic is what Juslin argues will develop an emotional connection in a listener. I know for a fact that "A Balance" uses long-form motivic development in a variety of ways, some more obvious than others (especially to a trained musician), and therefore makes it a testable example for this emotional mechanism. Participants will be asked to take open-ended notes during the listening about certain sections of the music that may catch their attention. The questions for participants pertaining to this example will be answered following a complete listen, and are as follows:

1. What were some of your favorite parts of the piece, if any?
2. Can you remember any melodic themes from the piece?
3. On a scale of 1-10, rate this piece

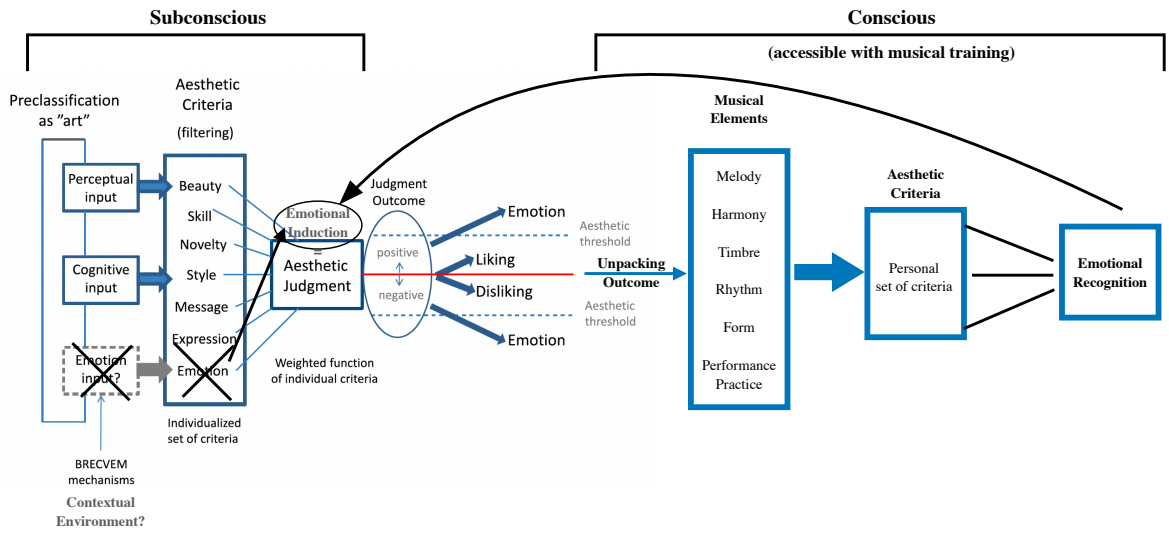
I understand that this experiment as currently proposed is quite large in scope and attempts to gather a large amount of data at once. On one hand, I sense that this type of question on measuring musical preference through emotional mechanism requires this amount of data to come to anything remotely conclusive, and such a study warrants itself to be as time-consuming as it seems in order to potentially measure mood changes in participants over time. On the other hand, though, I also appreciate being able to narrow in and focus on a specific question whenever possible; perhaps this experiment can be broken into several different comments, each measuring one or two specific mechanisms for emotion.

**Hypothesis & Discussion**

Below is Juslin's (2013) chart that visualizes his hypothesis on how emotional mechanisms fit into the process of making an aesthetic judgement:



Having slightly altered and expanded on this hypothesis, here is my revised chart on how I believe emotional mechanisms, as well as musical training, may impact aesthetic judgement:




In my hypothesis, "emotion" as a phenomenon is not simply one of several separate individual criteria that make up an aesthetic judgement, but rather those criteria all inform one's emotional induction that is then directly equated to the aesthetic judgement. If this is the case, then I would expect some sort of correlation between the prevalence of certain emotional mechanisms and the value judgment, which this experiment would attempt to measure.

This experiment also aims to measure the impact that the "conscious" side of the chart has on the overall aesthetic judgement. I hypothesize that a background of higher eduction in music gives one a unique accessibility to recognize elements of emotional induction that otherwise happen at the subconscious level. In turn, this may allow for a more charged emotional experience that more often crosses Juslin's line of aesthetic threshold. I anticipate that consciousness to musical structure does not so much affect the outcome of being positive/ negative, but is instead more influential in crossing the aesthetic thresholds.

Another measurement to hypothesize is the specific emotional mechanism that may be more consequential to the AM group over the NAM group, and vice-versa. Below is a chart from Juslin (2013) that outlines both the overall perceivability and the dependence on the musical structure that each emotional mechanism has:

| Mechanism | Availability to Consiousness | Dependence on Musical Structure |
|---|---|---|
| **Rhythmic Entrainment** | Low | Medium |
| **Evaluative Conditioning** | Low | Low |
| **Contagion** | Low | Medium |
| **Visual Imagery** | High | Medium |
| **Episodic Memory** | High | Low |
| **Musical Expectancy** | Medium | High |

If a mechanism has a high dependence on musical structure, it can be surmised that those mechanisms will be more influential to listeners who are more aware of musical structure. A point not directly made in Juslin's work is that a mechanism's availability to one's consciousness may very well likely depend on musical expertise, and could therefore provide a difference in consequence between different listeners.

From Juslin's model, we'd expect *Musical expectancy* to be more heavily consequential for musicians in the process of emotional induction. I accept this reasoning to a degree, though with some caution due to my personal experience in witnessing how non-musicians are still able to musical motion despite not having the vocabulary to explain it. I will more so hypothesize that *Evaluative conditioning* may be a more consequential mechanism for musicians, since an understanding of structure comes with it a significantly greater availability to consciousness. I also anticipate that *Rhythmic entrainment* will be more consequential among non-musicians, as

having a perceivable, consistent pulse has become a common musical scheme among mainstream music. This may also be the case with *Contagion,* as the modern popular music world seems to have become more concerned with the identifiable communication between the musician(s) and their audience. Overall, I hypothesize that at least a profile for each participant can be made from the questions that are asked, upholding that there is some truth to either BRECVEM, arousal/valence, or cultural context in emotion induction and its impact on musical preference.

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