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Music is awesome: Influences of emotion, personality, and preference on experienced awe

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Abstract

Awe is a complex, cognitive–conceptual emotion associated with transcendence and wonder. Music has the power to create this kind of transcendence. Can music evoke awe? Previous research demonstrates that awe is associated with individual differences in personality such as openness. This study examined whether different kinds of music across a wide variety of genres can evoke awe and whether the experience of awe depends on individual differences. The study further investigated the relationship of awe to patterns of emotional responses to different dimensions of musical genre. Study 1 demonstrated that high need for cognition and low cognitive closure predicted awe for reflective and complex music, that felt happiness predicted awe for all kinds of music, and that perceived happiness and sadness predicted awe only for reflective and complex music. Study 2 replicated the finding that perceived sadness can evoke awe in reflective and complex music and further demonstrated that experienced musical awe correlates with individual differences in the tendency to experience awe more generally. These results are of interest to advertisers interested in evoking awe with music and marketers interested in segmenting to target the appropriate populations for this purpose.

KEYWORDS
awe, emotion, music, need for cognition, openness, personality

1 | INTRODUCTION

Music is mediator between spiritual and sensual life. — Ludwig Von Beethoven

Expansive mountainsides and sublime sunsets, rousing oratory, soaring cathedrals, and national monuments are often described as awe inspiring. Yet perhaps nothing has the range, power, and universal ability to inspire awe than the simple pleasure of music. Awe is of recent and growing interest to researchers (Keltner & Haidt, 2003). Modern perspectives on awe closely mirror Beethoven’s on musical emotion: Like all emotions, awe is embodied in sensual experience; unlike any other, awe has the power to transport us to spiritual places.

Emotion theorists often invoke the power of music in attempts to capture the feeling of awe, yet little research has actually examined the ability of music to produce it. Although few may argue the ability of Beethoven to induce overwhelmingly powerful feelings, it is not clear that individuals would characterize these feelings as awe and even less clear that all music possesses this ability equally. Music has the ability to produce a wide range of emotional experiences, both felt and perceived (Gabrielsson, 2002; Zentner, Grandjean, & Scherer, 2008), and different kinds of music evoke different kinds of emotions. Likewise, individuals themselves may differ in their capacity to experience certain emotions, such as awe.

This research examined several related questions. First, we were interested in whether specific genres (e.g., classical, country, and pop) or dimensions (e.g., reflective and complex and energetic and rhythmic) of music are more likely than others to elicit awe and how these experiences are more generally related to felt and perceived emotions in music. Second, we were interested in whether some individuals are more likely to experience awe in music and whether individuals’ musical preferences play a role in their ability to experience awe in music.

These questions are of interest to both psychology and marketers alike. Although awe has received some attention in the psychology literature over the last decade, it has received far less in the consumer behavior literature specifically (Berger & Milkman, 2012). Yet inspiring awe is a goal that marketers strive for, from product design to branding and advertising. Awe has been used as a term to characterize iconic brands such as Nike and Apple (Holt, 2003). A quick Google search with the conjunction of words “awe” and “marketing” yielded over six
million hits, many of which were marketing and advertising agencies with the term “awe” in their own brand descriptions. Music may be particularly useful to marketers interested in cultivating awe as part of their brand image (e.g., Oakes & North, 2013).

More generally, emotional reactions to music are well studied in the psychology literature. Yet given the ubiquity of music in advertising and the increasing importance of arts marketing in a far more competitive music industry, understanding musical emotion is of increasing importance to marketers (North & Hargreaves, 2010).

1.1 | Awe

According to Keltner and Haidt (2003), awe is widely considered to be a vital component of our experiences with art, nature, and religion. Prior to their landmark exploration, however, there was little understanding of how awe fits into existing models of emotion. Like happiness, awe can be invoked by a range of experiences. Although awe is overwhelmingly described as a positive experience, it can be distinguished from happiness by the physical and affective responses it evokes. At the psychological level, awe has been strongly associated with the experience of “chills” or “shivers-down-the-spine,” a response that is not typically evoked by feelings of happiness (Shiota, Keltner, & Mossman, 2007).

Awe is also distinguishable from other emotions at a cognitive–conceptual level. Theorists agree that in order to evoke feelings of awe, the experience must both be vast and require accommodation. That is, it must project a perception of something larger than oneself in terms of physical or social size and challenge the perceiver to adapt or adjust their thinking in order to conceivably grasp their experience (Keltner & Haidt, 2003). Experiences lacking in one or both of these features cannot be described as awe and should be called by another name. For instance, "surprise" requires accommodation but not vastness.

Like all emotions, awe seems to have a specific adaptive function. Awe diminishes the importance of the individual self (Shiota et al., 2007) and increases feelings of closeness with others (Van Cappellen & Saroglou, 2012). Awe helps explain why people share extraordinary news with each other (Berger & Milkman, 2012). Most recently, research indicates that awe can promote prosocial behavior across a variety of domains (Piff, Dietze, Feinberg, Stancato, & Keltner, 2015). Thus, awe is thought to be an emotion that promotes collective interests (e.g., Keltner & Haidt, 2003). This may in part explain the importance of awe in religious experience.

Although awe has been examined in a number of domains, music does not appear to be one of them. Music provides fertile ground for exploring the ability of individuals to experience awe. Keltner and Haidt (2003) suggest that various musical selections may be perceived as both vast and accommodating. It is an experience for which the listener must utilize structures outside of what they use on a regular basis in order to comprehend the greatness of skill the musician possesses and the beauty of the music that results. If a selection of music challenges or goes beyond the expectations of the listener, it is more likely to induce a sense of awe that is often accompanied by feelings of amazement and the physical sensation of chills or shivers-down-the-spine.

Music is a central component of religious ceremony. Beethoven believed that music is what enables spiritual transcendence. Indeed, “spiritual” and “transcendent” are both terms that appear in Zentner et al.’s (2008) comprehensive taxonomy of musical emotions. Live music experiences in particular are often described in transcendent terms. Like religious ceremony, live music fosters social connectedness, positive emotion, and feelings of arousal (Grant, Bal, & Parent, 2012).

Like awe, music’s relationship to emotion is complex and multidimensional (e.g., Bigand, Vieillard, Madurell, Marozeau, & Dacquet, 2005; Gabriëls, 2002; Larsen & Stastny, 2011; Zentner et al., 2008). Music has the ability to elicit mixed emotions or simultaneous feelings of happiness and sadness (Larsen & Stastny, 2011). Music also has the ability to generate both felt and perceived emotions, which may or may not be consistent with one another (Zentner et al., 2008). Perceiving sadness in a musical selection, such as a slow dirge or a melancholy minor-key hymn, does not necessarily equate to felt sadness.

Although the awe experience is thought to be universal, the extent to which music has the extent to elicit awe may vary among individuals. Some research suggests that personality differences may affect a person’s ability to experience awe more generally. Shiota et al. (2007) found that awe-prone individuals tend to describe themselves with a greater representation of “universal” or self-diminishing descriptors (e.g., defining oneself as being a part of something bigger). They also found that such individuals are low in need for cognitive closure. Cognitive closure is associated with discomfort with ambiguity and dislike of change in the environment, which suggests that awe-prone individuals may be more open to new ideas and experiences (Roets & Van Hiel, 2011) and have higher tolerance for ambiguity or uncertainty (Valdesolo & Graham, 2013). This also suggests that awe-proneness may be associated with cognitive flexibility, allowing such individuals to be comfortable with revising their world and self views. For instance, viewing time as expansive may facilitate engagement in prosocial behaviors, such as donating time rather than material goods (Rudd, Vohs, & Aaker, 2012).

Closely related to the cognitive characteristic of preference for closure is the personality characteristic openness to experience, which refers to a motivation to enlarge one’s cognitive and conscious experiences (McCrae, 2007). As a stimulus must be vast and require accommodation, whether structural or cognitive, in order to evoke awe, it makes sense that individuals who are high in openness may be more inclined to experience awe. Nusbaum and Silvia (2011) confirmed this in a study that explored the relationship between personality traits, genre preference and one’s reported ability to experience chills to music. Openness was the strongest predictor of self-reported propensity for chills as well as the preference for reflective and complex music (classical and jazz). Preference for this type of music in and of itself, however, did not predict the reported experience of chills.

Although openness has been shown to associate with chills, to date, there is little empirical research examining the correlation between personality traits and the ability to experience music-induced awe while listening to selections of music (cf. Silvia, Fayn, Nusbaum, & Beaty, 2015). What is known is the relationship between genres of music and the personality trait of openness. A series of studies by Rentfrow and Gosling (2003) examined the relationship between personality traits and music preference by identifying four music preference dimensions (energetic and rhythmic, upbeat and conventional, intense and rebellious, and reflective and complex) and then examining the relationship between the Big Five personality traits and the level of preference for each music dimension.
Their results indicated that a relationship exists between certain musical preferences and personality traits. The energetic and rhythmic dimension (i.e., rap or hip-hop, soul or funk, and electronica or dance) was positively related to extraversion and agreeableness. The upbeat and conventional dimension (i.e., country, pop, religious, and soundtracks) was positively correlated with extraversion, agreeableness, and conscientiousness, and negatively correlated with openness. Intense and rebellious music (i.e., alternative, rock, and heavy metal) and reflective and complex music (i.e., classical, jazz, blues, folk) were positively correlated with openness.

1.2 | Overview of the current research

The purpose of this research was to examine the relationships among music genre, personality, musical emotions, and the experience of awe. Our work is built on the foundation provided by Nusbaum and Silvia (2011), who correlated the Big Five personality factors with the reported tendency to experience chills while listening to music as categorized by Rentfrow and Gosling’s four genre dimensions. Whereas their work utilized retrospective self-reports, we were interested in the experience of awe more specifically. Therefore, we had participants report their experience of awe while actually listening to music across the four genre dimensions. This allowed us to utilize an experimental behavioral approach to explore the ability of different kinds of music to evoke awe. It also allowed us to capture felt and perceived emotions in situ in order to examine their relationship to experienced awe, something that is not possible with retrospective self-reports.

With these research objectives in mind, we made several distinct hypotheses. First, it was hypothesized that individual characteristics related to openness (such as the personality trait of openness and need for cognition) would be positively correlated with the experience of aesthetic awe. Conversely, it was hypothesized that need for closure would be negatively related to awe. Second, it was expected that individuals would be most likely to experience awe when listening to their preferred selections. For example, Liljeström, Juslin, and Västfjäll (2012) found that participants’ psychophysiological arousal was higher when listening to their own musical selections. Finally, we predicted that preference and personality might interactively predict the experience of awe. That is, someone high in openness who prefers reflective and complex music might be most likely to experience awe when listening to these selections.

With respect to the affective bases of musical awe, given the affective complexity of musical experience, both felt and perceived emotions were predicted to contribute to the awe experience. Some even suggested that music might invoke awe by virtue of affective complexity—that is, it might be associated with complex patterns of experience and perceived or even mixed patterns of positive and negative affect (Schubert, 2013).

2 | STUDY 1

2.1 | Methods

2.1.1 | Participants

Participants included 150 undergraduate students (M_{age} = 20.85; 93 females; 82% Caucasian) enrolled in a regional Midwestern university. Nearly half (48%) of the participants had formal training in music, with a median of 7 years of training. No participants were removed from the analyses.

2.1.2 | Materials and procedure

Participants first completed a measure of demographics and music preference, which was assessed using the Short Test of Music Preference (STOMP; Rentfrow & Gosling, 2003). This measure assesses an individuals’ level of preference for 14 music genres (i.e., alternative, blues, classical, country, electronica or dance, folk, heavy metal, rap or hip-hop, jazz, pop, religious, rock, soul or funk, and soundtracks) on Likert-type scales from 1 (not at all) to 7 (extremely).

Participants were then informed they would be hearing several clips of music and were instructed to rate the extent to which they felt awe, happiness, and sadness in response to each selection, as well as the extent to which they perceived the music itself to be happy or sad. The following definitions were read aloud and listed at the top of each page:

- **Awe**—feeling as if one is filled with wonder or admiration; this is often accompanied by the physical sensation of chills or shivers-down-the-spine.
- **Happiness**—feeling joyful or pleasant; content.
- **Sadness**—feeling unhappy or “down.”

Participants then listened to 2-min excerpts chosen to include the least amount of lyrics possible. This was to decrease the influence lyrics may have on a listener’s emotional responses to a selection. Each selection of music represented one of the four dimensions of music preference (reflective and complex, intense and rebellious, upbeat and conventional, and energetic and rhythmic) identified and based on guidelines provided by Rentfrow and Gosling (2003). Three songs, resulting in 12 excerpts, represented each dimension (see Appendix A). The selections were based on examples from a taxonomy provided in Rentfrow and Gosling (2003). The selections were the same for each testing session; however, the order of excerpts was randomized for each group of participants. Randomization was achieved by using iTunes to shuffle the order of songs for each testing group into 16 playlist orders. Each playlist was then saved and labeled for each session.

After all selections were played and rated, participants completed a modified version of the Ten-Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003), which served as a brief measure of the Big Five domains: neuroticism, extraversion, openness, conscientiousness, and agreeableness. We were particularly interested in openness or the inclination to explore new ideas and engage in creative endeavors. Openness has been shown to predict the tendency to experience chills in music in previous research (Nusbaum and Silvia, 2011).

We also examined two individual differences measures that are related to openness: need for cognition and cognitive closure. The need for cognition scale (Cacioppo, Petty, & Kao, 1984) measures individual differences in the tendency to engage in intellectual endeavors. The cognitive closure scale (Roets & Van Hiel, 2011) measures individual differences in the desire for predictability, order and structure, as well as discomfort with ambiguity. Studies show that need for cognition is positively related to openness (e.g., Sadowski & Cogburn, 2013).
1997), whereas cognitive closure is negatively related to openness (Shiota et al., 2007).

2.2 Results

The results section is organized as follows: First, we examined differences in the ability of music dimensions to predict awe. We then examined individual differences in the tendency to experience awe, including the contributions of both personality and music preference. Finally, we examined affective state differences in the ability of music to evoke awe by predicting awe from felt emotions.

2.2.1 Musical dimension

Our first goal was to determine whether any of the four dimensions had a greater ability to elicit awe than others (see Figure 1). To examine this possibility, we averaged self-reported awe across each of the three tracks in each dimension and submitted these to a one-way analysis of variance, which was significant, \( F(1, 146) = 16.43, p < .001 \). A series of pairwise comparisons revealed that upbeat music elicited the greatest amount of awe (\( M = 3.89, SD = 1.29 \)), which was significantly more than complex music (\( M = 3.50, SD = 1.47 \)), \( t(146) = 3.29, p < .001 \). Complex music, in turn, elicited greater awe than energetic music (\( M = 3.24, SD = 1.30 \)), \( t(146) = 2.22, p < .05 \). Energetic music did not elicit significantly greater awe than intense music, which elicited the least (\( M = 3.19, SD = 1.35 \)).

2.2.2 Individual differences

The correlations among the Big Five personality factors, need for cognition, and cognitive closure, with the experience of awe by each musical dimension are in Table 1. To determine if the experience of awe for any musical dimension could be predicted by individual differences in personality or cognition, we conducted separate regression models for each dimension predicting the experience of awe from each of the individual differences measures, controlling for years of music training. For reflective and complex music, higher need for cognition was associated with greater experienced awe, \( \beta = .26, t(146) = 2.03, p = .003 \). Conversely, higher need for cognitive closure was associated with diminished experience of awe, \( \beta = -.17, t(146) = 1.99, p = .049 \). The effect of openness was nonsignificant when accounting for these two variables. The models predicting experienced awe for intense, upbeat, and energetic music from the personality variables were nonsignificant.

2.2.2.1 Personality and preference

Table 2 illustrates correlations among these three variables and preference for each of the genres measured by the STOMP. Need for cognition was positively correlated with the preference for classical (\( r = .33 \)), jazz (\( r = .26 \)), blues music (\( r = .25 \)), and folk (\( r = .26 \)), the four genres that make

![FIGURE 1](image-url) Experienced awe, felt happiness and sadness, and perceived happiness and sadness by dimension in Study 1

**TABLE 1** Correlations of personality traits and the experience of awe by dimension, Study 1

<table>
<thead>
<tr>
<th>Dimension</th>
<th>E</th>
<th>A</th>
<th>C</th>
<th>N</th>
<th>O</th>
<th>NFC</th>
<th>CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflective and complex</td>
<td>.06</td>
<td>−.01</td>
<td>−.17*</td>
<td>.07</td>
<td>.14</td>
<td>.32***</td>
<td>−.23**</td>
</tr>
<tr>
<td>Intense and rebellious</td>
<td>.01</td>
<td>−.15</td>
<td>−.12</td>
<td>.04</td>
<td>.09</td>
<td>.15</td>
<td>−.14</td>
</tr>
<tr>
<td>Upbeat and conventional</td>
<td>.16*</td>
<td>−.02</td>
<td>−.12</td>
<td>.15</td>
<td>.10</td>
<td>.06</td>
<td>−.09</td>
</tr>
<tr>
<td>Energetic and rhythmic</td>
<td>.12</td>
<td>−.06</td>
<td>−.19*</td>
<td>.05</td>
<td>.20*</td>
<td>.22**</td>
<td>−.19*</td>
</tr>
</tbody>
</table>

Note. \( E = \) extraversion; \( A = \) agreeableness; \( C = \) conscientiousness; \( N = \) neuroticism; \( O = \) openness; NFC = need for cognition; CC = cognitive closure.

\*\( p < .05 \)  
\**p < .01. \n\***p < .001.

**TABLE 2** Correlations of openness, need for cognition (NFC), cognitive closure (CC), and genre preference

<table>
<thead>
<tr>
<th>Genre</th>
<th>Openness</th>
<th>NFC</th>
<th>CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classical</td>
<td>−.08</td>
<td>.33***</td>
<td>−.22**</td>
</tr>
<tr>
<td>Jazz</td>
<td>&lt;.01</td>
<td>.26**</td>
<td>−.27**</td>
</tr>
<tr>
<td>Blues</td>
<td>.03</td>
<td>.25**</td>
<td>−.30***</td>
</tr>
<tr>
<td>Folk</td>
<td>.02</td>
<td>.26**</td>
<td>−.32***</td>
</tr>
<tr>
<td>Alternative</td>
<td>.13</td>
<td>.23**</td>
<td>−.26**</td>
</tr>
<tr>
<td>Rock</td>
<td>−.06</td>
<td>.002</td>
<td>−.22**</td>
</tr>
<tr>
<td>Metal</td>
<td>.09</td>
<td>.13</td>
<td>−.29***</td>
</tr>
<tr>
<td>Country</td>
<td>−.14</td>
<td>−.20*</td>
<td>.29***</td>
</tr>
<tr>
<td>Religious</td>
<td>−.06</td>
<td>−.11</td>
<td>.08</td>
</tr>
<tr>
<td>Soundtrack</td>
<td>−.02</td>
<td>.10</td>
<td>.01</td>
</tr>
<tr>
<td>Pop</td>
<td>−.03</td>
<td>−.12</td>
<td>.06</td>
</tr>
<tr>
<td>Dance</td>
<td>.14</td>
<td>.12</td>
<td>−.04</td>
</tr>
<tr>
<td>Rap</td>
<td>.09</td>
<td>−.16*</td>
<td>−.05</td>
</tr>
<tr>
<td>Soul</td>
<td>.04</td>
<td>.11</td>
<td>−.30***</td>
</tr>
</tbody>
</table>

Note. \*\( p < .05 \)  
\**p < .01. \n\***p < .001.
up the reflective and complex dimension. Need for cognitive closure was positively correlated with the preference for country music ($r = .29$) and negatively correlated with preference for jazz ($r = -.27$), blues ($r = -.30$), folk ($r = -.32$), alternative ($r = -.26$), metal ($r = -.29$), and soul ($r = -.30$). Openness was unrelated to preference for any of the musical dimensions.

### 2.2.2 Preference and awe

To test the hypothesis that listening to one's most preferred style of music would most likely elicit awe, we estimated separate regressions for the experience of awe for each musical dimension. The first model predicted the experience of awe for complex music from preference for each of the four dimensions as measured by the STOMP. In this model, only a preference for complex music predicted the experience of awe for complex music, $\beta = .35$, $t(146) = 4.48, p < .001$. In the second model, only a preference for intense music predicted the experience of awe for intense music, $\beta = .27$, $t(146) = 2.31, p = .001$. In the third model, only a preference for upbeat music predicted the experience of awe for upbeat music, $\beta = .23$, $t(146) = 2.86, p = .005$. In the fourth model, a preference for energetic music predicted the experience of awe for energetic music, $\beta = .31$, $t(146) = 3.82, p < .001$. A preference for complex music also predicted the experience of awe for energetic music, $\beta = .17$, $t(146) = 2.13, p = .035$.

### 2.2.3 Preference, personality, and awe

The final regression model tested the hypothesis that personality and preference would interactively contribute to the experience of awe when listening to one's preferred music. Given that only the model predicting reflective and complex music from personality was significant, we focused on this dimension. However, because both need for cognition and cognitive closure were associated with significant main effects on the experience of awe, we focused on openness in this analysis. A hierarchical regression was conducted to predict the experience of awe for reflective and complex selections from openness and preference for reflective and complex music, controlling for years of formal training in music. The first step yielded main effects of formal training, $\beta = .16$, $t(146) = 2.30, p = .02$; preference for reflective and complex music, $\beta = .50$, $t(146) = 7.00, p < .001$; and openness, $\beta = .16$, $t(146) = 2.28, p = .02$. In the second step, there was a significant interaction between openness and preference for reflective and complex music on the experience of music-induced awe for reflective and complex selections of music, $\beta = .14$, $t(146) = 2.00, p = .05$. Follow-up regressions revealed that the effect of openness was significant only in the regression equation predicting the experience of awe for individuals with a higher level of preference for reflective and complex music, $\beta = .24$, $t(146) = 3.01, p = .003$.

### 2.3 Affective state

In order to determine the extent to which felt and perceived happiness and sadness could predict the experience of awe, we estimated four separate regression models, one for each of the four dimensions. In each model, experienced awe for the selections of music in the dimension was predicted from felt happiness, felt sadness, perceived happiness, and perceived sadness. We also controlled for participants’ expertise by including years of musical training in each model. All four overall models were significant (see Table 3 for the standardized regression coefficients).

#### 2.3.1 Reflective and complex music

Formal training in music significantly predicted the experience of awe for reflective and complex music, $\beta = .22$, $t(146) = 3.23, p = .002$. Both greater felt happiness, $\beta = .29$, $t(146) = 2.61, p = .010$, and perceived happiness, $\beta = .24$, $t(146) = 2.62, p = .010$, predicted the experience of awe. Only perceived sadness predicted awe, $\beta = .22$, $t(146) = 2.02, p = .045$. The effect of felt sadness was nonsignificant, $p = .746$.

#### 2.3.2 Intense and rebellious music

The effect of formal training on experienced awe was nonsignificant for intense music, $p = .318$. Both felt happiness, $\beta = .35$, $t(146) = 3.02, p = .003$, and felt sadness, $\beta = .34$, $t(146) = 2.93, p = .004$, predicted awe. Neither perceived happiness ($p = .299$) nor perceived sadness ($p = .468$) predicted awe for intense music.

#### 2.3.3 Upbeat and conventional music

The effect of musical training was nonsignificant, $p = .974$. Only felt happiness significantly predicted awe, $\beta = .43$, $t(146) = 3.21, p = .002$. The effect of felt sadness was marginally significant, $p = .080$. Neither perceived happiness ($p = .859$) nor perceived sadness ($p = .579$) predicted awe for intense music.

#### 2.3.4 Energetic and rhythmic music

The effect of musical training was marginally significant, $p = .094$. Both felt happiness, $\beta = .46$, $t(146) = 3.09, p = .002$, and felt sadness, $\beta = .48$, $t(146) = 4.08, p < .001$, significantly predicted awe. Neither perceived

### Table 3 Relationship of perceived and felt happiness and sadness to awe by dimension in Study 1

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Overall F</th>
<th>Training</th>
<th>Felt Happiness</th>
<th>Felt Sadness</th>
<th>Perceived Happiness</th>
<th>Perceived Sadness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex</td>
<td>16.39</td>
<td>.22**</td>
<td>.29**</td>
<td>-.03</td>
<td>.24**</td>
<td>.23**</td>
</tr>
<tr>
<td>Intense</td>
<td>14.33</td>
<td>.07</td>
<td>.35**</td>
<td>.34**</td>
<td>12</td>
<td>.09</td>
</tr>
<tr>
<td>Upbeat</td>
<td>10.11</td>
<td>.97</td>
<td>.43**</td>
<td>.25</td>
<td>.03</td>
<td>.07</td>
</tr>
<tr>
<td>Energetic</td>
<td>16.09</td>
<td>.12</td>
<td>.46**</td>
<td>.48***</td>
<td>.02</td>
<td>-.03</td>
</tr>
</tbody>
</table>

Note.

*p < .05.

**p < .01.

***p < .00.
2.4 | Discussion

The four musical dimensions differed in their ability to evoke awe. Upbeat music elicited the greatest amount of awe, followed by reflective and complex music and energetic music. Intense music elicited the least amount of awe. For reflective and complex music, however, participants differed in their tendency to experience awe. Specifically, high need for cognition and low need for closure were associated with greater awe. Preferences played a powerful role as well, as participants reported experiencing awe most greatly for the kinds of music they preferred. Finally, for the personality trait openness, personality and preference interactively predicted awe for reflective and complex music.

Just as trait differences in preference and personality predicted unique patterns of awe experiences for each musical dimension, state differences in affect also predicted unique patterns of awe experiences. For all dimensions, felt happiness predicted experienced awe. This is consistent with the idea that awe is a positive emotion (Shiota et al., 2007). Awe is a complex emotion, however. For intense music, felt sadness also predicted awe. Perhaps of greatest interest, the experience of awe did not necessarily depend on the experience of affect at all, as both perceived happiness and perceived sadness predicted awe for reflective and complex music. In a review of the literature on mixed emotional reactions to music, Schubert (2013) suggests that such mixed patterns of felt and perceived emotions might be specifically characteristic of awe-like experiences. Although a detailed review of his arguments are beyond the scope of this paper, Schubert likens felt emotion to the enjoyment that participants feel from listening to their preferred music. This may explain both why felt positive emotion predicted awe for all dimensions as well as preferences for each dimension.

The primary purpose of Study 2 was to replicate and extend Study 1 in a more representative sample of working adults. We focused specifically on the reflective and complex dimension, given that this dimension seemed to be associated with the most unique relationships of the awe experience with both trait differences and state differences in affect. We also sought to increase the validity of our findings by utilizing different musical selections. For instance, we used Cannonball Adderley’s “Work Song” in Study 1. Jazz is a diverse style of music and its many subgenres differ greatly in their complexity (Friedwald et al., 2002). Given that this style of jazz is arguably not as reflective and complex as some other forms, we utilized John Coltrane’s “Blue Train” in Study 2. Coltrane is included as one of the artists in the reflective and complex dimension in Rentfrow and Gosling’s (2003) taxonomy. Critics have described the album “Blue Train” as both reflective (Blue Note, 2012) and complex (Jazz Loop, 2014), making this track a particularly respectable representation of the dimension.

3 | STUDY 2

The primary goal of Study 2 was to replicate the findings that perceived emotions can predict the experience of awe for reflective and complex music. The second goal was to demonstrate a relationship between the experience of musical awe and individual differences in the tendency to experience awe. So as to increase the validity of our findings, it was important to demonstrate that the kind of awe participants report experiencing when they listen to reflective and complex music is predicted by the tendency to experience awe more generally.

3.1 | Method

3.1.1 | Participants

Participants were 97 individuals recruited from Amazon Mechanical Turk (Mage = 32; Range = 20–67; 35 females). Three participants that failed a manipulation check, which required them to identify the correct genre of music for each musical selection were removed, for a final sample of 94. Participants were compensated $1.00 for their participation.

3.1.2 | Procedure

Participants completed the survey in Qualtrics survey software. They were first informed that they would be listening to a series of musical selections and were required to verify they had working speakers or headphones with the volume adjusted properly before continuing.

Participants then listened to two 45-s musical selections from the reflective and complex dimension: “Blue Train” by John Coltrane (jazz) and “Adagio for Strings” by Samuel Barber (classical). Their order of presentation was randomized. After each selection, participants responded to the exact same prompts as in Study 1 in order to report their felt happiness and sadness, the extent to which they perceived happiness and sadness in the music and the extent to which they experienced awe. Participants responded on 7-point scales anchored by not at all and intensely.

After responding to these items for each selection, participants completed the 6-item awe subscale from the Dispositional Positive Emotional Scale (Shiota, Keltner, & John, 2006). The scale measures individual differences in the tendency to experience awe (sample items: “I see beauty all around me” and “I feel wonder almost every day”). Participants answered on 7-point Likert-type scales (strongly disagree to strongly agree).

Finally, participants reported their age, gender, and their years of formal musical training.

3.1.3 | Results

We conducted two separate regression analyses for each musical selection, predicting the experience of awe from felt happiness and sadness, perceived happiness and sadness, years of formal musical training, and awe-proneness as measured by the Dispositional Positive Emotional Scale. For the jazz selection “Blue Train” the overall model was significant, \( R = .57, F(6, 84) = 6.81, p < .001 \). As for all the genres examined in Study 1, felt happiness strongly predicted experienced awe, \( \beta = .48, t(84) = 3.32, p < .01 \). Replicating the findings for reflective and complex music specifically, perceived sadness also predicted experienced awe, \( \beta = .45, t(84) = 1.97, p = .05 \). No other effects were significant.

For the classical selection “Adagio for Strings,” the overall model was also significant, \( R = .58, F(6, 82) = 6.86, p < .001 \). For this selection, awe proneness was significantly related to experienced awe, \( \beta = .31, t(82) = 2.35, p < .05 \). Felt sadness strongly predicted awe, \( \beta = .48, t(82) = 3.32, p < .01 \).
\( t(82) = 3.55, p < .01 \), as did perceived happiness, \( \beta = .49, t(84) = 2.32, p < .01 \).

3.1.4 Discussion

To sum, Study 2 yielded findings that were generally consistent with Study 1 findings, but in a more representative sample of working adults. Study 2 also replicated Study 1 findings using different musical selections that more greatly generalize the findings, including the reflective and complex selection \( \text{Blue Train} \) by Coltrane. We also obtained a similar pattern of results utilizing a different classical music selection, Barber's \( \text{Adagio} \).

Study 2 also demonstrated that awe-prone individuals are more likely to experience awe when they listen to some kinds of music, although in this study the effect only held for the classical selection. At the very least, this finding lends some construct validity to our results by demonstrating that a validated measure that has been shown to predict a wide range of attitudes and behaviors related to the experience of awe when they listen to Barber's \( \text{Adagio} \).

For instance, the preference for reflective and complex music was found to affect and personality. Below, we summarize the results and address several findings of note. We then highlight limitations of the research and directions for future research.

Several studies suggest that personality traits are associated with an individual’s ability to experience awe (Panksepp, 1995; Roets & Van Hiel, 2011; Shiota et al., 2007). According to McCrae (2007), one of the best indicators of the trait openness is the frequent experience of chills in response to aesthetic stimuli. In Study 1, openness was not significantly related to preferences for any specific genre of music. Need for cognition and cognitive closure, however, which are both related to openness, were more closely related to musical preferences and the experience of awe. High need for cognition and low cognitive closure were related to preference for all four genres that comprise the reflective and complex dimension in Rentfrow and Gosling’s (2003) taxonomy, indicating musical expertise is not a necessary condition of experiencing musical awe.

The general purpose of this study was to examine music-induced awe. Results indicate that the ability of music to induce awe differed for different musical dimensions. More specifically, we were interested in the relationship of music-induced awe to affect and personality. Below, we summarize the results and address several findings of note. We then highlight limitations of the research and directions for future research in marketing and consumer behavior.

For example, the preference for reflective and complex music was the only dimension for which predicted awe interactively with preference—that is, individuals high in openness experienced awe only when they also preferred reflective and complex music. Finally, all of these effects emerged controlling for musical training, indicating musical expertise is not a necessary condition of experiencing musical awe.

The fact that openness was not strongly related to preferences or to the experience of awe generally may seem at odds with prior research and theory. Indeed, McCrae (2007) indicates that this should be one of the best indicators of aesthetic chills. Nusbaum and Silvia (2011) found that openness was the best of the Big Five predictors of music-induced chills. Some of this may be due to our operational definition of awe. As

4 General Discussion

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4.1 Limitations

The fact that openness was not strongly related to preferences or to the experience of awe generally may seem at odds with prior research and theory. Indeed, McCrae (2007) indicates that this should be one of the best indicators of aesthetic chills. Nusbaum and Silvia (2011) found that openness was the best of the Big Five predictors of music-induced chills. Some of this may be due to our operational definition of awe. As
reported in the literature review, chills are thought to be the physiological component of awe, but it is also a cognitive–conceptual emotion. More important, though, our data were dependent entirely on what participants reported experiencing while they were actually listening to musical selections. Such online reports may differ from participants’ self-reported retroactive evaluations like those utilized by Nusbaum and Silvia (2011). Because we actually had participants listen to music, we had to make selections that were generally representative of the genres in each dimension. There was undoubtedly wide-ranging variance in the extent to which these tracks were consistent with the kinds of tracks that participants remember when they reflect on their experience of chills. Of course, our study was about the experience of awe, not chills, and it is also possible that experiencing chills does not always or necessarily translate into the experience of the emotion aesthetic awe.

There were also some limitations to the methodology. There is a certain level of subjectivity involved with selecting tracks that are representative of each genre. The excerpts were chosen because the artist or the song itself could be identified as belonging to or representing a specific genre based on the taxonomy provided by Rentfrow and Gosling (2003). Furthermore, although we were only able to utilize one selection per genre, Study 1 included 150 participants in a within-subjects design. Therefore, individual differences in preference and subjective classifications for each selection should be expected to normalize across our sample.

Most important, it should be noted that preferences, as categorized by the STOMP (Rentfrow & Gosling, 2003), were excellent predictors of experienced awe. This provides powerful evidence that the selections used in this study were in fact good exemplars of the preferences participants reported, given that we categorized participants’ preferences on our selections with the exact same classification system.

Finally, Study 1 utilized a sample of college students, whose findings may not generalize to a more representative population. For this reason, we utilized a representative sample of working adults in Study 2. In order to obtain this population, we conducted the study online, reducing the potential time and intensiveness of the research study and limiting us to a smaller number of audio selections. Although this is a potential limitation of the design, we were able to replicate the basic pattern of findings that perceived and even felt sadness can contribute to the experience of awe for reflective and complex music.

4.2 Future directions

The literature on awe indicates that awe may be described as either a positive or a negative experience (Keltner & Haidt, 2003); however, our study suggests the experience of aesthetic awe may also result from more complex emotional responses to music. Results showed that although individuals felt high levels of happiness and awe when listening to reflective and complex selections, they also perceived the music itself to be sad. Conversely, it was found that when individuals felt high levels of sadness and awe while listening to upbeat and energetic music they perceived the music itself to be happy. Prior research has examined mixed emotional responses to conflicting cues in music (e.g., upbeat songs in minor modes and sad songs in major modes; Hunter, Schellenberg, & Schimmack, 2010). Individuals are more likely to experience mixed emotions to music when conflicting cues are present (Larsen & Staatsy, 2011). This research further suggests a relationship between mixed emotions and the experience of awe in music, particularly for reflective and complex selections. Furthermore, it suggests that music may be an ideal context in which to more closely examine the relationship between mixed emotions and the experience of awe in future research.

These results should be of interest to psychologists and marketers alike interested in consumer behavior. Music is ubiquitous in marketing and advertising, and since Gorn’s original study (1982) demonstrating that music can be used to classically condition product preferences (see also Vermeulen & Beukeboom, 2015), understanding emotional reactions to music is of increasing interest to marketers (North & Hargreaves, 2010). Need for cognition (e.g., Hägge, Petty, & Cacioppo, 1992; Reinhard & Messner, 2009) and cognitive closure (Kardes, Sanbonmatsu, Cronley, & Houghton, 2002; Niculescu, Payne, & Luna-Nevarez, 2014) have been of interest to consumer behavior researchers for some time. However, this work is the first to examine them in the context of the experience of awe in any domain. Finally, awe has received some attention in the psychology literature but has only relatively recently been examined in a consumer context (Berger & Milkman, 2012; Rudd et al., 2012). Given the incredible power of music and its ubiquity in advertising, marketers may specifically be interested in tailoring their ability to elicit awe in their target audiences appropriately with respect to differences in musical preference and characteristics such as openness and need for cognition. This may be particularly useful to marketers wishing to cultivate an awe-inspiring brand image. Oakes and North (2013) found that different kinds of music can play a powerful role in this regard. For example, students perceived a university to be more sophisticated when an advertisement was paired with classical music but more exciting when paired with dance music.

One potentially rewarding area to explore is the impact of awe on prosocial behavior. Piff et al. (2015) showed that individuals higher in the tendency to experience awe, as measured by the same scale used in this study, are more generous in economic bargaining games. Individuals induced to experience awe also behave more generously, suggesting that state effects have awe can have real consequences for consumer behavior. Our results demonstrate that such manipulations of awe can be made relatively easily with short musical excerpts, which are ubiquitous in advertising. Audio clips selected to evoke awe may be particularly useful for charitable organizations or nonprofits that rely on consumers’ generosity. Our results suggest that awe-inspiring music may have consequences for behavior even if the music does not impact one’s emotional state directly, as long as it is reflective and complex enough to communicate emotions within its structure.

Finally, the suggested relationship between mixed emotions and the experience of awe may be of specific interest to consumer behavior researchers in future research as well. Mixed emotions have been shown to have unique effects on persuasion (Williams & Aaker, 2002) and purchase intention (Bee & Madrigal, 2013). These results indicate that music may be a particularly important domain in which to investigate the effect of mixed emotions on attitudes and purchase intentions in addition to their impact on the experience of awe.
Beethoven believed that music connected the spiritual and the physical. To the extent that awe is a transcendent emotion that is ultimately embodied, our results indicate that music has the power to induce it. But not all music appears to possess this ability, and not all people have the ability to grasp it. The relationship of need for cognition to awe indicates that, to Beethoven’s spiritual and physical dimensions of musical experience, we can add the mental.

REFERENCES


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## APPENDIX A

### Study 1 musical selections with genre and dimension

<table>
<thead>
<tr>
<th>Artist/composer</th>
<th>Song title</th>
<th>Genre</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beethoven</td>
<td>Sonata No. 8 in C minor</td>
<td>Classical</td>
<td>Reflective and complex</td>
</tr>
<tr>
<td>Mahler</td>
<td>Symphony No. 5—Mov 4</td>
<td>Classical</td>
<td>Reflective and complex</td>
</tr>
<tr>
<td>Cannonball Adderley</td>
<td>Work Song</td>
<td>Jazz</td>
<td>Reflective and complex</td>
</tr>
<tr>
<td>Taking Back Sunday</td>
<td>New American Classic</td>
<td>Alternative</td>
<td>Intense and rebellious</td>
</tr>
<tr>
<td>Tool</td>
<td>Schism</td>
<td>Metal</td>
<td>Intense and rebellious</td>
</tr>
<tr>
<td>Pink Floyd</td>
<td>Shine On You Crazy Diamond</td>
<td>Rock</td>
<td>Intense and rebellious</td>
</tr>
<tr>
<td>Devotchka</td>
<td>The Winner Is</td>
<td>Soundtrack</td>
<td>Upbeat and conventional</td>
</tr>
<tr>
<td>Perry</td>
<td>If I Die Young</td>
<td>Country</td>
<td>Upbeat and conventional</td>
</tr>
<tr>
<td>Rebecca St. James</td>
<td>Emmanuel</td>
<td>Religious</td>
<td>Upbeat and conventional</td>
</tr>
<tr>
<td>The Fugees</td>
<td>Killing Me Softly</td>
<td>Hip-hop</td>
<td>Energetic and rhythmic</td>
</tr>
<tr>
<td>Boyz II Men</td>
<td>It’s So Hard to Say Goodbye to Yesterday</td>
<td>R&amp;B/soul</td>
<td>Energetic and rhythmic</td>
</tr>
<tr>
<td>Radiohead</td>
<td>Reckoner</td>
<td>Electronic</td>
<td>Energetic and rhythmic</td>
</tr>
</tbody>
</table>