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What Does Your Musical Instrument Say About You: Analyzing Musical Instrument Preference And the Big 5 Personality Traits

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Abstract

Personality traits have unique abilities to shine through every action, thought, and belief that an individual engages in. These traits, in addition to other influential life experiences, shape all expressions of personality. Past publications in psychomusicology suggest that music listening preferences can be measured and predicted by personality traits. The present study expands on these discoveries by asking the question: What correlations exist between the Big Five personality traits (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Negative Emotionality) and musical instrument listening preferences? 202 participants recruited from Amazon's Mechanical Turk completed a survey on Qualtrics measuring personality traits through the Big Five Inventory-2, as well as musical instrument and genre preferences. First, results revealed that individuals who prefer to listen to traditionally melodic instruments (such as guitar and piano) tend to have higher Agreeableness and Openness to Experience personality scores than those who prefer rhythmic instruments (such as bass and drums). Second, this study found significantly different Extraversion scores among musical instrument preferences. Third, this study found significantly different Extraversion scores among different musical genre preferences. The findings of this study indicate that musical instruments may provide more personality correlations than other musical elements, such as genres.

KEYWORDS: Personality Traits, The Big Five, Musical Genre Preferences, Musical Instrument, Musical Instrument Preferences, Personality Correlates, BFI-2

Introduction

For thousands of years, music has been a fundamental component of society. Music is so integral to listeners' lives that some consider music listening preferences as an identifier or compatibility badge that could serve to indicate one's personality traits or social groups (North & Hargreaves, 1999; Dunn et al., 2012). Rentfrow and Gosling examined this skill and found that strangers were able to make correct guesses about individuals solely based off conversations regarding music. They also found that music preferences were discussed more frequently than any other conversation topic (2006). While the appeal and utilization of music is evident throughout history and psychological literature, what is it about music that allows these correlations to exist? First, it is necessary to establish what is meant by "musical preferences." North and Hargreaves measured "musical preferences" as they related to various listening situations (1996). Similarly, Kopacz defined "musical preferences" as the auditory musical elements that draw individuals to listen (2005). These studies suggest that there is a great value in researching the influence of music listening tendencies on personality traits outside of instrument playing or music composition. Therefore, this study defines "musical preferences" as preferred listening habits. When researchers investigate musical preferences, they often examine their relationships with personality traits. Costa and McCrae developed the "Big Five," one of the most popular concepts in personality psychology (1985). This study found Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Negative Emotionality to be the most fundamental personality traits. Their Five-Factor Model (FFM) of personality was utilized in entirely different contexts as well, such as clinical assessments and psychopathology research (Costa & McCrae, 1992; Costa & Widiger, 1994; Soldz et al., 1993; Trull, 1992). Over the years, their assessment measures have been expanded upon and developed into more generalizable forms (Costa & McCrae, 1992;

John et al., 1991; Rammstedt & John, 2007; Soto & John, 2017). Currently, one of the most comprehensive measures of the Big Five personality traits is the Big Five Inventory-2 (Soto & John, 2017).

Research into the psychology of music is also gaining interest. Due to the universality of music, researchers have attempted to identify its roles in many aspects of life. One specialty within psychomusicology examines music preferences based on the auditory features of music, such as rhythm, pitch, bass, and others (Krumhansl, 2000; McCown et al., 1997). However, there are other researchers that organize music by genre and subgenre for analyses (Cattell & Anderson, 1953; Cattell & Saunders, 1954; Rentfrow & Gosling, 2003; Rentfrow & Gosling, 2006).

Currently, the most popular method in determining musical listening preferences is the Short Test of Music Preferences (STOMP) from Rentfrow and Gosling's comprehensive study (2003). This measure of music preference asks participants to rate their familiarity and enjoyment of certain genres and subgenres on a 7-point Likert-style scale (1 being "not at all," and 7 being "a great deal"). Based on how highly participants rate their preferences, researchers can determine the degree to which a person enjoys a certain type of music. Findings from this study indicated 4 major types of music: Reflective and Complex (R&C), Intense and Rebellious (I&R), Upbeat and Conventional (U&C), and Energetic and Rhythmic (E&R). They also found that personality traits, such as Openness to Experience, were correlated with R&C, I&R, and U&C styles of music. While effective in analyzing musical genres and their sonic and emotional attributes, the STOMP did not test for musical elements relating to individual musical instruments nor their categorizations as rhythmic or melodic.

The Current Study

The study of personality traits and their associations can be helpful in estimating attitudes, emotional stability, and even health outcomes. Because music is a central component of many cultures, research into music preferences could reveal more about individuals than their personality scores could. The goal of the present study is to assess the importance of musical instrument preferences in the development of personality, which has been largely ignored in psychomusicological literature. Redirecting efforts to more elemental components of music might provide specific understandings of the functions of musical personality correlates. Also, the present study will not draw a line between experienced musicians and passive music listeners. We believe that a population with varied relationships with music can make the results more generalizable and account for individuals who play an instrument, but do not commit their lives to it. The current study will examine the relationship between a preference of rhythmic or melodic instruments and the Big Five personality traits. For the purposes of this study, rhythmic instruments will be defined as instruments that establish the fundamental groove or beat of the song. Melodic instruments will be defined as instruments that usually produce a melody on top of the beat provided by the rhythm instruments. While some instruments can be both rhythmic and melodic, the present study will limit rhythmic instruments to percussion instruments and bass guitars. Additionally, we will determine the relationship, if any, between certain musical instruments and personality traits. The current study will also replicate Rentfrow and Gosling's methods to see if their results could be found using strictly musical genres, as opposed to their 4-factor model of music (2003).

First, we hypothesized that individuals who prefer rhythmic instruments would be lower in Conscientiousness. Second, individuals who prefer rhythmic instruments would be lower in Agreeableness than those who prefer melodic instruments. These hypotheses are based on the

findings of George, Stickle, Rachid, and Wopnford, which claimed that fans of rhythmic musical styles were lower in Conscientiousness and Agreeableness (2007). Third, we hypothesized that individuals who prefer rhythmic instruments would have higher Extraversion scores than those who prefer melodic instruments because previous literature indicates a relationship between Extraversion and preferences for rhythmic musical styles (Langmeyer et al., 2012). Fourth, we hypothesized that individuals who prefer melodic instruments would have higher Openness to Experience scores than those who prefer rhythmic instruments.

Methods

Participants

The present study recruited 202 participants from Amazon's Mechanical Turk (MTurk), aged 21 to 70 ($M=35.14$, $SD=8.68$). This sample included 145 men, 55 women, one other, and one who preferred not to answer. Regarding ethnicity, participants were reported as 69.31% Caucasian, 14.85% Black, 8.42% Asian, 3.47% Native American, 2.97% Hispanic, 0.495% Pacific Islander, 0.495% Other. The only exclusion criteria for recruitment stipulated that participants must reside in the United States of America. All participants, regardless of experience creating music or playing an instrument, were invited to participate. Participants were compensated \$1.00 USD for their time.

Procedure

MTurk users who chose to participate in the present study followed a link to Qualtrics, where the survey was operated. On Qualtrics, participants read and approved an informed consent form. Then, participants completed the Big Five Inventory-2 and a brief music preference questionnaire. Afterwards, participants were prompted to answer demographic questions regarding their age, gender, and ethnicity. Upon completion of the Qualtrics survey, participants

received a unique passcode to enter on their MTurk tab. After the participants submitted their code, they were thanked for their time, informed they could exit the website, and compensated.

Measures

Personality traits were assessed using the BFI-2 (Big Five Inventory-2), a 60-item survey meant to obtain values for the individual's Big 5 Personality traits (Soto & John, 2017). Sample questions included, "Keeps things neat and tidy," and "Tends to be quiet." Questions were answered on a 5-point Likert-style scale, with responses ranging from 1 ("strongly disagree") to 5 ("strongly agree"). In the current study, Cronbach's α s of the Big Five Personality Traits (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Negative Emotionality) ranged from 0.7776 to 0.8503.

Musical listening preferences were determined in a direct manner through free-response text boxes. Participants responded to three questions: "Do you prefer rhythmic or melodic instruments," "What is your favorite musical instrument," and "What is your favorite musical genre?"

Results

Responses in the personality questionnaire were coded according to the instructions in Soto and John (2017). Scores closer to 1 indicated a lesser presence of a certain personality trait and scores closer to 5 indicated a greater presence of a personality trait. Responses to the three questions in the musical listening preference questionnaire were grouped into three respective categories for analysis. We performed One-Way ANOVAs for each of the three categories to determine the degree to which musical preferences differed in terms of the Big Five personality traits. The results in **Table 1** depict the average personality scores for those who prefer rhythmic or melodic instruments. As shown in the table, we found significant results regarding the

personality traits of Agreeableness ($F(1, 194) = 7.0245, p < 0.01$) and Openness to Experience ($F(1, 194) = 5.7923, p < 0.05$). Those who preferred rhythmic instruments were observed to be less Agreeable and less Open to Experiences than those who prefer melodic instruments, which supports the second and fourth hypotheses. The responses for six participants had to be discarded in this analysis because they declined to answer or did not appropriately respond. **Table 2** contains the data from a One-Way ANOVA analyzing the relationships between average musical instrument listening preferences and personality traits. Here, the only significant differences between groups were found in the personality trait, Extraversion ($F(10, 177) = 1.9737, p < 0.05$). A post hoc test was performed to identify specific significant differences between instruments but found none. This meant that the specific instruments responsible for this significant finding were unable to be identified. Fourteen responses had to be removed from this analysis for the same reasons as before. Lastly, **Table 3** shows the data from a One-Way ANOVA analyzing the personality differences between individuals of differing musical genre preferences. The relationship between musical genre preference and Extraversion ($F(10, 171) = 1.8941, p < 0.05$) was the only significant result that came from this analysis of variance. A subsequent post hoc test did not determine any specific differences between groups. This meant that the individual genres responsible for the significant result could not be identified. Eighteen responses had to be removed from this analysis for the same reasons.

Table 1: Means, Standard Deviations, and F-Values of One-Way ANOVAs between Personality Traits and Rhythmic and Melodic Instruments

	Extraversion	Agreeableness	Conscientiousness	Negative Emotionality	Openness to Experience
Rhythmic Instruments	3.07 (0.68)	3.33 (0.61)	3.56 (0.73)	2.66 (0.78)	3.41 (0.66)
Melodic Instruments	3.12 (0.84)	3.62 (0.71)	3.76 (0.83)	2.65 (0.96)	3.70 (0.78)
$F(1,194)$	0.11	7.02**	2.49	0.01	5.79*

Note: * $p < 0.05$. ** $p < 0.01$. Instrument results are reported in the form “Mean Personality Score (Standard Deviation).”

Table 2: Means, Standard Deviations, and F-Values of One-Way ANOVAs between Personality Traits and Individual Musical Instruments

	Extraversion	Agreeableness	Conscientiousness	Negative Emotionality	Openness to Experience
Guitar	2.99 (0.90)	3.52 (0.73)	3.66 (0.83)	2.78 (0.95)	3.57 (0.82)
Piano	3.23 (0.64)	3.53 (0.69)	3.66 (0.81)	2.54 (0.77)	3.55 (0.74)
Bass	2.24 (0.88)	3.65 (0.62)	3.67 (0.85)	3.27 (1.14)	3.82 (0.79)
Violin	3.56 (1.52)	3.53 (0.91)	4.06 (0.83)	2.58 (1.96)	4.39 (0.55)
Cello	2.72 (1.20)	3.94 (0.61)	2.94 (0.54)	3.11 (0.39)	4.56 (0.24)
Saxophone	3.28 (1.00)	3.59 (0.79)	3.83 (0.80)	2.58 (1.00)	3.5 (0.92)
Organ	3 (0.59)	4.25 (0.71)	3.58 (0.94)	2.79 (0.41)	4.54 (0.53)
Flute	2.38 (0.77)	3.58 (0.94)	3.63 (1.12)	3.96 (1.12)	3.25 (0.59)
Drums	3.30 (0.51)	3.37 (0.68)	3.76 (0.74)	2.41 (0.69)	3.46 (0.58)
Keyboard	3.08 (0.25)	3.67 (0.71)	4 (1.10)	1.94 (1.06)	3.39 (0.57)
Synthesizer	2.04 (0.53)	3.38 (1.00)	3.79 (0.77)	4 (1.18)	4.71 (0.29)
<i>F</i> (10, 177)	1.97*	0.45	0.42	1.86	1.77

Note: * $p < 0.05$. Instrument results are reported in the form “Mean Personality Score (Standard Deviation).”

Table 3: Means, Standard Deviations, and F-Values of One-Way ANOVAs between Personality Traits and Musical Genres

	Extraversion	Agreeableness	Conscientiousness	Negative Emotionality	Openness to Experience
Rock	3.03 (0.83)	3.63 (0.78)	3.80 (0.77)	2.56 (0.99)	3.74 (0.80)
Pop	3.25 (0.78)	3.48 (0.67)	3.50 (0.86)	2.74 (0.76)	3.59 (0.71)
Hip Hop	3.53 (0.65)	3.63 (0.69)	3.77 (0.88)	2.45 (0.76)	3.62 (0.68)
Classical	3.11 (0.45)	3.39 (0.55)	3.54 (0.57)	2.81 (0.51)	3.29 (0.53)
Jazz	3.20 (0.83)	3.60 (0.75)	3.90 (0.88)	2.50 (1.03)	3.56 (0.88)
Alternative	2.63 (1.04)	3.93 (0.69)	3.77 (0.99)	2.76 (1.36)	4.24 (0.69)
Rap	3.08 (0.18)	3.17 (0.48)	3.36 (0.58)	2.66 (0.39)	3.25 (0.50)
Metal	2.39 (1.13)	3.43 (0.79)	4.08 (0.80)	2.68 (1.16)	3.51 (1.10)
Electronic	2.85 (0.58)	2.98 (0.29)	3.5 (0.79)	3.43 (0.85)	3.73 (0.82)
Folk	3.23 (0.31)	3.46 (0.92)	3.58 (0.93)	2.52 (0.86)	3.27 (0.61)
Country	2.96 (0.61)	3.58 (0.45)	4.31 (0.93)	1.85 (1.03)	3.25 (0.49)
<i>F</i> (10, 171)	1.89*	1.20	1.06	1.00	1.77

Note: * $p < 0.05$. Genre results are reported in the form “Mean Personality Score (Standard Deviation).”

Discussion

In addition to being an essential component to cultures around the world, music can be a correlate of personality traits. The present study addressed one question regarding this relationship: What are the correlations between musical instrument listening preferences and the

Big Five Personality Traits? This question was analyzed in groups of rhythmic and melodic instruments, as well as at the individual instrument level. This study also attempted to replicate the findings of Rentfrow and Gosling by using a more direct method to determine musical genre preferences (2003). Neither rhythmic nor melodic instruments were found to be significantly correlated with Conscientiousness. While this does not negate the findings of George, Stickle, Rachid, and Wopnford, it simply suggests that findings regarding rhythmic music preferences and Conscientiousness do not extend to those instruments classically identified as rhythmic (2007). Despite sharing an emphasis on maintaining an orderly, consistent, and metronomic beat, rhythmic instruments might not share personality associations with rhythmic musical styles. This finding sets an important precedent in psychomusicology and can be helpful in informing future hypotheses. It was also hypothesized that those who prefer rhythmic instruments would be higher in Extraversion than those who prefer melodic instruments. The results in this paper do not support this hypothesis, as neither rhythmic instruments nor melodic instruments were significantly related to Extraversion. This finding does not negate Rentfrow and Gosling's finding that those who prefer E&R types of music were more Extraverted (2003). Alternatively, it suggests that rhythmic instruments likely are not the factors that facilitate their observed correlation. These findings might be observed due to an insufficient sample size, as previous studies have drawn results from populations of over 1,000 participants. However, individual musical instrument preferences had significantly different group means in the Extraversion trait. This finding might be observed because certain instruments are more socially prominent than others. Those who are more Extraverted might prefer instruments that are commonly at the forefront during songs and performances, while those who are less Extraverted might identify with the instruments in the background.

The current study also found that those who preferred rhythmic instruments were lower in Agreeableness and Openness to Experience than those who preferred melodic instruments. This could be a result of rhythmic instruments having more pronounced timbres and fewer beat arrangements than melodic instruments. These musical elements could be associated with more disagreeable or tradition-oriented personality characteristics. These two results support earlier hypotheses and provide evidence that some findings regarding musical preferences can be generalized and expanded to groupings of instruments. The generalizability of previous findings regarding genre preferences is important for the future of psychomusicology research because it might attest to the centrality of musical instruments in certain genres. For example, a future study can investigate the correlation between the personality traits of those whose favorite music genre is classical and whose favorite instrument is piano.

The results of the present study have implications for the importance of musical instrument listening preferences, their personality correlations, and their centrality to certain musical genres. It is helpful to consider the instruments that facilitate the connections between personality traits and music preferences. For example, one should reflect on the roles of rhythmic instruments when forming conclusions about the personality traits of those who prefer Rhythm & Blues. By recognizing the number and significance of the personality correlates of musical instruments, researchers might be able to better understand the root of personality associations in musical genre listening preferences.

Findings from the present study have the potential to support future studies. Now that there are preliminary results supporting musical instrument and personality correlations, future studies can create a rigorous, STOMP-like method of determining musical instrument preferences. We can also analyze the results from the current study from an ethnomusicological standpoint. The

ethnomusicological method of organizing instruments would account for a more diverse range of instruments and their use in songs as both rhythmic and melodic. Additionally, future studies should investigate the degree to which musical performance and composition skills influenced the correlations found in the present findings. The importance of certain musical instruments within genres should be further studied. For example, analyzing drum samples in the electronic beats of rap and hip hop might identify similar personality associations. Future studies should also diversify the findings from this study by using the personality traits reflective of the culture of interest.

Although the current study had some significant results, future studies can improve on the validities and reliabilities of these findings by addressing their limitations. First, the present study had a limited sample, drawing only participants from the United States of America who were over eighteen years old and had MTurk accounts. Future studies should obtain a more diverse population, as the demographics in the present study are not reflective of the entire United States of America. Additionally, future international studies should be careful to consider whether the Big Five Personality Traits accurately represent the basic personality traits found in the culture and language that they are researching (Benet-Martínez & John, 1998). Lastly, with more time, greater funding, and a larger sample size, some of those musical instrument preferences that only had a few responses could be better represented.

CONCLUSION

Due to the abundant interactions that many people have with musical instruments, it is necessary that research in psychomusicology expands to more specific aspects of music than simply genre. The present study addressed this lack of musical instrument research by investigating the personality correlates of musical instrument preferences. The current study found that those who

prefer traditionally rhythmic instruments were lower in Agreeableness and Openness to Experience than those who prefer traditionally melodic instruments. Additionally, the results of this study suggest that Extraversion may play a role in musical instrument preferences. The current study also found more personality associations with musical instrument preferences than genre preferences. These findings reflect the importance of instruments in certain musical genres and their role in developing a unique connection with personality traits.

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