WHAT DOES YOUR MUSICAL INSTRUMENT SAY ABOUT YOU: ANALYZING THE INFLUENCE OF MUSICAL INSTRUMENTS ON 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, including musical preferences. Past publications in psychomusicology suggest that music preferences can be measured and predicted by personality traits. The present study expands on these discoveries by investigating what influences the Big Five personality traits (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Negative Emotionality) have on musical instrument preferences. 202 participants recruited from Amazon's Mechanical Turk completed a survey on Qualtrics measuring personality traits through the Big Five Inventory-2 and musical instrument and genre preferences. First, results reveal that individuals who prefer traditionally melodic instruments (such as guitar and piano) tend to be higher in Agreeableness and Openness to Experience than those who prefer rhythmic instruments (such as bass and drums). Second, this study found Extraversion scores to be significantly different among musical instrument preferences. Third, this study replicated previous results and found Extraversion to be a predictor of musical genre preference. The findings of this study indicate that musical instruments may provide more personality correlates than musical genres.

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INTRODUCTION

For thousands of years, music has been a fundamental aspect of both social and solitary life. Socially, music has been a staple in events such as Native American Sun Dance rituals, Latin hymns in traditional Catholic masses, and 1920's speakeasy parties. Recently, music has become popular to enjoy as a solitary experience when riding public transportation, studying for an exam, or cleaning the house. Music is so integral to listeners' lives that some consider musical preferences as an identification or compatibility badge that could serve to indicate one's personality traits or social groups (North & Hargreaves, 1999; Dunn, de Ruyter, & Bouwhuis, 2012). Rentfrow and Gosling (2006) 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. While the appeal and utilization of music is evident throughout history and psychological literature, what is it about music that has an ability to make listeners of certain music predictable?

Musical Preference

First, it is necessary to establish what is meant by "musical preferences." North and Hargreaves (1996) researched the extent to which individuals preferred listening to certain music in specific contexts and environments. They found specific musical preferences to be correlated with certain emotional or physical aspects of the listening environment. For example, people preferred certain types of music when jogging, at a nightclub, at a party, and driving on the motorway. They grouped these conditions into a musical factor titled "activity." The findings from this study suggest that musical preferences largely refer to appealing auditory and emotional components of music based on certain situations.

Similarly, Kopacz (2005) researched how personality traits influenced preferences regarding auditory musical elements. This study operationally defined the preference component of "musical preferences" as "the act of choosing, esteeming, or giving advantage to one thing over another through a verbal statement, rating scale response, or choice made from one or two alternatives" (Kopacz, 2005; Kuhn, 1980). With regards to musical preferences, Kopacz (2005) referred to the musical component of "musical preferences" as musical elements, including tempo, melodic theme, meter, sound dynamics, and more.

These studies, along with many others in psychomusicology, seemingly suggest that there is a great value in researching music listening preferences, as opposed to instrument playing or music composition. In accordance with previous definitions, the present study defines musical preferences as preferred listening habits.

The Big Five Personality Traits

When researchers investigate the predictive nature of musical preferences, they often examine its relationship with personality traits. In the past 100 years, psychologists have researched the development, utility, and importance of personality. One of the earliest investigations into the study of personality was Allport and Odbert (1936). They attempted to identify key traits in personalities by compiling a list of thousands of adjectives relevant to personality traits and key behaviors. Subsequent studies, such as Cattell (1947), Comrey (1962), and Eysenck (1963) formed their own personality inventories that were more thorough and replicable. These studies were also successful in reducing the amount of personality factors.

Costa and McCrae (1985) developed one of the most popular concepts of unique personality traits known as the "Big Five." This study identified Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to be the most fundamental personality traits.

Additionally, they outlined facets of each trait to enable specific analyses within each factor. Costa and McCrae (1985) loosely defined Extraversion as one's capacity to be sociable and people oriented. Some of the facets that they identified within Extraversion included Assertiveness, Activity, Gregariousness, Warmth, and more. Costa and McCrae (1985) referred to an individual's ability to be trusting and helpful as Agreeableness. Their facets of Agreeableness included Altruism, Compliance, Modesty, Trust, and more. Costa and McCrae (1985) defined Conscientiousness as one's organization and preference of goal-oriented activities. Some of the facets of this factor are Achievement Striving, Dutifulness, Order, and Self-Discipline. While the label "Neuroticism" has been alternatively referred to as "Negative Emotionality" or "Emotional Stability," Costa and McCrae (1985) initially defined this fourth factor as one's tendency to feel or manage negative emotions. In the current study, we will refer to this factor as "Negative Emotionality," as found in Peabody and Goldberg (1989) due to its eloquence and precision. The original facets for this factor include Angry Hostility, Anxiety, Depression, Self-Consciousness, and others. Similar to Neuroticism, the term "Openness" has gone through changes in recent years. For improved clarity, the current study will use the term "Openness to Experience" coined by Digman and Inouye (1986). Despite the lengthier title, Openness to Experience still refers to one's interest in new experiences and embracing untraditional ideas (Digman & Inouye, 1986). The facets for Openness to Experience include Actions, Fantasy, Ideas, Values, and more (Costa & McCrae, 1985).

Costa and McCrae's (1985) Five-Factor Model would go on to be utilized in entirely different contexts as well, such as clinical assessments and psychopathology research (Costa & McCrae, 1992; Costa & Widiger, 1994; Soldz, Budman, Demby, & Merry, 1993; Trull, 1992). However, their measure for assessment has been expanded upon and developed into more

generalizable forms over the years (Costa & McCrae, 1992; John, Donahue, & Kentle, 1991; Rammstedt & John, 2007; Soto & John, 2017). Currently, one of the most comprehensive measures of the Big Five personality traits is the BFI-2 (Soto & John, 2017).

Musical Preference Assessments

Concurrently, research into the psychology of music was gaining interest. Because the reach of music is so universal, researchers have attempted to identify its role in many aspects of life. One popular specialty within psychomusicology examines personality as it relates to auditory features of music, such as rhythm, pitch, bass, and others (Krumhansl, 2000; McCown, Keiser, Mulhearn, & Williamson, 1997). However, there are other researchers that group together music by genre and subgenre for analysis (Cattell & Anderson, 1953; Cattell & Saunders, 1954; Rentfrow & Gosling, 2003; Rentfrow & Gosling 2006).

The importance of Dr. Raymond B. Cattell in the development of psychomusicology cannot be understated. Within two years, he published two seminal pieces of research investigating the utilization of musical preference analyses as predictors of personality traits or behavior disorders. Cattell and Anderson (1953) identified seven unique aspects of personality that were correlated with musical preferences. The most innovative feature of this study was its creation of the I.P.A.T. Music Preference Test. In this test, participants were shown various musical excerpts and asked their opinions on them. Results from this test would indicate preferences for certain types of songs. The next year, Cattell and Saunders (1954) analyzed 120 different musical pieces and identified eight personality factors that could predict music preferences. However, there are many aspects of music that could be responsible for liking or disliking a song (the artist, the song's meaning, emotional attachment, etc.).

Later, Litle and Zuckerman (1986) developed the Music Preference Scale (MPS) to assess musical preferences. To test the efficacy of the MPS, the researchers analyzed the degree to which high sensation seekers tolerated or enjoyed intense music styles. This questionnaire contained 75 different items assessing preferences of established musical categories, musical activity, and demographic data. To account for some individuals unfamiliar with certain musical categories used by the music industry, Litle and Zuckerman (1986) included example artists. The findings from this study supported their hypothesis that high sensation seeking individuals have a higher threshold of musical intensity for enjoyment. Thus, these people had a greater preference for more intense and complex music styles. Although the MPS was effective in determining this relationship, they only examined musical genres categorized by a dated music industry. In order to stay relevant, a test of music preference must stay up to date and account for new music genres.

Currently, the most popular method in determining musical preferences is the Short Test of Music Preferences (STOMP) from Rentfrow and Gosling's (2003) groundbreaking study. The findings from this study suggested that personality traits, such as Openness to Experience, were correlated with Reflective and Complex, Intense and Rebellious, and Upbeat and Conventional 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 addresses this by investigating the relationships between musical instruments, their categorizations as rhythmic or melodic, and personality traits.

The Current Study

The goal of the present study is to better understand the importance of musical instruments in the development of personality, which has been largely ignored in psychomusicological literature. Redirecting efforts to more elemental components of music can provide deeper understandings of the functions of musical personality correlates than broader aspects, such as genres. The current study will examine the relationship between a preference of rhythmic instruments (ie. Bass and drums) or melodic instruments (ie. Guitar and piano) and the Big Five personality traits. Additionally, we will determine the relationship, if any, between certain musical instruments and personality traits. The current study will also replicate Rentfrow and Gosling (2003) to see if their results could be found using strictly musical genres, as opposed to their 4-factor model of music. First, it is hypothesized that individuals who prefer rhythmic instruments will be lower Conscientiousness. Second, individuals that prefer rhythmic instruments will be lower in Agreeableness than those who prefer melodic instruments. These predictions are based on the findings by George, Stickle, Rachid, and Wopnford (2007), which claimed that fans of rhythmic musical styles were lower in Conscientiousness and Agreeableness. Third, it is hypothesized that individuals who prefer rhythmic instruments will be higher in Extraversion than those who prefer melodic instruments because previous literature indicates a relationship between Extraversion and preference for rhythmic musical styles (Langmeyer, Guglhör-Rudan, & Tarnai, 2012). Fourth, we hypothesize that individuals who prefer melodic instruments will be higher in Openness to Experience.

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, 1 other, and 1 other 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. 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 Big Five Inventory-2 (BFI-2), a sixty-item survey meant to obtain values for the individual's Big 5 Personality traits (Soto & John, 2017). Sample questions include, "Keeps things neat and tidy," and "Tends to be quiet." Questions were answered on a 5-point Likert-style scale, with responses ranging from "strongly disagree" to

"strongly agree." In the current study, Cronbach's αs of the Big Five Personality Traits (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Negative Emotionality) ranged from 0.7776 to 0.8503.

Musical preferences were determined in a direct manner through free-response text boxes. This questionnaire was designed to understand which instruments and genres individuals preferred to listen to, as opposed to perform in. 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.

Rhythmic and Melodic Musical Instruments

The results in **Figure 1** depict the personality differences between those who prefer rhythmic instruments and those who prefer melodic instruments. We were unable to find significant results in Extraversion ($F(1, 194) = 0.1141$, $p > 0.05$), Conscientiousness ($F(1, 194) = 2.4935$, $p > 0.05$), and Negative Emotionality ($F(1, 194) = 0.0059$, $p > 0.05$). However, we found significant results regarding rhythmic and melodic preferences and the personality traits of Agreeableness ($F(1, 194) = 7.0245$, $p < 0.01$) and Openness to Experience ($F(1, 194) = 5.7923$, $p < 0.05$). The responses for 6 participants had to be discarded for this analysis because they declined to answer or did not know how to appropriately respond to the Musical Preferences Questionnaire.

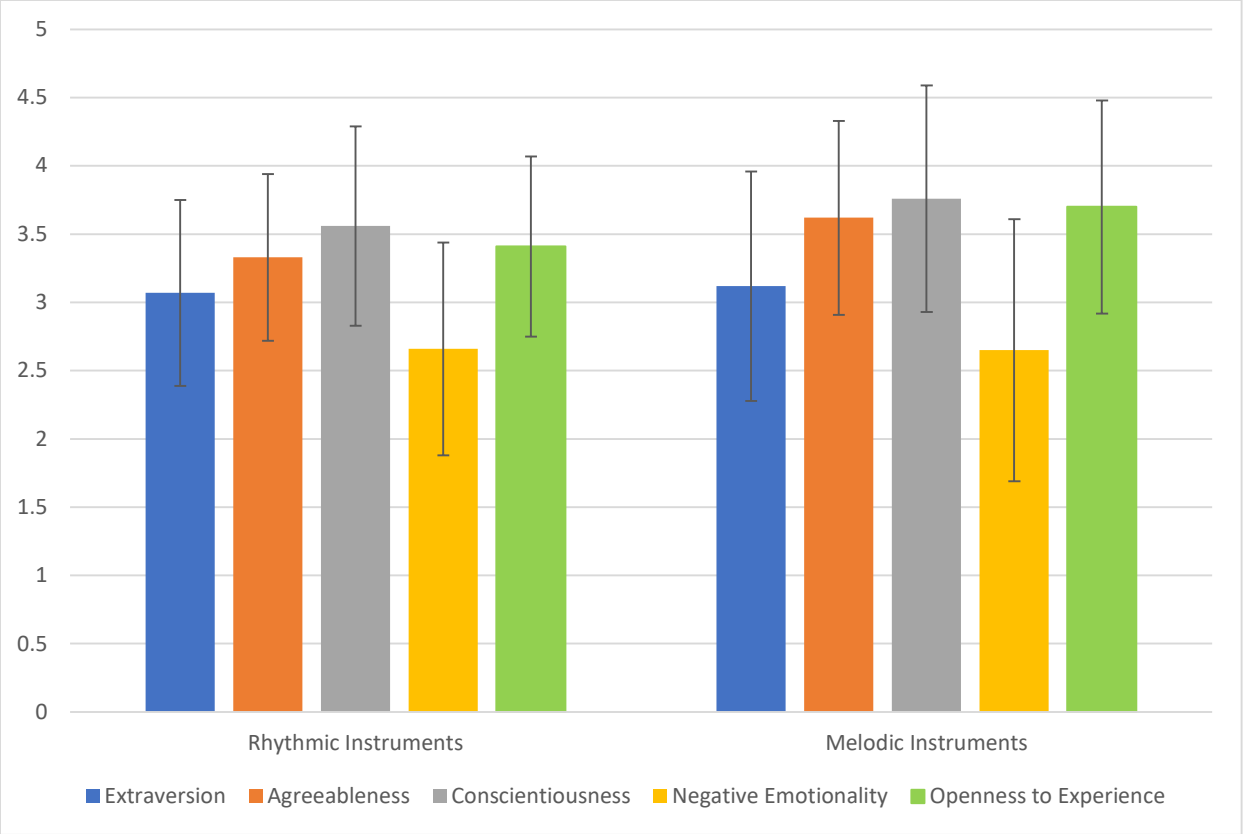

Figure 1. Average BFI-2 scores and Rhythmic and Melodic Instruments. Error bars represent Standard Deviations.

Individual Musical Instruments

Figure 2 contains the data from a One-Way ANOVA analyzing the relationships between musical instrument preferences and personality traits. Here, there were no significant results within Agreeableness ($F(10, 177) = 0.4534$, $p > 0.05$), Conscientiousness ($F(10, 177) = 0.4193$, $p > 0.05$), Negative Emotionality ($F(10, 177) = 1.8602$, $p > 0.05$), or Openness to Experience ($F(10, 177) = 1.7691$, $p > 0.05$). 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. Fourteen responses had to be removed from this analysis for the same reasons as before.

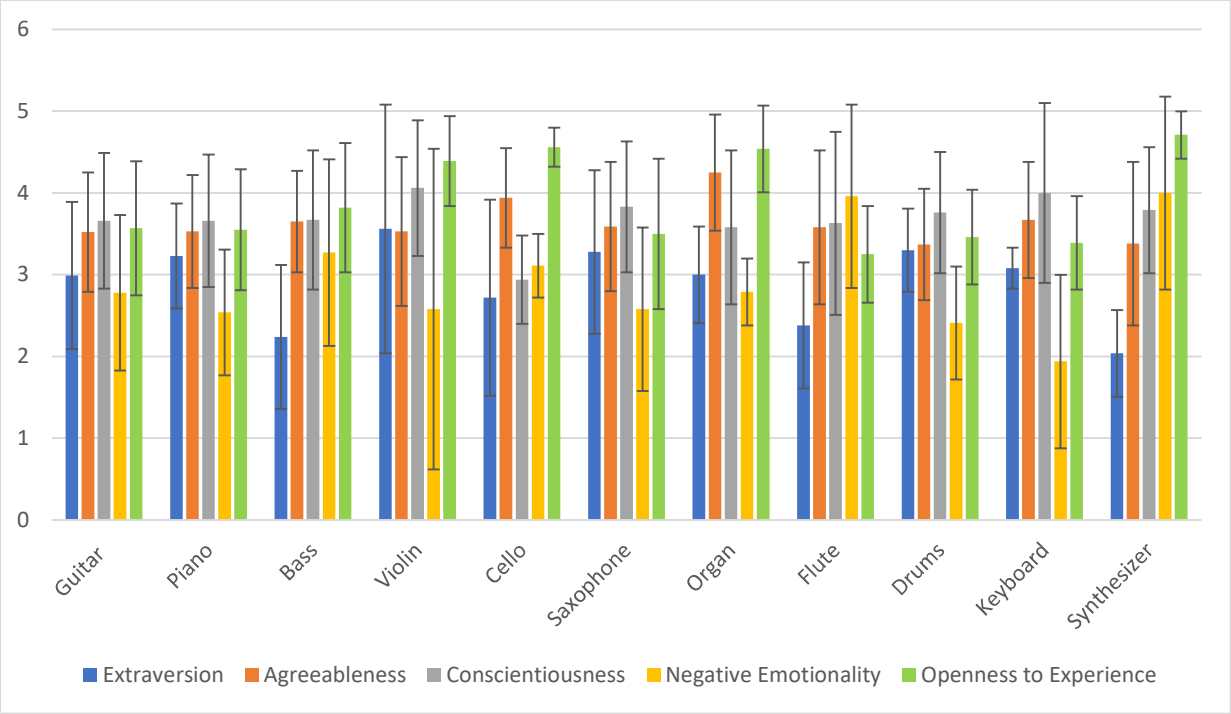

Figure 2. Average BFI-2 scores and Individual Musical Instruments. Error bars represent Standard Deviations.

Musical Genres

Lastly, **Figure 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. Eighteen responses had to be removed from this analysis for the same reasons. No significant findings were found in the Agreeableness ($F(10, 171) = 1.195$, $p > 0.05$), Conscientiousness ($F(10, 171) = 1.0586$, $p > 0.05$), Negative Emotionality ($F(10, 171) = 1.0005$, $p > 0.05$), or Openness to Experience ($F(10, 171) = 1.7738$, $p > 0.05$) factors.

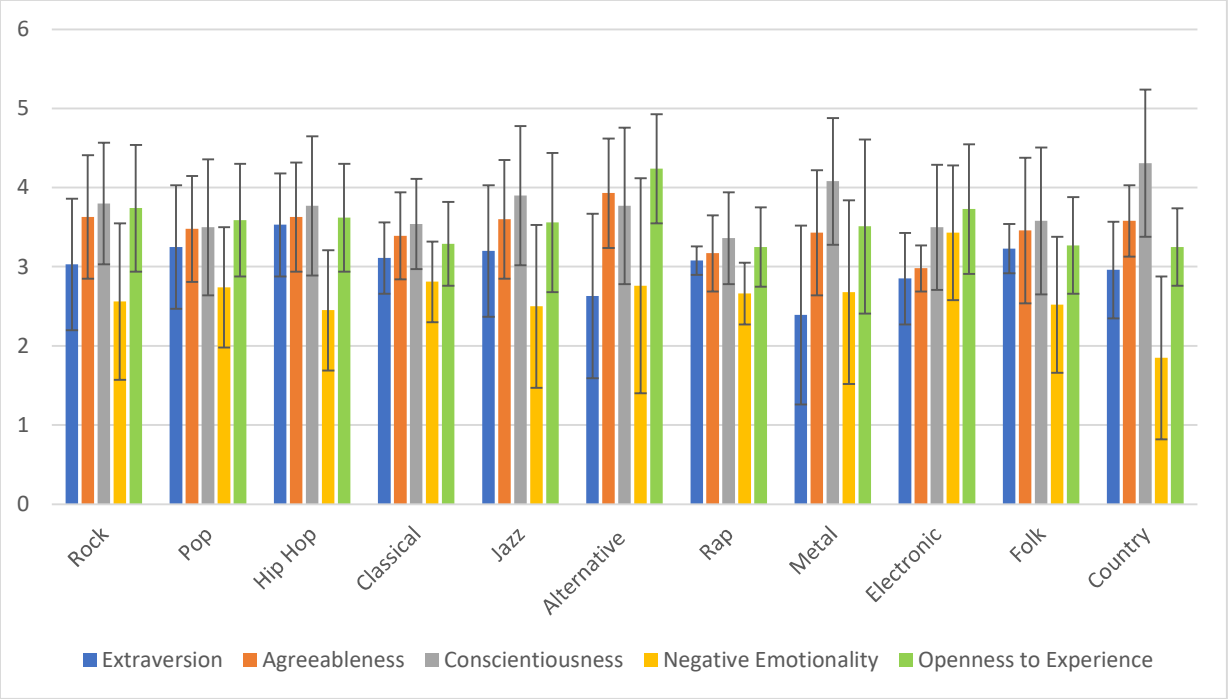

Figure 3. Average BFI-2 scores and Musical Genres. Error bars represent Standard Deviations.

DISCUSSION

In addition to being an essential component to cultures around the world, music can be a predictor of unique personality traits. The present study addressed one question regarding this relationship: What are the correlations between musical instrument 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 (2003) to establish a baseline for comparison of efficacies between musical genre relationships and musical instrument relationships with personality. 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 (2007), it simply suggests that findings regarding rhythmic music preferences and Conscientiousness do not extend to those instruments classically identified a rhythmic. It was also predicted 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. However, individual musical instruments, when not grouped based on their labels as melodic or rhythmic, were shown to have significantly different group means in the Extraversion trait. The nature of this finding might suggest that grouping musical elements into groups could be more harmful to research and might conceal results that are apparent when components are analyzed individually.

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. These two results support earlier hypotheses and provide evidence that some findings in

psychomusicology regarding musical preferences can be generalized and expanded to groupings of instruments. The generalizability of findings regarding previous genre preferences is important for the future of psychomusicology research because they can direct researchers during hypothesis formation and aid in determining the centrality of musical instruments in genres as one reason behind the observed correlations.

Implications

The results of the present study have implications for the importance of musical instruments, their personality correlates, and their centrality to certain musical genres, which has been largely ignored in psychological literature. It is crucial to understand not only the sonic elements or groupings of music, but the instruments that facilitate the connections between personality and music preference. For example, it is difficult to form conclusions about the personality traits of those who prefer Rhythm & Blues without considering the role of rhythmic instruments in that genre. By recognizing the number and significance of the personality correlates of musical instruments, researchers might be able to better understand the root of personality traits in musical genre preferences. For example, Langmeyer and colleagues (2012) suggested that rhythmic music, such as rap and hip hop, was correlated with certain personality traits. The importance of drum samples in the electronic beats of rap and hip hop could share the same results because those instruments and those genres are so fundamentally linked.

Future Research

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. Future studies can also diversify the findings from this study by using the

personality traits reflective of the culture of interest. Additionally, future studies can investigate the significance of musical performance and composition skills in the correlations found in the present findings.

Limitations

Although the current study had some significant results, future studies can improve on these findings by addressing its 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 an MTurk account. As personalities and musical preferences have the potential to grow and change over time, future researchers might consider looking into data collection including younger participants. Future studies should also obtain a more diverse population, as the demographics in the present study are far from even or perfectly reflective of the 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). Limited funding was another limitation to the study. With greater funding and a larger sample size, some of those musical instrument preferences that only had a few responses could be better represented during the analyses. Lastly, given more time to collect data, the current results could have been much more substantial and potentially generalizable.

CONCLUSION

After listening to a soulful guitar solo or a powerful drum solo, individuals can be inspired to learn to play that instrument and give a greater part of themselves to music. Due to the personal connections that individuals can form with these instruments, it is necessary that research in psychomusicology focuses on more specific aspects of music than simply genre. The

present study addressed one part of this disparity in musical instrument research by investigating the personality correlates of musical instruments. 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 correlates with musical instrument preferences than genre preferences. The implications of these findings reflect the importance of instruments in certain musical genres and their role in developing a unique connection with personality traits.

REFERENCES

Allport, G. W., & Odbert, H. S. (1936). Trait names: A psycho-lexical study. *Psychological Monographs*, *47*(1, Whole No. 211).

Benet-Martínez, V., & John, O. P. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait-multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology, 75*(3), 729-750.

Cattell, R. B. (1947). Confirmation and clarification of primary personality factors. *Psychometrika*, *12*, 197-220.

Cattell, R. B., & Anderson, J. C. (1953). The measurement of personality and behavior disorders by the I. P. A. T. music preference test. *Journal of Applied Psychology, 37*(6), 446-454.

Cattell, R. B., & Saunders D. R. (1954). Musical preferences and personality diagnosis: A factorization of one hundred and twenty themes. *Journal of Social Psychology*, *39*, 3-24.

Comrey, A. L. (1962). The minimum residual method of factor analysis. *Psychological Reports*, *11*, 15-18.

Costa, P. T., & McCrae, R. R. (1985). *The NEO Personality Inventory: Manual*. Odessa, FL: Psychological Assessment Resources.

Costa, P. T., Jr., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.

Costa, P. T, Jr., & Widiger, T. A. (1994). *Personality disorders and the five-factor model of personality*. Washington, DC: American Psychological Association.

Digman, J. M., & Inouye, J. (1986). Further specification of the five robust factors of personality. *Journal of Personality and Social Psychology, 50*(1), 116-123.

Dunn, P. G., de Ruyter, B., & Bouwhuis, D. G. (2012). Toward a better understanding of the relation between music preference, listening behavior, and personality. *Psychology of Music*, *40*, 411-428.

Eysenck, H. J., & Eysenck, S. B. G. (1963). *Eysenck Personality Inventory*. London: University of London Press.

George, D., Stickle, K., Rachid, F., & Wopnford, A. (2007). The association between types of music enjoyed and cognitive, behavioral, and personality factors of those who listen. *Psychomusicology*, *19*, 32-56.

John, O. P., Donahue, E. M., & Kentle, R. L. (1991). *The Big Five Inventory—Versions 4a and 5*. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.

Kopacz, M. (2005). Personality and music preferences: The influence of personality traits on preferences regarding musical elements. *Journal of Music Therapy, 42*(3), 216-39.

Krumhansl, C. L. (2000). Rhythm and pitch in music cognition. *Psychological Bulletin*, *126*, 159-179.

Kuhn, T. L. (1980). Instrumentation for the measurement of music attitudes. *Contributions of Music Education, 8*, 2-38.

Langmeyer, A., Guglhör-Rudan, A., & Tarnai, C. (2012). What do music preferences reveal about personality? A cross-cultural replication using self-ratings and ratings of music samples. *Journal of Individual Differences*, *33*, 119-130.

Litle, P., & Zuckerman, M. (1986). Sensation seeking and music preferences. *Personality and Individual Differences*, *7*, 575-577.

McCown, W., Keiser, R., Mulhearn, S., & Williamson, D. (1997). The role of personality and

gender in preferences for exaggerated bass in music. *Personality and Individual Differences*, *23*, 543-547.

North, A. C., & Hargreaves, D. J. (1996). Situational influences on reported musical preference. *Psychomusicology: Music, Mind and Brain, 15*(1-2), 30-45.

North, A. C., & Hargreaves, D. J. (1999). Music and adolescent identity. *Music Education Research*, *1*(1), 75-92.

Peabody, D., & Goldberg, L. R. (1989). Some determinants of factor structures from personality-trait descriptors. *Journal of Personality and Social Psychology, 57*(3), 552-567.

Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, *41*, 203-212.

Rentfrow, P. J., & Gosling, S. D. (2003). The do re mi's of everyday life: The structure and personality correlates of music preferences. *Journal of Personality and Social Psychology, 84*(6), 1236-1256.

Rentfrow, P. J., & Gosling, S. D. (2006). Message in a ballad: The role of music preferences in interpersonal perception. *Psychological Science*, *17*, 236-242.

Soldz, S., Budman, S., Demby, A. & Merry, J. (1993). Diagnostic agreement between the Personality Disorder Examination and the MCMI-II. *Journal of Personality Assessment*, *60*, 486-499.

Soto, C. J., & John, O. P. (2017). The next big five inventory (BFI-2): Developing and assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and predictive power. *Journal of Personality and Social Psychology, 113*(1), 117-143.

Trull, T. J. (1992). DSM-IIJ-R personality disorders and the five-factor model of personality: An

empirical comparison. *Journal of Abnormal Psychology*, *101*, 553-560.