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Personality Traits and the Expression Area of Synthetic House-Tree-Person Drawings in Early Adolescent Japanese

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Abstract

This study surveyed the expression areas of the Synthetic House-Tree-Person drawing test (S-HTP test, Mikami, 1995) for Japanese early adolescents. The S-HTP test is a projective method in which subjects are asked to draw a house, tree, and person. The expression area is defined as the area of each drawn item, such as the house, tree or person. The participants consisted of 186 Japanese junior high school students and their S-HTP drawings were analyzed using path analysis. The relationships between the expression areas of each item in the test and the students' personality traits were examined. The personality traits were measured using the Five-Factor Personality Inventory for Children (FFPC, Soga, 1999). The results show that personality traits of high conscientiousness were associated with larger houses ($p < .10$) and trees ($p < .10$). In addition, higher scores on openness to experience ($p < .01$) and on agreeableness ($p < .05$) correlate with bigger person figures as their size, whereas higher scores on neuroticism correlate with smaller figures as their size ($p < .01$). The findings also indicate that the total fitness of the model was sufficient (CFI = .984, RMSEA = .021). These findings may aid the development of useful criteria for future psychological assessments.

Keywords: Synthetic House-Tree-Person Test, personality, area and size of drawn items

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Introduction

Buck (1948) developed the House-Tree-Person Test (HTP test) as a projective method for personality analysis. In this test, the clients are asked to draw a house, tree, and person on separate pieces of paper after which the resulting drawings apparently project several psychological features, such as their personality. Several fundamental studies have been conducted to confirm the reliability and validity of the HTP test. For instance, Marzolf and Kirchner (1972, 1973) examined the relationships between personality traits and the features of HTP drawings using the Sixteen Personality Factor Questionnaire (16-PF).

Since cultural backgrounds are also projected in the features of HTP drawings, cross-cultural studies have also been conducted. For example, Kuhlman and Bieliauskas (1976) compared the drawings among different ethnic groups. Comparisons between countries have also been conducted, such as the study by Kline and Svaste-Xuto (1981) that compared the drawings of individuals from Thailand and Great Britain. Their results showed that the

Thai children were more dependent on their families than their British counterparts. Soutter (1994) compared data regarding children from Oman and Ireland, and found a prototypical house and tree in each group, which were indicative of personality variables.

Based on Buck's HTP test, some applied approaches have been developed. Burns (1987) introduced the Kinetic House-Tree-Person (K-HTP) method in which clients draw a house, tree, and person involved in a certain action. Mikami (1995) developed another approach known as the Synthetic House-Tree-Person test (S-HTP test), which has frequently been used in Japan. The S-HTP test differs from the original in that the clients draw all three items on a single sheet of paper. These drawings include significant information, and multiple perspectives are necessary to interpret them. Some numerical studies have been conducted that bear this point in mind. For instance, poor-quality human figures drawn by adolescents in the test represent an unstable identity (Aoyama & Ichikawa, 2006). Fukunishi, Mikami, and Kikuchi (1997) investigated the relationships between alexithymic characteristics and the features of the S-HTP test. Kohketsu and Morita (2011) surveyed the S-HTP test features of adolescents from the perspective of their communication style with friends. However, for this technique to be as a useful and reliable medium for psychological assessment as these previous studies have shown, it is necessary to collect statistical data from several age groups and countries, as well as for different genders and clinical features. Moreover, the participants in most previous studies were adults, thus creating a gap in applying these findings to the psychological assessment of children or adolescents. Furthermore, since the drawing techniques can easily be applied to children or adolescents, studies focusing on these age groups are necessary. Especially, the S-HTP includes familiar items, such as a house, tree, and person, and the items provide useful information for psychological assessment. For these reasons, the present study focused on Japanese early adolescents and examined the features of their S-HTP drawings.

Regardless of how the S-HTP test projects personality, it is vital to provide evidence based on statistical studies for a more reliable application of the test. In previous studies, some attempts were made to quantify the features of the S-HTP test based on statistics. However, the number of such studies is insufficient. The reason for such a gap in the literature lies in the difficulty of quantifying the results. While the S-HTP test was originally a projective method, it does not directly provide numerical information as is the case for quantitative tests. Nevertheless, the development of analysis technology has allowed researchers to use new analysis methods for fundamental studies of art therapy. For instance, Imamura (2001) quantified the expression area in collage works using photo retouching software and compared the works of normal and schizophrenic individuals. Kato and Morita (2009) analyzed the expression areas in LEGO creations using the same method. Such studies suggest that new analysis techniques can be used to quantify the features of drawing tests such as the S-HTP test. Therefore, the present study focused on the quantities of the expression areas in S-HTP tests and examined their relationships with the participants' personalities.

The Five-Factor Model, proposed by Tupes and Christal (1961) and Norman (1963), and organized by Goldberg (1981), was adopted as the theory of personality governing the present study. The main feature of the model is the use of the following five factors to measure personality: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. Based on the model, McCrae and Costa (1987) developed and confirmed the validity of the scale, and referred to it as the NEO-Personality Inventory (NEO-PI). Several versions of this scale have been used in previous psychological studies. However, the majority of these inventories were intended for adults. Soga (1999) developed the Five-Factor Personality Inventory for Children (FFPC) and confirmed its reliability and validity through usage. More specifically, the FFPC consists of simple items and contents that are

not difficult. On the contrary, they are suitable for investigating the personality of children and early adolescents. For this reason, this particular scale was used as the index for personality traits to investigate its relation to the expression areas of the S-HTP drawings. The hypothesis of the present study is that the sizes of the expression areas of S-HTP were affected by the score of FFPC.

Method

Participants

The participants consisted of 186 Japanese junior high school students (97 males and 89 females). In Japanese junior high school, the students are divided into three grades: 1st, 2nd, and 3rd, which encompass the age groups of 12–13, 13–14, and 14–15, respectively. The number of participants (*N*) in each respective group was 65 (37 males and 28 females), 60 (28 males and 32 females), and 61 (32 males and 29 females). All of the participants voluntarily joined the study. The data was collected in a general public school in Japan. The population and economic level of the area is at a standard level for Japan. The information of the participants' clinical assessment, such as developmental or mental disorders, and the social and economical status of each participant were not considered. Supplementally, Kato and Suzuki (2015) examined the human relationships in S-HTP drawings by Japanese junior high school students. The data of Kato and Suzuki's 2015 study ($N = 199$) and the present study ($N = 186$) were collected in the same school. The data of each study were collected at different times in the same school year. Therefore, as the timing of the surveys was different, some students were unexpectedly absent from school on the day of the survey, and the number of participants differed between Kato and Suzuki's 2015 study and the present study.

Material and Procedure

For the S-HTP test, an HB pencil and a B5-sized sheet of paper (182 mm × 257 mm) were prepared for each participant. The participants were asked to draw a picture of a house, tree, and person on the sheet of paper. They were also asked to answer the FFPC (Soga, 1999), which is a 40-item survey that measures personality traits by using a three-point scale ranging from 1 (disagree) to 3 (agree). These items are divided into five subscales: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. Soga (1999) collected more than 3,000 samples from Japanese children and confirmed the reliability and validity of the scale. Therefore, since the previous study proved the validity of these five factors, the present study also accepted the same structure as the original scale. The process of drawing and answering the questionnaire was conducted simultaneously in the classroom. Each class included between 45 and 48 students.

The S-HTP drawings were captured onto a computer by converting them to digital data via a scanner. Using Photoshop software, the house, tree, and person in each drawing were colored in black. Each drawing's data was then binarized into black and white. Subsequently, the percentages of the black areas were calculated and these scores were used as the expression areas of the house, tree, and person. All of these processes were conducted using Photoshop software.

Results

The reliability of the FFPC was confirmed using Cronbach's α and acceptable scores were found: extraversion, α = .74; agreeableness, α = .72; conscientiousness, α = .69; neuroticism, α = .82; and openness to experience, α = .80. The mean and standard deviation (*SD*) of each subscale was as follows: extraversion, *M* = 1.91, *SD* = 0.27; agreeableness, *M* = 1.81, *SD* = 0.30; conscientiousness, *M* = 2.21, *SD* = 0.40; neuroticism, *M* = 2.17, *SD* = 0.54; and openness to experience, *M* = 2.19, *SD* = 0.55.

The correlations were calculated to overview the relationships among the variables. Table 1 shows the correlation among the variables in the FFPC and S-HTP drawings. Based on the results of the correlation and hypothesis, a model was constructed using structural equation modeling. In this model, the personality traits measured by the FFPC were treated as independent variables, while the expression areas for each house, tree, and person were treated as dependent variables. It was hypothesized that the sizes of the expression areas were affected by personality traits and thus, model fitness was examined using path analysis. Based on the results of the analysis, non-significant paths were removed, which reconfirmed the model's fitness. Finally, the model shown in Figure 1 was accepted and the fit indices were acceptable ($\chi^2(18) = 19.52$, *n.s.*, GFI = .974, AGFI = .949, CFI = .984, RMSEA = .021). In this model, higher scores on neuroticism related to smaller expression areas of the persons ($p < .01$), whereas higher scores on openness to experience ($p < .01$) and agreeableness ($p < .05$) related to bigger expression areas of the persons. However the impacts were not significant, higher scores on conscientiousness related to bigger expression areas of the houses ($p < .10$) and trees ($p < .10$)

Table 1

The Correlation Among the Variables in the FFPC and S-HTP Drawings

Measure	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness	House	Tree
Agreeableness	0.186*						
Conscientiousness	0.013	-0.298**					
Neuroticism	0.107	0.363**	-0.293**				
Openness	0.143	0.157*	-0.013	0.348**			
House	0.033	-0.02	0.141	0.006	0.084		
Tree	0.025	-0.115	0.142	-0.08	0.078	0.132	
Person	0.139	0.123	0.099	-0.108	0.16*	0.06	0.015

$p < .05$. $^{**}p < .01$.

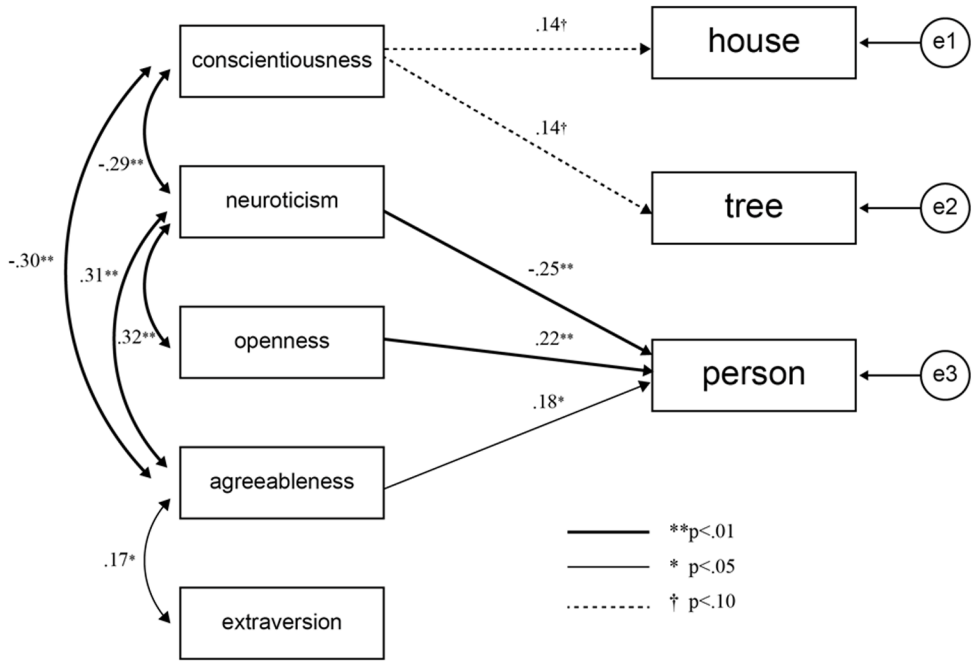

Figure 1. Relationships between personality traits and expression area of S-HTP.

Discussion

The sizes of the person drawings were positively related to openness to experience and agreeableness. Openness to experience is concerned with curiosity and it has more modest relationships with aspects of subjective well-being than other five factor model personality traits (Steel, Schmidt, & Shultz, 2008). Therefore, the participants with this trait tend to take part in situations in their environment, have positive relationships with others, and are satisfied with them. In addition, agreeableness is concerned with how to maintain relationships with others, while high agreeableness is related to adequate social skills. In regard to the latter, students with this trait are more likely to maintain good relationships with friends or teachers. Sakurai (1984) examined the relationships between perceived competence and the size of the person drawn by Japanese children, and found a positive correlation between them. The present study corroborates what Sakurai (1984) found; namely, the expression areas of the person drawings represent competence and confidence. Participants with high openness and agreeableness had largely positive experiences with others and thus, they felt confident about human relationships. As Mikami (1995) mentioned, a participant's conscious ideals and realistic self-image is projected in the person drawings. Finally, participants with high openness and agreeableness have a positive perception of their self-image. Hence, the expression areas of the person drawings are larger in this study.

In contrast, neuroticism negatively influenced the expression areas of the person drawings. Neuroticism generally includes worrying and having a pessimistic nature. Schmidt and Riniolo (1999) suggested that neuroticism was significantly related to social anxiety, whereas it was modestly related to shyness. As this evidence shows, the participants with high neuroticism hesitate to act in situations in their environment or to try new things. This trait may suppress the expression areas of the person drawings.

The model assumed that conscientiousness has an effect on the house and tree drawings. In contrast with the impacts of neurotisism or openness to experience, the impacts of conscientiousness were not significant. Therefore it is necessary to carefully interpret these relationships. However, discussing these relationships is useful for future studies. In addition, high conscientiousness generated larger houses and trees. The personality trait of conscientiousness represents earnestness and honesty. Recent studies also show significant relationships between conscientiousness and honesty. An honest social-networking service user will also attempt to promote personality traits that are associated with honesty and, more specifically, conscientiousness (Dunn & Guadagno, 2012). Furthermore, conscientiousness includes items concerned with leadership and working for other people. Brown, Cober, Kane, Levy, & Shalhoop (2006) showed that conscientiousness had positive relationships with self-esteem and self-efficacy. In order to improve conscientiousness, keeping good relationships with others, especially parents or family members, is necessary. From this viewpoint, the role of family or relationships with parents is important in the formation of identity and development of self-esteem. Particularly in this younger generation, the expression areas of the house drawings are larger in participants with higher conscientiousness. Tsunashima (1992) investigated the relationships between the features of the Baum test (the projective drawing test that clients draw a tree with fruits on a drawing paper) and personality and discovered a positive correlation between the heights of the drawn trees and the general activeness of the participants. Since Schouws et al. (2015) mentioned that conscientiousness was related to an active coping style, high conscientiousness in the present study was also related to higher levels of activeness, the desire for self-improvement, and the need to perform positive actions for oneself and others. These features are considered to be expressed via larger tree drawings.

Limitation and Future Applications

This study investigated the relationships between personality traits and the expression areas of figures drawn for the S-HTP test. It was found that the expression areas of the houses, trees, and persons represent the personality traits of the participants. These findings may aid the development of useful criteria for future psychological assessments. As it is shown that the neuroticism tendency affects the size of human figures negatively, the viewpoint of the expression area may thus be an important index of mental health, in addition to personality traits. Investigating relationships with some other specific mental problems, such as depression or anxiety, may be valuable in future studies.

However, it is necessary to exercise caution in the applicability of these findings. Although it has been shown that conscientiousness influences the expression areas of houses and trees, the scores of the path analysis were not as strong as other indices such as neurotisism or openness to experience. Although focusing on the expression areas in the S-HTP is one important perspective, the drawings must be interpreted in a multidisciplinary manner. Especially in a clinical situation, the drawing competencies of clients may affect the S-HTP drawings. Therefore, clients who lack confidence in their drawing skills may draw small items as a result and researchers must consider this. In addition, the total impression or the relationships among the drawn items, for example, are also important. Therefore, investigating the relationships between the total impression of drawings and personality traits (or inter-item relationships), such as humans and trees, is necessary in future studies.

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Competing Interests

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