CORRELATIONS AMONG DEPRESSIVE SYMPTOMS, PERSONALITY, AND SYNTHETIC HOUSE-TREE-PERSON DRAWINGS IN SOUTH KOREAN ADULTS

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This study aimed to examine correlations among the synthetic House-Tree-Person drawing, depressive symptoms, and personality. In this descriptive correlational study, 186 Korean adult participants completed the synthetic House-Tree-Person drawing test, Eysenck Personality Questionnaire, and Patient Health Questionnaires-9. Persons with depression drew fewer two-dimensional body parts \( p = .027 \) and rectangular primary walls \( p = .011 \) compared with people without depression. Psychoticism was negatively correlated with two-dimensional house parts \( r = -.21, p = .026 \) and active person \( r = -.20, p = .027 \). Neuroticism and addiction were negatively correlated with two-dimensional tree \( r = -.20, p = .030 \); \( r = -.20, p = .026 \). Impulsiveness was negatively correlated with central location of a house \( r = -.20, p = .032 \) and additional decoration of a person \( r = -.22, p = .019 \). Additional house decorations showed a negative correlation with empathy \( r = -.22, p = .015 \) and a positive correlation with lie \( r = .23, p = .013 \).

Key words: personality, depressive symptoms, projective technique

INTRODUCTION

Projective drawing tests have been used in clinical settings since the 1940s. Commonly used projective drawing tests for the last 25 years include the House-Tree-Person drawing test (HTP), Draw a Person Test, and Kinetic Family drawing (Piotrowski, 2016). HTP is based on the theory that drawings of a house, a tree, and a person represent the person’s desires, relationships, emotional reactions to the fear, and situation (J. N. Buck, 1948). This test has three kinds, namely, the original HTP, synthetic HTP (S-HTP), and kinetic HTP (K-HTP; Chung, 2015). In HTP, participants are asked to draw a house, a tree, and a person on three pieces of paper. In S-HTP, the drawings appear on one piece of paper, whereas K-HTP adds the requirement of drawing an active person (Chung, 2015). Buck developed quantitative scoring methods for the HTP drawings in 1948 (J. N. Buck, 1948). Scoring for S-HTP and K-HTP is based on Buck’s scoring system (Chung, 2015).

HTP has been used to examine developmental disorders (Fuji et al., 2016), psychiatric disorders (Choi & Oh, 2002; T. Kim & Bae, 2013; Kwak & Lee, 2010), personality (Kato & Suzuki, 2016), and intelligence (Eyal & Lindgren, 1977). T. Kim...
and Bae (2013) found that children with depression did not draw a house, a tree, or a person compared with children without depression; they also did not draw lips and tend to draw sad faces (T. Kim & Bae, 2013). Kato and Suzuki (2016) reported that high conscientiousness was related to the drawing of larger trees and houses, whereas openness to experience and agreeableness was related to the drawing of a bigger person, and neuroticism, to smaller figures (Kato & Suzuki, 2016).

The interpretation of HTP is based on existing research (Becker-Weidman, 2017). The house represents family life: too small houses mean that a patient may disregard family life, whereas too big houses mean that a patient may be overwhelmed. The person and the tree both represent self-concept. Larger trunks mean more strength, and smaller trunks mean limited ego strength. Drawing the same sex means accepting oneself, whereas drawing the opposite sex means rejecting oneself (Becker-Weidman, 2017).

Moreover, HTP drawings have been used for psychological assessment, prediction of events, and as an intervention (Dyer, 2018; Yu, Ming, Yue, Li, & Ling, 2016). Dyer (2018) developed 66 scoring items for HTP drawings to predict psychiatric hospitalization, diagnoses, arrests, and violent behaviors in 252 people with forensic cases (Dyer, 2018). Sohn, Kong, & Choi (2016) found predictors for personality in HTP drawings among college students (Sohn et al., 2016). In another study, an intervention using HTP is reported to have decreased anxiety in 36 prisoners compared with a control group who received a group interview intervention. The HTP intervention was applied for one hour 10 times for five weeks. Prisoners explained and interpreted their drawings, and then shared their feelings after HTP (Yu et al., 2016).

S-HTP has been applied to gain insights into participants’ problems in smoking cessation counseling. Depressive symptoms and personality are predictors of cigarette smoking (Eory et al., 2015; Yanez, Leiva, Estela, & Cukic, 2017). Depressive symptoms consist of depressed moods, loss of interest, weight change, slow movement, fatigue, feeling of worthlessness, difficulty concentrating, and suicidal ideation (American Psychiatric Association, 2013). Personalities are classified as psychoticism, extraversion, neuroticism, lie, addictiveness, criminality, impulsiveness, venturesomeness, and empathy (Lee, 1997). Persons who have higher scores on the psychotic personality trait are aggressive and emotionally very cold, as well as tend to think of dangerous things and put them into action (Lee, 1997). Persons who have higher scores on the extraversion trait make many friends, are dominant, self-assertive, uplifting, active, and full of vitality. Persons who score higher on the neurotic trait are often vulnerable to mental and physical illnesses, have an upright and irrational tendency, have low self-esteem, and are tense and sensitive to minor stresses. Persons who have higher scores on the lie trait think that their habits and actions are all right. These persons often point out the wrongs of others while tending to act in the same manner (Lee, 1997). Persons who have higher scores on the addiction trait have eating disorder or substance abuse problems. Persons who have higher scores on the empathy trait cannot express difficult requests and cannot decide without thinking about other people’s feelings. Their mood also changes according to the mood of others (Lee, 1997).

There have been dozens of studies on HTP since 1950 but few have focused on the
correlations between S-HTP, depressive symptoms, and personality in the last 10 years. The present study thus aimed to describe the characteristics of S-HTP by depressive symptom, and examine correlations among the S-HTP drawings, depressive symptoms, and personality among South Korean adults.

**METHOD**

**Design and Participants**
This study adopted a descriptive correlational design and conducted secondary analysis of a randomized controlled trial (E. J. Lee, 2019). Participants were recruited via flyers and webpage advertisement from July 2013 to February 2017. The inclusion criteria were adults who were older than 19 years and able to complete questionnaires.

**Procedure**
This study was performed in South Korea. Institutional Review Board approval was obtained at 1 university hospital (No. 2013–058). The researcher explained the research to the participants before the latter signed an informed consent form. The participants were asked to draw a house, a tree, and a person on one sheet of paper (29.7 cm * 42 cm) using 12 colored pencils. The S-HTP drawings were photographed, converted to PDF files, and then adjusted to a standardized vertical size (17.8 cm). The researcher and research assistance performed the coding.

**Measures**
The Eysenck Personality Questionnaire (EPQ) consists of 121 questions with dichotomized answers (Eysenck, Eysenck, & Barrett, 1985). The questionnaire measures nine personalities: psychoticism, extraversion, neuroticism, lie, addiction, criminality, impulsiveness, venturesomeness, and empathy. Raw scores were converted to standard T scores that had a mean of 50 ± 10 (Lee, 1997). The cut-off was a T score of 50 for a specific personality on the EPQ. The internal consistency of the EPQ is reported as 0.65–0.78 in Korean adults (Jeong, Goh, Joo, Kim, & Lee, 2004). The EPQ has been reported to have good convergent validity with the Korean version of the Temperament and Character Inventory (r = .34–.64, p < .01; Jeong et al., 2004).

The Patient Health Questionnaire-9 (PHQ-9) measures nine symptoms of major depressive disorders (Spitzer, Kroenke, & Williams, 1999). The PHQ-9 uses a four-point Likert scale; scores range from 0 to 36, with higher scores indicating severe depressive symptoms (Spitzer et al., 1999). Its internal consistency is 0.88, and test-retest reliability, 0.60, in 1,060 older adult Koreans (Han et al., 2008). The PHQ-9 has been shown to have good convergent validity with the Geriatric Depression Scale (r = .74, p < .01; Han et al., 2008). The cut-off score is 9 for major depressive disorders in the Korean population (An, Seo, Lim, Shin, & Kim, 2013).

Buck’s Quantitative Scoring for the House-Tree-Person drawings was used to score S-HTP in the current work. The quantitative scoring manual for the HTP drawings developed by J. N. Buck (1948, 1992) has been translated to Korean (D. Y. Kim & Gong, 2001). In this measure, 223 items are evaluated for details, proportion, and perspective. One point is given for the existence of each item. The 223 items are grouped into 23 items. Details, proportion, and perspective each consist of three levels: Default (D1, D2, D3), Average (A1, A2, A3), and Superior (S1, S2). D1 represents moron; D2, imbecile; D3, very inferior; A1, borderline; A2, dull average; A3, average; S1, above average; and S2, superior. For example, 5% of the above average group, 10% of the average group, 35% of the dull average, 45% of the borderline, and 65% of the moron group were reported to draw one-dimensional branches only. The weighted law score is the sum of the D1 scores, twice the D2 scores, and thrice the D3 scores. The weighted good score is the sum of the A1 scores, two times the A2 scores, three times the A3 scores, four times the S1 scores, and five times the S2 scores. In this study, 10% of the S-HTP drawings were randomly selected using a random table to compare intra-rater reliability between the researcher and research assistant; the intra-rater reliability was .80.

The integrity of S-HTP was evaluated using Mikami’s scoring system (Min, 2010). In the present
study, perspectives, harmonization, and attachment between figures were used. The scoring system was revised for statistical analysis. One point was given for appropriate perspectives between figures (tree > house > person) and 0 for inappropriate perspectives. Two points were given for overall harmonization, 1 point for drawing in a row, and 0 for no harmonization. Harmonization refers to the drawing of a house, a tree, a person, and additional decorations in a proper location and realistic concept according to the developmental stage of a participant. No harmonization means the drawing is missing a house, a tree, or a person or has unrealistic size and perspective. Two points were given for three attached figures, one point for two attached figures, and 0 for separate. Attachment is defined as drawing a house, a tree, and a person at a spacing of < 3 cm.

Statistical Analysis

IBM SPSS 23 was used for statistical analyses. An independent t-test was used to compare the differences in the HTP scores between people with and without depression. Bivariate correlation with Pearson correlation coefficient was used to analyze correlations among depressive symptoms, personality, and the S-HTP drawings.

Results

A total of 186 Korean adults participated in this study. Their mean age was 26.34 ± 4.8 years. Nearly all of the participants were male (96.8%) and college students (95.2%), whereas more than a third (37.7%) indicated being non-smokers. The mean of the PHQ-9 was 4.07 ± 3.72 (range 0–21). A total of 163 participants did not have depressive symptoms; 23 participants had depressive symptoms as measured by the PHQ-9.

There was no significant difference in the integrity of S-HTP between participants with and without depressive symptoms. Compared with participants without depression, those with depression drew more disproportionate house parts ($p = .048$), and they drew less of the following: rectangle-shaped primary wall ($p = .011$), proportionate body parts ($p = .050$), and two-dimensional body parts ($p = .027$; Table 1).

The S-HTP drawings and personality showed correlations ($r = .20$), while there was no strong correlation between depressive symptoms and the S-HTP drawings ($r < .20$; Table 2). Two-dimensional house parts and active person were negatively correlated with psychoticism ($r = -.21, p = .026; r = -.20, p = .027$). Additional house decorations showed a negative correlation with empathy ($r = -.22, p = .015$) and a positive correlation with lie ($r = .23, p = .013$). The house’s central location on a vertical line was negatively correlated with impulsiveness ($r = .20, p = .032$). Two-dimensional trees were negatively correlated with neuroticism ($r = -.20, p = .030$) and addiction ($r = -.20, p = .026$). Additional decoration of a person was negatively correlated with impulsiveness ($r = -.22, p = .019$).

Fig. 1 shows the characteristics of the S-HTP drawings by depressive symptom. The picture on the left was drawn by a male smoker who had severe depressive symptoms, scoring 21 points on the PHQ-9. The participant drew a thatched-roofed cottage that did not have windows and was very small. The primary wall’s shape was not rectangle. He drew a tree with the left and top parts cut out. The tree was extremely tall and had saggy branches, like a willow. The branches did not have a baseline and lacked a branch system. He did not draw the following body parts: eyes, nose, lips, ears, neck,
### Table 1. Comparison of S-HTP drawings by depressive symptom

|                  | No depression (n = 163) | Depression (n = 23) | t    | p   |
|------------------|-------------------------|---------------------|------|-----|
| **House**        |                         |                     |      |     |
| Missing parts (D)| 2.61 (±2.22)            | 3.09 (±2.52)        | 0.95 | .341|
| Two-dimensional parts (A) | 3.87 (±2.24)        | 3.57 (±1.95)        | 0.62 | .541|
| Additional decoration (S) | 7.25 (±5.25)        | 6.91 (±4.30)        | 0.29 | .772|
| Atypical perspective (D) | 1.13 (±1.50)        | 1.26 (±1.36)        | 0.40 | .689|
| Central location on a vertical line (A) | 0.92 (±1.39)        | 0.70 (±1.26)        | 0.79 | .435|
| Perpendicular intersection of primary and side walls (S) | 1.18 (±1.83)        | 1.04 (±1.80)        | 0.33 | .741|
| Disproportionate parts (D) | 2.08 (±2.08)        | 3.30 (±2.72)        | 2.07 | .048|
| Rectangle shape of primary wall (A) | 0.97 (±0.79)        | 0.52 (±0.73)        | 2.57 | .011|
| **Tree**         |                         |                     |      |     |
| Missing parts (D) | 0.54 (±0.76)            | 0.30 (±0.56)        | 1.80 | .080|
| Two dimensional (A) | 8.23 (±2.37)        | 8.70 (±2.79)        | 0.87 | .387|
| Wood bark / two-dimensional roots (S) | 2.48 (±2.85)        | 2.26 (±2.36)        | 0.35 | .727|
| Biased location or half-tree (D) | 1.74 (±1.44)        | 1.87 (±1.29)        | 0.40 | .689|
| Attachment of branch–branch, branch–stem (A) | 3.95 (±1.67)        | 3.57 (±1.85)        | 1.01 | .315|
| Atypical ratio of stems and branches (D) | 0.41 (±0.68)        | 0.65 (±0.88)        | 1.29 | .209|
| Appropriate ratio of stems and branches (A) | 3.53 (±1.55)        | 3.22 (±1.20)        | 0.93 | .350|
| **Person**       |                         |                     |      |     |
| Missing or one-dimensional body parts (D) | 10.28 (±4.13)        | 11.83 (±5.96)       | 1.21 | .239|
| Two-dimensional body parts (A) | 7.43 (±3.67)        | 5.61 (±3.60)        | 2.23 | .027|
| Additional decoration (S) | 3.63 (±2.80)        | 2.96 (±3.86)        | 0.81 | .425|
| Inappropriate attachment of body parts, inappropriate sex, age, transparency (D) | 1.50 (±1.28)        | 1.96 (±1.92)        | 1.51 | .134|
| Appropriate attachment of body parts (A) | 3.37 (±1.96)        | 4.00 (±1.60)        | 0.94 | .351|
| Active person/bent two-dimensional arms (S) | 1.12 (±2.05)        | 1.57 (±2.63)        | 0.88 | .374|
| Inappropriate ratio of body parts (D) | 3.58 (±2.21)        | 3.83 (±1.88)        | 0.52 | .606|
| Proportionate body parts (A+S) | 6.01 (±2.67)        | 4.83 (±2.79)        | 1.98 | .050|

*Notes.* D: weighted flaw scores, A and S: weighted good scores
Table 2. Correlation among S-HTP drawings, depressive symptoms, and personality traits

|                           | Psychoticism | Neuroticism | Lie   | Addiction | Criminality | Impulsiveness | Empathy |
|---------------------------|--------------|-------------|-------|-----------|-------------|---------------|---------|
| Depression                | .58 (.000)   | -.24 (.009) | .55 (.000) | .60 (.000) | .25 (.006) | .31 (.001)    |         |
| Two-dimensional house parts | -.21 (.026) |             |       |           |             |               |         |
| Additional decorations of the house | .23 (.013) |     |      |           |             | -0.22 (.015)  |         |
| Central location of the house on a vertical line |   |     |  |      |  | -.20 (.032) |         |
| Two-dimensional tree      | -.20 (.030)  |             |       | -.20 (.026) |             |               |         |
| Additional decoration of the person |   |     |      |           |           |               | -.22 (.019) |
| Active person             | -.20 (.027)  |             |       |           |             |               |         |
Fig. 1. Sample S-HTP drawings of a person with depressive symptoms (left) and a person without depressive symptoms (right)

Fig. 2. Sample S-HTP drawings of a person with higher scores on pathologic personality (left) and a person with lower scores on pathologic personality (right)

and shoulders. He drew an oval-shaped head that is longer horizontally than vertically as well as wider than the body. It was difficult to measure the proportions of the body parts because the drawn person hid his arms behind his back. A house was smaller than a tree and a person. A house, a tree, and a person were drawn separately. The picture on the right was drawn by a male non-smoker who did not have depressive symptoms, scoring 0 on the PHQ-9. He drew a four-story house with a rectangular wall. He drew a two-dimensional tree trunk with a height five times that of the perimeter. The perimeter of the tree was not greater than the baseline of the trunk. The drawing of a house, a person, tress, and a swing were harmonized. A tree was bigger than the first floor of house, and a person was smaller than a house. Trees were attached to a house and a person.

Fig. 2 shows the characteristics of the S-HTP drawings by personality. The picture on the left was drawn by a male smoker who scored 70 on neuroticism, 32 on lie, 68 on addiction, 70 on criminality, and 60 on impulsiveness. He did not draw the wall of the house in a rectangle shape but used rounded corners. He did not draw a ground line for the tree, nor branches, a branch system, and a branch system baseline. He did not draw certain body parts: nose, ears, neck, shoulders, and fingers. The eyes and lips were one-
dimensional. He drew an oval-shaped head that is longer horizontally than vertically as well as wider than the body. The ratio of length to width of head was 1.2:1.6. The ratio of width of head to width of body was 1.6:1.4. He drew the arms as attached to the neck. He drew a line of clothing that was not clear. The location of the person was not realistic. The person and the tree were attached, and the house and the tree were attached. The picture on the right was drawn by a male non-smoker who scored 29 on neuroticism, 29 on lie, 29 on addiction, 32 on criminality, and 37 on impulsiveness. He drew a two-dimensional house that had a rectangle-shaped wall. He drew a chimney, netted roof, and window shading. He drew two-dimensional roots, branches, a branch system, and a branch system baseline. He drew a sitting person who had eyebrows, eyes, a nose, lips, a neck, and shoulders.

**DISCUSSION**

In this study, participants with depression tended to draw more disproportionate house parts and not draw the wall of a house in a rectangle shape, two-dimensional body parts, and proportionate body parts compared with those without depression. No significant differences were observed in the characteristics of the tree drawings between participants with and without depression. Notably, previous studies have reported conflicting results. Choi and Oh (2002) found that depressed older adults tend not to draw proportionate body parts, and that people with depression tend to draw a person whose leg length was less than one-fourth of the body length. They further revealed that older adults with depression do not draw doors, windows, tree branches, legs, feet, hands, and decorations on clothing compared with older adults without depression (Choi & Oh, 2002). Molnar found that patients with depression tend to draw small figures situated in the left upper corner of the paper (Molnár, 2008). Murayama et al. (2016) reported that the size of the tree, such as occupied areas (less than 40% of the paper) and its height and width, differs between older adults with and without depression (Murayama et al., 2016). Further studies are needed to examine the characteristic of the S-HTP drawing in people with depression.

In the present study, correlations were noted between personality and S-HTP drawings. The central location of the house on a vertical line, two-dimensional house and tree, and additional decoration of the drawn person were negatively correlated with pathological personalities, such as neuroticism, addiction, and impulsiveness. This result is somewhat consistent with previous studies. In a study on 783 college students, Sohn and colleagues (2016) found that the psychosomatic subscale of neuroticism is positively related with additional decoration of the drawn person, such as neckties. In addition, they reported a correlation of neuroticism with the following: the size and sex of the drawn person, presence of eyes and eyelashes, expression of the nose, shape of the mouth, thickness of the neck, size ratio of the head (vertical: horizontal), length of the legs, facial expression, and appearance of two arms (Sohn et al., 2016). They concluded the following to be predictors of neuroticism: the person drawn as too big or too small, big
eyes, closed eyes, one eye, a big nose, ambiguous facial expression, missing nose, missing eyes, and missing lips (Sohn et al., 2016). Further studies should examine the correlations between S-HTP and pathological personalities.

In the present study, the lying personality was positively correlated, and empathy negatively correlated, with the additional decoration of the house drawn. Further studies are needed to examine the characteristics of S-HTP in persons with high scores on lying and empathy.

The results of this study cannot be generalized because the majority of the participants were young male Korean adults. It was difficult to recruit female smokers due to low smoking rates in females (6%) and social stigma on females’ smoking (K. Kim, 2015; Ministry of Health and Welfare, 2019). Another limitation is that this study was conducted in a non-clinical sample, although the PHQ-9 was used to screen for depression.

In conclusion, the results of this study showed that the S-HTP drawings drawn by people with depressive symptoms differed from those drawn by people with no depressive symptoms. Personality was correlated with the addition of decorations for the house and person drawn, as well as the central location of the house on a vertical line, active person, and two-dimensional house and tree parts. This result suggests that S-HTP can be used to obtain insight on depressive symptoms and personalities.

CONFLICTS OF INTEREST

The author declares no conflicts of interest.

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