

# A Pilot Study of Psychological Traits in the Sasang Constitution According to the Braverman Nature Assessment

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## Key Words

body mass index, Braverman nature assessment, QSCC II, Sasang constitutional medicine

## Abstract

**Objectives:** The purpose of this study was to investigate the psychological characteristics of the Sasang constitutions by using Braverman nature assessment (BNA).

**Methods:** One hundred seventy-four students participated in this study, and among them, the 142 individuals who had clearly identified Sasang constitutional types were used for the analysis. Sasang constitutions and the Braverman temperaments of the subjects were determined by using a questionnaire for the Sasang constitution classification (QSCC) II and BNA, respectively. Body mass index (BMI) was used to compare the inclinations of the Sasang constitutions and Braverman temperament types.

**Results:** Significant differences in Braverman temperament type existed among the Sasang constitutions ( $P = 0.042$ ), and the relations between Soyangin and the dopamine type and between Taeumin and the gamma-aminobutyric acid (GABA) type were meaningful. Significant differences were also shown in the comparison with the Yin and the Yang constitutions ( $P =$

0.017), and the post-hoc analysis showed a strong and significant relation between the Yang constitution and the dopamine type and between the Yin constitution and the GABA type. The one-way analysis of variance (ANOVA) and the independent  $t$ -test were conducted to examine the BMI and the degree of obesity among the Sasang constitutions and the Braverman temperament types. Concerning the BMI, Taeumin showed a bigger BMI than the other constitutions ( $P < 0.001$ ), but no significant differences in the BMI were observed between the Braverman temperament types.

**Conclusion:** Soyangin has a close relationship to the dopamine type and Taeumin has a close relationship to the GABA type. The correlation between two types were more clear when the Yin and the Yang types were compared to Braverman temperaments. These results may serve as a basis for identifying the psychological traits of Sasang constitutional types, especially in regard to the characteristics related to the four Braverman temperament types.

## 1. Introduction

Sasang constitutional medicine, which originated from Jema Lee, is a unique form of Korean medicine that classifies people into four types of constitutions, Taeyangin, Soyangin, Taeumin, and Soeumin, according to relative differences in organ function [1]. The Sasang constitutional types represent different

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personalities, temperaments, functions and structures of organs, body shapes, susceptibilities to particular diseases, and drug responses [2]. The functions of the four emotions, sadness, anger, joy, and pleasure, cause differences in the functions of organs, and these differences lead to physiological and physical traits and to particular diseases according to the four constitutions [3].

Korean medicine holds the point of view that psychological and emotional changes based on human Qi can influence physiological changes in organs and induce different disorders [4]. The Yellow Emperor's Classic of Medicine mentions a close relationship between physical and psychological phenomenon and states that the mental and the emotional activities of humans are supervised by the heart, the king of internal organs [4, 5].

Many studies have been done concerning the psychological characteristics of the Sasang constitutions by using various psychological test tools, such as the Minnesota Multiphasic Personality Inventory (MMPI) [6], the Myers-Briggs Type Indicator (MBTI) [1, 7], the Beck Depression Inventory (BDI) [8], the State-Trait Anxiety Inventory (STAI) [7], the Positive and Negative Affect Schedule (PANAS) [9], the Symptom Checklist-90-Revision (SCL-90-R) [10], and the twenty-item Toronto Alexithymia Scale (TAS-20K) [2]. Moreover, research has been done concerning the relationship between the autonomic nervous system and the Sasang constitutions [11]. However, no research has addressed the relationship between the characteristics of the Sasang constitutions and the inclinations of personality, temperament, health, and physical and psychological illnesses related to neurotransmitters.

Braverman suggested that physiological characteristics and pathological conditions could be explained based on the sufficiency and the deficiency of neurotransmitters because neurotransmitters influence memory, attention, personality, health, and so on. According to Braverman's theory, there are four temperaments: the powerful dopamine nature, the creative acetylcholine nature, the stable gamma-aminobutyric acid (GABA) nature, and the playful serotonin nature. Therefore, Braverman's theory about four temperament types has features similar to those of the Sasang constitution theory in that both regard the unity of mind and body as important [12].

In this study, therefore, the relationship between Sasang constitutions and Braverman temperament types was explored by using the Braverman nature assessment (BNA). Because much research has been done to show the connection between the Sasang constitutions and body mass index (BMI), BMI was measured to compare the inclinations of the Sasang constitutions and Braverman temperament types. This investigation could provide a new viewpoint for understanding the Sasang constitutions *via* an analysis of the connection between the psychophysiology of Korean medicine and biochemical activity in the brain.

## 2. Materials and Methods

This study was conducted to understand the relationship between the Sasang constitutions, the Braverman temperaments and the BMI. Data were collected from October

2011 to June 2012. The participants of the present study were 174 students from the College of Korean Medicine, Sangji University, who gave consent for the conduct of the assessments. The questionnaire for Sasang constitution classification (QSCC) II, BNA and BMI were examined. Among the 174 individuals, the 142 individuals who had clearly identified Sasang constitutional types were selected for the analysis. Of those 142, the Braverman temperament types of 14 individuals were not clearly identified. Therefore, 128 individuals were analyzed to compare their Braverman natures to their Sasang constitutions and BMIs.

Every participant was classified according to his or her Sasang constitution by using the QSCC II [13]. The results from the questionnaire were analyzed by using analysis software at the department of Sasang constitutional medicine, Sangji oriental hospital, to determine each participant's Sasang constitution.

The BNA, an inventory about personality, psychological features and physical health, was developed by Braverman [12] and has been used to identify the tendencies of individual traits related to neurotransmitters. The BNA consists of a total of 200 true or false questions about memory, attention, physical status, personality, and the characteristics of the 4 specific temperament types, and 50 questions are related to each of the 4 temperament types. The types with the greatest numbers of true responses identifies the dominant-neurotransmitter-related tendencies. The four temperament types are classified as dopamine, acetylcholine, GABA, and serotonin types according to the tendency of the presumed neurotransmitters to affect personality and health.

Height and weight were measured by using an automatic height-weight measuring device (BSM370, Inbody Co., Korea). The BMI was calculated as the body weight divided by the square of the body height ( $BMI = \text{weight (kg)} / \text{height (m}^2\text{)}$ ). Based on the Asia-pacific classification of obesity [14], the BMI can be placed into one of four categories: low body weight ( $BMI < 18.5 \text{ kg/m}^2$ ), normal body weight ( $18.5 \leq BMI \leq 22.9 \text{ kg/m}^2$ ), overweight ( $22.9 < BMI \leq 25.0 \text{ kg/m}^2$ ), and obesity ( $BMI > 25.0 \text{ kg/m}^2$ ).

Demographic differences between the Sasang constitutional types were tested by using the one-way analysis of variance (ANOVA) for continuous variables (age and BMI) and the chi-square test for categorical variables (gender). Pearson's chi-square test and Fisher's exact test were conducted to compare the distribution of Sasang constitutional types with those of Braverman temperament types and obesity. Statistical analysis of the data was performed by using SPSS statistics 22 for Windows (SPSS Inc., Chicago, U.S.A.). The data were presented as means and standard deviations and frequency with percentage. Null hypotheses of no difference were rejected if *P* values were less than 0.05.

## 3. Results

One hundred twenty-eight subjects were included in the present study. Among them, 37 subjects were classified as Soyangin, 28 as Taeumin, and 63 as Soeumin. Taeumin showed a significant increase in the BMI ( $P < 0.001$ ), but

there were no significant differences in age or gender among the Sasang constitutional types (Table 1).

To investigate the relationship between Sasang constitutional types and Braverman temperament types, we used the chi-square test to analyze the data on the 128 subjects. First of all, statistically significant relationships were found between the Sasang constitutions and Braverman temperaments (chi-square = 12.630;  $P = 0.042$ ) (Table 2). As shown in Table 2, 43.2% of Soyangin were dopamine types, and 50.0% of Taeumin and 57.1% of Soeumin were GABA types, so a connection between the Yin and the Yang types and Braverman temperament types can be presumed. The results of the chi-square tests showed significant differences between the Yin and the Yang types and Braverman temperament types (chi-square = 9.962;  $P = 0.017$ ) (Table 3).

BMI and the obesity degree according to the Sasang constitutional types and Braverman temperament types were investigated by using the ANOVA. Significant differences in BMI among the Sasang constitutional types ( $F = 31.888$ ;  $P < 0.001$ ) were demonstrated, and Dunnett's post-hoc analysis showed that the BMI of Taeumin ( $23.96 \pm 2.70$ ) was significantly higher than those of Soyangin ( $21.06 \pm 1.91$ ) and Soeumin ( $20.33 \pm 1.93$ ) ( $P < 0.001$ ) (Table 4).

The distribution of obesity according to the Sasang constitutional types was analyzed by using Fisher's exact test, and the results showed significant differences between Sasang constitutional types (chi-square = 45.214;  $P <$

0.001). The number of overweight and obese subjects of the Taeumin type was the greatest (48.4%) while that of the Soeumin type was the smallest (7.4%). On the contrary, the number of low-body-weight and normal subjects of the Soeumin type was the greatest (92.6%) while that of the Taeumin type was the smallest (48.4%). Moreover, no subjects of the Taeumin type had low body weights ( $P < 0.001$ ) (Table 4).

No significant differences of BMI ( $F = 1.598$ ;  $P = 0.193$ ) and the distribution of obesity (chi-square = 10.998;  $P = 0.216$ ) were noted among Braverman temperament types. However, the BMI of the serotonin type was the highest ( $22.35 \pm 3.67$ ) while that of the acetylcholine type was the lowest ( $20.49 \pm 2.13$ ). The number of overweight and obese subjects of the serotonin type was the greatest (41.6%) while that of the subjects of the acetylcholine type was the smallest (11.1%) (Table 5).

#### 4. Discussion

In the field of neuropsychiatry, several studies have suggested that psychological and emotional disabilities, such as anxiety, depression, and compulsion, may induce behavioral problems like aggression and violence. Recently, several research efforts have revealed that these psychological, emotional and behavioral troubles are associated with abnormal secretions of neurotransmitters in the brain

**Table 1** General characteristics of the participants according to Sasang constitution

	Number (%)	Gender (male / female)	Age*	BMI†
Soyangin	43 (30.3%)	26 / 17	20.65 ± 2.42	21.15 ± 1.86
Taeumin	31 (21.8%)	25 / 6	20.55 ± 1.34	23.96 ± 2.70
Soeumin	68 (47.9%)	44 / 24	20.71 ± 3.15	20.28 ± 1.94
Total	142 (100.0%)	95 / 47	20.71 ± 2.62	21.34 ± 2.54
$\chi^2$ or F	-	3.597	0.132	31.888
P-value	-	0.166†	0.876‡	< 0.001‡

\*Values are means ± SDs, †Pearson's chi-square test, ‡one-way ANOVA.

BMI, body mass index; SDs, standard deviations; ANOVA, analysis of variance.

**Table 2** Braverman temperament types according to Sasang constitutions

	Dopamine type*	Acetylcholine type*	GABA type*	Serotonin type*	N (%)
Soyangin	16 (43.2%)	7 (18.9%)	9 (24.3%)	5 (13.5%)	37 (100%)
Taeumin	7 (25.0%)	3 (10.7%)	14 (50.0%)	4 (14.3%)	28 (100%)
Soeumin	16 (25.4%)	8 (12.7%)	36 (57.1%)	3 (4.8%)	63 (100%)
$\chi^2$		12.630			-
P-value		0.042			-

\*number (%).

GABA, gamma-amino butyric acid.

**Table 3** Braverman temperament types according to Yin and Yang constitutions

	Dopamine type*	Acetylcholine type*	GABA type*	Serotonin type*	N (%)
Yang constitution	16 (43.2%)	7 (18.9%)	9 (24.3%)	5 (13.5%)	37 (100%)
Yin constitution	23 (25.3%)	11 (12.1%)	50 (54.9%)	7 (7.7%)	91 (100%)
$\chi^2$			9.962		-
<i>P</i> -value			0.017		-

\*number (%).

GABA, gamma-amino butyric acid.

**Table 4** Body mass index according to Sasang constitutions

	BMI (kg/m <sup>2</sup> )*	Distribution of obesity <sup>#</sup>			N (%)	
		LBW	Normal	Overweight		Obese
Soyangin	21.06 ± 1.91	5 (11.6%)	31 (72.1%)	7 (16.3%)	0 (0.0%)	43 (30%)
Taeumin	23.96 ± 2.70	0 (0.0%)	15 (48.4%)	2 (6.5%)	14 (45.2%)	31 (22%)
Soeumin	20.33 ± 1.93	13 (19.1%)	50 (73.5%)	4 (5.9%)	1 (1.5%)	68 (48%)
F or $\chi^2$	31.888		45.214			-
<i>P</i> -value	< 0.001 <sup>†</sup>		< 0.001 <sup>‡</sup>			-

\*values are means ± SDs, <sup>#</sup>number (%), <sup>†</sup>one-way ANOVA, <sup>‡</sup>Fisher's exact test.

BMI, body mass index; LBW, low body weight; SDs, standard deviations; ANOVA, analysis of variance.

**Table 5** Body mass index according to Braverman temperament types

	BMI (kg/m <sup>2</sup> )*	Distribution of obesity <sup>#</sup>			N (%)	
		LBW	Normal	Overweight		Obese
Dopamine type	21.73 ± 2.67	4 (10.3%)	26 (66.7%)	5 (12.8%)	4 (10.3%)	39 (30%)
Acetylcholine type	20.49 ± 2.13	4 (22.2%)	12 (66.7%)	2 (11.1%)	0 (0.0%)	18 (14%)
GABA	20.33 ± 1.93	13 (19.1%)	50 (73.5%)	4 (5.9%)	1 (1.5%)	68 (48%)
type	21.38 ± 2.17	5 (8.5%)	43 (72.9%)	5 (8.5%)	6 (10.2%)	59 (46%)
Serotonin type	22.35 ± 3.67	2 (16.7%)	5 (41.7%)	1 (8.3%)	4 (33.3%)	12 (9%)
F or $\chi^2$	1.598		10.998			-
<i>P</i> -value	0.193 <sup>†</sup>		0.216 <sup>‡</sup>			-

\*values are means ± SDs, <sup>#</sup>number (%), <sup>†</sup>one-way ANOVA, <sup>‡</sup>Fisher's exact test.

BMI, body mass index; LBW, low body weight; GABA, gamma-amino butyric acid; SDs, standard deviations; ANOVA, analysis of variance.

[15-18]. More than 40 kinds of neurotransmitters, showing various functions through the excitation and the suppression of neurons, such as dopamine, serotonin, acetylcholine, norepinephrine, GABA, glutamate, glycine, etc., have been discovered. Dopamine is related to recognition and arousal, acetylcholine to vigilance and concentration, serotonin to happiness, satisfaction, and learning memory, and GABA to stability [15]. The interactions among various neurotransmitters may be the mechanisms behind diverse psychological and physical disorders. For example, dopamine is mainly related to the pathophysiological mechanism of schizophrenia, as are GABA, acetylcholine,

serotonin, and glutamate [17]. In addition, a disharmony between the dopamine and the serotonin systems is considered relevant to impulsive aggression [18]. This means that an imbalance of internal neural units may cause psychological and physical disorders [19, 20], which is, in other words, quite similar to the Korean medical theory that physical phenomenon and mental phenomenon are interdependent [4].

BNA is a screening questionnaire on the physical and the psychological tendencies of neurotransmitters based on the theory that differences of neurotransmitters may influence a person's characteristics, emotions, psychology, and

physical health. Braverman suggested representative biochemicals such as dopamine, acetylcholine, GABA, and serotonin and composed 50 questions for each biochemical about memory, concentration, characteristics and physical health. Therefore, BNA is a good questionnaire for analyzing not just psychological and emotional traits but also physiological and pathological status with respect to various neurotransmitters, which is quite similar to the QSCC II in the way that the differences of nature, such as joy, anger, sorrow, and pleasure, may cause differences in the internal organs and then influence the physiology and the pathology of the human body. In this study, in order to provide more objective identification of Sasang constitutional types and psychological and physical characteristics, we investigated the relationship between various neurotransmitters-related tendencies and the Sasang constitutions by using the QSCC II, BNA, and the BMI.

A total of 142 participants were enrolled in the present study, and among them, 30.3% showed the Soyangin constitution, 21.8% the Taeumin constitution, 47.9% the Soeumin constitution, and 0% the Taeyangin constitution (Table 1). The distribution of Sasang constitutions showed no differences between genders. Among the participants, 30.4% were dopamine types, 14.1% acetylcholine types, 46.1% GABA types, and 9.4% serotonin types.

In this research, significant relationships were found between Sasang constitutional types and Braverman temperament types ( $P = 0.042$ ). Dopamine types were the greatest among Soyangin (43.2%), and GABA types were the greatest among Taeumin (50.0%) and Soeumin (57.1%) (Table 2). The connections were more concrete when the analysis was conducted between the Yin and the Yang types and Braverman types ( $P = 0.017$ ). The Yang constitutional type is closely connected to the dopamine type, and the Yin constitutional type to the GABA type (Table 3). This result shows the neurotransmitters-related psychological and physical traits can be related to the difference between sorrow and anger for the Yang constitution and between joy and pleasure for the Yin constitution. Dopamine is related to recognition and mental arousal, and GABA is connected to stability. Therefore, dopamine disorders include borderline personality disorder, compulsive inclination and schizophrenia [17-18, 21] whilst GABA disorders are neuropathy accompanied by depression and anxiety [22]. This could explain the connection between the active and outgoing Yang constitution and the dopamine type and between the placid and careful Yin constitution and the GABA type.

In this study, BMI was used as a representative physical measure indicating the degree of obesity because in Korean medicine, psychological and emotional inclinations are considered to be relevant to physical traits. The BMI of Taeumin was significantly higher than those of Soyangin and Soeumin ( $P < 0.001$ ), and 57% of overweight and obese subjects were Taeumin while Taeumin had no subjects with low body weight. However, unlike existing research results, the number of overweight and obese subjects among the participants with the Taeumin constitution was not that high because 48.4% of the participants with the Taeumin constitution had normal weights (Table 4). This may be partly because the participants were young

and active college students, so tendencies to be overweight or obese had not yet been expressed.

No significant differences were found between the BMI and Braverman temperament types ( $P = 0.193$ ), and there were no differences between low body weight, normal weight, overweight, and obese individuals ( $P = 0.216$ ). Interestingly, the number of normal weight participants for every Braverman temperament type and for every Sasang constitutional type, was higher than the total number of the low weight, overweight, and obese participants. This might be due to the following limitations: the sample size was not large enough, the age group was biased, and neurotransmitters-related tendencies were checked only by the use of a questionnaire not by the use of a biological test such as a blood test. Therefore, a bigger survey and a biological analysis of neurotransmitters are still needed to assure the relations between the Sasang constitutional type and Braverman temperament type. However, the attempt to compare Sasang constitutions and Braverman temperaments by using questionnaires can be a very good preliminary study for re-interpreting the psychological and the emotional traits of Korean medical theory and for providing useful data for developing a new diagnostic method for the Sasang constitutions.

## 5. Conclusion

This study was a pilot study to investigate the connection between the psychological traits of the Sasang constitutions and the biochemical activity in the brain. In conclusion, this study demonstrated that Soyangin has a close relation to the dopamine type and that Taeumin has a close relation to the GABA type. The connections between the two types were stronger when the constitution was classified as Yin and Yang. These results indicate that the Sasang constitutions may be closely related to the psychological and the physiological functions that come from the function of neurotransmitters in the brain.

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## Conflict of interest

The authors declare that there are no conflict of interest.

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