PREFERENCE MEASURES OF RECTANGLE RATIO ON MBTI PERSONALITY TYPES

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ABSTRACT

Whether the golden ratio is the favorite ratio for people is a controversial research issue until now. The purpose of this study is to investigate whether oriental people in Taiwan have the preference to the western culture originated golden ratio and to find out how the personality affects ratio preference by using the MBTI (Myers-Briggs Type Indicator) test to classify people into different personality types. First, 120 subjects been classified into 16 identified personality types by the MBTI test were screened out from 195 subjects recruited in this study. After that, they were asked to estimate the preference to 15 horizontal and 15 vertical rectangles with varied ratios, respectively. The results of the study were summarized as follows: (1) The most popular personality types of the subjects are ISTJ and ISFJ types, while ENTJ and ESTP types are much less popular; (2) The tendency of preference to varied ratios can divide into three classes: people tend to like the ratio of a square, the preference to golden ratio is fair, and when the ratio increases to exceed the golden ratio will be gradually disliked; (3) The personality of a person does affect his preference to golden ratio. The V6, H7 and H8 ratios are liked by people with different types of personality, I type and T type people prefer V6, people of S type and J type prefer H7 and people of F type and J type prefer H8; (4) Women with non-designer background like golden ratio, but men dislike. Most designers prefer golden ratio. This result could be used as guidelines for product design and market position setting.

Keywords: golden ratio, MBTI, preference measures

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1. INSTRODCTION

In the history of humans, the concept of "ratio" has been widely applied in architecture, furniture, crafts arts, and paintings. There are some ratios which have been regarded as the ideal ones for achieving aesthetic quality in design. Among them, the most significant one is the "golden ratio". The golden ratio of 1/1.618…has been treated as the "Divine Proportion" by the famous mathematician Pacioli [9]. But do people really prefer this ratio?

There have been experiments to investigate this question but without consistent results. Some studies proved the existence of preference to golden ratio [1] and [5]. On the contrary, some studies denied this preference [6], [10], [16], and [17]. The reasons for the consistent results may be due to the different experiment methods (For example, the rectangle is placed vertically or horizontally), the different methods of assessment (assessment by ordering or assessment by comparing to standard). But some demographic or characteristic attributes of subjects, such as age, gender, cultural background and personality, may affect the preference trend to golden ratio. For example, Thompson found that the different preference trends to ratio among different age group [18]. On the other hand, Nienstedt and Ross discovered that subjects from 61 to 91 years old more preferred to the ratio of a square [11].

Personality may be another critical factor to affect aesthetic evaluation. For example, Lin and Chuang adopted the Lai Personality Scale to investigate the influence of subjects' personality on their color preferences [19]. It showed that people with different personality types did have different preference trends on color. Huang discovered that there is association between preference on color and personality for college students with art background [20]. So, Personality may be a significant factor to affect the preference to golden ratio. However, there is no research addressed to this issue so far. Thus, this study tries to explore the relation between preference of the golden ratio and personality types of people. Cultural background of subjects may also be an important factor which will affect the preference to golden ratio. Since the origin of golden ratio is form western culture, whether do oriental people have the same preference to golden ratio is doubtable. Previous studies on preference to golden ratio were basically conducted to western people. By comparing the result of this study on oriental subjects to those of previous studies may reveal the different trends due to cultural background. In addition, this study will compare the difference between male and female subject on the preference to golden ratio.

There are many scales to classify people into different personality types. Among them, the Myers-Briggs Type Indicator (MBTI), which will be adopted in this study, is the well-known and widely applied character test after 50 years of development [14]. The test classifies people into 16 different personality types according to their answers to a set of 2-polar questions in four distinctive aspects. The four aspects and the eight dimensions of genetic predisposition are: (1) E (**E**xtraversion) or I (**I**ntrovert) type psychological inclination; (2) Understanding the external world through S (**S**ensing) or N (i**N**tuition) type; (3) Relying on T (**T**hinking) or F (**F**eeling) type for decision making; (4) Lifestyle and dealing with people through J (**J**udging) or P (**P**erceiving) type attitudes. These letters of combination will form the 16 different personality types, as shown in Figure 1. [8]

Figure 1. The sixteen Myers-Briggs personality types

2. METHOD

2.1. Purpose

The purpose of the study aims to survey how the different types of personality affect the degree of preference to rectangle ratios.

2.2. Subjects

The study conducted personality survey to 195 subjects (99 males and 96 females). Among them, 75 subjects (41 males and 34 females) are with mixed personality, the subjects show two or more personality types. The remaining 120 subjects (58 were males and 72 females) with single-type personality were used as subjects for further survey on preference to rectangle with different ratios. The age of these subjects ranges from 20 to 34 years old with an average age of 25.6 years (SD = 3.0 years). With respect to professional background, there are 48 subjects with design training background and 72 subjects without design training background.

2.3. Process

2.3.1. MBTI personality testing system

This study utilized Visual Basic 6.0 programming to put the content of MBTI personality test questions into the MBTI Experimental Vehicle System (Figure 2), which contained questionnaires for basic information of subjects and for personality test with a total of 70 questions. Each personality test question contains two choices "a" and "b". Among them, the EI personality test contains 10 questions, while the SM, TF and JP tests contain 20 questions, respectively. The questions of test are referred from the site: http://tracymanford.typepad.com/test.pdf. Upon starting the system, the subjects are asked to fill in their personal information, including sex, age, professional background and way to contact with, before entering to the phase of personality test.

Figure 2. MBTI personality test vehicle system

2.3.2 Measurement on preferred rectangle ratios

The preference experiment of rectangle ratios then was subsequently followed after the completion of personality test. Adopting from the experiment conducted by [6], there are 15 ratios of rectangle (side 1 / side 2) to be tested, including 1, 1.07, 1.15, 1.23, 1.32, 1.41, 1.51, 1.62, 1.74, 1.86, 1.99, 2.14, 2.30, 2.46 and 2.64. The tested samples consisted of horizontal and vertical sets of samples (the length of the horizontal rectangle, marked as H, is equal to or larger than its height; the vertical rectangle, marked as V, is the reverse of H.) Each set contains 15 rectangles, with a total number of 30 rectangles to be tested, as shown in Figure 3. The ratio of rectangle H8 and V8 is golden ratio. The actual size of tested samples measured in the screen is 2 cm for the ratio 1, i.e. with the size of 2cm x 2cm for the squares (H1 and V1); with size of 2cm x 5.28cm for the 1:2.64 rectangles (H15 and V15), and so on. All tested samples were presented to the each subject one by one in random order. Subjects were ask to report their preference to each rectangle by using an assessment scale from 1 to 5 (with 1 being the least favorite, 5 being the most favorite.) Upon completion of the experiment, the "testing questionnaire.txt" file will be automatically generated from the MBTI Experimental Vehicle System for further analysis.
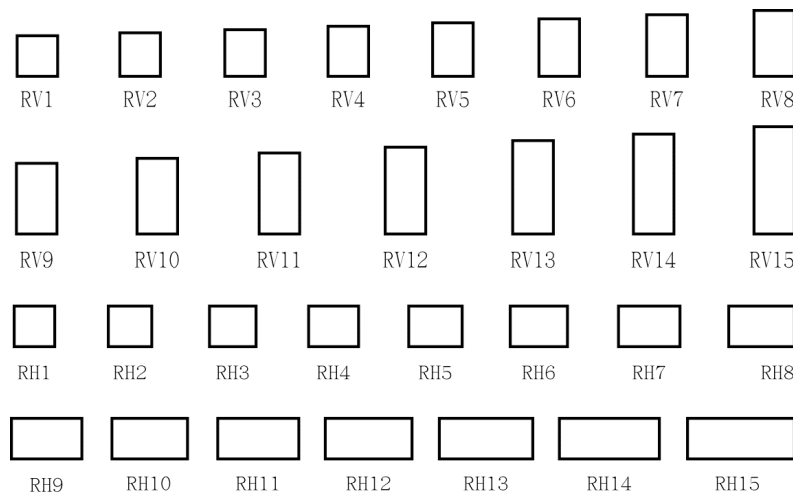

Figure 3. Tested Samples of rectangles with different ratios

3. RESULT AND DISSCUSION

We computed the score of each subject according to his response to the MBTI test first, and then classified him into one of the 16 personality types. The result is shown Figure 8. In this figure, the percentage in the middle is the classified result of this study, whereas the percentage on the lower right corner represents the result [4]. The personality types which account for the majority ratio are the following in order: ISFJ taking care type, ISTJ civil servant type, ESFJ master type, and INFP philosopher type; whereas the personality distributed with the least ratio are the following in order: INTJ expert type, ESTP challenge taking type and ENTJ general type.


Figure 4. Percentage and statistical result of 16 personality types (tested number of subjects for this study was 120 people)

3.1. The result of measurement on preferred rectangle ratios

The averaged preferred scores to rectangles were calculated and plotted as curves in Figure 5. The general preference to varied ratios of H rectangles (shown as the 'all'curve in Figure 5a) could be divided into two trends: (1) The ratios of H1~H2 are preferred (mean=3.7); (2) The preference to ratios of H3~H15 is about average (mean=3). That of V rectangles could be divided into three trends ('all' curve in Figure 5b): (1) The ratios of H1~H2 preferred (mean=3.6); (2) The ratios of H3~H9 are neither liked nor disliked (mean=3.1); (3) The ratios of H10~H15 are disliked (mean=2.7).These differences have been verified to be significant by the Chi square test. It is discovered that people preferred rectangles with ratio closed to a square, the preference decreases with the increase of ratios. Further statistical test revealed that, the preference scores of the rectangles V6, H7, and H8 (with ratios closed to golden ratio) were significantly larger than 3, for almost all types of people. Thus, golden ratio is slightly preferred by people in Taiwan, though it is less preferred than the ratio of 1:1.
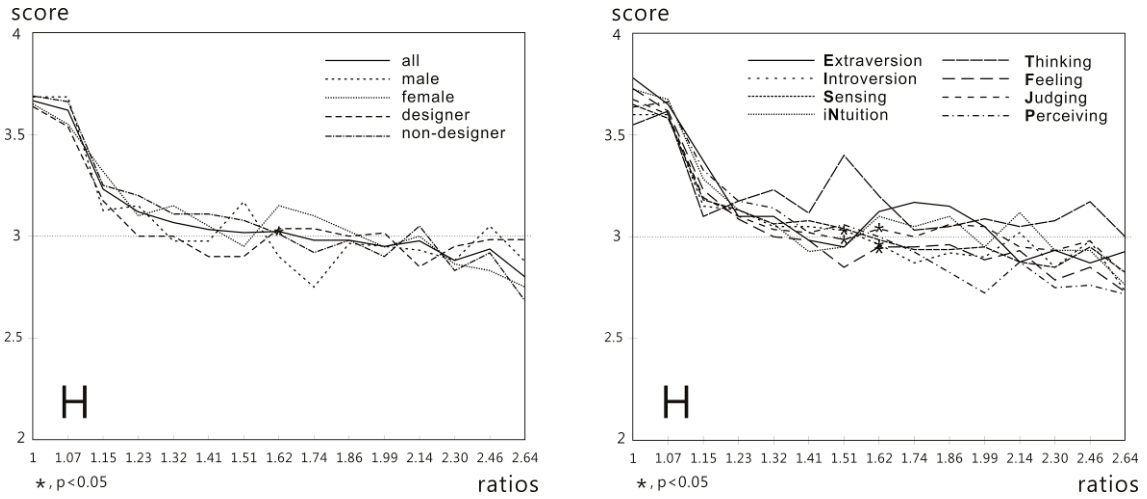
(a) Assessment result of H rectangles
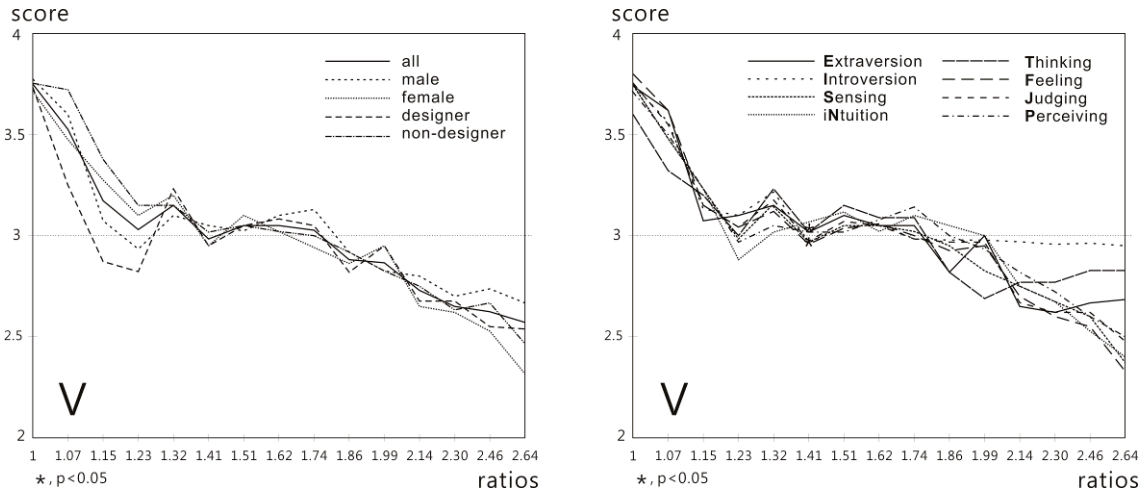
(b) Assessment result of V rectangles

Figure 5. Assessment results

3.2. Different of preference for different gender and backgrounds

Upon conducting the Independent Samples t-Test, we discovered that the male and female subjects with non-designer background will display significant difference of preference to golden rectangle (t=-2.7, p=.009). Males with non-designer background dislike H8 (Mean=2.8, SD=0.8), while females like H8 (Mean=3.2, SD=0.8.) On the contrary, the subjects with designer background do not reveal any significant difference caused by the factor of gender.

3.3. Difference of preference for different personalities

The overall result shows significant different on H8 (F= 2.0, p<0.05), with the degree of preference falling on average. The following conducts Duncan's post comparative analysis with emphasis on the N type, F type and J type of people with degree of preference for H8 reaching significance, in order to attain the difference of preference among all personalities. Applying Duncan's test and we discovered that (Table 1), there is no significant clustering for N type and J type; while F type displays significant clustering. In particular, ESFP

performing type and ENFJ educator type personalities like H8 the most, however ENFP reporter type least likes H8. Each type is further clustered by genders and applied with Independent Samples T-Test to find out only N type shows significant difference in gender (t=-3, p=.005). The N type make does not like H8 (Mean=2.6, SD=0.9), while the N type female like H8 (Mean=3.4, SD=0.1), with the two displayed a contradictory degree of preference. One intriguing notice from the distribution of genders, we discover that N type female accounts as high as 3/4 of this percentage. Kroeger and Thuesen pointed out that only the percentage of S type and N was correlated with gender [8]. Approximately 2/3 of the females belong to N type.

From the overall result, we observe that when it comes to people choosing their favorite ratios, golden rectangles are usually the least favorite (degree of preference is average), while on the contrary the squares have been more widely chosen. This result slightly differs from the result of Fechner, in which the subjects were inclined to like square, nonetheless golden rectangles still won over the regular square [5]. This could be discussed from the Berlyne's conservative inference [2], that when comparing square with rectangles, the Western people were inclined to show favor for rectangles while the Oriental people believe that squares are more stable visually. The result of the subjects did not like extreme ratios, which clearly refuted [6].

Supposing people make distinction between personalities, some personalities consider golden ratios as the most aesthetics, while on the contrary some personalities dislike these ratios. For example, ESFP and ENFJ like golden ratios the most, but the ENFP will detest this point. Therefore, we know that different personalities will result in different ratios of preference. From the aforementioned literature, we either believe or query the concept of the existence of golden ratios. The study believes there is no absolute right or wrong to either concept, with the reason that neither takes into account the difference of individual personality. Additionally, the gender factor of the study is also one of the impacts, resulting in the significant difference in preference between male and female, whereas the female show far more preference over golden ratios than males.

Table 1: The result of measurement on H8 for N, F and J type

Type	N	iNtuition	Feeling	Judging	All
ESFP (Champion)	3	-	a	-	3.7 (0.6) a
ENFJ (Architect)	7	a	a	a	3.6 (0.8) a
ISTJ (Inspector)	13	-	-	a	3.5 (0.7) a
INTJ (Supervisor)	2	a	-	a	3.5 (0.7) a
ENTP (Inventor)	2	a	-	-	3.5 (0.7) a
ENTJ (Field Marshal)	2	a	-	a	3.5 (0.7) a
INTP (Composer)	3	a	-	-	3.3 (0.6) a
ESFJ (Teacher)	15	-	a, b	a	3.2 (0.9) a, b

ISFP (Protector)	6	-	a, b	-	3.2 (0.8) a, b
ESTP (Counselor)	2	-	-	-	3.0 (1.4) a, b
INFP (Provider)	12	a	a, b	-	3.0 (1.0) a, b
INFJ (Performer)	10	a	a, b	a	3.0 (0.8) a, b
ISTP (Crafter)	4	-	-	-	2.8 (0.5) a, b
ESTJ (Healer)	7	-	-	a	2.7 (1.0) a, b
ISFJ (Promoter)	28	-	b, c	a	2.6 (0.6) a, b
ENFP (Mastermind)	4	a	c	-	2.0 (0.0) b
Mean (S.D.)	120	3.1 (0.9)	3.0 (0.8)	3.0 (0.8)	3.0 (0.8)

a, b: Duncan

4. CONCLUSION

The study applies MBTI psychology test to distinguish the 4 pairs of basic personalities and to conduct preference assessment on rectangle ratios. The study result reveals that: (1) The study result differs significantly from the personality of American people, with the statistical result showing the majority of personalities fall on taking care type and civil servant type, while the general type and challenging type account for the lest favorite; (2) The preference of ratios could be divided into three trends: Most people like the ratio of square, with average degree of preference for golden ratios and a gradual declining dislike for ratios after golden ratios; (3) Personality will impact the ratio of preference. V6, H7 and H8 with different ratios have been preferred by different personalities. I type and T type personalities generally prefer V6, S type and J type generally prefer H7, while F type and J type generally prefer the golden ratios H8; (4) Male and female with non-designer background will have different degree of preference on golden ratios, whereas the female like the golden ratio while the male dislike it. Most people with designer background all show inclination towards golden ratios.

Although the number of subjects for this study has already reached 195 people it was still insufficient in that: (1) The cross personalities with two or more personalities account for the majority of the subjects, while single type personality is rare to find; (2) Some types of personalities are still hard to find, for example, the general type and the performing type, which could result an uneven number of samples and thereby affect the results. Currently the number of subjects for test continues to increase, whereas more time is required to make up the deficiencies of subjects with more different personality types. The subsequent procedures shall start from different field of groups to assist with a more integral data of analysis.

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