On the Influence and Mechanism of Five - state Personality of Traditional Chinese Medicine on Self - others Risk Decision

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Abstract: This study applied personality psychology of traditional Chinese medicine to the risk decision-making, and explored the influence and mechanism of five-pattern personality on self-other risk decision-making. The Chinese Medicine Five State Personality Scale and a multi-round mixed gambling game simulating a risky decision-making situation were used to administer the test to 97 university students. Data analysis indicated that the higher scorers of Taiyang personality dimension, compared with self-interest, was less concerned about the interests of others; the higher scorers of Taiyin personality dimension, compared with the interests of others, was more disgusted with the loss of self-interest. Conclusion: Taiyang and Taiyin personality affect self-other risk decision-making, and have a higher risk propensity when making risk decisions on behalf of others.

1. Introduction

In today's increasingly open and reformed world, market development, resource allocation, business operation, credit investment and many other areas of economic life are full of risky decisions. In the field of decision psychology, risky decisions have also become an important research content, and self-other decisions are gradually becoming the core of research. In social life, making decisions on behalf of others is part of daily life for people from all walks of life, and making risky money-related decisions (such as proxy investments) on behalf of strangers is becoming increasingly common. It is worth pointing out that in the area of self-other risky decision-making, researchers' findings are inconsistent. Eriksen, Kvaloy et al. demonstrated that risky decisions on behalf of others were less risky than risky decisions on behalf of the self from a risk-seeking perspective[1], whereas Chakravarty et al. showed that risky decisions on behalf of others were more risky than decisions on behalf of the self[2]. The study by Sun et al. found that risk-taking was lower when making decisions on behalf of others from the perspective of irrational bias [3]. However, Jung, Sul and Kim used a mixed gambling game to simulate a risky decision-making situation and found that decision making on behalf of others showed a higher risk-taking tendency than decision making on behalf of oneself[4]. Taken together these suggest that self-other risky decision making differences are not stable and may be influenced by a variety of factors.

The study by Liu et al. analysed the violations of rational decision-making principles that exist for self-decision making and decision-making on behalf of others in different decision-making situations, and provided explanations for self-other risky decision-making from three perspectives: cognitive, motivational and emotional [5]. Some researchers have also looked at loss contexts and found that lower value conditions make decision making for others more likely to prevent losses compared to self-decision making, i.e. showing lower levels of risk preference [6]. Zhang et al. suggested that these inconsistencies might be due to the fact that researchers have not taken into account the influence of personality traits on decision-making behaviour. For this reason, the researchers selected the personality trait of social value orientation (SVO) to explore its influence on ego-other risky decision-making and its mechanisms, and conducted an experimental study by completing multiple rounds of a mixed gambling game task in two contexts where decision gainers were ego and unfamiliar others respectively. The results found that the pro-ego was more risky than the pro-social person in making decisions on behalf of others [7]. In addition, Zhang et al. explored college students' risky decision-making behaviour based on the Big Five personality theory and showed that neuroticism in the Big Five personality traits was closely related to risky decision-making behaviour [8]. Zhao et al. also showed that the higher the impulsive personality tendencies of those serving sentences, the higher the tendency to take risks when making risky decisions, controlling for other influencing factors [9].

Chinese medicine is rich in psychological ideas, and in the process of localising psychology, traditional Chinese medicine psychology is a good example of
combining clinical psychology with traditional Chinese medical theories of emotion and ambition. The five states of personality in traditional Chinese medicine are based on the theory of yin and yang, and the five personality types proposed according to the different tendons, bones, qi and blood of the human body, namely Taiyang, Shao yang, Peace in the Yin and Yang, Shaoyin and Taoyin, which are used as the basis for regulating one's emotion and will to achieve therapeutic purposes. For example, Lv et al. used a decision tree model to explore the predictive effect of the traditional Chinese medicine five-state personality model on the diagnosis of achalasia in traditional Chinese medicine [10]. In recent years, scholars have also focused on the application of traditional Chinese medicine five-state personality in the field of clinical psychology, such as bipolar disorder [11] and generalized anxiety disorder [12]. In contrast, the application of the five states of traditional Chinese medicine personality in the field of risk decision-making is still lacking so far. In this paper, starting from the perspective of the traditional Chinese medicine five-state personality, we attempt to explore the influence of the traditional Chinese medicine five-state personality traits on the risky decision-making behaviour of self-others and propose the following hypotheses after conducting a preliminary exploratory study:

H1: Those who score high on the Taiyang personality dimension of the traditional Chinese medicine five-state personality have a lower concern for the interests of others compared to self-interest, and therefore have a higher propensity to take risks when making risky decisions on behalf of others than on behalf of self.

H2: Those who score high on the Tai Yin personality dimension of the traditional Chinese medicine five-state personality have a higher aversion to loss of self-interest compared to the interests of others, and therefore have a higher propensity to take risks when making risky decisions on behalf of others than on behalf of self.

2. Methodology

2.1 Subjects

We used G*Power 3.1 to calculate the sample size needed for this study, and a repeated measures ANOVA within subjects applicable to the study predicted a total sample size of at least 52 to achieve a statistical power level of 80% at a significance level of $\alpha = 0.01$ and a medium effect of $f = 0.25$. For this study, 118 university student subjects were recruited, aged 18.79 ± 1.10 years old (M±SD), and all subjects volunteered to participate in this experiment after clarification of its content, and subjects were paid according to the results after the experiment. Nineteen of the subjects scored less than 5 on the masking scale of the traditional Chinese medicine Five State Personality scales and the results were unreliable and were excluded. One subject participated in gambling 14 times when making decisions for self and one subject participated in gambling 14 times when making decisions for others, which were considered as extreme data for exclusion. The final valid sample size retained was 97.

2.2 Experimental design and materials

Self-other risky decision making a 2-level (beneficiary: self, other) one-way within-subjects design was used. The experimental procedure was adapted from de Martino, Camerer and Adolphs [13] and a multi-round mixed gambling game by Zhang, Yu, and Mai [7]. The mixed gambling game informed subjects through an instructional message that they would hold 100 game coins by default in each gambling round and needed to complete 28 rounds of gambling, with the gainers being self and others for 14 rounds each. The subjects would play 6 rounds of the mixed gambling game as a practice experiment before the formal experiment begins. Before the start of each round, a G (potential gain) and a L (potential loss) would be presented to the subject, with G ranging from {20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50} and L ranging from {22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48}. Subjects were presented with two choices in each round of the game, pressing "Q" to gamble and "P" to not gamble. Pressing the "Q" key gives the subject a 50% chance of winning G and a 50% chance of losing L. Pressing the "P" key results in a zero gain or loss for the round.

Measurement of the five states of personality in traditional Chinese medicine Developed by Xue et al. [14], it consists of 103 questions on six subscales, namely the Taiyang, Shaoyang, Peace in the Yin and Yang, Shaoyin, Taiyin and Masking scales. The first five subscales measure the intensity, flexibility, balance, persistence and convergence of the individual's responses on each personality trait dimension; the masking scale is used to test the validity and reliability of the test, with a score of less than 5 indicating that the test was not completed carefully and the results should be excluded. The test is a self-administered test, in which all questions are scored with a "yes" answer and "no" answer is not scored. In this study, the Cronbach’ $\alpha$ coefficient for this scale was above 0.70.

2.3 Experimental procedure

Demographic information, such as gender and age, were collected before the experiment began, followed by the Chinese Medicine Five State Personality Test. After the subjects’ scores on the masking scale were $\geq 5$ (the subjects' results on the traditional Chinese medicine Five State Personality Test were reliable), the subjects were then given a mixed gambling game on the computer, and were informed through instructions that their reward for the experiment would be the average of their 28 rounds of gambling, and that the final amount of coins would be converted into cash at a ratio of 10:1.

2.4 Data analysis

SPSS 24.0 software was used for statistical analysis. In the experiments of mixed gambling games using pseudo-
3. Results

3.1 Comparison of the scores of risk-taking subjects and conservative subjects on the traditional Chinese medicine Five State Personality Inventory

The results of the one-sample t-test on the risk-taking sample (risk-taking for self versus risk-taking for others) and the conservative sample (risk-taking for self versus conservative risk-taking for others) are shown in Table 1. The sample of decision-adventurous subjects was found to score significantly higher on the Taiyang and Taiyin personality trait dimensions than the sample of decision-conservative subjects (p<.05). In contrast, there was no significant difference between the two on the Shaoyang, Peace in the Yin and Yang and Shaoyin dimensions (p > .05).

### Table 1 Scores and t-tests of decision-adventurous subjects and decision-conservative subjects on the traditional Chinese medicine Five State Personality Scale

<table>
<thead>
<tr>
<th>Type of decision (mean ± standard deviation)</th>
<th>t</th>
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</thead>
<tbody>
<tr>
<td>Taiyang type (n=26)</td>
<td></td>
</tr>
<tr>
<td>Taiyang Personality Trait Dimension Score</td>
<td>12.31±2.81</td>
</tr>
<tr>
<td>Taiyin personality trait dimension score</td>
<td>13.85±3.88</td>
</tr>
<tr>
<td>Conservative type (n=26)</td>
<td></td>
</tr>
</tbody>
</table>

notes: ***p < 0.001

3.2 Correlation analysis

Pearson's bivariate correlation analysis was conducted on the Taiyang dimension score, Taiyin dimension score, the number of risky decisions made for self, the number of risky decisions made for others, and the value of decision differences among the experimental subjects as a whole, as shown in Table 2. We found: (1) subjects’ Taiyang dimension scores were significantly and negatively correlated with the value of subjects' decision differences, p < .01; (2) subjects’ Taiyin dimension scores were significantly and negatively correlated with the value of subjects' decision differences, p < .01; (3) subjects’ Taiyang dimension scores were significantly and positively correlated with the number of risky decisions made for others, p < .01; (4) subjects’ Taiyin dimension scores were significantly and negative correlation, p < .05.

### Table 2 Results of Pearson correlation analysis

| Number of risk decisions made for self | .101 | -.224* |
| Number of risk decisions made for others | .465** | .099 |
| Poor decision-making | -.391** | -.361** |

notes: *p < 0.05, **p < 0.01

4. Discussion

This study explored the relationship between the five personality traits of Chinese medicine and self-interpersonal risk decision-making by simulating a risky decision-making situation through a multi-round mixed gambling game. Yang and Xue proposed the "theory of composition of personality traits with different Yin and Yang contents", which pointed out that different amounts of Yin and Yang make up an individual's personality traits, and that an individual can have some personality traits of the five types at the same time, and that there are differences in the traits of the five types, but they do not belong to only one type [17]. Accordingly, this study looked at the subjects' scores on the five dimensions of the traditional Chinese medicine Five State Personality Test, and the t-test results demonstrated that the subjects' risk-taking level in making risky decisions on behalf of others was mainly influenced by the subjects’ Taiyang personality traits and Taiyin personality traits.

We found that subjects' scores on the solar dimension were significantly and positively correlated with the number of risky decisions made on behalf of others, but not with the number of self-risky decisions. Decision-risky subjects scored significantly higher on the solar personality trait than the experimental subjects as a whole, and decision-conservative subjects scored significantly lower on the solar personality trait than the experimental subjects as a whole. In conclusion, compared to other subjects, those with high scores on the solar personality trait were more risky in making risky decisions on behalf of others, and there was no significant difference in making risky decisions on behalf of the self. A study by Wang and Li et al. pointed out that the specific manifestations of solar personality traits are good at talking about big things, conceited and self-absorbed, assertive and indomitable [18], and that solar people are arrogant, self-righteous and stubborn [19]. Summarising the typical characteristics of the solar personality, it can be shown that people with significant solar personality traits have difficulty in thinking differently and being easy to deal with, which leads to
the conclusion that they do not care about the interests of others when making risky decisions for them and are thus more risky, and H1 holds true.

The subjects’ scores on the Taiyin dimension were significantly negatively correlated with the number of risky decisions they made for themselves, but not with the number of risky decisions they made on behalf of others, and the risky subjects scored significantly higher on the Taiyin dimension than the experimental subjects as a whole. There was no significant difference. The value function derived from the analysis of the multidimensional psychological mechanisms of self-other risky decision making by Lu et al. can explain the above findings. When faced with gains, the decision maker for others was more concerned with gains than the decision maker for self, while when faced with losses, the decision maker for others was less concerned with losses than the decision maker for self\(^{[20]}\). According to a study by Xue and Li, Taiyin personality traits include being thoughtful, pessimistic, timid, fearful and indecisive\(^{[19]}\), and Taiyin people do not like to get in touch with others, are withdrawn, have a sense of distance from others and stay in a fixed social circle\(^{[19]}\). Summing up the typical characteristics of Taiyin personality, it shows that people with significant Taiyin personality traits are more thoughtful, conservative and closed-minded, and therefore have a high aversion to loss of self-interest when making self-risk decisions, and are thus more conservative and less likely to take risks, and H2 holds true.

There are still many shortcomings in this study: (1) Insufficient research on relevant variables, such as gender, age and other demographic factors. (2) It is doubtful whether multiple rounds of mixed gambling games in the laboratory experimental method can objectively simulate decision-making situations in the real world. (3) The psychological mechanism of self-other risky decision making from the perspective of the five-state personality theory in Chinese medicine needs to be further explored, and future research needs to examine the influence of factors such as psychological distance, social distance, and individual self-esteem levels of decision makers on the differences in self-other decision making\(^{[21]}\).

5. Conclusion

Those who score high on the Taiyang personality dimension of the traditional Chinese medicine five-state personality have a lower concern for the interests of others compared to self-interest, and therefore have a higher tendency to take risks when making risky decisions on behalf of others than on behalf of self.

Those who score high on the Taiyin personality dimension of the traditional Chinese medicine five-state personality are more averse to the loss of self-interest compared to the interests of others, and therefore have a higher tendency to take risks when making risky decisions on behalf of others compared to the surrogate self.

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