

Experiment on How Type A and Type B Behavior Pattern Affect Decision-Making

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Abstract. Individual decision-making behaviors are affected by context probability, success experiences and individual difference. Experiment on difference of individual decision-making behaviors is designed to explore the rules. Subjects are tested as type A or B behavior pattern before participated in experiment. Decision-making tendency is main analyzed option. The conclusions show that given probability leads subjects' decision-making behaviors in extreme probability states, last outcome and individual differences also impact subjects in average probability states. The causations about subjects' decision-making behaviors match choice's probability, correct-unchanged tendency was more than other tendencies, and difference with type A or B behavior pattern are discussed.

Keywords: decision-making behaviors, probability matching, decision-making tendency, type A and B behavior pattern, last outcome.

1 Introduction

Kahneman found choices of individual decision-making matching with given probability but deviated from the rational choice, pointed those unrational deviation from typical model was followed some rules and could be predicted [1]. Anderson pointed given probability, successful experience and individual difference was main affection factors and simulated individual decision-making by ACT-R model in 1998[2].

Personality will affect decision-making and Phineas Gage was the first sample due to brain injures inducing decision-making [3, 4]. We would explore whether type A and B behavior pattern will affect individual decision-making, whether individuals with different type pattern will make different choice in different probability, and how given probability and successful experience affect decision-making. Type A Behavior Pattern (TABP) was defined by Rosenman and Friedman, which included two type pattern: A and B [5]. Individuals with type A behavior pattern were impetuous, unsteadily emotion, emulative, high efficiency, impatience and high time pressure etc, on the contrary, individuals with type B were peace and quiet, relaxed, comfortable, less ambition, obedient, reticent, cogitative, deep-voiced, costive etc.

Subjects with type A or B behavior pattern are invited to test difference of decision-making behavior to prove those hypotheses:

1. In extreme probability states given probability would be dominant subjects decision-making behaviors, in average probability states last outcome and individual differences would all impact subjects.
2. In average probability difference of subjects with type A or B behaviors pattern would be remarkable.

Decision-making tendency is main analyzed option. Decision-making tendencies are choices after the last outcome. Last outcomes include correct and error and choices includes changed and unchanged, so there are four tendencies: correct-unchanged, correct-changed, error-unchanged, and error-changed.

2 Difference of Individual Decision-Making Behaviors Experiment

2.1 Testing of Type A or B Behavior Pattern

Testing of type A or B behavior pattern mostly uses questionnaires, those questionnaires include Structure interview (SI), Jenkins activity survey (JAS), Common life scale (CLS) and Type A behavior pattern questionnaire (TABPQ). We use DXC psychometrical instrument, which was developed by the Fourth Military Medical University, and embodied a type A behavior pattern questionnaire which was self-presentation and edited by Zhang Boyuan in 1984. There are 23 students as subjects to be invited to identify type behavior pattern. Table 1 is the outcome. One subject' lie detector exceeded seven, and then his questionnaire was eliminated.

Table 1. The outcome of type A and B behavior pattern identification

type behavior pattern	A (36~50)	A- (28~35)	M (27)	B- (19~26)	B (1~18)
amount	3	10	0	5	4

2.2 Methods

The test process is developed by E-Prime software.

Subjects: 22 students of College of Aeronautics.

Material: There are two alarm lamps, master caution lamp and master warning lamp in the experimental interface. One lamp will light in each test, and the probability is 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, then another will reverse. There are nine groups, and each group has fifty tests. Experimenters forecast and choose which one lamp will light between two alarm lamps. Software will give probability clue of one lamp will light for subjects before starting and correct or error clues after they each choose. The probability of lamp lighting is random and no name. Correct or error clue will show on the interface. Subjects will modify their choices according to clues and probability of lamp light.

3 Results and Discussions

3.1 Affection of Given Probability

Individual chooses according with option' right proportion is defined as Probability Matching. The probability of subjects' choices is gradually close to the given probability, as Fig.1 presents. This result consists with former' experiments.

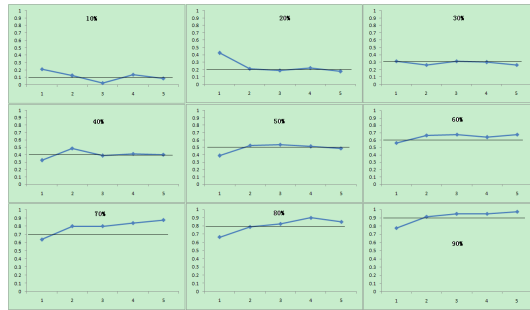


Fig. 1. Subjects' choices matching given probability

Given probability is dominant subject decision-making in extreme probability such as 10%, 20%, 80%, 90% and subject prefers former option and ignores last outcome; in average probability such as 40%, 50%, 60% each choice option has near probability and subject adjusts choice according of last outcome, finally probability of subjects' choices is also close to given probability, from another point of view, it affects subject. In significant level $\alpha = 0.05$, difference of unchanged tendency and changed tendency is significant in all extreme probability state, and insignificant in all average probability state.

3.2 Affection of Last Outcome

Subject' decision-making tendencies are mainly affected by last outcome in average probability, as Fig.2 shows. In extreme probability last outcome is ignored by subjects. In average probability if last outcome is correct, subject will prefer correct option and correct-unchanged tendency is higher than correct-changed; if last outcome is error, subject will change their choice, then error-changed tendency is higher than error-unchanged.

Correct-unchanged tendency is higher than other tendencies and correct-changed is lower than other tendencies in all probability. That is subject will prefer former option if last outcome is correct and weaken affection of given probability. For example, four tendencies would be same in 50% probability, but correct-unchanged tendency is highest, and correct-changed is lowest. Then last outcome is another main factor to affect subject decision-making. Literature 2 described subject choice was affected by last outcome and last last outcome, for example, the probability of A option was chosen lower in turn from AA, BA, AB, BB.

In significant level $\alpha = 0.05$, difference of correct-unchanged tendency and other three tendencies is significant in all given probability.

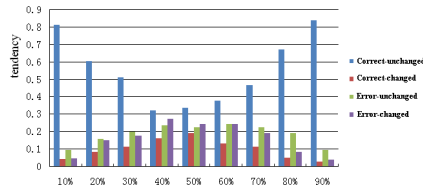


Fig. 2. Differences of four tendencies in vary given probability

3.3 Affection of Individual Difference

In average probability subject' personality affect subject decision-making liked Fig.3. Correct-unchanged tendency of type A is lower than type B, correct-changed tendency of type A is higher than type B, and other two tendencies is nearly. But in extreme probability, given probability cover other affection factors, and subject' tendencies of type A and B is nearly, as Fig.4 showed.

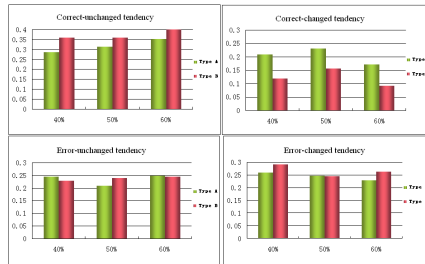


Fig. 3. Differences of subjects with type A or B behavior pattern in average probability

In significance level $\alpha = 0.05$, correct-unchanged tendency of subjects with type A is significantly lower than subjects with type B in average probability; correct-changed tendency with type A is significantly higher than type B; two error tendencies aren't significant in average probability and differences of four tendencies of two types aren't significant in extreme probability.

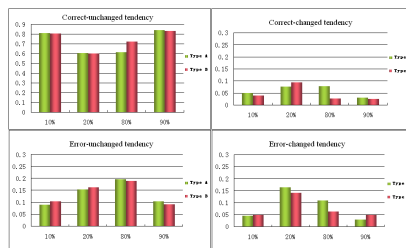


Fig. 4. Differences of subjects with type A or B behavior pattern in extreme probability

3.4 Discussions

1. Explaining probability matching in psychology could be considered that individual adjusts choices according to given probability for most incomes. Affections of last outcome and individual difference for subjects are unnoticed in extreme probability and very clearly in average probability. Explaining correct-unchanged tendency is more than other tendencies could be consider that there is subconscious inertia affecting subject's choices. This inertia is contrary with rational decision-making. When the last outcome is correct, subject prefers the former option, even though accurate rate of that option isn't higher than other options. Hypothesis one is tenable.
2. In average probability difference of subjects with type A or B behaviors pattern are remarkable: Correct-unchanged tendency of subjects with type A is significantly lower than subjects with type B; correct-changed tendency with type A is significantly higher than with type B. Hypothesis two is tenable. That could be considered subjects with type B are more affected by subconscious inertia, and more obedient than type A.

4 Conclusions

Individual decision-making behaviors adjust mainly according to options' given probability and also are affected by last outcome and individual difference. Affection of given probability results in probability matching, affection of last outcome results in correct-unchanged tendency is more than other tendencies, and affection of individual difference results in significant difference of subjects with type A or type B in average probability. But whether correct-unchanged tendency is more than other tendencies, whether difference type pattern behavior results in different decision-making behaviors, those would be proved by more experiments.

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