

Study on Commitment Escalation Based on the Self-esteem Level of Decision-makers and the Sunk Cost of a Program

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Abstract

The phenomenon of "commitment escalation" originated from decision makers, and is part never encountered by traditional risk control theory. The phenomenon of commitment escalation frequently occurs in decision making of an enterprise, which seriously affects cultural establishment and training of core competition of the enterprise. In order to search for explanatory variables of "commitment escalation", authors of this article introduced "self-esteem level" and "sunk cost level" for examination, employed scenario simulation experiment and the analytical technique of contingency table for a statistic test. The research results indicate that, when faced up with the high level of sunk cost, the decision maker is more likely to choose commitment escalation than when faced up with the low level of sunk cost, no matter the self-esteem level of the decision maker is high or low; when faced up with the same level of sunk cost, the decision maker with high self-esteem level is believed to be much more likely to choose commitment escalation than the one with low self-esteem level.

Keywords: Self-esteem level, Sunk cost, Commitment escalation

Traditional decision making theory is established on the presupposition of "full rationality of decision makers", focusing on factors related with the project itself, such as "market environment" and "prospective earnings", and neglecting the behavioral factors of decision makers who are at the topmost of the decision making system. The Prospect Theory (Kaheman, 1979) brought the "bounded rationality" of decision makers into traditional decision making system, which enabled behavioral factors and personal traits of decision makers to be generally concerned.

Commitment escalation refers to a phenomenon that when decision makers are faced up with a series of negative action consequences information, they still hold on to the previous decision plan and continue to invest more resources and human power into unfavourable projects, which may get the enterprise more and more into hot water (Note 1). Since 1976 when Barry·M·Stow discovered the phenomenon of commitment escalation through his study on "relationship between possibility of decision makers to assume responsibilities and tendency of commitment escalation", the issue of commitment escalation has become a difficult subject in decision making and the focus of studies by managerialists, psychologists and sociologists. However, according to study by Chee Chow (2000), the phenomenon of commitment escalation existed generally in Chinese enterprises, which would exert great influences upon scientificity of decision making. In this article, the authors are going to employ the method of scenarios simulation experiment based on "bounded rationality" of decision makers and analyze influences of personal traits of decision makers on commitment escalation through data collection and processing, which will open a new train of thought for decision making risk control.

1. Literature review and research hypothesis

1.1 Literature review

Barry. M. Stow made an exploratory analysis in the phenomenon of "commitment escalation", which had a great effect on management of decision making, and accordingly, a large number of research achievements appeared in

the fields of management, psychology and organizational behavior. As for studies on “commitment escalation”, we can sort out from the following two aspects.

1.1.1 Study on influential factors of “commitment escalation”

It is a main route for study on commitment escalation to search for new explanatory variables for the phenomenon of “commitment escalation” by decision makers. Stow (1976) found out influences of “whether decision makers should assume direct responsibility” on “commitment escalation”. Afterwards, a great many academics continued to try new characteristic variables to seek for new explanatory variables for “commitment escalation” by decision makers. There are mainly the following typical variables: “sunk cost” (Stow, 1981; Greer, 2001; Scott, 1998; Ren Xulin, 2006, etc.), “factors of organization” (Brockner, 1992), “political factors” (Ren Xulin, 2006) and “progress of implementation of a project” (Scott, 1998), etc, which are factors of design projects per se and the aspect of investment environment. Studies on “sunk cost” are most extensive, and have become the core factor for study on the phenomenon of commitment escalation, because “self explanation” and “sunk cost” are understood as obligatory investment foundation. Stow studied “tendency of commitment escalation”, “strength of commitment escalation” and “degree of self confidence in their subsequent decision” by decision makers when they were faced up with “sunk cost” and “unfavorable news”, which made “sunk cost” become a significantly indispensable variable for study on commitment escalation of decision makers (Stow, 1981). Domestic academics Ren Xulin and Wang Chongming made a comparison of “tendency of commitment escalation” between “entrepreneur” and “managerial personnel” in face of “unfavorable news”, and made an instructive contrastive analysis by presenting the role of “sunk cost” to decision makers of different sorts (Ren Xulin, 2006).

Existing researches have already proved the indispensability of “sunk cost” in study on “commitment escalation” as a significant variable. In this article, the authors will go on with study on “sunk cost” by Stow (1981) and conduct control over it as a primary variable.

1.1.2 Study on personality trait of decision makers

The biggest breakthrough of application of personality trait of decision makers into study on “commitment escalation” lies in its challenge to “complete rationality in economics”. Focus of traditional study on risk control is on market and environmental factors, neglecting behavioral factors of decision makers, which is exactly assumption based on “complete rationality of decision makers” in economics. By contrast, relevant studies of “Prospect Theory” and “Behavioral Economics” have brought “bounded rationality” of decision makers into traditional economic decision making, which will open new train of thought for study on commitment escalation. “Bounded rationality” is a kind of ambiguous assumption, that is, degree of rationality of decision makers varies with different people, whereas the personality trait of decision makers is just an important factor to affect “bounded rationality” of decision makers.

Barry. M. Stow (1981) made an exploratory attempt to bring the personality trait factor of decision makers into study on route analysis of “commitment escalation”, and discovered a certain influential role of personality factor through evidence test of experiment, but he did not present specific route and influential relations. Brockner (1992) selected such factors as “level of self esteem” and “dictatorial democracy trend” of decision makers, but he thought this had no obvious association with “commitment escalation”. Domestic expert Sun Lijun (2006) concentrated on the effect of “personality trait of decision makers” on “commitment escalation”, and selected such factors as “trends of internal control and external control”, “risk propensity” and “endurance of frustration” to examine relationship between personality trait of decision makers and commitment escalation through experimental research. The study indicated, “managerial personnel with higher risk propensity, higher level of self esteem and stronger internal control trend were more likely to choose commitment escalation, and were more inclined to enhance commitment on previous choice when faced up with negative information” (Note 2).

However, in view of current studies on “commitment escalation”, study on personality trait of decision makers is still at its initial stage, and relevant studies are still deficient. Moreover, studies on “level of self esteem” of decision makers are as scarce as hen’s teeth. Then, the Psychologist Carl Gustav Jung (1933) believed, decision makers with “high self esteem” would be more likely to choose opportunity and possibility of “self explanation”, which opens up a new research space for us to study influences of self esteem of decision makers on tendency of commitment escalation.

Generally speaking, most studies on commitment escalation still remain at the first stage, that is, to search for new explanatory variables for the phenomenon of commitment of escalation by decision makers. Study on “personality trait of decision makers” is still at its initial stage, and content, scope, width and breadth of study are

still open for more researches and exploration. Currently, China is in a particular period of economic transition, in which the issue of investment risk from the perspective of the state, industry and enterprise can not be avoided, so this article is going to provide a new breakthrough from the perspective of organizational behavior based on the personality trait of decision makers.

1.2 Research hypothesis

“Sunk cost” refers to the fact of investment which has already been formed in a project decided. According to “self explanation mechanism” in psychology, when decision makers receive unfavorable news about the investment project decided, they would not like to easily acknowledge failure, since his/her personal authority is involved. However, most of the time, decision makers may explain “sunk cost” as the foundation for profits in the future, and “unfavorable news” is merely temporary. Self-esteem level of decision makers affects the psychological activities of decision makers to a great extent. When faced up with unfavorable news about investment decision, decision makers with low self-esteem level would not give too much consideration into protection of their authority, but would make a sensible analysis and make an effective decision to prevent serious commitment escalation. In contrast, when faced up with unfavorable news, decision makers with high self-esteem level would have high aspiration of self explanation to protect their authority and wait for opportunities for a favorable turn of investment, and attempt in vain to bring favorable news by means of additional investment, which may lead to high tendency of commitment escalation. Hence, this article proposes Hypothesis 1 as follows:

H1: When faced up with the same level of sunk cost, the decision maker with high self-esteem level is believed to be much more likely to choose commitment escalation than the one with low self-esteem level;

As for decision makers with high self-esteem level, when faced up with different levels of “sunk cost”, their aspiration of self explanation would also differ from each other, which would affect the tendency and degree of commitment escalation. When “sunk cost” of a small scale is met with unfavorable news, it is quite likely that decision makers have a definite anticipation on malignant profits in the future, and repeal investment decision in order to avoid bigger mistakes from affecting their authority and personal value. On the contrary, when “sunk cost” of a large scale is met with unfavorable news, decision makers would be doomed to assume reliabilities for outcomes of their decision, and pin their hopes on additional investment to bring a possible favorable turn, so they would exhibit high tendency of commitment escalation. Hence, the article proposes Hypothesis 2 as follows:

H2: when decision makers have high self-esteem level, the decision maker faced up with high sunk cost is more likely to choose commitment escalation than the one faced up with low sunk cost;

By contrast, decision makers with low self-esteem level have low aspiration for “self explanation”, and would not invest blindly due to personal authority damaged. Thus, when investment of “sunk cost” with a large scale happens, decisiveness presented by decision makers with low self-esteem level will prevent occurrence of commitment escalation. However, when investment of “sunk cost” with a small scale happens, even if unfavorable news comes, this sort of decision makers would still like to try additional investment for they are not concerned about influences of investment failure on themselves, which will lead to the phenomenon of commitment escalation. Hence, the article proposes Hypothesis 3 as follows:

H3: when decision makers have low self-esteem level, the decision maker faced up with low sunk cost is more likely to choose commitment escalation than the one faced up with high sunk cost;

According to the above analysis, this article selects “self-esteem level” of decision makers and “sunk cost level” of the project as independent variables, and selects “strength of aspiration of commitment escalation” of decision makers as a dependent variable, constructing the following research model:

Insert Figure 1 Here

2. Research design

In order to test effectively the above research hypotheses, we conduct an effective research design by reference to existing studies (Stow, 1981; Brockner & Rubin, 1992; Ren Xulin, 2006; Sun Lijun, 2006, etc.).

2.1 Compilation of scale

2.1.1 Self-esteem scale

Self-esteem scale by Rosenberg (1965) is widely applied in current studies which is constituted altogether by 8 items. The primary issues of the scale involve evaluation of individuals on the ability to deal with a problem. Through calculation of scores of self-esteem, higher score means higher self-esteem level of the subjects, and

otherwise lower self-esteem level.

2.1.2 Scale of strength of aspiration of commitment escalation --- credit questionnaire

This experiment uses the experimental method of scenarios simulation and draws up a scenarios questionnaire by reference to the “credit questionnaire” designed by Stephen ·B· Salter & David ·J· Sharp (2001) and the revision of research by Sun Lijun (2006). The specific scenario is as follows:

Design of experimental scenario

Scenario	<p>Subject: Decision maker of bank credit is faced up with the decision whether to approve a loan</p> <p>Scenario: A user of an enterprise applied for a loan worthy of 5 million Yuan two years ago, which is expired for the time being. However, the enterprise is unable to repay the loan as a result of difficulties in operation, so it applies for another loan in the hope of pulling through and turning losses into gains, and decides to repay these two loans together. If the second loan is refused, then the first loan will become a bad debt and the decision maker of the credit will have to take responsibility for this. If the second loan is approved, whether the enterprise will get out of the trouble has no way to be known. Moreover, according to information grasped by the bank, there is extremely small possibility that this enterprise can turn losses into gains.</p>
Decisions	<p>1= Decline requirement for the loan;</p> <p>2= Approve requirement for the loan.</p>

(Data source: corrected from credit questionnaire by Salter and Sun Lijun)

According to the above experimental scenario, the credit decision maker gets hold of data about operation condition of the enterprise whose possibility to turn losses into gains is extremely low. Under such a circumstance, authors of this article come to the conclusion: if the credit decision maker declines requirement for the loan, he/she is believed to be sensible; if the credit decision maker approves requirement for the loan, he/she is thought to exhibit tendency of “commitment escalation”.

In order to guarantee clear-cut, explicit and unequivocal convey of the experimental scenario, the researchers conducted a strict training on the subject and convey the scenario information in a expressive way without any tendentiousness. The authors make a research in advance on the basis of understanding the scenario and guarantee consistency of the experimental scenario by means of repeated correction.

2.2 Experimental subject

Since this experiment is quasi experiment, requirement for the method of sampling is not that high. This experiment is going to sample 80 persons as the subjects and then they are grouped into four groups of 2*2, each group with 40 subjects. Situation of grouping is as follows:

Insert Table 1 Here

According to above table, subjects in this experiment are altogether grouped into four groups, each group with 20 persons, respectively four scenarios experiments of “low sunk cost --- low self-esteem”, “low sunk cost --- high self-esteem”, “high sunk cost --- low self-esteem” and “high sunk cost --- high self-esteem”.

3. Analysis of the experiment

According to data obtained from the experiment, the authors use spss16.0 for data analysis and employ “reliability analysis” and “validity analysis” to respectively conduct effective reliability and validity test on the scale applied. Then, the authors use “cross tabulation”, “odds ratio” and “chi-square test” to conduct test on interactive effect of “self-esteem level” and “sunk cost”.

3.1 Test on reliability and validity of the scale

3.1.1 Test on reliability

Reliability (Note 3) refers to ratio of variance of proper fractions to that of actually measured fractions in a group of fractions tested.

This study uses Cronbach α to test validity of the questionnaire. According to requirement of psychometrics, if this coefficient is above 0.8, then it is indicated that this survey scale has high internal consistency; if this coefficient is above 0.7 and below 0.8, then it is indicated that internal consistency of this scale is acceptable

(Note 4).

Considering characteristics of this questionnaire, first of all, this article makes a validity test respectively on “scale of self-esteem level” and “credit questionnaire” which measures “level of commitment escalation”, and then conducts a validity test on the entire questionnaire. SPSS is employed for test on the questionnaire, and the result is shown as in Table 2:

Insert Table 2 Here

According to above table, Cronbach α of “scale of self-esteem”, “scale of strength of aspiration of commitment escalation” is all above 0.7, indicating internal consistency of the scale acceptable and with definite reliability.

3.1.2 Validity test

Validity (Note 5) refers to correctness of a test, that is, the degree that a test can exactly test the mental trait or function that is anticipated to be tested, or the degree that results of a test achieve the purpose of the test. The more correctly the purpose is understood, the higher the validity of the test is, which can then prove that results of the test more represent the actual trait of the behavior tested. Usually, validity is divided into content validity, criterion validity and construct validity. This article employs “matrix (Note 6) of multiple methods --- multiple traits” to make an analysis in validity of the questionnaire and presents distinction validity and convergent validity of the questionnaire by listing analysis results in Table 3.

Insert Table 3 Here

According to the validity analysis of Table 3, validity of distinction between “commitment escalation” and “self-esteem level” and “sunk cost” is significant. According to research by Peng Kaiping (1989), this questionnaire has good distinction validity and this scale can be applied to conduct an effective experimental research, whose results will have definite dependability.

3.2 Stratified test on cross tabulation --- Stratification based on self-esteem level

In order to effectively test influences of “self-esteem level” and “sunk cost” on “strength of aspiration of commitment escalation”, here the authors make an analysis of cross tabulation and odds ratio to conduct relevant test.

3.2.1 Test on cross tabulation

Level of “independent variable” is used as evidence of grouping to study influences of the degree of sunk cost on commitment escalation. And cross tabulation in spss16.0 is employed. Then we come to Table 4 which is stated as follows:

Insert Table 4 Here

According to Table 4, and by reference to analytical method of cross tabulation by Wang Jinglong (2008), we can get:

With low self-esteem level, when sunk cost is low, there are actually 8 persons who abandon continuing to invest, expected 13 persons, and there are actually 12 persons who continue to invest, expected 7 persons. When the sunk cost is high, there are actually 18 persons who abandon continuing to invest, expected 13 persons, and there are actually 2 persons who continue to invest, expected 7 persons. Obviously, the expected frequency is not equal to frequency actually observed, indicating relevancy exists between “sunk cost” and “commitment escalation”.

The same situation also happens under the circumstance of high self-esteem level. At this time, great difference also exists between expected frequency and frequency actually observed, which, according to statement by Wang Jinglong (2008), indicates relevancy exists between “sunk cost” and “commitment escalation”.

Although we have got relevancy between “sunk cost” and “commitment escalation” through analysis of cross tabulation, we are not certain of the test on the above hypotheses. In order to further formulate convincing hypothesis, we conduct a chi-square test on verify results of cross tabulation analysis.

3.2.2 Chi-square test

A chi-square test on results of the above cross tabulation, we come to Table 5 as follows:

Insert Table 5 Here

Chi-square test is not only verification of the aforementioned “stratified cross tabulation”, but is also important

evidence for deduction of hypotheses in this study. According to the statistical research results in Table 5, we can get:

With low self-esteem level, the value of chi-squared statistic is .99, and p-value of the test statistics based on Pearson chi-square (Note 7) is 0.01, being significant under the condition of significance of 1%, indicating influence of “sunk cost” on “commitment escalation” is significant with low self-esteem level and verifying conclusion of cross tabulation analysis.

With high self-esteem level, the value of chi-squared statistic is 3.58, and p-value of the test statistics based on Pearson chi-square is 0.048, being significant under the condition of significance of 5%, indicating influence of “sunk cost” on “commitment escalation” is significant with high self-esteem level and verifying conclusion of cross tabulation analysis.

3.2.3 Test of odds ratio

According to the aforementioned “stratified cross tabulation analysis” and “Chi-square”, we have already been aware of the significant relevancy between “commitment escalation” and “sunk cost” with high self-esteem level and low self-esteem level”. Furthermore, we would like to have an idea about degree of this relevancy so as to better guide practice in an enterprises. Therefore, according to the aforementioned test results, this article makes a test of odds ratio and gets Table 6:

Insert Table 6 Here

According to definition (Note 8) by Wang Jinglong (2008) on odds ratio, we can get the following conclusions:

With low self-esteem level, when odds ratio=0.07, subjects with low self-esteem are more likely to choose higher commitment escalation when sunk cost is high than when sunk cost is low.

With high self-esteem level, when odds ratio=0.21, subjects with high self-esteem are more likely to choose higher commitment escalation when sunk cost is high than when sunk cost is low.

3.3 Stratified cross tabulation test --- taking stratification of sunk cost as an example

The aforementioned test mainly looks into relationship between “sunk cost” and “commitment escalation” with different self-esteem levels, and in the following will conduct a stratified cross tabulation test and odds ratio test by taking “sunk cost” as evidence for stratification.

3.3.1 Stratified cross tabulation test and Chi-square

By means of stratified cross tabulation test with cross tabulation and Pearsib chi-square test, we can get:

According to “stratified cross tabulation analysis”, with low sunk cost, when the self-esteem level is low, there are actually 8 persons who abandon continuing to invest, expected 5 persons, and there are actually 12 persons who continue to invest, expected 15 persons. When self-esteem level is high, there are actually 18 persons who abandon continuing to invest, expected 7 persons and there are actually 2 persons who continue to invest, expected 13 persons. Obviously, frequency expected is unequal to frequency actually observed, indicating relevancy exists between “self-esteem level” and “commitment escalation”. According to Pearson chi-square test, the chi-square statistic value is 4.80 ($p=0.028<0.05$), indicating significant relevancy exists between “self-esteem level” and “commitment escalation” at the significant level of 5%.

Likewise, According to “stratified cross tabulation analysis”, with high sunk cost, frequency expected about commitment escalation is unequal to frequency actually observed, indicating relevancy exists between “self-esteem level” and “commitment escalation”. According to Pearson chi-square test, the chi-square statistic value is 12.91 ($p=0.000<0.01$), indicating significant relevancy exists between “self-esteem level” and “commitment escalation” at the significant level of 1%.

3.3.2 Test of odds ratio

In order to test influences of “self-esteem level” on “commitment escalation”, this article makes a test of odds ratio, and gets Table 7 as follows:

Insert Table 7 Here

According to statistical research results in Table 7, we can come to the following conclusions: with low sunk cost, when odds ratio = 6.00, subjects with high self-esteem level are more likely to choose higher commitment escalation; with high sunk cost, when odds ratio = 16.71, subjects with high self-esteem level are more likely to choose higher commitment escalation.

4. Conclusions and enlightenment

By means of scenario simulation, this article has verified the mechanism of action by “sunk cost” and “self-esteem level of decision makers” in the process of generation of tendency of their commitment escalation. The research results indicate that, when faced up with the high level of sunk cost, the decision maker is more likely to choose commitment escalation than when faced up with the low level of sunk cost, no matter the self-esteem level of the decision maker is high or low; when faced up with the same level of sunk cost, the decision maker with high self-esteem level is believed to be much more likely to choose commitment escalation than the one with low self-esteem level.

As for decision makers with high self-esteem, it is easy to understand: According to study by Gustav Jung (1933) on relationship between “self-esteem level” and “self explanation mechanism”, decision makers with high self-esteem level are more likely to have strong aspiration of self explanation, so in the situation of high sunk cost investment, unfavorable news may stimulate decision makers to have “self-explanation” for their decision making behavior, and the most effective method for self explanation is to continue to add investment. Therefore, decision makers with high self-esteem level are much more likely to exhibit tendency of commitment escalation when faced up with high sunk cost. By contrast, although decision makers with low self-esteem level do not have as strong aspiration of self explanation as that of decision makers with high self-esteem level, they still tend to choose commitment escalation when faced up with “sunk cost” with a large scale, which, for decision makers, is better than a stick in the eye who pin their hope on a favorable turn of investment in the future. However, when different decision makers are faced up with the same level of sunk cost investment, decision makers with high self-esteem are much more likely to choose commitment escalation than decision makers with low self-esteem.

This study is an tentative exploration into personality trait of decision makers, which provides a new train of thought for study on expansion of decision control. In an economic era of “bounded rationality”, behavioral factors of decision makers become the headstream of the system of decision control and degree of their rationality determines decision risk to a great extent. The traditional “market environment” and “prospective earnings” are also affected by personal views of decision makers in a sense. Self-esteem level of decision makers is an important influential factor of rationality of decision makers, which will offer effective suggestions for “management of behavioral decision” of an enterprise.

However, this study is conducted in a Chinese cultural environment and Chinese cultural value system has its own characteristics. The pattern of “social relation network centered with individuals” affects behavior of decision makers, so research achievements in this study can not be simply applied to other cultural environment. However, study on behavior of “commitment escalation” of decision makers based on cultural value will be a new research direction in the future. Comparative study was conducted by Charles R. Greer, Gregory K. Stephens (2001) on tendency and degree of “commitment escalation” of decision makers from US and Mexico, and discovered that decision makers from Mexico were much more likely to manifest tendency of commitment escalation than decision makers from US when faced up with the same situation, with more vigor of commitment escalation, and even leaders of Mexico would tend to be more confident in their “commitment escalation”. This study provides a new train of thought for us to make a discussion of commitment escalation by decision makers, but in a strict sense, “US” and “Mexico” can not stand for two kinds of totally distinct cultural value. Comparison of commitment escalation of decision makers based on different cultural value will exhibit stronger vitality in the future study and will make significant contribution to decision control in cross-cultural management.

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Notes

- Note 1. Barry. M. Stow. The escalation of Commitment to a Course of Action. *Academy of Management Review*, 1981 (14)
- Note 2. Sun Lijun & Xu Jianrong. The Effects of Decision Maker's Personality Traits on Commitment Escalation. *Commercial Research*. 2006 (23).
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- Note 6. Price J.L. Handbook of Organization Measurement. *International Journal of Manpower*, 1997, 18.

Note 7. Pearson's chi-square:
$$Q_p = \sum_i \sum_j (n_{ij} - m_{ij})^2 / m_{ij}$$

Note 8. Odds ratio =
$$\frac{odds_1}{odds_2} = \frac{p_1(1-p_1)}{p_2(1-p_2)} = \frac{p_1(1-p_2)}{p_2(1-p_1)}$$
, p_1 and p_2 respectively stand for probability

of subjects to choose "abandoning" commitment escalation when sunk cost is low/high in stratified cross tabulation; if odds ratio=1, then it is proved that there is no relevancy between variables. On the contrary, there is obvious relevancy between variables.

Appendix 1: Self-esteem scale by Rosenberg

The following test is based on your emotional experience within one week, which should be answered with practice:

A: Quite coincident; B: Coincident C: Not coincident; D: Quite not coincident

1. I believe I am a useful person, at least neck and neck compared with others.

(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree

2. I find a lot of advantages in myself.

(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree

3. Generally speaking, I tend to consider myself a loser. *

(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree

4. I can do everything as well as most people.

(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree

5. I find no aspect to be proud of in myself. *

(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree

6. I hold a positive attitude towards myself.

(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree

7. Generally speaking, I feel satisfied with myself.

(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree

8. It would be better if I could have a good opinion of myself. *

(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree

9. Sometimes, I really believe myself good for nothing. *

(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree

10. Sometimes, I consider myself good for nothing. *

(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree

Scoring method: the sign * means reverse scoring. There are four levels of scores, respectively 1-4, and scope of the total score is 10-40. Higher score means higher self-esteem.

Appendix 2. Credit questionnaire

Choice is made according to the following scenario:

Scenario	<p>Subject: Decision maker of bank credit is faced up with the decision whether to approve a loan</p> <p>Scenario: A user of an enterprise applied for a loan worthy of 5 million Yuan two years ago, which is expired for the time being. However, the enterprise is unable to repay the loan as a result of difficulties in operation, so it applies for another loan in the hope of pulling through and turning losses into gains, and decides to repay these two loans together. If the second loan is refused, then the first loan will become a bad debt and the decision maker of the credit will have to take responsibility for this. If the second loan is approved, whether the enterprise will get out of the trouble has no way to be known. Moreover, according to information grasped by the bank, there is extremely small possibility that this enterprise can turn losses into gains.</p>
Decisions	<p>1= Decline requirement for the loan; 2= Approve requirement for the loan.</p>

Table 1. Grouping of the experiment

Low sunk cost level		High sunk cost level	
Low self-esteem	High self-esteem	Low self-esteem	High self-esteem
G1	G2	G3	G4

Table 2. Analysis of reliability of the questionnaire

Name of the scale	Cronbach's Alpha
Scale of self-esteem level	0.81
Scale of strength of aspiration of commitment escalation	0.74
Entire questionnaire	0.76

Table 3. Correlation analysis of variables

		Self-esteem level	Sunk cost	Commitment escalation
Self-esteem level	Pearson Correlation	1	.00	.43**
	Sig. (2-tailed)		1.00	.000
	N	80	80	80
Sunk cost	Pearson Correlation	.00	1	-.38**
	Sig. (2-tailed)	1.00		.00
	N	80	80	80
Commitment escalation	Pearson Correlation	.43**	-.38**	1
	Sig. (2-tailed)	.00	.00	
	N	80	80	80

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4. Cross tabulation of sunk cost, commitment escalation and self-esteem level

Self-esteem level				Commitment escalation		Total
				Abandon	Commitment	
Low	Sunk cost	Small	Count	8	12	20
		Large	Count	18	2	20
	Total	Count	26	14	40	
High	Sunk cost	Small	Count	2	18	20
		Large	Count	7	13	20
	Total	Count	9	31	40	

Table 5. Chi-Square Tests

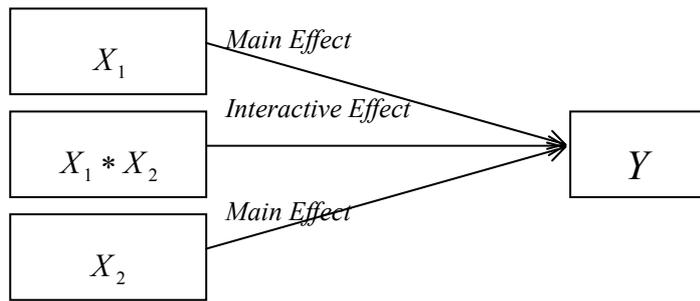
Self-esteem level		Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
1	Pearson Chi-Square	10.99 ^a	1	.001		
	Likelihood Ratio	11.87	1	.001		
2	Pearson Chi-Square	3.58 ^c	1	.048		
	Likelihood Ratio	3.75	1	.053		

Table 6. Test of odds ratio

Self-esteem level	Value	95% Confidence Interval		
		Lower	Upper	
1	Odds Ratio for sunk cost (1.00 / 2.00)	.07	.01	.41
	For cohort commitment escalation = 1.00	.44	.26	.78
	For cohort commitment escalation = 2.00	6.00	1.54	23.44
	N of Valid Cases	40		
2	Odds Ratio for sunk cost (1.00 / 2.00)	.21	.04	1.16
	For cohort commitment escalation = 1.00	.29	.07	1.21
	For cohort commitment escalation = 2.00	1.385	.97	1.97
	N of Valid Cases	40		

Table 7. Test of odds ratio

Sunk cost	Value	95% Confidence Interval		
		Lower	Upper	
1	Odds Ratio for self-esteem level (2.00 / 1.00)	6.00	1.08	33.27
	For cohort commitment escalation = 1.00	4.00	.97	16.55
	For cohort commitment escalation = 2.00	.67	.45	.98
	N of Valid Cases	40		
2	Odds Ratio for self-esteem level (2.00 / 1.00)	16.71	2.97	93.89
	For cohort commitment escalation = 1.00	2.57	1.39	4.76
	For cohort commitment escalation = 2.00	.15	.04	.60
	N of Valid Cases	40		



$$Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2$$

X_1 : Level of self esteem of decision makers

X_2 : Level of sunk cost of the project

$X_1 * X_2$: Interactive Effect of X_1 and X_2

Y : Strength of aspiration of commitment escalation of decision makers

Figure 1. Research model