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Influence of Different Types of Intergroup Relationship on Decision-making Behavior of Chinese Enterprise Employees

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Abstract

In real life, individuals tend to divide people into “us” (in-group) and “them” (out-group), then give a positive social identity and evaluation to the in-group, and give out-group a negative evaluation or attitude. In other words, the intergroup relationships affect individual rational judgment. For studying the relationship between individual and group interests, in order to explore and forecast the individual decision-making behavior in intergroup relations, social psychologists brought forward the Intergroup Prisoner’s Dilemma Game (IPD) and Intergroup Prisoner’s Dilemma-Maximizing Difference Game (IPD-MD), these experimental paradigms are referenced in many fields by posterity.

On the basis of predecessors' research paradigm, the experiment adds the scheme of win-win cooperation to IPD-MD, adopts the repeated experimental design which accords with realistic state, and the study utilizes 120 Chinese enterprise employees to participate in the experiment that is named “Investment Game”, by artificially establishing four virtual intergroup situations, including conflict, neutral, cooperation and relationship change. Finally, the study draws a conclusion, which is based on the statistical analysis and self-reports.

Different types of intergroup relationship have an important influence on the decision-making behavior of chinese enterprise employees. Chinese enterprise employees in the intergroup conflict situation tend to be more aggressive and less friendly, meanwhile ingroup could reach consensus through higher efficiency. chinese enterprise employees in the intergroup cooperation situation could alleviate egocentric motivation and reach a win-win cooperation with outgroup in a faster rate. When the intergroup situation is changed from conflict to cooperation, the reactions of different chinese enterprise employees are various.

Keywords: *intergroup relationship; intergroup conflict; intergroup cooperation; intergroup decision-making; Intergroup Prisoner’s Dilemma-Maximizing Difference Game (IPD-MD)*

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Introduction

In real life, it can be seen everywhere that individuals in intergroup relations faced selection dilemmas. For example, in the rapid development and continuous change of society, major powers and ethnic disputes, decision-making of leaders and the interaction of intergroup relations were not only hot topics in the academic field, but also topics that governments of various countries paid close attention to and social researchers deeply studied. On November 15, 2019, the Regional Comprehensive Economic Partnership Agreement (RCEP) was officially signed. This historic event marked the establishment of the largest free trade zone of world. This was not only an important milestone in the process of east asian regional economic integration, but also an important part of the flourishing development of multilateralism and free trade. Good and healthy competition and cooperation had great significance to stabilizing the global economy. The competition and cooperation of enterprises were the most important relationship attributed in the economic environment. Many small and medium-sized enterprises competed with other alliances through alliances. When necessary, they also needed to cooperate with each other in the alliances. In this state, decision makers will constantly adjust strategies according to the previous choices of others, and also rationally anticipated the impact of the decision-making results on the relationship and the further decision-making of others.

Social psychologist Bornstein (2003) invented the Intergroup Prisoner's Dilemma Game (IPD) in order to study the relationship between individuals, groups and collective interests to explore and predict individual decision-making behaviors in intergroup relationships. IPD can reflect the behavioral decision-making characteristics of individuals in the context of intergroup conflict. This classic paradigm had been continuously used and improved by the posterity in many fields. Among them, Halevy (2008) proposed the Intergroup Prisoner’s Dilemma-Maximizing Difference Game (IPD-MD) paradigm, which can clearly reflect the individual's decision-making motivation. Balliet (2008) confirmed that there was a difference between single decision and repeated decision, because the intergroup relationships in reality had multiple interactions for a long time, and this effect will lead to the changes in the individual's decision-making behavior. The design concept of repeated decision-making was more in line with the actual situation, allowing decision-makers to obtain the results obtained by using the strategy in time, thereby adjusting and re-selecting, and maximizing profitss.

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Using the prisoner's dilemma model to explore the decision-making behavior of individual in intergroup relations had important practical significance for understanding the phenomena in the fields of management, economics and sociology. Public choice theorists also used a simple prisoner's dilemma model to see through the most general characteristics of intricate interactions. However, Western research and theories paid more attention to the situation of intergroup conflict, but ignored the situation of intergroup cooperation, which was related to the impact of cultural differences between the East and the West and the changes of the times on values. On the one hand, as one of the representatives of eastern culture, the Chinese nation, especially the Han nationality, had always insisted on being benevolent, righteous and moderate, and living in peace with others since ancient times. Individuals under the influence of this culture were more willing to show the intention of pursuing intergroup harmony in the group. Even in the face of deliberate attacks and competition from outside groups, they will show tolerance and non-attack. On the other hand, the changes of the times had made people in various fields gradually realize the far-reaching significance of strategic cooperation. A rational group realized that intergroup relations were similar to interpersonal relations, not only had conflict relations, but also had cooperative relations. The cooperative relations obtained through long-term mutual altruism can win more benefits for each other. Therefore, it was necessary to explore individual behaviors in the context of intergroup cooperation.

This study simulated four types of intergroup situations that interacted in reality, namely conflict threats, neutrality and irrelevance, cooperation and win-win, and relationship change, to explore the impact of Chinese employees on decision-making behaviors in different types of intergroup relationship situations, and through repeated decision-making experimental design to create long-term and complex intergroup relationships in line with real life. It was

not only analyzed the attitudes of Chinese employees to the outside group and the corresponding behavior changes, but also explored the attitudes in the inner groups and change in decision-making behavior caused by attitude of Chinese employees. It was intended that the conclusions drawn can be used as a basis for predicting the behavior of Chinese employees within a certain range.

Literature Review

Group decision

Decision-making behavior was a hot topic in the fields of management and economics. Zhang (2012) summarized it as a high-level cognitive process, which refered to the selection or adjustment process of the direction, content and method of future activities by individuals or organizations in order to achieve their goals. Decision-making was a process of analysis, evaluation and judgment, which was affected by the values of the decision-maker and the external environment. From the hypothesis of "rational man" to the development hypothesis of "bounded rationality", it had been continuously proved that individual decision-making will be influenced by personality and environment to a large extent. Since individuals cannot live alone without being separated from the group, and many individual decision-making processes will be completed in the group, the understanding of the interrelationships among individuals, groups and collective interests will have a very important impact on individual decision-making.Inzlicht (2010) pointed out that a group refered to a group of two or more people who were connected in a certain way to perform activities together in order to achieve a common goal. Studies had shown that many decisions are made in groups, and the interpersonal environment can lead to changes in individual decision-making behaviors and made irrational decisions.Balliet (2008) confirmed that there was a difference between single decision and repeated decision, because the intergroup relationships in reality had multiple interactions for a long time, and this effect will lead to the changes in the individual decision-making behavior. The design concept of repeated decision-making was more in line with the actual situation, allowing decision-makers to obtain the results by using the strategy in time, thereby adjusting and re-selecting, and maximizing profitss.In order to study the decision-making behavior of individuals in intergroup relations, social psychologists usually adopt the classic IPD intergroup prisoner's dilemma game paradigm and the IPD-MD intergroup prisoner's dilemma difference maximization game paradigm.

Intergroup relationship

Fu (2002) proposed that intergroup behavior refered to the behavior of people interacting as the members of different social groups. Since the 1950s and 1960s, the study of intergroup behavior had became one of the hottest topics in Western social psychology. Fu (2005) defined the intergroup relations as the interactions that people regarded themselves as members of different social groups rather than interactions between single individuals, or the thoughts, emotions, or behaviors that occured due to the group membership. In other words, the intergroup relationship was the social psychological relationship between the inner group and the outside group. Although it was regarded as the relationship between two groups, but they always reflected in between the specific individual relationship.The research of Inzlicht (2010) showed that the emotions, thoughts, or behaviors of individuals in a group will change with the relationship between the inner group and the related outside group. For example, when members of a group realized that being in a certain position of another group will harm them, they will experience intergroup threats, which will lead to bias and forgiveness towards the inner group, and increase the allocation of resources to the inner group,and initiating competition with outside groups, etc.Intergroup relations had two prominent characteristics. One was conflict. From the perspective of social psychology, the so-called conflict here included not only explicit confrontational and aggressive behavior, but also implicit discrimination and hostility. Second, intergroup interaction tended to trigger competitiveness. Fu(2005) research showed that when people feel that they were dealing with other groups, they will be more competitive and less cooperative than when they regarded communication as an interpersonal situation. As a result, the research on intergroup behavior in the West currently focuses on intergroup conflicts and threats.

Intergroup threats and conflicts

Riek (2010) defined intergroup threats as the actions, beliefs and various characteristics of a group threatened by goals, development and survival of another group. Inzlicht (2010) believed that when group members experienced intergroup threats, members of the group will increase the cohesion of the inner group, and at the same time, the behavior of the outside group will generate negative perceptions, triggering the counter threat of the outside group, and forming an intergroup conflict situation. The Integrated Threat Theory (ITT) of Stephan (2000) classified the intergroup threats into four categories: realistic threats, symbolic threats, intergroup anxiety and negative stereotypes. Among them, realistic threat refered to the perception of competitive goals, material and economic threats of groups. Symbolic threat refered to the threats that came from the conflict of standards, beliefs and values between

groups. Stephan (2000) believed that intergroup threats should be added to the two factors of intergroup anxiety and negative stereotypes, because these two threats reflected negative intergroup attitudes and prejudices in intergroup relations. Becker (2011) pointed out that prejudice stemmed from the lack of adequate understanding of members from a certain group of people, which leading to negative emotions and attitudes. Negative attitudes and prejudice among groups will increase the degree of intergroup threats and deepen intergroup discrimination and conflict. Davis (2011) proposed through related research on electrophysiology that when an individual was aware of the threats of outside groups, the activity of electromyography (EMG) increased, resulting in an emotional experience of anger. There were also many studies that showed that as conflict situations generated and threats increased, group members will have more negative attitudes and avoidance behaviors, and even violent behaviors.

Intergroup cooperation

At present, there is no clear definition of intergroup cooperation, and previous studies focused more on strategies to reduce intergroup threats. Based on years of research on intergroup conflicts, social psychologists proposed many specific methods and strategies to reduce conflicts and threats. The most famous theories were social classification theory and intergroup contact theory. Dang (2014) pointed out that under the influence of social pressure, social groups often distinguished themselves from other groups, which will produce inner group preference and outside group rejection tendencies in the process of group interaction, and consciously assigned beneficial resources to the inner group. Therefore, the social classification theory advocated weakening the prominence of categories, and by increasing the identity of the common group and blurring the group boundary, it was an important way to reduce the intergroup threats. Li (2014) believed that intergroup contact theory was generally regarded as one of the most effective strategies to promote intergroup relations. A large number of studies had shown that specific methods such as direct interaction and communication, expansive and alternative indirect contact, and psychological simulation of positive imaginative contact can promote intergroup harmony.From the perspective of individual psychological motivation, intergroup cooperation was a broadly altruistic behavior. In this study, the narrowly defined altruistic behavior refered to the contribution behavior of group members to maximize the interests of the inner group, and the broadly defined altruistic behavior refered to the behavior of individuals voluntarily contributing to the outside group. Zhang (2005) concluded that altruistic behaviors were usually divided into three types: kinship altruism, reciprocal altruism, and pure altruism.

Among them, reciprocal altruism was most in line with economic principles. Individuals hoped that others treated themselves in the same way of benefit, and individuals were willing to provide help because looking forward to receiving rewards in the future, which had also been verified in the behavior of intergroup cooperation. Economics assumed that the behavior of people always pursued the maximization of their own benefits, but in a group environment, it manifested not only as a concrete self-interested motive, but also as an altruistic motive for maximizing group benefits. It was worth noting that this kind of altruistic motivation often depended on the altruists who interacted with each other. When the other party had been showing egoistic behaviors or even exclusive aggressive behaviors during the long-term relationship, this kind of altruistic motivation will gradually disappear.

Intergroup Prisoner Difference Maximization Game

The IPD inter-group prisoner's dilemma game was proposed by social psychologist Bornstein (2003) to study the decision-making behavior of individuals in intergroup relations. It has been cited in economic games and computer games. The IPD game was played between two groups, each group was composed of three people, and each participant had 10 virtual coins to determine the proportions allocated to different plans before the start of the investment. Every time you kept 1 virtual coin to yourself, you will get 2 virtual coins, which did not affect the income of the group and outsiders. Every time you donated 1 virtual coin to the public fund, every member of the group (including donors) will receive 1 virtual coin, but at the same time every member of the outgroup will lose 1 virtual coin. In this way, the individual gained 3 units of virtual coins for his team at the cost of losing 1 unit of virtual coins, and caused the outside group to lose 3 units of virtual coins. Zhao (2014) believed that this game paradigm reflected the key strategies adopted by individual decision-making in the context of intergroup conflict: individual advantage strategy and group advantage strategy. If the individual kept all the virtual coins for himself, and the individual advantage strategy was adopted, the individual will obtain the maximization of personal benefits. If all members donate all the virtual coins, and the group advantage strategy was adopted, the group of the members will gain group benefits However, if the two groups donate all the virtual coins, the benefits of the two groups will become 0. Song (2007) showed the IPD game paradigm in the computer virtual competition of the prisoner's dilemma, and the winner will always be the the strategy of group advantage. However, this paradigm was too simple and controversial. Although this paradigm can reflect the characteristics of individual decision-making behaviors in the context of intergroup conflicts, but in the intergroup conflicts simulated by the IPD paradigm, the motives for donation and retention were very unclear. Donations may

be caused by altruistic motives that help the inner group, or it may also be driven by the desire to increase competition within the group advantage; Retention may be motivated by self-interest, or it may be a concern for group interests.

In order to distinguish these motivations, Halevy (2008) proposed a new game paradigm, the IPD-MD inter-group prisoners dilemma difference maximization game. The IPD-MD game designed two public funds, namely the inner group public funds and the intergroup public funds. Participants decided how much to keep for themselves and how much to donate to the inner group and intergroup funds of the 10 virtual coins obtained before the investment officially started. For each virtual coin reserved for themselves, the subject will receive 2 units of coins. For each donation of 1 virtual coin to the fund within the group, each member of the group (including donors) will receive 1 unit of coin, so the individual at the cost of losing 1 unit of coin, the inner group will get 3 units of coins without affecting the outside group. For each donation of 1 virtual coin to the intergroup fund, each member of the inner group (including donors) will get 1 unit at the same time, each member of the outer group will lose 1 unit of money, so the individual will gain 3 units of money for the inner group at the cost of losing 1 unit of money, and at the same time caused the outside group to lose 3 units of money, the difference in relative interests is maximized. The IPD-MD game paradigm can reflect the decision-making motives of individuals in intergroup relations. Reserved for oneself was for self-interested motives. Donating to the fund within the group can reflect the altruistic motivation of the individual not to harm the outside group. The donation to the intergroup fund reflected the competitive motivation to increase the comparative advantage of the inner group.

As a result, this research will expand the IPD-MD game paradigm and propose a win-win cooperation model. For every donation of 1 virtual coin to a win-win fund, not only each member of the group (including donors) will get 1 unit of coin, each member of the outside group can also get 1 unit of coins, so the individual will get 3 units of coins for the inner group at the cost of losing 1 unit of coins, while allowing the outside group to obtain 3 units of coins to achieve a cooperative win-win situation. The improvement of this paradigm added broad altruistic motives in the decision-making process. On the one hand, individuals can have more choices, instead of making the relationship tense and worse in the long-term relationship through a simple "tooth for tooth" strategy. On the other hand, It provided a basis for understanding the decision-making behavior of individuals in intergroup cooperation, and also provided technical reference and supported for researchers to better explore the influence of different types of intergroup situations on individual decision-making in the future.

Experiment

Experimental hypothesis

1. In the context of the intergroup conflict, Chinese enterprise employees showed negative perceptions to the outside groups, resulting in a behavioral pattern that competed with outside groups, and the efficiency of reaching consensus among inner groups was higher than neutral groups.
2. In the context of the intergroup cooperation, Chinese enterprise employees tended to choose an altruistic win-win model to maximize collective interests, and the efficiency of reaching consensus among groups was higher than neutral groups.
3. In the context of the intergroup relationship change, when the conflict turned to cooperation, Chinese enterprise employees will change their decision-making behaviors according to the cooperation intention of the outside group.

Experimental participant

The participants of the experiment were selected from 120 employees of Chinese ordinary enterprises. Among the 120 people who participated in the experiment, 60 were males and 60 were females, with an average age of 30.61 years old. And it was required that each of the six members participating in the experiment must be strangers to each other.

Experimental materials

This experiment used a virtual intergroup relationship situation, adopting an experimental design of repeated decision-making, and used a modified version of the intergroup prisoner difference maximization game plan to conduct the experiment. The experimental materials were as follows:

Only one virtual coin can be selected for each investment, and the investment rules are:

Plan A is to vote for yourself, you can get 2 units of virtual coins, this plan has no effect on the members of the group and outside the group;

Plan B is to vote in the group, so that everyone in the group can get 1 unit of virtual coins, this plan has no effect on the outside of the group;

Plan C is to vote in the group. Not only will everyone in the group get 1 unit of virtual coins, but everyone outside the group will lose 1 unit of virtual coins;

Plan D is to vote for outside the group. Not only can everyone outside the group get 1 unit of virtual coins, but everyone in the group can also get 1 unit of virtual coins.

Experimental Variable

Independent variable:

Intergroup situation: competitive conflict situation, neutral and irrelevant situation, cooperation and win-win situation, and competition change situation.

Dependent variable:

Individual decision-making results: Individual level was measured by personal interest, contribution within the group, contribution outside the group, and loss outside the group. The group level measured the efficiency of reaching consensus within the group in the order in which stable answers were formed within the group.Individual attitudes: This experiment will be based on the self-reports of participants to analyze the changes in the mental state of participants during the decision-making process, their attitudes towards inner groups and outside groups, as well as investment ideas and strategies. Analyzing the self-reports can explore the attitudes of participants towards members of the inner groups and outsider groups, the ideas and strategies in the decision-making process, and the motivation behind them.

Experiment preparation

Experimental research required two adjacent rooms with suitable physical conditions and no interference factors. There were three sets of tables and chairs in each room, so that the participants sat back to back at the three vertices of an equilateral triangle, so that the other two members cannot be seen from the corner of the eyes.

Two points needed to be paid attention to during the experiment: one was for participants, avoiding discussing and negotiating decision-making strategies in the real investment process, and the staffs in the laboratory had a supervisory role to prevent communication between members from affecting the results. The second was for the experimental process, in order to effectively simulating intergroup relations, creating the conflict situations, neutral situations, cooperation situations, and conflict change situations. In fact, the result of decision-making in the opposing group displayed in front of the participants was the mobile phone information sent by the third staff, not the actual selection of the opposing group.

Experiment procedure

One staff selected six participants, and they were randomly divided into two groups after confirming that they are not familiar with each other, and the other two staffs brought them into the laboratory, distributing the experimental materials (Appendix 1), and conducting two exercises to clarify game rules and calculations method. Then the participants entered the formal behavioral game experiment. After the experiment was over, the participants wrote a

self-report of investment strategy and attitude (Appendix 2) in written form, finally received the prize and left the laboratory, next let the next six-person group enter the laboratory.

The first step was to select participants to enter the experiment. Two staffs each led three participants into the laboratory to sit down, handing out the experimental materials, and explained the rules of the game to them, making the participants clarify the meaning of the instruction, and answered the questions of the participants.

The second step was pre-test. The two groups conducted two investment behavior exercises. The staff recorded the results of each investment in the group and reported the results of the decision-making of the members in the group, such as: "One of the three choose A, and one choose B, One chooses D", and then supposed that the first investment choice of the three members in the opposing group was one A and two B, and the second choice was one C and two D. The staffs asked the participants to calculate the profits and losses of the individual and the group separately. The purpose of Pre-test was to ensure that the participants fully understood the rules of the game and mastered the calculation method of profit and loss.

The third step was a formal experiment. Participants had 30 seconds to make a decision each time. Subsequently, the staff recorded the investment results of the three members and reported to them. After three to five seconds, the staffs reported to the members the selection results of the three members in the opposing group based on the mobile phone text messages. The members were asked to calculate the single profits and losses, and then gave 30 seconds for the next investment behavior. This process looped 25 times until all decisions were over.

The fourth step was to end the experiment. Participants needed to calculate the total personal profits and losses. After writing down the strategy and attitude explanations in the investment process (Appendix 2), they got the rewards from this experiment according to a certain percentage and left the laboratory.

Data Analysis

We used SPSS software to enter the data. The main content included: participant decision-making results everytime, the amount of personal profit gained after 25 decisions, the amount of group contribution, the amount of external contribution and the amount of loss to the outside group, and the order in which the group achieved a stable result.

There were four main aspects of data analysis:

The first step, we made statistics on the results of the first investment decision for the entire sample, and continued to analyze the data on the premise that there was no difference between groups.

The second step, we used the neutral group in the type of intergroup relationship as the control group, taking the conflict group and the cooperation group as the experimental group, analyzing the influence of the intergroup context of the conflict group and the cooperation group on individual choice;

The third step, when analyzing the data of the relationship change group, we mainly counted the decision-making changes of participants at the turning point of the relationship change, and using self-report to analyze the decision-making and attitude changes of participants after the change of outside group strategy.

The fourth step, regarding the analysis of the efficiency of the inner groups to reach agreement, the conflict groups and the cooperation groups were compared with the neutral group respectively, and the relatively complicated relationship change group situation was not considered for this time.

Experiment Result

Descriptive statistics of the first decision-making behavior

Table 1 Frequency distribution of the first decision behavior

	Investment plan selection			
Group type	A	B	C	D
1	8	17	3	2
2	8	16	2	3
3	11	15	2	2
4	9	18	1	2
Total	36	66	8	10
Frequency （%）	30.0	55.0	6.7	8.3

Two points can be seen from the above table: First, there was no significant difference in the frequency distribution of the first investment behavior of participants before the intergroup relationship situation was formed. The result of random grouping had no effect on the dependent variable, and the interference of this unrelated variable can be excluded. Second, judging from the frequency distribution of plan selection, a small number of participants chose to form a threat conflict or a win-win relationship with the outside group at the beginning, and more than half of the participants voted money to the group,in order to seek to maximize the interests of the inner groups, and 30.0% of participants first ensured the maximization of their own interests when they are uncertain about the choices of other members in the group, which also conformed to the economic man hypothesis.

Table 2 Gender frequency difference of the first investment behavior

	Investment plan selection			
Gender	A	B	C	D
Male	11	37	7	4
Female	25	29	1	6
Total	36	66	8	10

It was worth noting that the decision-making of participants had gender differences in the selection of the plan before forming an intergroup situation with the outside group. According to the chi-square test, it can be seen that : $\chi 2=73.867$, $p=6.338\times10^{-16}<0.01$. From the frequency distribution, it can be seen that the women were more inclined to retain than men, while the men were more willing to consider the inner groups and they were more aggressive and less cooperative than the women.

Analysis of repeated decision-making results in a single situation

When analyzing the influence of a single intergroup situation on the decision-making of participants, the data of the relationship change group did not count in the statistical scope. Therefore, the study used the individual profit, the contribution within the group, the contribution outside the group and the loss outside the group as dependent variables to analyze the three levels of conflict group, cooperation group and neutral group.

What needed to be explained here was that the original data collected through experiments were non-linear continuous data, and the frequency itself did not fully represent the motivations of the participants such as self-interest and altruism. Since the selfish, altruistic, and exclusive behaviors of all human beings in reality presented a normal distribution, the original data must be transformed to convert the frequency into a Z score to form a standard normal score.

Taking personal profit data as an example, we converted the cumulative percentage of the personal number frequency corresponding to the amount of investment reserved by the participant into a Z score, and then used the formula Y=10Z+50 to convert all the data into a non-negative standard normal score , in order to form a self-interest index. Since the sum of one-half profit of each participant and the contribution within the group was 25, the personal profit and the contribution within the group were inversely proportional, and the generosity index of the contribution within the group was set = 100-Self-interest index. Similarly, the contribution outside the group and the loss outside the group were also transformed into an altruistic index and an exclusive index using the formula Y=10Z+50.

Table 3 Descriptive statistics of self-interest index and generosity index

	Conflict group	Neutral group	Cooperation group
	M ± SD	M ± SD	M ± SD
Self-interest index	60.148 ± 8.072	55.694 ± 9.337	51.187 ± 6.205
Generosity index	39.852 ± 8.072	44.306 ± 9.337	48.813 ± 6.205

According to the one-way analysis of variance, it was concluded that there was a significant difference between the self-interest index and the generosity index between the three levels. $F_{self\text{-}interest}=9.468$, $p_{self\text{-}interest}=1.905\times10^{-4}<0.01$, $F_{generosity}=9.468$, $p_{generosity}=1.905\times10^{-4}<0.01$.On this basis, the post-hoc test of pairwise comparison was used to further explore the difference and significance between the neutral group and the conflict group and the cooperation group.

Table 4 Self-interest index and Generosity index LSD post-hoc test

Mean difference		Conflict	Neutral
Altruistic index	Neutral	4.4535*	
	Cooperation	8.9607*	4.5072*
Exclusivity index	Neutral	4.4535*	
	Cooperation	8.9607*	4.5072*

Remarks: * shows significance, and the significance level of the mean difference is 0.05.

Combining the above two tables, it can be seen that the self-interest index was significantly different in the comparison between the conflict group and the neutral group, between the neutral group and the cooperation group, and it had been verified in the post-test. It can be seen that compared with the situation where the outside group did not affect the interests of the members, the participants had stronger self-interest motivation when their interests were threatened in order to retain the personal profits and minimize the losses. Correspondingly, the generosity index was also significantly lower than the value when the intergroup was irrelevant to the situation. When the outside group used the altruistic strategies to seek for maximizing the collective interests, compared with the outside groups that had no influence on the group, the self-interest of individuals motivation were reduced significantly, and the degree of generosity increased accordingly. It was also in line with the assumption of rational decision-making. Individuals were always seeking to maximize their own interests. It was a more rational choice for the contribution of participants when the increase in group interests allowed participants to obtain more profitss than personal profitss,

Table 5 Descriptive statistics of altruistic index and exclusive index

	Conflict group	Neutral group	Cooperation group
	M ± SD	M ± SD	M ± SD
Altruistic index	44.943 ± 4.498	49.990 ± 5.103	60.826 ± 8.023
Exclusivity index	62.407 ± 6.269	48.967 ± 3.825	47.000 ± 2.737

According to the one-way analysis of variance, it was concluded that there was a significant difference in the altruistic index between the three levels. $F=53.567 p=6.864\times10^{-16}<0.01$, The exclusivity index was also significantly different between the three levels, $F=103.040$, $p=1.135\times10^{-23}<0.01$. On this basis, using the post-hoc test of pairwise comparison to further explore the differences and significance of the neutral group, the conflict group and the cooperation group for the two groups of indexes.

Table 6 Altruistic index and Axclusive index and LSD post-test

Mean difference		Conflict	Neutral
Altruistic index	Neutral	5.0470*	
	Cooperation	15.8827*	10.8356*
Exclusivity index	Neutral	13.4407*	
	Cooperation	15.4070*	19.6630*

Remarks: * shows significance, and the significance level of the mean difference is 0.05.

It can be seen from the above two tables that the altruistic index and the exclusive index are significantly different in the comparison between the neutral group and the conflict group and the cooperative group, and they are verified in the post-test. When the participants perceive the continuous threat from outside groups, they will have anti-threat attitudes and strategies. At this time, the exclusivity index is significantly higher than the value of the intergroup irrelevant situation, and the altruism index is lower than the value of the intergroup irrelevant situation. The self-report showed that the participants were often confused and puzzled at the beginning of malicious attacks from outside groups. Some people will use altruistic tactics at first to try to reverse the strategies of outside groups, but when they saw that the outside groups were indifferent, they will resist this threat without hesitation and continue to counterattack. Some people also stated that after adopting a strategy that does not affect outside groups, they find that the interests of the other groups are constantly increasing while their own interests are constantly being reduced, and even reduce the principal invested. They found that only by reducing the interests of outside groups at the same time the difference in relative interests can be reduced.

When the outside groups continue to contribute funds to the group of the subject, the exclusivity motivation of participants is reduced. The exclusivity index is significantly lower than the value in the intergroup irrelevant context, and the altruistic index is significantly higher than the value in the intergroup irrelevant context. This result is different from the results of previous studies. The data results of Zhao (2014) show that individuals always tend to reduce the absolute interests of outside groups, so that they can maximize their interests while increasing the difference in relative interests. However, the results of this experiment

show that in the context of intergroup cooperation, people are willing to achieve win-win cooperation under the premise of maximizing their own interests, reducing the difference in relative interests.

The Relationship Change Group

In the manually controlled relationship change group, the establishment of the first 14 conflict threat scenarios can be regarded as successful, and there was no significant difference between the four dependent variable indicators and the conflict group. The original data of decision-making and self-reports showed that 96.7% participants said that once they realized that the outside group continued to use attack strategies, the members will gradually reached an agreement to automatically implement an anti-threat attack plan and form an attack confrontation relationship with them.The next step was to analyze the behavior changes of the participants after the relationship changes.

First of all, according to the results of the 16th decision, when the outside group suddenly changed from a continuous threat state to seek for a friendly cooperation, 23 of the 30 members continued the original threat state, and the other seven people chose the B option, guaranteed the interests of the inner group and no longer derogate the outer group. This data showed that when more people learned that the attitude of the outside group had changed, the original negative perception will not be eliminated immediately, but will continued to threaten the other group. The self-reports of members also indicated that the decision-making results of outside groups made it difficult for them to accept for the time being. If they chose a win-win solution, and the outside groups were capricious, this was more traumatic than malicious attacks. Therefore, the participants tended not to change their original choices before clarifying the next strategy of outside group.

In the subsequent 10 decision-making processes, the strategy of the outside group was to choose all cooperation and win-win plan, attempting to ease the conflicts established in the past. At this time, the choices of the participants showed a more obvious differentiation: seven participants no longer used the threat strategy, but adopt a neutral strategy, MB=3.29, SD=1.254, when the outside groups continued to use the friendly win-win strategy, they wound ignore the previous suspicion and use the cooperative plan to maximize the profitss, MC=6.71, SD=1.254; 10 participants also used a threat plan when the relationship changed, MA=3.10, SD=1.912. After seeing the sincerity of the outside group, they stopped attacking each other and used a neutral plan, MB=6.90, SD= 1.912, maximize the interests of our group with the help from outside groups.

In addition, the decision-making results of the members from the inner group also affected the choice of participants. In the self-reports, some participants expressed dissatisfaction with other members of the inner group, because they chose the result that the members were unwilling to accept. For example, other members quickly accepted the sincerity of the outside group and chose a win-win solution, and this allowed the participants who did not trust the outside group to offset the contribution of the outside group by threatening the outside group. There were also some participants followed the trend in the group and made decisions based on the other members.

Analysis of the Influence of the Results of the Inner Group Decision on Individuals

Analyzing the influence of the inner group on the decision-making of the participants, the explicit behavior was mainly manifested in two aspects. One was the efficiency of the decision-making behavior of inner group to reach a consensus. The consistent here did not mean that the three participants in the group chose exactly the same answer in the decision-making process, but a stable choosing tendency after eliminating the infighting (there were both B and D options in a single decision). Inner group consistency used the next investment sequence in which the inner group began to reach agreement as the dependent variable index. The conflict group and the the cooperation group were compared with the neutral group using single-factor multivariate analysis (pairwise comparison).

According to the data, the conflict groups, M=12.80, SD=4.517, the neutral groups, M=18.50, SD=4.428, the cooperation group, M=10.40, SD=1.897, there is a significant difference between the conflict group and the neutral group, F=8.120, p=0.011< 0.05, there is a significant difference between the cooperation group and the neutral group, F=28.267, p=4.703×10-5<0.05. Through means comparison and the self-reports, it can be concluded that the participants were more willing to increase the cohesion of the inner group when faced with intergroup threat situations, showing the behavior of the same hatred and unanimous towards the outside world, even if some participants will show external affinity and altruism before they were clearly aware of the intergroup situation, but for the profits of the group, participants had to minimize the difference in relative profitss by harming the interests of outside groups. When facing the cooperation and win-win intentions of outside groups, the participants were also willing to return to each other in the same way, because all the participants knew that the win-win model can maximize the collective profitss. If the number of people stayed the same and the cake was bigger, then everyone will profit the most.

It was unexpected worth noting that the efficiency of reaching agreement among members of the neutral group. According to the analysis of choices and self-reports in the decision-making process, when the decision-making results of the outside group did not interfere with the inner group, the phenomenon of infighting and self-interest in the inner group was very obvious. Three groups have experienced continuous rigidity, such as when describing the strategy, 7 members said that even if the outside group can not achieve mutual profits and win-win, allowing them to earn more profitss may gain a sense of gratitude and profits in the continued interpersonal relationship in the future. However, there were 5 participants thought that the members of inner groups chose to invest in the outside group, but the outside group did not give any feedbacks, so the balance should be obtained by devaluing the interests of the outside group.

Another aspect of the influence of intergroups on the participants was that the participants intended to influence other members by changing their own strategies. This was reflected in the self-report. Among the three groups of 90 people, 37 people expressed that they had tried to change the decision-making plan of the members of the group. Since they could not communicate directly, they could only insist on their own choices many times, or offset the profits and the losses of the outside groups to get a balance; 13 people expressed their willingness to consciously follow the choices of other members and choose the same plan, and 2 people indicated that they had always made decisions according to their own ideas from the beginning to the end, never caring about the views of other members.

Discussions

Experimental variable control

This experiment mainly explores the influence of the type of intergroup relationship on the decision-making of chinese enterprise employees. First of all, the communication history between individuals must be excluded. Therefore, the six participants participating in the experiment each time must not know each other to eliminate the interference of personal emotions in decision-making. The origin of this setting is that the staff used the members who are familiar with each other to do a prediction test before the experiment officially started. It was found that the participants did not believe in the results of the selection of outgroups reported by the staff. The original data also showed that, When the in-group is acquainted with each other, the efficiency of reaching an internal agreement is very high, and these two points will affect the results of the research.

Secondly, the experimental paradigm mainly focuses on the control of the intergroup relationship of the independent variables, and this variable is mainly based on the artificial control method to virtualize the real intergroup situation. During the experiment, it was questioned by two participants in conflict situations, they said that they vaguely felt that the selection of the outside group reported by the staff was not true, because they continued to choose the cooperation and win-win solution after the outside group remained unmoved, which made them suspicious. In addition, the control of independent variables is good.

Since individual decision-making is a relatively complex process, excluding individual internal factors, environmental factors also have an impact on decision-making behavior. Therefore, this experiment chose two identical rooms as much as possible, and played "Happy" music before distributing the experimental materials to eliminate negative emotions. The two staffs were similar in image and received the same training. In addition, according to a previous study, the method of return has a significant impact on the decision-making motivation and behavior of individuals in the context of intergroup conflict. The specific performance is: under the condition of virtual return, individuals will start to devalue the motivation of outside groups to maximize the relative income of the group, and under the condition of cash return, the altruistic motive that makes the in-group profit dominates the individual's behavior to maximize the absolute income of the group. Therefore, in this experiment, in order to eliminate the motivation of individuals to devalue the external group in the virtual return, the method of cash return is used.

Data analysis method

After sorting out the original data, only the selection of the first game and 16th game plan in the relationship change situation was used. The main data analysis object is the frequency and conversion of the individual's choice of different plans throughout the game. As a result, the analysis of the individual's strategy choice in the course of 25 games is missing. However, it is not easy to make up for this deficiency through data analysis. On the one hand, because the choices of individuals continue to change with the in-group relations and intergroup relations, this change process is the key object of the research, and the pure cumulative frequency cannot effectively reflect the thinking route of the individual behavior game. On the other hand, different individuals have different ideas at different stages of the game, and the analysis results of a single individual decision in a certain situation cannot be well explained. In the process of data analysis, I tried to analyze the data of a single decision in a single situation. It was found that before the in-group reached a stable decision-making tendency, the sample group's choice of the four options was in a discrete state. There is no significant

correlation and association in the selection of the second decision compared with the previous two. Therefore, the differences within the group of the decision-making process lead to the result that the original data cannot be statistically analyzed. Therefore, this experiment introduces the self-reports method.

Self-reported presentation

This study adopts the self-reports method, which aims to reflect the cognitive changes of the external group and the internal group during the intergroup interaction, as well as the strategies adopted in decision-making, which can be used as the most direct explanation of the results of data analysis. For the same choice, different people have different considerations. For example, individuals in conflict situations will choose counter-threat solutions in the later stages. Some people are forced to choose because of the threat of outside groups, and some people feel pressure from inside group members. In the context of intergroup neutrality, some people use altruistic strategies and find that the outside group is indifferent, and they will use derogatory methods to offset the profitss they have given to the outside group. These behavior reports can reflect changes in individual thinking and attitudes, which is an irreparable part of data analysis. In addition, there are still many reports that have not been presented, and this part of the content is also very helpful for researchers to analyze individual decision-making behaviors.

Comparison of Previous Studies

This research was an improvement of the research paradigm proposed on the basis of the research of the predecessors, and had a more real basis for understanding the intergroup cooperation and the transformation of intergroup relations. It proved that the added collective altruistic plan was used more frequently. It was not only used in situations of cooperation and win-win, but also as a kind of lubricant to ease intergroup relations in the conflict situations. The individual hopes to reduce the threat to the ingroup by increasing the profitss for the out-group, or to promote interpersonal harmony and gain friends through such a friendly indirect contact.

In addition, some of the conclusions of this study are different from those of previous studies. On the one hand, the reason is that this study was done by Western countries twenty years ago, and people nowadays have a new understanding and concept of win-win cooperation. The behavior under the guidance has also changed accordingly; on the other hand, because the predecessor’s research objects were Westerners, the participants used in this experiment were all Chinese, which can also be explained as the Chinese people’s cultural influence of

"Restrain Yourself and Follow Social Norms" since childhood. Because of this, tend to live in peace with others instead of malicious competition.

Reflection and Prospect

Regarding the improvement of the IPD-MD research paradigm, this study used 120 chinese enterprise employees as a sample to verify the effectiveness of the adaptation. However, whether it can truly express intergroup cooperation and whether it can be promoted and quoted in the future still needed to be tested by posterity.

This experiment adopted the self-report method to collect the cogitation and cognition of each participant, Because of the huge workload, most of them failed to show due to time and space factors. More content in the report can be presented in the future as a reference for future generations to research the influence of intergroup relations on the decision-making of Chinese enterprise employees, especially the influence of chinese enterprise employees on behavioral strategies of the in-group.

In addition, some phenomena had not been reflected in the data analysis, and the reasons had not been expressed in the self-reports, but they were worthy of attention. For example, 14 participants reserved virtual coins for themselves in the last decision. At this time, other members of the group had formed a stable behavior tendency to donate to the group. In this way, these participants can maximize individual profitss. It remains to be verified accurated that the nature of their behavior can be explained as selfish behavior guided by self-interested motivation.

Conclusion

Different types of intergroup relationship have an important influence on the decision-making behavior of chinese enterprise employees. Chinese enterprise employees in the intergroup conflict situation tend to be more aggressive and less friendly, meanwhile ingroup could reach consensus through higher efficiency. chinese enterprise employees in the intergroup cooperation situation could alleviate egocentric motivation and reach a win-win cooperation with outgroup in a faster rate. When the intergroup situation is changed from conflict to cooperation, the reactions of different chinese enterprise employees are various.

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Appendix

Appendix 1

Hello! Welcome to participate in this profitable game. Each member of your group has an investment principal of 30 virtual coins, and the opposite group you just saw is the same. Only 1 virtual coin can be used for each investment. When the game is over after 25 investments, we will remunerate you in proportion to the amount of profitss you ultimately get. We hope that you will participate seriously.

The investment plan is as follows:
Plan A is to vote for yourself, you can get 2 units of virtual coins, this plan has no effect on the members of the group and outside the group;
Plan B is to vote in the group, so that everyone in the group can get 1 unit of virtual coins, this plan has no effect on the outside of the group;
Plan C is to vote in the group. Not only will everyone in the group get 1 unit of virtual coins, but also everyone outside the group will lose 1 unit of virtual coins;
Plan D is to vote for outside the group. Not only will everyone outside the group get 1 unit of virtual coins, but also everyone in the group will get 1 unit of virtual coins.

Two points to be noted:
First, the members of the group cannot discuss with each other after the game really starts, and the staff will tell you the results of the choices made for each investment.
Second, due to the internal and external investment situation may affect your choice, and accordingly, your decision may also affect the choice of members within and outside the group.
If there are members who are not clear or understand related matters, please consult the staff in time.
In order to verify that you understand the rules and the profit and loss calculation methods of this investment game, we will simulate two investment activities before the game officially starts.
Please tick √ in the boxes A, B, C, D according to your choice, and then fill in the profit and loss amount in the following three columns according to the staff reports, and then calculate the total profit and loss for a single time.
Single profit and loss = personal profit + profit in the group + profit and loss outside the group, the total profit and loss of the next time does not need to accumulate the previous profit and loss.

	A	B	C	D	personal profit	profit in the group	profit and loss outside the group	total profit and loss
1								
2								

Next, the experiment officially begins.

	A	B	C	D	personal profit	profit in the group	profit and loss outside the group	total profit and loss
1								
2								
3								

4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
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15								
16								
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21								
22								
23								
24								
25								

The investment game is temporarily over.

Next, please calculate the total single profit and loss of these 25 investments, plus the remaining 5 virtual coins out of the 30 virtual coins given to you at the beginning of the game.

In the end, the number of virtual coins you get are:

Appendix 2

Before receiving the bonus payment, please elaborate on your strategy during the game participation process, and including the following questions in the interpretation process:
1. When the game officially started, why did you choose this option for the first investment?
2. What is your strategy in the subsequent investment process?
3. How do you feel about the choices of the opposing group members? How does this feeling affect your next choice?
4. What is your opinion on the selection of members in the group? Have you ever compromised or tried to change their choices?
Thank you again for your participation! You can receive rewards and small gifts from the staff when you go out.