



The effect of realistic threat in intergroup competition on Chinese college students' aggression: the moderating role of social comparison orientation

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Abstract. Realistic threat in an intergroup competitive situation could lead to intergroup conflict and aggression, which is negative to intergroup relationship. Meanwhile, social comparison orientation in competition could also lead to intergroup aggression. This study explored the relationship of intergroup realistic threat, social comparison orientation and aggression using questionnaire method. Results showed that intergroup realistic threat could significantly predicted aggressiveness, with the social comparison orientation playing a moderating role. The study concluded that intergroup realistic threat could be a factor eliciting aggression, varying from different level of social comparison orientation. This study also inspired us that we should mitigate aggression in intergroup competition through reducing the impulse to social comparison.

Keywords: intergroup realistic threat; aggression; social comparison orientation; intergroup competition.

1 Introduction

Intergroup conflict has been a key topic of discussion in intergroup relations. In recent years, intergroup conflict has become more frequent due to the global economic downturn, increasingly competitive employment situations, and conflicts arising from irreconcilable differences^[44,46]. Especially with the rapid development of the Internet and technology, the forms and carriers of intergroup conflict have gradually become diversified^[4,38], resulting in the occurrence of intergroup conflict is no longer limited by time and distance, thus greatly increasing the probability of intergroup conflict. Given the many negative consequences of intergroup conflict^[16,21,55], it is essential to explore the causes of intergroup conflict so that effective solutions can be found afterwards.

Intergroup threat is an important cause of intergroup conflict and affects the harmonious development of intergroup relations^[45,54]. Intergroup realistic threat is one kind of intergroup threats, which refers to the threat to the real interests of the in-group when members of the in-group compete with the out-group, and the out-group outperforms the in-group due to its more advantageous position in various aspects such as resources^[58]. This sense of realistic threat is the result of individuals comparing the

in-group to the out-group in the intergroup competition. Because the strength of the willingness to make social comparisons (social comparison orientation) varies from individual to individual^[23], people react differently when faced with intergroup realistic threats. The general aggression model proposes that aggression is affected by the interaction of personal and situational factors^[6]. Many current studies have explored a variety of factors that may contribute to aggression^[32,33], but further inquiry is needed into the effects of the interaction of personal and situational factors on aggression. Plus, it remains to be verified whether intergroup aggression is also consistent with the general aggression model. The present study attempts to investigate whether the interaction of the realistic threat (situational factor) and the social comparison orientation (individual factor) has an effect on aggression under an intergroup competition condition.

2 Literature Review

2.1 Intergroup Threat Theory

The intergroup threat theory proposes that intergroup conflicts can be attributed to a sense of threat^[52], and this includes both real and imagined threats, which can fuel negative reactions and contribute to the breakdown of intergroup relationships^[58]. One common form of intergroup conflicts is intergroup aggression. In the field of psychology intergroup conflict is often studied using the aggression paradigm. Intergroup threat can result in various aggressive behaviors, such as antagonism, hostility, conflict, and violence^[52]. Intergroup reality threat, as one type of intergroup threats, can also trigger intergroup conflict. Realistic threat belongs to one types of intergroup threat, which could be caused by intergroup conflicts and competition^[7]. Researchers found that competition between groups is more competitive and aggressive than between individuals^[29,42]. Many studies have shown that intergroup realistic threat could result in hostile behavior towards out-groups^[30], causing intense motivations and conduct of intergroup aggression and conflicts^[34,36]. This suggests that realistic threat could lead to aggression to out-groups. Previous research on intergroup threat theory has focused more on intergroup threats arising between macro groups, such as between different countries, between different races^[24,39,53]. Whether intergroup conflicts between small groups, such as different students' groups in real life can also be explained by intergroup threat theory remains to be further verified.

2.2 The General Aggression Model

The general aggression model proposed by Anderson and Bushman (2002) provides a more systematic and comprehensive account of the mechanisms of aggression, and the theoretical model consists of three parts: (1) Input variables, including personality and situational factors. Personality factors include an individual's personality traits, beliefs, values, etc.; situational factors include provocation, frustration, and aggression cues, etc.; (2) intermediate variables, which include an individual's cognitive, affective, and arousal interactions, through which the input variables function; and (3) output varia-

bles, which are the thoughtful or impulsive actions taken after an individual has evaluated and made a decision. The results of these actions are fed back into the social context to be recycled as input variables^[5]. Many research on general aggression models to explain individual aggression in daily life has been studied^[31,59], however, whether this model can be used to explain intergroup aggression needs to be explored further. Meanwhile, although many current studies have explored various factors that could influence aggression^[20,40,50], whether the interaction between personal and situational factors has an impact on aggression needs to be further investigated.

2.3 Social Comparison Orientation

The concept of social comparison orientation was introduced by Gibbons and Buunk (1999), which refers to an individual's personality trait predisposition to make comparisons with others^[23]. They proposed that individuals with high social comparison orientation will compare themselves more frequently with others. People with different social comparison orientation may have different willingness to compare and compete with others^[56]. Realistic threat in intergroup competition is the sense of threat resulting from the realization that the outgroup will cause a loss to the real interests of the in-group when competing for resources, after individuals have compared themselves with the more dominant outgroup^[58]. It can be seen that the sense of intergroup realistic threat arises after comparisons with the outgroup, accompanied by the psychological process of social comparison. Because individuals with different social comparison orientation differ in the intensity of their willingness to make comparisons, they could feel different levels of realistic threat, which could make them express different level of aggressiveness. Therefore, the situational factor of intergroup realistic threat and the personal factor of social comparison orientation may interact under the intergroup competition condition to influence people's aggression.

Therefore, three questions as follows are proposed:

1. Could intergroup realistic threat lead to intergroup aggression?
2. Could social comparison orientation lead to intergroup aggression?
3. Could social comparison orientation make a moderating role between intergroup realistic threat and aggression?

According to previous studies, there are three hypotheses:

1. Intergroup realistic threat can lead to intergroup aggression.
2. Social comparison orientation can lead to intergroup aggression.
3. Social comparison orientation make a moderating role between intergroup realistic and aggression.

3 Method

3.1 Participants

In this study, 138 students (55.8% males) was recruited from Northeast Normal University as participants. Their average age of the sample was 21.880 ($SD=2.386$) years. Subjects were selected from freshmen to senior students from a university in Jilin

Province, China. The numbers of freshmen, sophomores, juniors, and seniors were 27, 63, 36, and 12, respectively. There were 50% of arts and 50% of science students. A sensitivity analysis using G*Power 3.1, in which the power level was 0.80 and the alpha level was 0.05, indicates that this study had power to detect a small-to-medium effect of $d=0.484$ based on the current sample size.

3.2 Procedures and Tools

3.2.1. Preliminary Experiment

Firstly, two different text materials was designed to initiate the sense of realistic threat. The text in realistic group was about advantages of students in another better university in local in the employment competition, while in control group it was about local beautiful landscapes. Involving 20 psychology postgraduate students, a pre-experiment was conducted and revealed a significant difference in the perceived realistic threat between the experimental and control groups, $t(38)=11.917, p<0.001, d=3.770$. This implies that the original materials had a significant effect. To better test the validity of the experimental material, it was also tested whether there was a significant difference between the experimental and control groups in terms of worry, anger, fear, and anxiety. According to Table 1, it can be seen that there is a significant difference between the experimental and control group subjects on these emotions. The results of the test are shown in the table 1 below:

Table 1. Differences in realistic threat perception and emotions triggered by materials in the realistic threat and control groups

variables	realistic threat group		control group		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
realistic threat perception	4.40	1.046	1.25	0.550	11.917***
concern	3.35	0.745	1.10	0.308	12.481***
anger	1.70	0.657	1.00	0.000	4.765***
fear	2.35	0.933	1.10	0.308	5.688***
anxiety	2.95	1.050	1.05	0.224	7.914***

Note: * indicates $p<0.05$, ** indicates $p<0.01$, *** indicates $p<0.001$, same below.

3.2.2. Formal Experiment

3.2.2.1. Procedure

The formal experimental procedure is shown in Table 2 below:

Table 2. Procedure for Formal Experiment

Steps	Contents
Step 1: Survey for demographic information	Subjects were randomly assigned to either the realistic threat group or the control group and were asked to finish corresponding questionnaires. The questions included their gender, age and major.
Step 2: Survey for additional variables	Subjects' levels of group identification and trait anger were tested, controlling for additional variables.
Step 3: Manipulation of realistic threat and validity check	The realistic threat group was given a questionnaire with material on the initiation of the perception of realistic threat, while the control group was given a questionnaire with material about scenery of Changbai Mountain. Then a seven-point scale was used to check whether the sense of realistic threat in experimental group was initiated successfully.
Step 4: Measuring social comparison orientation (SCO)	Social comparison orientation questionnaire was used to measure subjects' social comparison orientation.
Step 5: Measurement for aggression	Buss-Perry aggression questionnaire was used to measure subjects' aggression.

3.2.2.2. Research tools

Social Comparative Tendency Scale. The Chinese version of the Social Comparative Orientation Scale revised by Wang et al. (2006) was used^[57]. The scale has 11 questions and is divided into two dimensions: ability and perception. Validation factor analysis validated the two-dimensional scale structure ($\lambda^2/df = 3.91$, $CFI=0.96$, $GFI=0.95$, $AGFI=0.96$, $RMSEA=0.05$). The internal consistency reliability coefficient of the scale was 0.88. The retest reliability was 0.89.

Buss-Perry Aggression Questionnaire. Revised by Buss and Perry (1992), this questionnaire has 29 items categorized into four dimensions: physical aggression, anger, hostility, and verbal aggression^[12]. The retest reliability of this scale was: physical aggression, 0.80, verbal aggression, 0.76, anger, 0.72, hostility, 0.72, and total score, 0.80.

4 Results

4.1 Preliminary Analyses

4.2.1. Controlled Variables

Previous studies showed that group identity could affect people's sense of threat when they are confronting with out-group^[17]. People's trait anger has an inevitable effect on their aggression^[10]. These two variables need to be balanced in the realistic threat and control group to ensure they are controlled well. Independent samples *t* test

was used to test the differences, and found that the group identity between two groups do not have significant difference, $t(136)=-0.936, p=0.351$. The trait anger between subjects of two groups also do not have significant difference, $t(136)=-1.540, p=0.126$.

4.2.2. Realistic Threat Manipulation Check

Independent samples *t* test was used to check whether the sense of realistic threat was manipulated successfully. The result shows the sense of realistic threat was significantly different between the experimental and control group, $t(136)=-4.177, p<0.001, d=0.716$. The sense of realistic threat in experimental group ($M=0.279, SD=0.861$) is significantly higher than the control group ($M=-0.405, SD=1.062$), which means that the manipulation was successful.

4.2 Main Analyses

Process v3.3 model developed by Hayes was used to analyze moderating effects. Bootstrap method with 5000 random samples was used to calculate the moderating effect values, and the significance of the moderating effect was determined by whether the 95% confidence interval contained zero. First, the moderating roles of gender and age were examined. Results found that the moderating effects of gender was not significant, for the upper and lower limits of confidence intervals for its interaction with realistic threat was -5.531 and 18.815, which included 0. The same results happened in age, whose upper and lower limits of confidence intervals for interaction with realistic threat was -1.873 and 3.668, which included 0 as well.

The results of the analysis of the moderating effect of social comparison orientation is presented in the table 3 below:

Table 3. The moderating effect of SCO

Variables	Aggression			
	<i>Coeff</i>	<i>SE</i>	<i>t</i>	95% <i>CI</i>
Realistic Threat	10.149	2.531	4.011***	[5.144, 15.155]
SCO	1.621	0.202	8.046***	[1.223, 2.020]
Realistic Threat ×SCO	0.967	0.398	2.432*	[0.181, 1.753]

Note. SCO=Social comparison orientation

According to Table 3, the results showed that realistic threat was a significant predictor of aggression; social comparison orientation was a significant predictor of aggression; the interaction between realistic threat and social comparison orientation was also a significant predictor of aggression. Bootstrap 95% confidence intervals did not contain a zero, suggesting a significant moderating effect.

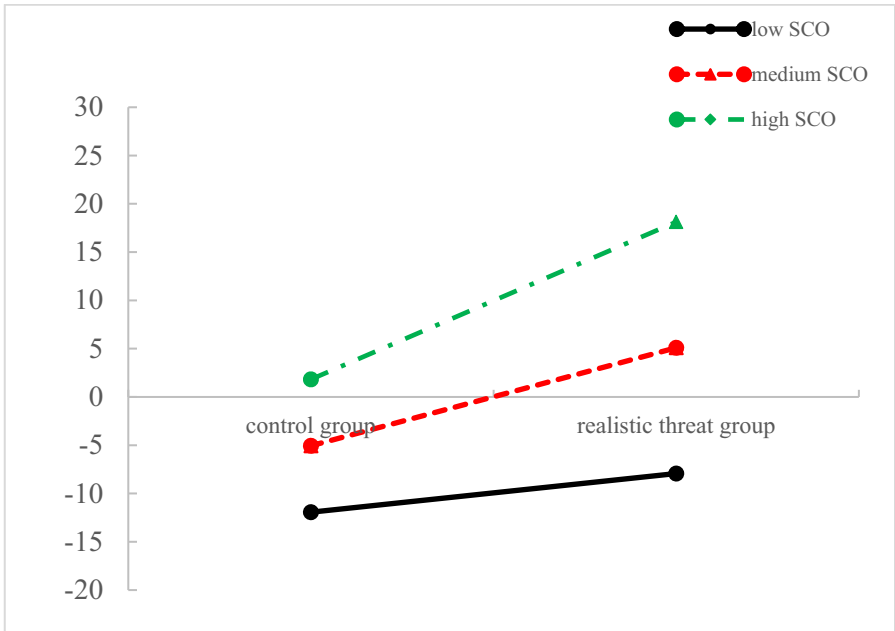


Fig. 1. The simple slope analysis of the moderating effect

To more clearly reflect the moderating role of social comparison orientation, the researcher plotted simple slope plots to see how realistic threat predicted aggression in high (Mean+SD), medium(Mean), low(Mean-SD) social comparison orientation groups(Figure1). As can be seen from Figure 1, realistic threat was not a significant positive predictor of aggression when subjects’ social comparison orientation was low; this predictive effect was significant when their social comparison orientation was at a medium level ($p<0.001$); when their social comparison propensity was high, this predictive effect remained significant ($p<0.001$), with the predictive validity gradually increasing($p<0.001$).

To more clearly reflect the moderating role of social comparison tendencies, J-N plots of intergroup realistic threat predicting aggression for high, medium, and low social comparison groups were developed. As shown in the Figure 2 below, the level of prediction of intergroup realistic threat on aggression significantly increased as the level of social comparison orientation increased when it was between -2.010 and 11.995. This shows the positive moderating effect of social comparison orientation between intergroup realistic threat and aggression.

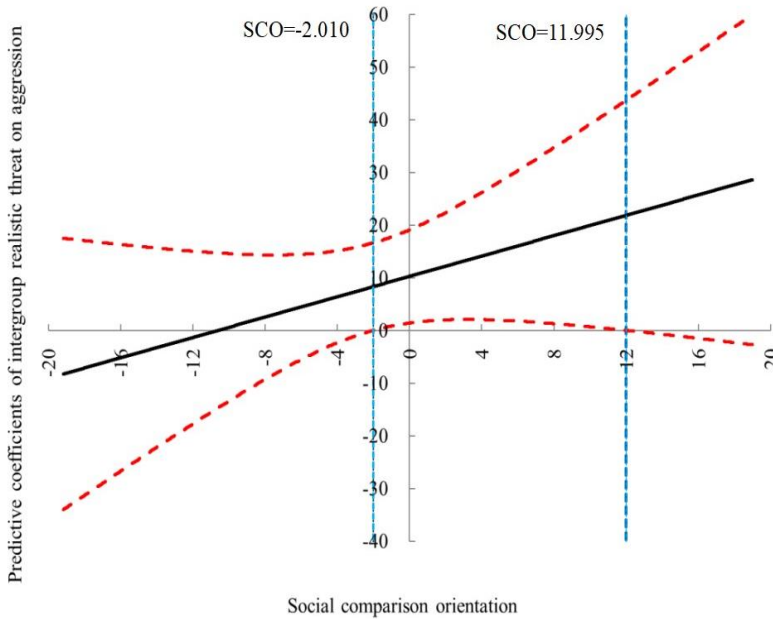


Fig. 2. J-N plot of the moderating effect of social comparison orientation

Using the scores on the dimensions of the Buss-Perry Aggressiveness Questionnaire as the dependent variables and Intergroup Realistic Threat as the independent variable, moderating effect analyses found that social comparison orientation moderated the relationship between intergroup realistic threat and the physical aggression dimension, the anger dimension, and the hostility dimension. The moderating effect was not significant between intergroup reality threat and the verbal aggression dimension. The results are shown in the Table 4 below:

Table 4. Analyses of the moderating effects of the subscales of Buss-Perry aggression

Sub-dimensions	<i>Coeff</i>	<i>SE</i>	<i>t</i>	95% <i>IC</i>
Physical aggression	0.239	0.106	2.257 *	[0.030, 0.448]
Anger	0.289	0.097	2.987**	[0.098, 0.481]
Hostility	0.158	0.070	2.258*	[0.020, 0.296]
Verbal aggression	0.080	0.087	0.921	[-0.092, 0.253]

According to Table 4, the results showed that when physical aggression, anger and hostility were used as dependent variables, the confidence intervals for the interaction terms did not contain 0, so the moderating effect was significant. Whereas when verbal aggression was used as a dependent variable, the confidence intervals for the interaction terms contained 0, so the moderating effect was not significant.

5 Discussion

The results of this study found that under an intergroup competition condition, realistic threat significantly predicted aggression, social comparison orientation significantly predicted aggression, and the interaction of realistic threat and social comparison orientation also significantly predicted aggression. The results of moderating effects analyses indicated a significant moderating effect of social comparison orientation between realistic threat and aggression. Across the sub-dimensions of the aggression, the moderating effect of social comparison orientation was significant between realistic threat and the dimensions of physical aggression, anger and hostility, but was not significant between realistic threat and the dimension of verbal aggression.

5.1 The Main Effect of Realistic Threat on Aggression

First, realistic threats significantly predicted aggressiveness, which is consistent with previous research^[9,34,35,36,52]. In this study, the aggression of the subjects in the realistic threat group was significantly higher than that of the subjects in the control group, thus demonstrating the effect of realistic threat on aggression. At a time when the employment situation is becoming more and more severe, the sense of realistic threat brought by employment competition is inevitable^[49]. Since the quality of work is closely related to the quality of life and the sense of well-being^[47,51], it is common to have some negative emotions and negative reactions when faced with a more advantaged out-group under competitive conditions^[14]. If results of this study are reflected in real life, it will trigger conflicts and contradictions between people of different groups. This will inevitably be a potential factor affecting the stability of the society, which needs us to pay attention to. This study differs from previous studies in that it combines realistic threat with the very real and pressing employment issues at present by examining a group of students, expanding the scope of application of intergroup threat theory.

5.2 The main effect of social comparison orientation on aggression

Second, social comparison orientation significantly predicted aggression. Gibbons and Buunk (1999) explicitly stated that there may be important individual differences in the extent and frequency of comparisons that people make when comparing themselves to others. Subsequently, they introduced the concept of social comparison orientation to such individual differences, which refers to a personality orientation of individuals to compare themselves with others in many aspects of their accomplishments and experiences. This concept is used to describe the individuals by manifesting the sensitivity to other people's relevant information^[23]. Depending on the degree of the orientation, social comparison orientation can be categorized into high social comparison orientation and low social comparison orientation. High social comparison orientation refers to individuals who use social comparisons more frequently than others in evaluating themselves, tend to seek out more comparisons, spend more time engaging in comparisons, and experience more emotional reactions in making comparisons with others.

While low social comparison orientation, on the contrary, refers to individuals who use social comparisons less frequently than others and do not tend to use social comparisons in evaluating themselves.

Results of this study is consistent with previous research. Previous research has found that college students with high comparative orientation also experience more stress in their job search^[8]. When individuals are under stress, they could experience a variety of demotivating emotions such as anger and anxiety, which in turn manifests non-adaptive behaviors such as aggression and violence^[1]. Some studies have directly shown that high social comparison orientation lead to cyberattacks^[22], as well as increasing bullying behaviors in student populations. In this study, a condition of intergroup competition was set up, along with an outgroup that was more advantaged in the competition^[18]. Since intergroup competition is more competitive and aggressive than individual competition^[29], and since the willingness to make comparisons is already stronger in individuals with a high orientation for social comparison^[23], intergroup competition could exacerbate their willingness. When the dominant outgroup wins the competition, individuals high in social comparison orientation experience more frustration as well as other negative feelings, which are factors that may contribute to their higher aggressiveness^[19].

5.3 The Moderating Effect of Social Comparison Orientation Between Realistic Threat and Aggression

Then, social comparison orientation has a moderating effect between realistic threat and aggression. The results of the moderating effect analysis showed that the confidence interval for the interaction between realistic threat and social comparison orientation did not contain 0, so the moderating effect of social comparison orientation between realistic threat and aggression was significant. Individuals' need to make social comparisons varies from person to person^[23]. Even the same comparative information may be different for different individuals, which researchers refer to as social comparison orientation^[28]. Schneider and Schupp (2014) ventured the hypothesis that social comparative orientation can be thought of as a personality trait^[48]. Various researchers have pointed to differences in the orientation of individuals to compare themselves to others. Buunk and Gibbons (2006) found that individuals with high social comparison orientation are more susceptible to comparative information because they tend to relate those things that happen to others to themselves when they make comparisons. When they are in similar situations to others, individuals with high social comparison orientation take a strong interest in the relevant information that others have. They have a stronger sense of uncertainty about themselves that they tend to evaluate themselves with more information about others, thus generating a stronger reliance on other people's situations^[13].

The results of this study suggested that intergroup realistic threat significantly predicts higher levels of aggression for individuals with high comparison orientation, which may be due to the fact that they are more susceptible to comparative information^[13], experience stronger sense of frustration and relative deprivation, which could elicit higher level of aggression^[2,25,26,27]. Then they could develop negative

emotions that trigger higher levels of aggressiveness when they perceive realistic threat from outgroups.

5.4 The Moderating Effect of Social Comparison Orientation Between Realistic Threat and Sub-Dimensions Of Aggression

Finally, the results of the study also showed that on all four dimensions of the aggression scale, individuals with high social comparison orientation were more aggressive than individuals with low social comparison orientation in both the experimental and control groups, illustrating the positive correlation that exists between an individual's social comparison orientation and aggression. In addition, on all dimensions of the aggression scale, social comparison orientation could play a significant moderating role between realistic threat and physical aggression, realistic threat and anger, and realistic threat and hostility, but not between realistic threat and verbal aggression. Physical aggression, anger, and hostility, as different dimensions of the aggression scale, reflect different aspects of aggression. Whereas the results regarding the verbal aggression dimension showed that intergroup realistic threat situations significantly predicted aggression in both high and low social comparison orientation subjects. There was no significant difference between the two types of subjects, which may be due to the fact that verbal aggression is more easily to practice in today's cyber-environment as compared to other types of aggression and is also more susceptible to the influence of other factors, such as the public opinion environment. In the all-media era, cluster verbal aggression, inflammatory rumor spreading and pathological leakage of information are all commonplace acts of online violence^[37,42,43]. Existing research has also shown that social comparison orientation can significantly predict cyberattacks^[22], and that the most prevalent form of cyberattacks is malicious comments in the form of verbal aggression^[11,41]. Due to the anonymity of the online environment, this may result in individuals with both high and low social comparison orientations exhibiting disinhibition and de-individuation in the broader context of the network^[3,15], and thus may exhibit high level of aggression under conditions of intergroup competition.

6 Conclusion

In this study, a moderating model of "intergroup realistic threat predicts aggression" was constructed. It was found that: (1) intergroup realistic threat significantly and positively predicted aggression; (2) social comparison orientation also significantly and positively predicted aggression; (3) social comparison orientation played a moderating role in the relationship between intergroup realistic threat and aggression, and the effect of intergroup realistic threat on aggression gradually and significantly increased with the increase of social comparison orientation in the range of -2.010 to 11.995.

The present study investigated that realistic threat and social comparison orientation interact with each other to influence aggression in intergroup competition, which further verifying the interaction between intergroup realistic threat and social comparison orientation through moderating effect analysis. In addition, this study extends

the applicability of intergroup threat theory. However, this study was conducted only through questionnaires. To further explore the relationship between intergroup realistic threat, social comparison orientation and aggression, an experimental study could be conducted in the laboratory, which would be more effective in exploring the causal relationship among the three. Due to the complexity of the factors affecting aggression, future research can continue to explore the interaction between situational and personal factors, which will provide more references for the study of intergroup threat and aggression.

7 Attachment

7.1 Material for Realistic Threat Group

Please imagine that you are recently preparing to apply for a job in a well-known company in the location of our university. Read the following materials and complete the questions based on your real feelings:

A major university in Jilin Province has better network resources and employment channels than the university. In its employment - entrepreneurship official website can be seen from the major state-owned enterprises, the world's top 500 companies, colleges and universities, as well as foreign institutions of recruitment information. According to the official statistics of the school, the average monthly salary of fresh graduates is 8,384.72 yuan, which is much higher than that of the school.

According to a survey conducted by Jilin Daily, among the 2022 graduates, 2,240 of them were employed by the world's top 500 companies, including FAW Group, China Construction, Volkswagen, Huawei, SAIC, etc. Large enterprises have gradually become the most popular choice for graduates of the university. Large-scale enterprises have gradually become a strong "absorber" of graduates from the university.

In addition, the number of graduates from this university going to the northern coastal area, the eastern coastal area and the southern coastal area is also higher than that of this university.

7.2 Material for Control Group

Please read the following materials and complete the questions according to your true feelings:

Changbai Mountain, located in the southeast of Jilin Province, is one of China's top ten mountains, and the five mountains, in 2007 became the first batch of 5A level scenic area, because of its main peak of Baiyun Peak white pumice and snow and named, known as "a thousand years of snow and ten thousand years of pines," the reputation.

Changbai Mountain is rich in resources and species, is the most representative of the northern half of the Eurasian continent typical natural complex, is the world's rare "species gene pool" and "natural museum". According to statistics, there are more than 1,800 kinds of higher plants, more than 50 kinds of animals, more than 280 kinds of birds, 50 kinds of fish and more than 1,000 kinds of insects living here.

Famous attractions in Changbai Mountain include Tianchi, Julong Spring, and Green Abyss Pool, etc., which are so beautiful and scenic that tourists come here every year in an endless stream.

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