Evaluative Implicit Aggression in College Students: Effects of Classroom Interpersonal Relationships

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Abstract

This study is a preliminary investigation of the effects of close classroom interpersonal relationships on the evaluation of implicit aggression by using college students as participants, as well as employing sociometry and implicit association tests. The experimental results show that the closeness of college students' interpersonal relationships does not have a significant influence on their evaluative implicit aggression, which means the existence of evaluative implicit aggression is not influenced by an individual's closeness in interpersonal relationship and that individuals with close interpersonal relationships still have evaluative implicit aggression.

Key words: Implicit aggression; Implicit Association Test (IAT); Interpersonal relationships; Sociometry

INTRODUCTION

Implicit aggression is the behavioral disposition or mental trait of an individual, under the lack of conscious monitoring or unclear state of consciousness, with the potential intention to harm an organism that is escaping from the intended harm. During the mid-1990s, motivated and inspired by the study of implicit memory, Greenwald and Banaji et al. (1995) proposed the concept of implicit social cognition, as well as its research system and paradigm, based on conscious and sub-conscious social information processing. This concept clearly states that social behavior of an individual consists of implicit and automated aspects. Based on this study, Chen, Yang, and Liu (1996) adopted the task dissociation paradigm for implicit social cognition with pictures as test materials to investigate aggressive behaviors among teenagers and found that the aggressive behaviors are significantly characterized in experimental dissociation. The result indicates that aggressive behavior is implicit and also that the research methods for implicit memory can be applied to other related studies of implicit social cognition. As a result, research on implicit aggression increased gradually. Based on previous studies, implicit aggression can be divided into evaluative implicit aggression and self-implicit aggression (Zhou, 2007). Evaluative implicit aggression is expressed as implicit attitude toward aggressive stimulus. The more positive attitude an individual has towards aggressive stimulus, the higher the evaluative implicit aggression they have. Self-implicit aggression is expressed as the strength of the connection between the self and aggressive concepts. The stronger the connection, the higher the aggression achieved unconsciously by the individuals, and the higher their self-implicit aggression is (Zhou, 2007). This study focused only on exploring evaluative implicit aggression.

The Implicit Association Test (IAT), first introduced by Greenwald et al in 1998, is a computer-based classification and dissociation task. IAT is a new method based on response time paradigm and improved from traditional response time method. Indirect measurement of an individual's implicit attitude and social cognitions can be conducted by measuring the correlation of the target words and the attributes. Researchers like Greenwald et

al. (1998) believe that IAT can avoid participants' self-presentation in their self reports and is also not influenced by left/right buttons, the number of items and adjacent inter-trial time. In addition, IAT can be flexibly used for various target words and attributes to design specific measurements for different aspects of implicit cognition. Greenwald, Nose and Banaji (2003) further pointed out that IAT has the characteristics of good psychological measurements (Dai, Yang, & Wu, 2005), such as good convergence, discrimination, repeatability and consistency of items. Although Sriram and Greenwald (2009) have already proposed the Brief Implicit Association Test (BIAT) which adopts the strategy of associative focus to eliminate the obfuscation of IAT effects during the recoding process. However, some studies have found that the revised method has not eliminated the obfuscation of non-associative effects on IAT effects in the recoding process. In fact, the new method may have introduced new variations to obfuscate the IAT effect (Li, Wang, Zhao, & Xu, 2011). The effectiveness of BIAT still has not received widespread experimental verification (Jin, 2010). Therefore, this study used the traditional IAT method to measure implicit aggression. Previous studies have shown that the stimulus is able to significantly influence implicit social cognition (Zhou, Chen, & Liu, 1998; Ye, 2001, 2004). Hence, experiments focused on studying the two dimensions of material type and property were designed and conducted.

Previous studies on implicit aggression have, thus far, mainly focused on potential factors, such as family issues and social media, while little effort has been made in terms of studying the influence of interpersonal relationship with implicit aggression. Studies on interpersonal relationship are mainly focused on external factors, such as its features, causes, adjustments, trends and so on, while little attention has been paid to internal psychological factors, such as personalities. In addition, based on the theory of personality traits within the field of psychoanalysis, interpersonal relationships can cause psychological reactions such as anxiety and security, thereby influencing the formation and development of personality. One study indicated that implicit aggression exists both in juveniles and adults (Ye, 2001), and that the social environment plays vital roles in the formation and development of teenage aggression. Social environments include family (Chen & Du, 2006; Yin, 2006), peers and social media (Hu, 2006; Zhou, 2006; Zheng & Sun, 2006; M. F. Chen, & S. P. Chen, 2005; Cui, Hu, Wu, & Xie, 2006) etc.. However, researchers have not studied the influence of peer relationship with implicit aggression so far.

Interpersonal relationship is the psychological distance and relation between different individuals, but is not completely identical to social relationships (Yue, 2004). In psychology, the structure of interpersonal relationship includes three categories: cognition, which is closely related to interpersonal cognition, and is the rational factor; affect, which is closely related to evaluative communication, and is the emotional factor; behavior, which is closely related to the outward manifestation and outcome during interpersonal activities (Yu, 2006). Peer relationship is a type of interpersonal relationship mainly established and developed among individuals who share similar physical age or mental age during their interactions (Zhou, 1998).

Sociometry, or sociometric technique, was established by the psychotherapist J. T. Moreno in 1934 and is used to quantitatively measure social relationships. Sociometry assumes that interpersonal choices actually reflect the psychological associations between the individuals: A positive interpersonal relationship indicates acceptance and a negative relationship indicates rejection (Yu, 2006). This study adopted this methodology, and measured and categorized the classroom interpersonal relationships of college students based on psychological distance and relation on the affect dimension.

In summary, the peer relationships (affect dimension) within the classroom interpersonal relationships of college students was used as the independent variable, in order to preliminaries to explore its relationship with evaluative implicit aggression. We hypothesized that the interpersonal relationships between individuals might affect implicit aggression. According to related studies on aggression and implicit social cognition, implicit aggression is the behavioral dispositions or mental traits of an individual, under the lack of conscious monitoring or unclear state of consciousness, with the potential intention to harm an organism that is escaping from the intended harm. Implicit aggression has characteristics such as being indirect, accumulative, unconscious, initiated spontaneously and so on (Xu, Tang, & Xie, 2007; Fang, 2007; Li, & Zhang, 2007; Ye & Peng, 2004; Ye, 2004, 2001; Liu & Zhang, 2000). Interpersonal relationship refers to the emotional distance and psychological association between two or more people.

This study uses interpersonal relationships as a starting point to investigate implicit aggression under different test conditions. The purpose of this study was to explore the correlation between interpersonal relationships and implicit aggression, which would not only expand the research on aggression, but also benefit the in-depth study of interpersonal relationships. Interpersonal relationships are not only an important part of social psychology, but also an important part of mental health education. Previous studies have indicated that the status of interpersonal relationships would affect and closely correspond to physical and mental health. In addition, the status of interpersonal relationships has more influence on mental health over physical health (Jin, Xu, & Jin, 1999). Additionally, studies have shown that the condition

of interpersonal relationships significantly affects mental health status (Ouyang, 2000). Therefore, this study can be used to complement other related fields. Studying implicit aggression by investigating interpersonal relationships, whether it is various interpersonal relationships initiate an individual's implicit aggression or the individual's implicit aggression induces interpersonal relationships of various degrees, would provide the basis and guidance for the directional implementation of school students' mental health education.

1. PRE-EXPERIMENT

Based on non-parametric simple selection method in sociometry (Yu, 2006), we designed college student interpersonal relationship questionnaires and tested on all sophomores and juniors with different majors in XX University XX Department. The self-designed questionnaire had 5 different questions respectively for 5 different scenarios, including outings, studying on campus, internship, staying in the dormitory and job recruitment after graduation, in order to measure the closeness of college students' interpersonal relationship. The questionnaire required participants to nominate only their classmates based on different scenarios and sort them from the closest (leftmost) one of the most distant (rightmost). In order to avoid the social expectation effect, the questionnaire only uses positive nomination and anonymous testing.

After excluding the improperly filled questionnaires, we retrieved 341 effective questionnaires and then summed up all nominated times of every individual. As shown by Kelley in 1939, in a normal distribution, the top/bottom 27% is the best demarcation point, which can give the largest group difference and the most participants. Therefore, we followed the 27% rule and first grouped the participants into two groups (close interpersonal relationship group and estranged interpersonal relationship group). From the remaining participants, we then removed the participants on both ends of the distribution according to the 27% rule and obtained the ordinary interpersonal relationship group. In sum, there were 279 effective participants who were divided into 3 groups (close interpersonal relationship group, ordinary interpersonal relationship group and estranged interpersonal relationship group) and each group had 93 members. The Kruskal-Wallis H test results showed that the participants in three groups had significant differences in the interpersonal relationship ($\chi^2 = 247.41$, $df = 2$, $p < .001$).

Stratified random sampling was used in the study. The same number of participants was chosen from the three groups, with equal numbers of males and females, and equal numbers of sophomores and juniors. They randomly participated in different IAT tests. All the participants volunteered for the study, were experienced in computer operations and were unfamiliar with the IAT. After the participants finished the required experiments, a small gift was given as a reward.

2. EXPERIMENT I

2.1 Participants

96 participants were chosen based on stratified random selection, which included 32 ones for each of the three interpersonal relationship types. Half of them were sophomores and the other half were juniors, with an equal number of male and female in each year.

2.2 Materials

2.2.1 Target Concept

All selected words were from the *Modern Chinese Verb Classification Dictionary* (Guo, 1994). The experimental words, selected after professional screening assessments included 24 two character phrases of verbal and physical aggression. The phrases selected are commonly used and clearly defined neutral words, in order to prevent confusion with attribute words. A previous study (Dasgupta, McGhee, Greenwald, & Banaji, 2000) has shown that the familiarity of stimulus words does not have a significant influence on the result. Therefore, there were no restrictions on the frequency of the selected phrases. The words selected must be commonly used and clearly defined neutral words, in order to prevent confusion with the attribute words.

The aggression levels of selected aggressive words were previously evaluated by Psychology major male and female students. After adding the points scored for each word, the first seven words in descending order were assigned to the strong aggression group while the first seven words in ascending order were assigned to the weak aggression group. 7 two character words were obtained for "strong aggression" (such as sarcasm and brawl) and "weak aggression" (such as rumor and fight). Kruskal-Wallis H test showed that there was a significant difference between strong aggression and weak aggression words ($\chi^2 = 10.25$, $df = 1$, $p = .001$).

2.2.2 Attribute Concept

Attributes included commendatory terms and derogatory terms from the experimental materials of the "Implicit social cognitive experimental study of aggression—the application of IAT in aggression studies" (Zhang, 2004)

Commendatory terms: smart, capable, beautiful, successful, proud, adorable, strong.

Derogatory terms: evil, stupid, ugly, clumsy, hateful, weakness, failure.

2.3 Design and Procedure

2.3.1 Design

3 (Interpersonal relationship types: close, ordinary and estranged)×2 (material properties: strong aggression

words, weak aggression words) two factors mixed design was used. Interpersonal relationship type was an indirect factor and material property was an internal factor of participants.

2.3.2 Procedure

IAT measurement programs were written using Inquisit 3 which was developed by Millisecond Professional Psychology Software Company, US. The software and program were used after converting to Chinese and various modifications. The classical 7 block IAT paradigm was adopted in all experiments. In the experiment, the type labels were on the top left and right parts of the screen and the stimuli (words or pictures) were presented in the center of the screen. The participants followed the instructions on the screen and indicated their decisions by pressing E and I keys. B3, B4, B6 and B7 were actual test trials. All the others were practice trials which helped the participants to understand the experimental requirements and be familiar with related operations.

The experiments adopted the one-person-one-computer model. The researcher or their assistance was not allowed to disturb or instruct the participants after clarifying the experimental requirements. The participants finished all the tests independently and successively by following only the instructions in the program. All response times and accuracy of the subject were automatically recorded by the computer. In order to avoid the order effect, ABBA experimental design was adopted, that is half the participants took the strong aggression test first and the other half took the weak aggression test first. After the completion of one test, the participants had five minutes of rest before moving on to the next one in order to avoid fatigue effect.

2.4 Data Processing

All the data were processed using SPSS13.0 statistical analysis software.

The measurement of IAT followed the revised IAT scoring method which was proposed by Greenwald, Nosek, and Banaji in 2003. Firstly, data with response times over 10,000 ms were deleted, then participants with a response time longer than 10% of the database but shorter than 300 ms were deleted. Standard deviations of all response times in block B3, B6 and block B4, B7 were calculated separately. The average response times of B3, B4, B6, and B7 were calculated and their differences were obtained (B6-B3 and B7-B4). Finally, we divided the differences of the average response time by the corresponding standard deviation to obtain the D value (Lane, Banaji, Nosek, & Greenwald, 2007). The higher the D value, the higher the implicit aggression.

2.5 Results and Analysis

There were 93 effective participants in this experiment. 2 male sophomores with estranged interpersonal relationships and 1 female junior with close interpersonal relationships were excluded as they did not meet the statistical requirements.

The description of IAT effect for effective participants is shown in Table 1

Table 1
Statistical Description of IAT Effect of Two Test Groups With Different Test Materials

	Strong aggression		Weak aggression	
	M	*SD*	*M*	*SD*
Close interpersonal relationships	.09	.59	- .10	.65
Ordinary interpersonal relationships	.02	.65	.20	.69
Estranged interpersonal relationships	.07	.73	.02	.75

The repeated measures ANOVA showed that there was no significant dominant effect in interpersonal relationship types [$F(2, 90) = .67$, $p > .05$, $\eta^2_p = .02$]; the material properties did not have any significant dominant effect [$F(1, 90) = .05$, $p > .05$, $\eta^2_p = .00$]; interpersonal relationship types and material properties did not have any significant interactions [$F(2, 90) = 1.09$, $p > .05$, $\eta^2_p = .02$]. The results demonstrate that the IAT effects with different material properties had no difference on the various interpersonal relationships.

3. EXPERIMENT II

3.1 Participants

96 participants were chosen by stratified random selection from the remains after Experiment I. There were 32 participants for each of the three interpersonal relationship types. Half of the participants were sophomores and the other half were juniors. The number of male participants and female ones was equal.

3.2 Materials

The target concept included aggressive words and pictures.

The meanings of Chinese words are complicated in terms of showing aggression, and some words have both positive and negative meanings. In order to avoid inconsistencies in the experimental results and theoretical expectations caused by inappropriate words selection, pictures were added as the targets in this implicit association test. Words and pictures were shown to participants in different IAT programs.

The words used were the same as that in Experiment I.

All the pictures were selected from "Outlaws of The Marsh: Collector's Comic" (Shanghai People's Fine Arts Publisher, 2007 edition). Both aggressive and unaggressive black and white pictures were selected and paired. After technical processing, 24 character-paired aggressive fighting pictures were selected. The attacked

character in the picture had 30% reduction in size and reduced brightness, so that the participants could quickly make decisions on the targeted stimulus of the whole picture.

There are 7 words and 7 pictures. The word test was the same as that in Experiment I. As demonstrated by the Kruskal-Wallis H test, 7 "strong aggression" pictures and 7 "weak aggression" pictures had significant difference ($\chi^2 = 11.49$, $df = 1$, $p = .001$).

3.3 Design and Procedure

3.3.1 Design

3 (Interpersonal relationship types: Intimacy, general and alienation)×2 (material properties: aggressive vocabulary, aggressive picture) two factors mixed design was used. Interpersonal relationship type was an indirect factor and material property was an internal factor.

3.3.2 Procedure

50% of the participants took the aggressive words test first and then took the aggressive pictures test. The other 50% did the reverse. Other details were the same as those in Experiment I.

3.4 Data Processing

Same as in Experiment I

3.5 Results and Analysis

There were 94 effective participants in the experiment. Data of 2 male juniors with estranged interpersonal relationships were excluded due to the high error rate.

The statistical description of IAT effect is shown in Table 2

Table 2
Statistical Description of IAT Effect of Two Test Groups With Different Test Materials

	Aggressive words		Aggressive pictures	
	M	*SD*	*M*	*SD*
Close interpersonal relationships	- .14	.62	- .05	.65
Ordinary interpersonal relationships	- .13	.64	- .02	.59
Estranged interpersonal relationships	- .13	.71	- .02	.73

Repeated measures ANOVA has shown that interpersonal relationships had no significant dominant effect [$F(2, 91) = .01$, $p > .05$, $\eta^2_p = .00$]; the material properties did not have any significant dominant effect [$F(1, 91) = 2.55$, $p > .05$, $\eta^2_p = .03$]; interpersonal relationship types and material properties did not have any significant interactions [$F(2, 91) = .02$, $p > .05$, $\eta^2_p = .00$]. The results demonstrate that the IAT effects with different material properties had no difference for various interpersonal relationships.

4. DISCUSSIONS

4.1 The Correlation of Interpersonal Relationship and Implicit Aggression

In this study on implicit aggression, we used the emotional dimensions of interpersonal relationships to classify the participants. We hoped to experimentally investigate the differences in implicit aggression of individuals with various interpersonal relationships. Many people intuitively think that individuals with close interpersonal relationships are not aggressive. The personality theory of psychoanalysis also believes that interpersonal relationships could bring about anxious psychological effects in individuals. Some studies have even found that students with low peer acceptance were more sensitive to bad words in their implicit memory (Zheng, 2003). However, the results of our implicit aggression study do not support this view. At least, this effect does not exist in college students, which has overturned the initial hypothesis of research. Based on the experimental results, we can conclude that, as a relatively stable personality or behavioral tendency, implicit aggression is not easily influenced by external environmental factors.

However, in implicit aggression studies with different stimulus types, experiments initially showed significant difference in the dominant effect of interpersonal relationships but did not show any significant difference in post-hoc tests. The insignificant difference in the latter may be due to the non-linear correlation between interpersonal relationship groupings obtained from the questionnaires and the implicit aggression constructs obtained using experimental methods. It may also due to the absence of direct causal link between implicit aggression and interpersonal relationship. They may interact indirectly through certain intermediate variables or be influenced by certain regulatory variables (Lin, Li, & Hu, 2004). For example, a study has shown that different dimensions of social support play an intermediate role between the personalities of college students and their interpersonal problems (Kong, Shi, & Li, 2008). These hypotheses above need to be further tested in experiments. Due to the vague connection between implicit aggression and interpersonal relationship, we cannot conclude explicitly that interpersonal relationship does not have any effect on implicit aggression. In fact, special caution is still necessary in future related studies.

Few researchers have previously introduced interpersonal relationship into their research, while studies attempting to quantify interpersonal relationships into interpersonal distance which can be used as a variable in causal discussions have yet to provide satisfactory conclusions. Nonetheless, these studies are preliminary investigations on the introduction of psychological factors that are influenced greatly by interpersonal relationships into causal studies. Despite the risks encountered when working in new or undeveloped research areas, these areas

are the source of innovation as well as originality and value in research.

4.2 Differences in the Attributes and Types of Implicit Association Test Materials

Two implicit association tests with different material types (one using words while the other using pictures as well) were designed in this study in order to more precisely measure the implicit aggression of the participants. The results of IAT effect investigations show that the words were more effective in the experiment. Word type research material can better reflect the implicit aggression of participants while the sensitivity of picture type material was slightly lower. However, there was another problem. Theoretically, some interference in word tests is inevitable such as word ambiguity, positive and negative meanings, lacking the sharpness of aggression. In contrast, picture type materials are more visual and less interfered by these factors. The experiment should have shown that the picture test was more effective than word test, while in fact the opposite was shown. During the pre-experiment to evaluate the aggression level of the pictures, we found that although the assessment of pictures was easier than that of words, most of the participants felt it was difficult to effectively measure the aggression level of pictures while the measurement of aggression in words relatively easier. In formal experiments, participants' response time in the picture test was shorter than that in the word test. This may be due to the ceiling effect caused by picture type materials which may have interfered with the results. In future studies, more precise and sensitive pictures will need to be used to test the hypothesis above.

4.3 Measurement, Grouping and Intergroup Differences of Interpersonal Relationship

A self-designed questionnaire about college students' classroom interpersonal relationship was adopted in this study. The interpersonal relationships of college students were grouped based on their closeness. Sociometric rules were followed in questionnaire design. We used peer nomination in the design in order to avoid social desirability effect on individuals as well as to measure the emotional relationships of an individual to other individuals in the group. However, in real modern social situations, the influence of social desirability cannot be completely avoided. In all the questionnaires retrieved, some participants still filled in the names of their teachers or other social celebrities although the questionnaires were anonymous.

Some studies have shown that the psychological development of college students is not yet complete and that the constancy of their psychological qualities is usually weak. Obvious mutability is shown in their choices of companies. The relationship among class members showed a certain extent of discretization. The further implementation of the credit system has further breaks down the habitual classroom concept. The increase of study freedom gives class members a certain extent of discretization in both time and space. Therefore, the class collective spirit is fading and interpersonal relationships between class members have been influenced somewhat. Some studies have demonstrated that the interpersonal relationships of college students showed no difference between male and female as well as between science majored and humanity majored students. However, the significant difference was found between urban and rural students. Urban students had better interpersonal relationships than rural students (Tang, 2001). Recent studies have also shown that aside from regional differences, sex and grade also significantly influenced interpersonal relationships of college students (Jia, 2009).

In the further analysis of the grouped participants, we also found that the interpersonal relationship variable was not consistent in the different groups. For the participants in the close interpersonal relationship group, 77.40% were first year students and only 22.60% were in the second year; for the participants in the ordinary interpersonal relationship group, 60.20% were first year students and only 39.80% were in the second year; for the participants in the estranged interpersonal relationship group, only 23.70% were first year students and 76.30% were second year students. This distribution seemed to illustrate that first year participants have closer interpersonal relationships than second year participants, and people become estranged as their school years increased.

Previous studies have also demonstrated that the subjective factors which influenced college students' interpersonal relationships have shown differences in sex, school year and subject major (Zhao, Zheng, Li, & Zhang, 2006). Further studies have shown that the subjective factors of college students' interpersonal relationships were more important than objective factors (Zhao & Zheng, 2009). Another related study on interpersonal relationship and self-awareness also demonstrated differences of interpersonal relationships in sex, school year and subject major (Wang & Chen, 2008). In the study on interpersonal relationship behavioral problems in college students, significant differences were also demonstrated in sex, school year and subject majors (Sun, 2007). Some researchers also conducted specialized research on interpersonal relationship characteristic in college students' dormitories. The results showed that the second year students had the best interpersonal relationship in their dormitories (Mao, Li, & Zhang, 2005), which is consistent with the investigations on interpersonal relationships. However, some researchers believe that there is no significant difference between the interpersonal relationships of second year students and third year students (Chen & Wang, 2007). Although no study has shown that implicit aggression is significantly different between school years, the differences in the

interpersonal relationship of participants in different years may have an influence on the significance of the differences between implicit aggression and interpersonal relationships.

In addition, since all participants volunteered for the experiments, the subject major and ethnicity could not be balanced during subject selection, especially the ethnicity. In the participants who actually participated in the experiments, excluding 5 participants who did not fill in their ethnicity information, 54.60% of the participants were Han, 31.60% were Zhuang, and 13.80% were other ethnic groups (including 6.90% Yao). In previous studies, researchers found that Hui and Han college students had significant difference in interpersonal relationship problems (Zhou & Wei, 2008). In the study of psychological factors related to interpersonal relationships in multi-ethnic college students, researchers found that these college students not only had interpersonal relationship problems (Huang, 2005) but many of them also suffer from serious problems such as mistrust in interpersonal relationships, or even some symptoms of interpersonal sensitivity (Zhou, 2007). Since no previous study has demonstrated ethnic differences in implicit aggression, this ethnic factor may have an effect on the results.

CONCLUSION

By using implicit association test and sociometry, a preliminary investigation of the effect of college students' class interpersonal relationships with their evaluative implicit aggression was conducted. The experimental results have shown that, for college students, the closeness of their classroom interpersonal relationship does not influence their evaluative implicit aggression, which means the existence of evaluative implicit aggression in college students does not vary due to different closeness of their interpersonal relationships. However, this study has not tested the external effectiveness of this conclusion, which has been planned to be further discussed in future studies in order to reveal any possible interactions between them.

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