

The Effect of Interpersonal Distance on Vicarious Embarrassment

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Abstract: Miller proposed the concept of Vicarious Embarrassment (VE), which refers to the experience of feeling embarrassed on behalf of someone else when witnessing their behavior violating social norms or moral standards in a public setting ^[1]. Recent research on embarrassment has highlighted the significance of interpersonal distance as a crucial factor influencing vicarious embarrassment. This study aims to investigate the specific impact of interpersonal distance, defined here as friends, annoying people, and strangers, on vicarious embarrassment. In this experiment, 30 college students will be presented with text-based stimuli depicting both awkward and non-embarrassing situations. Participants will then imagine themselves as bystanders observing friends, annoying people, and strangers experiencing these situations while engaging in an alternative embarrassment judgment task. Cognitive and behavioral data will be recorded to explore the cognitive mechanism underlying how interpersonal distance affects vicarious embarrassment. The findings revealed that: (1) When imagining their friend going through an embarrassing situation, participants rated it significantly higher than when imagining an annoying person or a stranger in such a situation; (2) For unpleasant individuals facing embarrassing situations, low levels or even absence of vicarious embarrassment were observed instead pleasure was induced.

Keywords: *Vicarious embarrassment; Interpersonal distance; Social pain empathy*

1. Introduction

Emotion plays a crucial role in various aspects of individuals' lives, exerting profound impacts on their work performance, personal well-being, and even physical health. Dealing with emotions is an everyday task that involves addressing emotional challenges. Some fundamental emotions include joy, anger, sadness, and fear; these emotions can elicit feelings of ecstasy, anger, sorrow, worry, and fear at different times. However, while research on emotion has reached a relatively advanced stage in general terms, there remains a dearth of studies focusing on alternative emotions such as social pain empathy or "substitutive embarrassment." Furthermore, the majority of existing research primarily originates from foreign countries with limited empirical investigations conducted within China. Nevertheless, substitutive embarrassment holds significant relevance to people's lives and warrants exploration subjective experiences and scholarly inquiry.

In our daily lives, the relationship between the subject of empathic embarrassment and ourselves plays a crucial role in determining the level of vicarious embarrassment experienced. While previous studies have primarily focused on physiological pain empathy^{[2][3][4]}, there has been limited research conducted on social pain empathy. Some studies suggest that intergroup relationships and social intimacy can influence physiological pain empathy, with closer social bonds leading to higher levels of arousal. However, there is a lack of empirical studies exploring the social pain empathy associated with vicarious embarrassment. Therefore, this study aims to investigate how interpersonal distance affects vicarious embarrassment from a cognitive perspective, thereby contributing to the existing theory on social pain empathy.

Studying the impact of interpersonal distance on vicarious embarrassment holds significant value for psychologists as it allows for a better understanding of key influencing factors and how these factors are influenced by varying degrees of closeness between individuals. Additionally, this research also carries practical implications as it helps individuals gain insight into others' experiences during embarrassing situations, enabling them to take appropriate actions to alleviate discomfort and potentially reduce aggressive behaviors.

This paper specifically examines the influence of interpersonal distance on vicarious embarrassment

through cognitive processes and behavior analysis. It focuses on operationalizing interpersonal distance by categorizing it into friends, annoying people, strangers; imagining different emotional responses exhibited by subjects when faced with various situations involving individuals at different distances; and investigating neural mechanisms underlying how interpersonal distance impacts vicarious embarrassment. By addressing these aspects comprehensively, this study fills gaps in previous research literature.

In this study, instructions were utilized to manipulate different interpersonal distances, and the order of the three interpersonal distances was randomized using an in-subject design. EEG was employed as a physiological index to investigate subjects' subjective scores of stimuli and explore the physiological arousal associated with vicarious embarrassment under varying interpersonal distances. Additionally, the influence of different interpersonal distances on vicarious embarrassment under diverse circumstances was compared. Two hypotheses were formulated: (1) Interpersonal distance impacts vicarious embarrassment; specifically, when individuals envision their friends in embarrassing situations, their emotional arousal of vicarious embarrassment is significantly higher than that experienced towards strangers or unpleasant individuals. (2) When individuals imagine unpleasant people facing embarrassing situations, inducing low levels of vicarious embarrassment does not even occur; instead, it may elicit pleasure.

2. Research design

2.1. Subjects

Convenient sampling method was used to select 60 students (30 male and 30 female) from college within the age range of 18-23 years old, with an average age of 21. Among them, two participants were left-handed while others were right-handed. All participants had sufficient rest prior to the experiment and did not stay up late. They met requirements for good health and normal or corrected vision. Monetary compensation was provided to participants at the conclusion of the experiment.

2.2. Instruments and materials

During the experiment, four types of embarrassing situations were manipulated based on a theoretical model: awkward situation stimulus and non-embarrassing situation scenarios were selected according to self-esteem model ("making a fool of yourself on a date"); drama model ("being reminded by a friend in public to return money"); disobeying others' expectations model ("speech jam"); involuntary violence model ("falling down in street on rainy day").

2.3. Experimental design

The experiment used the within-subjects design (3 interpersonal distances (friend, stranger, annoying person)×2 situations (awkward situation, general situation)).

2.4. Measurement indicators

Behavioral indicators: selection reaction time (the time from the end of stimulus presentation to the subject's button selection).

2.5. Experimental procedure

Subjects were separated from each other, and the abbreviations of the names of friends, strangers and people they hated were asked, and the program was filled in. Finally, the formal experiment began when the subjects were ready. There were 132 trial trials. The experimental flow chart of 66 awkward situations and 66 non-embarrassing situations is shown in Figure 1. At the beginning of the experiment, a focus point "+" was first presented in the center of the screen to remind the subjects to focus on the forthcoming stimulus for a duration of 500ms. Abbreviations of names and situations representing interpersonal distance are then presented for a duration of 3000ms. The task of the subjects was to judge whether their emotions were awkward (F), calm (H), or happy (J) for different people in different situations, make the key response as soon as possible and accurately, and then score their emotional arousal on a scale of 1-7.

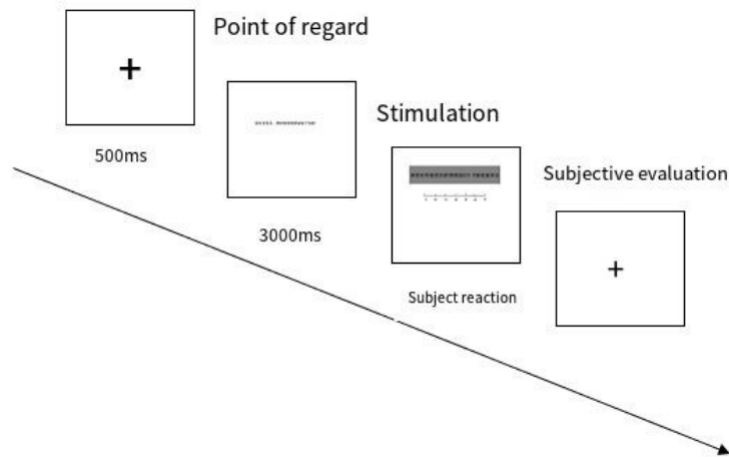


Figure 1: Experimental flowchart

3. Result

3.1. Data analysis

The data was recorded using E-prime 2.0, and the processing and analysis of the data were carried out using SPSS 20.0.

3.2. The subjects' responses to the awkwardness of the situation were analyzed under different interpersonal distance conditions

Prior to data analysis, reaction times exceeding 3000ms were excluded as invalid data, and a repeated measures ANOVA was conducted to examine emotional responses across different interpersonal distance conditions. The results revealed a significant main effect of interpersonal distance ($F(2,19) = 0.48, P = 0.02$), while the main effect of situation was found to be insignificant ($F(1,19) = 0.13, P = 0.18$). Furthermore, there was a significant interaction between interpersonal distance and situational factors ($F(5,19) = 0.42, P = 0.03$). Simple effect analyses were performed on variables with significant interactions. As depicted in Figure 2, the simple effect of emotion type was significant at the nearest interpersonal distance level (friend; $F(1,19) = 5.41, P = 0.02$); however it was not significant at distant interpersonal distances (annoying people; $F(1,19) = 2.56, P = 0.46$). At the level of strangers, the simple effect remained significant ($F(1,19) = 5.36, P = 0.03$). These findings suggest that vicarious embarrassment is influenced by interpersonal distance and is higher when compared to strangers in liked individuals.

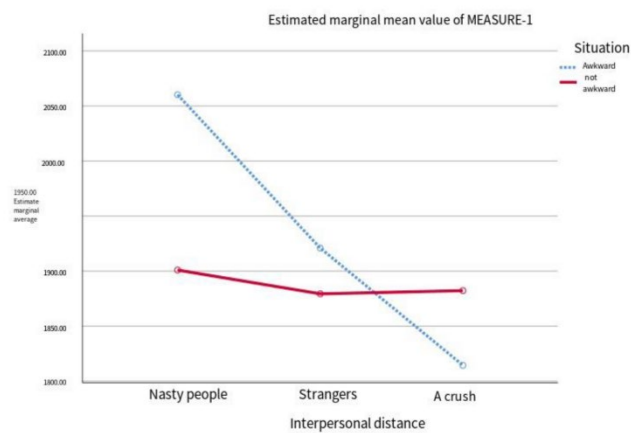


Figure 2: Reaction time difference.

3.3. The score analysis of subjects' emotional types under different interpersonal distance conditions

The subjective evaluation values of emotion type under different interpersonal distance conditions were analyzed by repeated measurement ANOVA. The scores of subjects under different interpersonal distance conditions were shown in Table 1. The results showed that the effect of emotion type was not significant $F(1, 19) = 0.94, P = 0.4$. The main effect of interpersonal distance was significant $F(2, 19) = 11.82, P = 0.001$. There was significant interaction between interpersonal distance and subjective evaluation of emotion type $F(5, 19) = 6.5, P = 0.003$. A simple effect analysis of the interaction showed that there was a significant difference in the score at the nearest (friend) interpersonal distance level $F(1, 19) = 5.03, P = 0.014$, and a significant difference in the score at the farther (annoying person) level $F(1, 19) = 25.61, P = 0.02$. There was no significant difference in scores at the stranger level $F(1, 19) = 1.26, P = 0.4$. These results suggest that ratings of perceived emotions are influenced by interpersonal distance, with high ratings at the nearest interpersonal distance.

Table 1: Description of subjects' rating of emotional types under different interpersonal distance

	Awkwardness score <i>M±SD</i>	Calm score <i>M±SD</i>	Pleasure score <i>M±SD</i>
Nasty people	3.65±0.52	3.60±0.38	3.97±0.69
Friends	4.38±0.82	3.71±0.26	4.04±0.54
Strangers	4.26±0.79	3.96±0.17	4.40±0.32

4. Discussion

4.1. The impact of interpersonal distance on vicarious embarrassment

The analysis of reaction time for subjects under different interpersonal distance conditions reveals a significant interaction between interpersonal distance and the situation, while the situation itself does not have a significant effect. This finding aligns somewhat with previous studies^{[5][6]}. However, this study hypothesized that when subjects substitute embarrassment for unpleasant individuals, they do not substitute emotions but rather experience calm and happy emotions. Nevertheless, the research did not draw a conclusive result on this hypothesis. It was found that substitutive embarrassment levels are higher when an annoying person appears in an embarrassing situation compared to a stranger; however, there is still a significant difference in the level of interpersonal distance between the annoying person and the preferred individual. Although this study provides evidence through behavioral data that interpersonal distance impacts substitutive embarrassment, further investigation is needed to reveal its cognitive mechanism.

4.2. Scores of emotional judgment types under different interpersonal distance conditions

Emotional judgment scores were examined under different interpersonal distance conditions in this study, categorizing participants' emotional responses into three types: embarrassment, calmness, and pleasure. The results indicate that interpersonal distance also influences emotional scores. When interpersonal distance is closest, vicarious embarrassment reaches its highest level even towards unpleasant individuals; however, arousal levels are lower compared to Schadenfreude observed in previous empathy studies. This may be attributed to many subjects not genuinely hating individuals mentioned during questioning about people they dislike; thus resulting in less intense stimulation from hearing their names mentioned. Nonetheless, significant differences remain regarding arousal levels towards friends and disliked individuals.

5. Shortcomings and prospects

First, the reliability and validity of experimental materials can be further improved. In this study, text stimulus materials are used to bring subjects into some awkward situations witnessed by onlookers, which may be at a low level. In the future, video, voice and other methods can be used to present situational stimuli, which may have better ecological validity.

Second, the subjects adopted the method of convenient sampling. In the sampling process, there were more female subjects and less male subjects, and they were all college students, so the gender

ratio was not balanced. These two factors also affected the promotion of the research conclusions, so the gender ratio and a wider range of subjects could be controlled in the future, not limited to college students.

Third, the impact of interpersonal distance on vicarious embarrassment. This study defines the operability of interpersonal distance as: friends, annoying people and strangers. The representation of interpersonal distance is limited to three kinds of interpersonal relationships, and the emotional feedback is only awkward, calm and happy. It can not be fully considered, and the subjects may have other emotions in the process and cannot give good feedback. In the future, the types of emotions can be further expanded, and the interpersonal distance can be defined in various operational ways, which is not limited to this.

6. Conclusion

Interpersonal distance affects vicarious embarrassment, that is, when individuals imagine their friends in an awkward situation, the emotional arousal of vicarious embarrassment is significantly higher than that of strangers and unpleasant people.

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