The Mediating Role of Self-mastery and the Regulating Effect of Friendship Quality between Strict Parental Discipline and the Problem Behavior of Junior High School Students in China

Peng Tiantian

Abstract—Family education and growing psychological problems in junior high school students have raised serious concerns in recent years. This study investigated the relationship between strict parental discipline and problem behavior in junior high school students. 1,067 Junior high school students were enrolled based on several variables—strict parental discipline, self-esteem level and friendship quality—to examine problem behavior in their age group. Our study found that: (1) strict parental discipline could contribute to problem behavior in junior high school students. (2) Self-esteem plays an intermediary role between strict parental discipline and junior high school students' problem behavior; strict discipline affects junior high school students' self-esteem level and they, in turn, develop behavior problems. (3) Friendship quality plays a regulating role in the intermediary effect of self-esteem.

Index Terms—Friendship quality, Junior high school students, self-esteem, strict discipline

I. INTRODUCTION

Problem behavior is defined as the violation of the social behavior code or socialization norms that negatively impacts or even causes harm to society, other people or individuals themselves. It mainly includes externalized and internalized behaviors (Erath, El-Sheikh, & Mark Cummings, 2009) [1]. Problem behavior states that perceived environment may affect an individual's behavior. The theory of Bioecology (Bronfenbrenner, 2005; Bronfenbrenner & Morris, 1998) [2] suggests that the effects of human psychology and behavior are influenced by macroscopic, outer, intermediate, and microsystems (Rosa & Tudge, 2013) [3]. According to bioecological theory, problem behavior in junior high school students stems from the interaction between individual factors and microenvironmental systems in direct contact with them and also macroscopic and outer environmental systems with no direct impact (Bronfenbrenner, 2005; Bronfenbrenner & Morris, 1998) [2]. As the foundation of the psychological and behavioral shaping of junior high school students, the family environment profoundly influences them (Rousos et al., 2001) [4]. Numerous studies have shown that severe parental discipline is closely related to junior high school students' development (Donovan & Jessor, 1985; Jessor, 1986, 1987; Patterson, DeBaryshe, & Ramsey, 1989) [5]. Empirical studies by Patterson show that families have a significant impact on individual problem behavior and that parenting style is one of the fundamental factors leading to behavior problems in children (Patterson et al., 1989) [6]. The Lafreniere study states that individual problem behavior is affected by language, behavioral attacks, background, and so on (Lafrenière, Provost, & Dubéau, 1992) [7]. Beverly Kingston uses the theory of differential repression to further explore problematic behavior; he believes that an individual is influenced by repressive behavior and the environment (Kingston, Regoli, & Hewitt, 2003) [8]. Severe parental discipline (harsh discipline) is a mandatory behavior or negative emotional expression (Erath et al., 2009) [1] carried out by parents in response to their children or adolescents' misconduct. Its primary forms include psychological assault and corporal punishment (Wang & Liu, 2014) [9]. Some studies found that parenting style profoundly affects teenagers and that poor parenting style can generate problematic behaviors. Many research found that teenagers subjected to long periods of parental psychological attack will be more inclined to engage in physical attacks and other problematic behaviors (Harper, Brown, Arias, & Brody, 2006; Ma, Han, Grogan-Kaylor, Delva, & Castillo, 2012; Turner & Finkelhor, 1996) [10]. Wang and Liu also found that harsh parenting can directly cause psychological anxiety in children and adolescents, leading to explicit adverse behaviors on their part (Wang & Liu, 2014) [9]. Therefore, this paper also studied the family environment's impact on junior high school students' problem behavior, focusing on strict parental discipline, to better help junior high school students avoid developing such problem behavior. Based on the existing literature, self-esteem is closely related to problem behavior in junior high school students (Boer & Tranent, 2013) [11]; As one of the core components of the individual self-system, self-esteem plays an essential role in an individual's health adaptation (Chassin, Presson, & Sherman, 1988) [12]. Psychosocial models according to the theory of problem behavior (Jessor, 1987) [13], the occurrence of problem behavior is caused by both the external environment and factors within the individual. As part of the external environment system, severe parental discipline can indirectly affect the behavior system through children's self-esteem (Herz & Gullone, 1999) [14]. Herz & Gullone believe that family factors like parenting style, family function and family relationships can influence an individual's development and self-esteem level. The article concluded that the relationship between adolescents
and their parents plays a vital role in their self-esteem development (Harris et al., 2015) [15]. At the same time, teenagers’ self-esteem level also profoundly affects their problem behavior. Studies show that individuals with low self-esteem are more prone to depression and anxiety (Garcia-Reid, Peterson, Reid, & Peterson, 2013) [16]. Pullmann & Allik found that middle school students with low self-esteem are more prone to aggressive behavior, negatively affecting their problem behavior (Pullmann & Allik, 2000) [17]. Numerous studies have also found that self-esteem is influenced by severe parental discipline while also contributing to problem behavior in adolescents.

Friendship quality refers to the intimate degree of friendship between individuals (Parker & Asher, 1993) and is also the protective factor of many psychological variables (Cuadros & Berger, 2016) [19]. As one of the essential social support systems for junior high school students, friendship profoundly impacts their social development and even their lives (Kim & Lee, 2011) [8]. Firstly, there were significant differences in the individuals’ social behavioral response patterns across different levels of friendship quality. The buffering theory of social support (Cohen & McKay, 2020)[20] suggests that the social support obtained by individuals can alleviate their stress experience and thus promote good social adaptation. High-quality friendship, as an essential social support for junior high school students, can not only provide individuals with instrumental help, emotional support, cognitive ability training, and so on, but it can also alleviate the negative impact of risk factors (Criss, Pettit, Bates, Dodge, & Lapp, 2002) [21]. Secondly, some studies have found that friendship quality, as a protective factor, can regulate the internalization problem in junior high school students (Woods, Done, & Kalsi, 2009) [22]. It also regulates their external behavior, such as negative social environment and friendship quality can predict individual problem behavior (Liu, Chui, & Chung, 2020) [23]. In addition, long-term exposure to a negative environment will reduce individual friendship quality, affecting the cognition and acceptance of negative information. This can easily lead to the generation of individual internalization problems (Barnicot, Wampold, & Priebe, 2014) [24]. It may be more difficult for individuals with low friendship quality to gain higher self-esteem levels on their own. This may, in turn, lead to the generation of junior high school problem behavior.

Therefore, this study explores the relationship between severe parental discipline and problem behavior in junior high school students and the impact on both their self-esteem and friendship quality. Specific assumptions are as follows: 1) Strict parental discipline positively predicts problem behavior in junior high school students. 2) Self-esteem plays an intermediary role between strict parental discipline and junior high school students’ problem behavior; parents’ strict discipline mainly affects junior high school students’ problem behavior through their self-esteem level. 3) Friendship quality plays a regulatory role in the mediating effect of self-esteem.

### Table I. The Mean, Standard Deviation and Correlation Matrix of Each Variable

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strict parental discipline</td>
<td>2.799</td>
<td>0.938</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friendship quality</td>
<td>3.196</td>
<td>0.984</td>
<td>-0.509**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-esteem behavior</td>
<td>3.443</td>
<td>0.8</td>
<td>-0.370**</td>
<td>0.474**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.21</td>
<td>0.915</td>
<td>0.529**</td>
<td>-0.578**</td>
<td>-0.548**</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: N = 1067, * p<0.05, ** p<0.01

A. **Relationship between Strict Parental Discipline and Junior High School Students’ Problem Behavior: There is a Regulated Intermediary Effect Test**

As shown in Table III-IV, strict parental discipline had significant positive effects on junior high school students’ problem behavior (B=0.256, t=10.101, p<0.01). Self-esteem had significant negative effects on junior high school students’ problem behavior (B=-0.161, t=-2.092, p<0.05). The interaction terms of friendship quality and self-esteem can have significant negative effects on junior high school students’ behavior problems. (B=-0.064, t=-2.703, p<0.01). Friendship quality has a significant positive impact on self-esteem. (B=0.571, t=9.2, p<0.01). Interaction terms of strict parental discipline and friendship quality can have a significant negative impact on self-esteem (B = -0.091, t = -4.531, p<0.01).

In the model, it can be observed that strict parental discipline positively predicts junior high school students’ problem behavior. The interaction of self-esteem and friendship quality on junior high school students and the interaction term of severe discipline and friendship quality on self-esteem are also described. Therefore, strict parental discipline, friendship quality, self-esteem level, and the relationship between junior high school students constitute a regulated intermediary. The mediating effect does not exist under the action of the low level of the regulatory variable (P=0.06). But the effect of harsh parental discipline on junior high school students’ problem behavior is significant (P<0.05), namely the existence of regulation (For example, direct effect diagram). Fitting relationship between the variables is shown in Fig 1. (with an adjusted mediation effect map).

II. METHODS

A. **Study Design and Sample**

A total of 1,100 questionnaires were issued to students from 4 primary schools in Henan Province, and 1,067 valid questionnaires were obtained, with a recovery rate of 97%. The participants were aged between 11 and 16 years, with 561 boys (52.58%) and 506 girls (47.42%).

B. **Instruments**

1) **Strict parental discipline scale**

Strauss’ parent-child conflict tactics scale is a widely used authoritative measurement tool in this field. This study
selected the corporal punishment scale and psychological attack scale to measure parents’ strict discipline. The corporal punishment scale consists of 6 items, with the degree of corporal punishment varying from light to heavy. The psychological attack includes 5, each with a different severity of psychological attack. This measuring method has been tested by many and obtained a high level of confidence and validity. Its internal consistency confidence for Chinese revisions ranges from 0.70 to 0.86, making it suitable for studies with Chinese backgrounds. If the subject scores more than 0 on all corporal punishment items, it is marked as “1” or “0”. If the child is subjected to corporal punishment “0 times”, it is recorded as “0”, “1 time” is counted as 1, “2 times” is counted as 2, “3 times” is counted as 3, “4 times” is counted as 4”, “6 to 10 times” is counted as 5, “11-20 times” is counted as 6, “20 times or more” is counted as 7 -the higher the score, the higher the frequency of corporal punishment. The sum of scores on all items of corporal punishment is the frequency of corporal punishment, and the prevalence and frequency of psychological attacks are scored in the same way.

2) Self-esteem scale

This study uses a self-esteem scale compiled by Rosenberg (1965), covering 10 topics and uses a Four-Point Likert score to measure the subjects’ self-esteem level. The higher the score, the more positive the subjects’ evaluation is of themselves. The results of the study conducted on Chinese students showed that the eighth topic of the scale (“I wish I could earn more respect for myself”) had a cultural applicability problem and could therefore not be used to measure the self-esteem level of Chinese people (Tian Rumei, 2006). In accordance with Tian Rumei’s practice, this study removed question 8 while retaining the other 9 -it has an internal consistency coefficient of 0.85 and a half-confidence of 0.83, which has better correlation validity and structural validity. In this study, the Cronbach’s α coefficient for the scale was 0.89.

3) Friendship quality scale

In this study, the friendship quality questionnaire (FQQ) was used to measure friendship quality (China revision), with 18 questions. It includes six factors; companionship and entertainment, affirmation and care, intimate ancestry and communication, help and guidance, conflict resolution, and conflict and betrayal. The first five factors are positive friendship quality, while the conflict and betrayal factors are negative. Each factor consists of 3 questions, scored at the likert5 level. As shown in Table 1, the credibility test for this questionnaire was carried out, Cronbach’s α coefficient was 0.875, and the confidence of each dimension was above 0.6, which proved that the volume had good confidence. In order to test the validity of the questionnaire, its structural validity test was carried out, as shown in Table II.

4) The problem behavior scale

Cui Lixia compiled an inter-volume to measure the problem behavior of middle school students from 4 school grades, with a total of 60 questions in the study; a higher score on the questionnaire meant the problem behavior tendency was more serious. It includes six dimensions: poor learning adaptation, aggressive behavior, discipline, withdrawal, neuroticism, and exams anxiety. The questionnaire was re-tested for confidence, and the results of the analysis are shown in Table III. The Cronbach coefficient of the problem behavior scale is 0.957, and the confidence

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### Table II: Regression Analysis

<table>
<thead>
<tr>
<th></th>
<th>Problem behavior</th>
<th>Self-esteem</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>β</strong></td>
<td><strong>SE</strong></td>
<td><strong>t</strong></td>
</tr>
<tr>
<td>Constant</td>
<td>2.918</td>
<td>0.294</td>
</tr>
<tr>
<td>Strict parental discipline</td>
<td>0.256</td>
<td>0.025</td>
</tr>
<tr>
<td>Friendship quality</td>
<td>-0.043</td>
<td>0.090</td>
</tr>
<tr>
<td>Strict parental discipline*Friendship quality</td>
<td>-0.091</td>
<td>0.092</td>
</tr>
<tr>
<td>Self-esteem*Friendship quality</td>
<td>-0.064</td>
<td>0.024</td>
</tr>
<tr>
<td>N</td>
<td>1067</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.484</td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.481</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>F (4,1062)=248.819</td>
<td>F (3,1063)=125.430</td>
</tr>
</tbody>
</table>

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### Table III: Test of Chain Mediation Effect

<table>
<thead>
<tr>
<th>Direct effect size</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>LLCI</th>
<th>ULCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.256</td>
<td>0.025</td>
<td>10.101</td>
<td>0.000</td>
<td>0.206</td>
<td>0.306</td>
</tr>
</tbody>
</table>

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### Table IV: Conditional Indirect Effect

<table>
<thead>
<tr>
<th>Indirect Effect</th>
<th>BootSE</th>
<th>BootLLCI</th>
<th>BootULCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.024</td>
<td>0.016</td>
<td>-0.002</td>
<td>0.060</td>
</tr>
<tr>
<td>0.061</td>
<td>0.015</td>
<td>0.035</td>
<td>0.094</td>
</tr>
<tr>
<td>0.110</td>
<td>0.022</td>
<td>0.071</td>
<td>0.158</td>
</tr>
</tbody>
</table>

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171
value of each dimension is above 0.7, proving that the questionnaire has good confidence.

5) Research procedures and statistical analysis

This study strictly complied with the ethics requirements and conducted the questionnaire under the premise of voluntary participation from students and informed the purpose of the study, information confidentiality, questionnaire filling method and points needing particular attention were explained to the students prior to the distribution of the questionnaires. All questionnaires were anonymously filled in and collected on the spot. Incomplete ones were excluded from the study. Data processing was then performed with the SPSS21.0 and the process plug in.

III. RESULTS

A. Baseline Characteristics

Harman's single-factor analysis was used for the common method bias test. The result showed that a total of 11 factors were generated without rotation, and the characteristic root values are all greater than 1, of which the variance explained by the largest factor is 38.103%, which is less than the critical standard of 40%. It can be inferred that there is no common method deviation in this study.

B. Each Variable Describes Statistics and Correlation Analysis

As seen in Table I-II, the correlation coefficient value between sex and friendship quality shows significance; the relationship between sex and friendship quality is 0.292, and shows the significance of 0.01 level, indicating a significant positive correlation between gender and friendship quality. The relationship between friendship quality and strict parental discipline was -0.509 and showed a significant level of 0.01. This indicates a significant negative correlation between friendship quality and strict parental discipline. In addition, the correlation between self-esteem and parental discipline was -0.370 and showed a significant level of 0.01, thus pointing at a significant negative correlation between self-esteem and parental discipline. The relationship between junior high school students' problem behavior and strict parental discipline was 0.529. It showed the significance of 0.01 level, affirming a significant positive correlation between the middle school students' behavior and strict parental discipline. In addition, there was a significant positive correlation between friendship quality and gender, and there were substantial differences in the quality of friendship between different gender samples. The t-test (full name is the independent sample t-test) was then performed to study the differences between gender groups on friendship quality. From the table above, it can be observed that t-test was used to analyze the differences in friendship quality between the gender groups. As illustrated, different gender samples for friendship quality showed significance (p<0.05), meaning that the friendship quality for different gender samples is different. Specific analysis shows that gender for friendship quality showed a 0.01 level of significance. A specific difference can be seen when the average for male students (2.92) is significantly lower than that of female students (3.50). This confirms that different gender samples would show significant differences in friendship quality.

C. The Moderating Role of Friendship Quality

Through the conditional indirect benefit analysis, we learned that when the average regulatory variable level is low, the Bootstrap 95% confidence interval is -0.00~0.060. This shows that parents have no intermediary effect on the influence of self-esteem on junior high school students'
problem behavior on the low level. On the average level, the Bootstrap 95% confidence interval is 0.035–0.094, indicating that self-esteem will mediate the impact of severe parental discipline on junior middle school students' problem behavior. On the high level, the Bootstrap 95% confidence interval was 0.071 to 0.158, meaning harsh parental discipline affects junior high school students' problem behavior. As such, self-esteem is a mediator on the average or high levels but is not so when the regulatory variables are low. The absence of a mediation of self-esteem at the three levels is inconsistent so that regulatory mediation exists at X＞M＞Y, as shown in Table IV-V, and shown in Fig 2-3.

IV. DISCUSSION

A. The Relationship between Strict Parental Discipline and Junior High School Students' Problem Behaviors

This study found that severe parents can significantly positively predict problem behavior in junior high school students, that is, the more severe parenting junior high school students receive, the more obvious is their problem behavior; harsh discipline negatively impacts their behavior, causing potential long-term harm and proneness to discipline violation and aggressiveness. This study is consistent with existing studies showing that parental corporal punishment presents adolescents with the wrong idea that problems can be solved through violence, leading to children externalizing problem behavior (Bandura, 1973). Straus & Mathur (Straus & Mathur, 2011) found that corporal punishment increased symptoms like depression and anxiety in adolescents. A study on adolescents by Calvete, Orue, & Gámez-Guadix (Calvete, Orue, & Gámez-Guadix, 2013) also confirmed that adolescents experiencing harsh parental corporal punishment were more likely to exhibit symptoms of depression, anxiety, indicating that harsh parental discipline led to long-term behavioral problems in them. Gershoff (2002) found that corporal punishment positively affected primary and middle school students' internalization behavior (Gershoff, 2002); research found that parental psychological attacks are carried into adulthood.

Higgins and McCabe (Higgins & McCabe, 2000) found that severe parental discipline is associated with serious problem behavior in adolescents. Rohner by presenting the parental acceptance-rejection theory (Parental Acceptance-Rejection Theory, PAR Theory), which states that parental warmth is an important dimension of parenting, referring to parents expressing support and love for their children through a series of behaviors and words. According to the parents' rejection theory severe discipline (corporal punishment, psychological attack) leaves children feeling rejected and more prone to maladaptive problem behavior. Therefore, parents should realize the behavioral impact of harsh discipline has on their children, reduce corporal punishment and psychological attack, increase parental support and communication, and use appropriate methods to deal with contradictions and problems in their relationship.

B. Junior High School Students: A Moderated Mediation

This study further clarified the path of strict parental discipline, self-esteem, friendship quality of the junior high school students' problem behavior, found that under the premise of high friendship quality level, tough parenting would affect the children's self-esteem, creating behavioral issues. Biocology Theory emphasizes the important impact that the combined effects of environmental and individual factors have on human psychological and behavioral development, with low self-esteem being caused by severe parental discipline and, in the end, leading to behavior problems (Bronfenbrenner, 2005; Bronfenbrenner & Morris, 1998). Research found that self-esteem may be an intermediary variable between childhood and individual behavior and that fragile self-esteem is often accompanied by verbal defense (Kernis, Lakey, & Heppner, 2008)). It was found that acceptance, inclusion, care, warmth, and democratic parenting practices facilitated high self-esteem development in children and that parental inclusive concern had a significant positive relationship with their children's self-esteem (Battle, 1978). Trzesniewski et al. (2006) found that low self-esteem in adolescence leads to poor mental and physical health and also higher levels of criminal activity in early adulthood (Trzesniewski et al., 2006). Meanwhile, self-esteem is also regulated by friendship quality; Keefe and Berndt (1996) found a positive relationship between self-esteem and friendship quality through studies on the relationship between friendship quality and self-esteem in early adolescence (Keefe & Berndt, 1996). Raboteg-Saric and Sakic (2014) found that adolescents with higher friendship quality were happier, had higher life satisfaction and corresponding higher self-esteem level (Raboteg-Saric & Sakic, 2014). A high friendship quality means that the individual is accepted and recognized by others. An increased evaluation of self-value will generate higher self-esteem, thus reducing problem behaviors in junior high school students. When junior high school students have a good friendship and are actively influenced by their friends, they can better cope with their parents' harsh discipline and maintain a positive attitude. The corresponding problem behavior of junior high school students will thus also be reduced; good friendship plays a positive role in junior high school students' physical and mental development. Parent education and friendship are important factors that affect junior high school students' physical and psychological development, and both are indispensable. Combining the two can help junior high school students develop and increase their self-esteem while reducing problematic behaviors.

C. The Moderating Role of Friendship Quality

This study also examined whether friendship quality can regulate the effects of harsh parenting that lead to problem behavior in junior high students and also the mediation path that affects problem behavior through self-esteem. According to the simple slope diagram, it can be observed that friendship quality can alleviate problem behavior caused by severe discipline; it also regulates junior high school students' self-esteem level. According to the Buffering theory (Dean & Lin, 1977), social support can alleviate an individual's stress and promotes good social adaptation. As an important social support for junior high school students, high-quality friendship can provide individuals with instrumental help, emotional support, cognitive ability training, and so on. Véroneau et al. (2010) state that friendship can help reduce
problem behaviors in junior high school students while helping them improve their self-esteem level and regulating their problem behavior (Dean & Lin, 1977; Dishion, Véroneau, & Myers, 2010).

D. Limitations

The limitation of this study resides in the fact that there is no further separation for the scale dimensions to obtain a more detailed and focused analysis on the student's behavior, for instance, the effects of paternal corporal punishment v/s maternal corporal punishment and paternal psychological attack v/s maternal psychological attack could be further explored. At the same time, when studying the relationship between gender and friendship quality, there is no specific analysis of how different distinct personalities affect friendship quality. Also, this study only extracted data on students within a limited time frame and did not track their latter dynamic development. In future studies, the impact of each dimension will be studied more specifically, gender studies will be increased while tracking student data as much as possible.

V. CONCLUSIONS

In summary, this study analyzes harsh parental discipline, self-esteem, friendship quality and junior high school students’ behavior in detail. It proved that strict parental discipline can positively predict problem behavior in junior high school students. It also discussed that self-esteem, as an intermediary variable with regulation, has an intermediary effect on the relationship between harsh parental discipline and junior high school students’ problem behavior. In contrast, friendship quality has a regulating effect on the intermediary effect of self-esteem as a regulating variable. Theoretically enriched parental discipline style, friendship environment, students' self-esteem level all affect the underlying mechanisms of problem behavior in junior high school students. In practice, this study can serve as a reference for parents and schools to deal with behavior problems in junior high school students. The main conclusions are as follows:

1) Strict parental discipline predicts problem behavior in junior high school students.
2) Self-esteem plays an intermediary role between severe parental discipline and junior high school students’ problem behavior, that is, harsh parental discipline mainly affects the students' problem behavior through their self-esteem level.
3) Friendship quality plays a regulating role in the intermediary effect of self-esteem.
4) Friendship quality was different for different gender samples. The average of male T-test was significantly lower than that of female's -the influence of friendship quality regulation was also higher for women than for men.

DECLARATIONS

A. Ethics Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional. The study was approved by School of Education, Universiti Putra Malaysia.

B. CRediT Authorship Contribution Statement

Peng Tiantian: Conceptualization, Calculation, Writing, Original draft, Methodology, Calculation, Data collection, Visualization, Project administration, Formal analysis, Writing Review & Editing.

C. Data Availability Statement

The data involves the personal privacy of the participants, in order to prevent abuse, so it is not availability.

D. Code Availability

For researchers with good reputation, if necessary, can ask the corresponding author for the code. It must be promised that all results will only be used for research, not for commercial purposes.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES
