

# Effects of Peer Victimization in Childhood and Trait Anxiety on Job Stress in Adulthood

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**Background:** The experience of peer victimization in childhood increases the risk of developing anxiety disorders and depression, risk of suicide, as well as sensitivity to stress, in adulthood. Various personality traits are known to be associated with these effects. However, the influence of trait anxiety on job stress has not yet been reported. In the present study, we tested the hypothesis that the experience of peer victimization in childhood and trait anxiety influence job stress in adulthood.

**Methods:** A questionnaire survey, including State-Trait Anxiety Inventory, Childhood Victimization Rating Scale, and Brief Job Stress Questionnaire, was administered to 566 adult workers. The interrelationship between multiple variables was analyzed by multiple regression analysis and path analysis.

**Results:** In the path model, childhood peer victimization had a positive direct effect on trait anxiety and the psychological and physical stress response (PPSR). Trait anxiety had a positive direct effect on job stressors and PPSR, and job stressors had a positive direct effect on PPSR. Regarding indirect effects, childhood peer victimization had a significant adverse effect on job stressors and PPSR via trait anxiety.

**Conclusion:** Our results showed that childhood peer victimization has a negative impact on job stress in adulthood, which is influenced by trait anxiety. Interventions to address peer victimization in childhood and trait anxiety may reduce job stress in adulthood, and thus contribute to improved occupational mental health and productivity in the workplace.

**Keywords:** job stress, peer victimization, trait anxiety, path analysis, mediation effect

## Introduction

Peer victimization is an urgent issue that should be addressed by society as a whole. According to a survey conducted by the Ministry of Education, Culture, Sports, Science and Technology-Japan, in 2020, there were a total of 517,163 cases of peer victimization in elementary, junior high, and senior high schools and special-needs schools, and many children continue to experience peer victimization each year.<sup>1</sup> In addition, previous studies have shown that peer victimization increases the risk of developing anxiety disorders and depression, risk of suicide, as well as increases sensitivity to stress, not only during childhood and adolescence, but also in adulthood.<sup>2-4</sup> Furthermore, it has been pointed out that the long-term effects of childhood stressors, such as abuse and inappropriate parenting experiences, including childhood peer victimization, on depression and depressive symptoms in adulthood are influenced by personality traits, such as neuroticism, and changes in personality traits are known to affect stress sensitivity in adulthood.<sup>5-12</sup>

On the other hand, in daily medical practice, clinicians often encounter cases of working adults who have developed common mental illnesses triggered by various types of stress, including harassment in the workplace.<sup>13-16</sup> Such stress is called “job stress”, and it is believed that human relationships, degree of control of their own work, workload and overtime, job prospects, aptitude for the job, work system (such as shift work and business trips), and work environment induce mental and physical stress reactions and mental illnesses, such as depression, in workers.<sup>17</sup> The job stress model proposed by the National Institute for Occupational Safety and Health (NIOSH) shows that acute stress reactions

(psychological, physiological, and behavioral changes) occur as a result of the job stressors described above, and that problems, such as stress-associated illness and reduced work efficiency eventually occur.<sup>17</sup> In addition to age, sex, and job class, personality characteristics are indicated as influencing this process,<sup>18–20</sup> and these factors increase the risk of developing depression and other mental illnesses.<sup>17</sup> Therefore, it is important to clarify whether personality traits are associated with the abovementioned effects of peer victimization on job stress.

What personality traits are associated with the effects of peer victimization in childhood on job stress in adulthood is an important point. As mentioned earlier, previous studies have focused on neuroticism, which refers to the tendency to be emotionally unstable, such as being prone to depression, anxiety, worry, anger, and irritability.<sup>21</sup> We previously reported that the type of parenting experienced in childhood influences job stressors and accompanying psychological and physical stress responses through its influence on neuroticism.<sup>20</sup> Furthermore, our research group previously reported that childhood peer victimization experiences enhance subjective job stressors through their effects on neuroticism, and exacerbate presenteeism at work.<sup>18</sup>

On the other hand, among the wide variety of personality traits, trait anxiety is a trait that has not yet been fully investigated in relation to job stress. Trait anxiety is an expression of “susceptibility to anxiety”, and refers to the trait of rapidly worsening anxiety under stress, despite the ability to respond normally in stress-free environments.<sup>22,23</sup> This trait is a characteristic that overlaps in part with neuroticism that was described earlier, but the concept of trait anxiety is more anxiety-focused.<sup>24</sup> To date, it has been suggested that childhood experiences of abuse and inappropriate parenting increase trait anxiety, and that high levels of trait anxiety are associated with higher rates of depression, stronger depressive symptoms in adults in general, and greater sensitivity to stressful events.<sup>25–29</sup> Recently, we reported that the experience of peer victimization in childhood increases trait anxiety.<sup>30</sup> However, to our knowledge, there have been no studies to date on whether or not peer victimization in childhood and trait anxiety affect job stress (job stressors and the accompanying psychological and physical stress responses).

Based on the previous studies described above,<sup>6–9,18–20,25,28</sup> we hypothesized that the experience of peer victimization in childhood and trait anxiety influence job stress in adulthood. To investigate our hypothesis, we distributed a questionnaire to adult volunteers and analyzed the association between these variables by multiple regression analysis and path analysis.

## Subjects and Methods

### Subjects

During the period from April 2017 to April 2018, a self-administered questionnaire-based survey was conducted on 597 general adult volunteers. The study was part of a larger study.<sup>19,20</sup> A total of 566 subjects (248 men and 318 women, mean age:  $41.6 \pm 12.0$  years) were included, excluding those with missing values. The inclusion criterion was being 20-years old or older, and the exclusion criteria were having a serious physical disease or organic brain disease. Participants were informed that participation in the study was voluntary, that they would not be disadvantaged if they did not consent, that their data would be kept strictly confidential, and that their personal information would be handled with the utmost care. The study was conducted in accordance with the 1964 Declaration of Helsinki (amended in Fortaleza in 2013), and was approved by the Medical Ethics Review Committee of Tokyo Medical University (study approval number: SH3502). The following 3 questionnaires and demographic information were investigated.

### Questionnaires

#### Childhood Victimization Rating Scale (CVRS)

This scale is a self-administered questionnaire on the degree and frequency of peer victimization experienced in local communities or schools during childhood.<sup>8,9</sup> Victimization was rated on a 5-point scale, as follows: “0 = never”, “1 = rarely”, “2 = sometimes”, “3 = often”, and “4 = always”. The 5 experiences that were evaluated were as follows: (1) In school or in the community, I experienced being left out, ignored, or talked about behind my back. (2) In school or in the community, I experienced being teased, called names, threatened, or having unpleasant things said to me. (3) In school or in the community, I experienced being hit lightly, or punched or kicked while pretending to play. (4) In school or in the

community, I experienced being hit hard, punched, or kicked hard. (5) In school or in the community, I experienced being robbed of money or other possessions, or having my belongings damaged. The total score of the above 5 items was used for the analysis.

### State-Trait Anxiety Inventory Form Y (STAI-Y)

The STAI-Y is a scale evaluating both state anxiety and trait anxiety, which was developed based on Spielberger's state-trait model of anxiety.<sup>31</sup> The 40 items of the STAI-Y is divided into 2 parts, ie, trait anxiety and state anxiety. In this study, we focused on trait anxiety, which indicates a relatively stable tendency to react to anxious experiences, by asking the subjects questions about how they generally feel. The 20 questions include "I feel that difficulties are piling up so that I cannot overcome them", "I worry too much over something that really doesn't matter", and "I lack self-confidence"; and they were rated on the following 4-point scale: "1 = almost never", "2 = sometimes", "3 = often", and "4 = almost always". The Japanese version was translated by Hidano et al, and its reliability and validity were verified.<sup>23</sup>

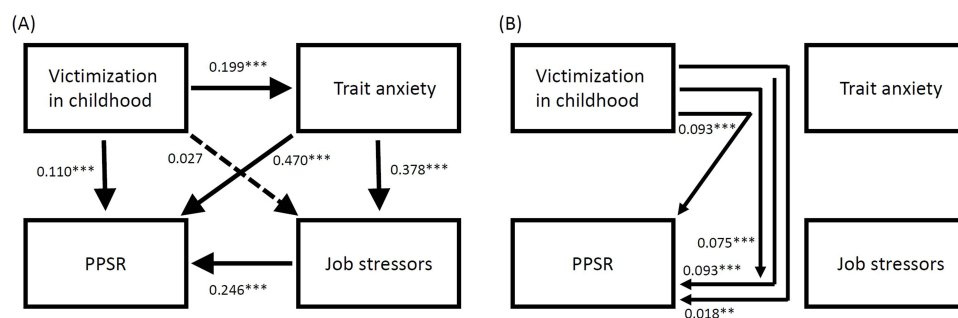
### Brief Job Stress Questionnaire (BJSQ)

The BJSQ is a self-administered questionnaire to assess occupational stress, which was developed by Shimomitsu et al.<sup>32,33</sup> It consists of 57 questions classified into the following 4 factors: subjective job stressors, psychological and physical stress response (PPSR), social support, and satisfaction. The BJSQ has 17 items of subjective job stressors (17–68 points), including quantitative job overload, qualitative job overload, physical demands, job control, skill utilization, interpersonal conflict, poor physical environment, job suitability, and meaningfulness of work, and 29 items of PPSR (29–116 points) experienced in the previous 1 month, such as vigor, anger-irritability, fatigue, anxiety, depression, and physical stress reaction. Higher scores for each subscale indicate higher levels of stress.

### Data Analysis

The association of demographic information and questionnaire data with PPSR was determined by the Pearson's correlation coefficient or Student's *t*-test and multiple regression analysis using SPSS 28.0 software (IBM, Armonk, NY, USA).

A path model was built using childhood peer victimization experiences on the CVRS, trait anxiety on the STAI-Y, and job stressors and PPSR on the BJSQ, considering the chronological order of events experienced in life (ie, peer victimization experiences in childhood, trait anxiety in adulthood as a personality trait, and job stressors and PPSR experienced in the workplace in the previous 1 month). The direct effects of childhood peer victimization on trait anxiety, job stressors, and PPSR, and the indirect effects of childhood peer victimization on job stressors and PPSR via trait anxiety were tested (Figure 1). The path model was analyzed by the analysis of covariance structure with the robust maximum likelihood estimation method using Mplus 8.5 software (Muthén & Muthén, Los Angeles, CA, USA). As there are no absolute criteria to determine the goodness of fit of the model, several goodness-of-fit indices were used to make an overall judgment. In this study, the Comparative Fit Index (CFI) and Root Mean Square Error Approximation (RMSEA) were used as goodness-of-fit indices. A model is considered to be acceptable if the CFI is greater than 0.95



**Figure 1** Results of covariance structure analysis using a path model, showing peer victimization experienced in childhood, trait anxiety on the State-Trait Anxiety Inventory form Y, and subjective job stressors and psychological and physical stress response (PPSR) on the Brief Job Stress Questionnaire of 566 adult workers. The arrows with solid lines represent statistically significant paths, and the arrow with a dotted line shows the nonsignificant path. The numbers beside the arrows indicate the standardized path coefficients. Direct effects (A) and indirect effects (B) are shown separately. \*\*  $p < 0.01$ , \*\*\* $p < 0.001$ .

and the RMSEA is less than 0.08. A model is considered to be good if the CFI is greater than 0.97 and the RMSEA is less than 0.05.<sup>34</sup> To evaluate the common method variance in this model, we performed the Harman’s single-factor test. The results showed that no single factor can explain the majority of the variance (the maximum component explained only 38.7% of the total variance), which means that there was no common method bias in this study. A *p*-value of less than 0.05 was considered to indicate a statistically significant difference.

Results

Associations of Demographic Information and Questionnaire Data with PPSR

Table 1 shows the results of associations of demographic information and questionnaire data with the PPSR score of 566 adult volunteers. Women, unmarried subjects, those with current psychiatric disease, and a past history of psychiatric disease had significantly higher scores than the other subjects (all *p* < 0.001). Age was negatively correlated with PPSR scores, but total scores of the CVRS, trait anxiety score, and job stressor scores were positively correlated with PPSR scores. No significant correlation of years of education or association of living alone were found with PPSR scores.

These results indicate that childhood peer victimization experiences, trait anxiety, and job stressors are significantly and positively correlated with PPSR scores. In the next step, we tested this reciprocal association using a path model.

Results of Multiple Regression Analysis with PPSR as a Dependent Variable

Table 2 shows the results of multiple regression analysis using PPSR score on the BJSQ as the dependent variable. Of the 10 independent variables, sex, current psychiatric disease, trait anxiety on the STAI-Y, total CVRS score, and job stressors on the BJSQ were the 5 independent variables that were significantly associated with the PPSR score. The adjusted *R*<sup>2</sup> was 0.428, and multicollinearity was ruled out.

Path Analysis

In the path model, childhood peer victimization, trait anxiety, job stressors, and PPSR scores were observed variables, and covariance structure analysis with the robust maximum likelihood was used to analyze the results, as shown in Figure 1A. The goodness-of-fit of the path model was CFI = 1.000 and RMSEA = 0.000, which indicates a good fit. The direct effects of childhood peer victimization on trait anxiety and PPSR scores were significantly positive. Trait anxiety had a positive direct effect on job stressors and PPSR scores, and job stressors had a positive direct effect on PPSR scores. The direct effect of childhood peer victimization on job stressors was not significant.

**Table 1** Characteristics, Peer Victimization Experience, Trait Anxiety, and Job Stress and Their Correlation with PPSR Score of the BJSQ or Effects on PPSR Score in 566 Adult Workers

Characteristic or measure	Value (number or mean ± SD)	Correlation with PPSR score ( <i>r</i> ) or effect on PPSR score (mean ± SD, <i>t</i> -test)
Age	41.6 ± 12.0	<i>r</i> = −0.090, <i>p</i> = 0.016
Sex (men:women)	248:318	Men 51.5 ± 14.4 vs women 56.0 ± 14.9, <i>p</i> < 0.001 ( <i>t</i> -test)
Education years	14.6 ± 1.8	<i>r</i> = −0.054, <i>p</i> = 0.103
Marital status (married:unmarried)	369:192	Married 52.0 ± 14.4 vs unmarried 57.7 ± 15.2, <i>p</i> < 0.001 ( <i>t</i> -test)
Living alone (no:yes)	445:114	No 53.5 ± 14.7 vs yes 56.0 ± 15.1, <i>p</i> = 0.104 ( <i>t</i> -test)
Current psychiatric disease (no: yes)	23:533	No 53.4 ± 14.6 vs yes 68.3 ± 15.3, <i>p</i> < 0.001 ( <i>t</i> -test)
Past history of psychiatric disease (no:yes)	498:68	No 53.0 ± 14.5 vs yes 61.4 ± 15.2, <i>p</i> < 0.001 ( <i>t</i> -test)
Trait anxiety of STAI-Y	43.1 ± 10.5	<i>r</i> = 0.591, <i>p</i> < 0.001
Total score of Childhood Victimization Rating Scale	2.4 ± 3.3	<i>r</i> = 0.229, <i>p</i> < 0.001
BJSQ		
Job stressor	40.6 ± 6.3	<i>r</i> = 0.440, <i>p</i> < 0.001
PPSR	54.0 ± 14.9	

**Notes:** Data are presented as means ± SD or numbers. *r* = Pearson’s correlation coefficient.  
**Abbreviations:** BJSQ, Brief Job Stress Questionnaire; PPSR, Psychological and Physical Stress Response; STAI-Y, State-Trait Anxiety Inventory form Y.

**Table 2** Results of Multiple Regression Analysis with PPSR Score of the BJSQ as a Dependent Variable (Forced Entry Method)

Independent variable	Standardized Partial Regression Coefficient ( $\beta$ )	p-value	VIF
Age	−0.042	0.280	1.412
Sex (women)	0.108	0.002	1.105
Marital status (married)	−0.020	0.637	1.697
Living alone	0.013	0.745	1.555
Education (years)	0.030	0.430	1.387
Past history of psychiatric disease	0.039	0.304	1.372
Current psychiatric disease	0.080	0.031	1.294
Trait anxiety of STAI-Y	0.444	< 0.001	1.342
Total score of Childhood Victimization Rating Scale	0.101	0.003	1.090
Job stressor on BJSQ	0.241	< 0.001	1.221

Notes: Adjusted  $R^2 = 0.428$ ,  $F = 41.687$ ,  $p < 0.001$ .

Abbreviations: VIF, Variance Inflation Factor; BJSQ, Brief Job Stress Questionnaire; PPSR, Psychological and Physical Stress Response; STAI-Y, State-Trait Anxiety Inventory form Y.

Regarding indirect effects (Figure 1B), childhood peer victimization had a significant impact on job stressors and PPSR scores via trait anxiety (standardized coefficient: 0.075,  $p < 0.001$  and 0.093,  $p < 0.001$ , respectively). Trait anxiety also had a significant effect on PPSR scores via job stressors (0.093,  $p < 0.001$ ). Childhood peer victimization had a significant effect on PPSR scores via a combination of trait anxiety and job stressors (0.018,  $p < 0.01$ ). With an  $R^2$  value of 0.408, this model explains 40.8% of the variation in PPSR scores in adult workers.

## Discussion

To our knowledge, this is the first report to date to demonstrate that childhood peer victimization and trait anxiety worsen job stressors and subsequent PPSR in workers in adulthood. Although there have been several reports focusing on the association between childhood peer victimization and mental health, such studies have often focused on the effects at the symptom level of individual common mental illnesses, such as depression and anxiety disorders and symptoms.<sup>2–4,8,9,12,30</sup> The present study is unique in that it indicates the impact of childhood peer victimization on occupational mental health and its psychological mechanisms.

In the present study, the experience of peer victimization in childhood was found to directly affect trait anxiety in the path model and multiple regression model. We recently reported on the effects of childhood peer victimization on trait anxiety.<sup>30</sup> In that study, as in the present report, a cross-sectional questionnaire survey in adult volunteers demonstrated that childhood experience of peer victimization augmented depressive symptoms by enhancing trait anxiety and further augmenting depressive rumination. In addition, childhood abuse shares similarities with childhood peer victimization in that it is an experience of being harmed by others in childhood. Several reports showed that childhood abuse increases trait anxiety, and trait anxiety exacerbates depression and presenteeism in adulthood.<sup>25,28,35</sup> Whereas childhood abuse usually occurs in the family environment, which may be more difficult to avoid, peer victimization is thought to be easier to avoid by leaving the situation. The fact that childhood peer victimization in the present study enhanced trait anxiety indicates how childhood stress strongly influences the development of personality, regardless of whether or not there is a possibility of avoiding the situation, and provokes long-term effects on psychiatric symptoms and mental health with its effects on personality.

To the best of our knowledge, there are no previous studies on the effects of childhood peer victimization on occupational stress. However, in a similar study, our research group recently reported that childhood peer victimization exacerbates presenteeism in the general adult workplace by enhancing neuroticism and job stressors.<sup>18</sup> In this previous study, childhood peer victimization experiences were found to augment job stressors via the enhancement of neuroticism.<sup>18</sup> As neuroticism and trait anxiety share common personality traits and brain mechanisms,<sup>24</sup> this may



explain why the 2 personality traits are related to the association between childhood peer victimization and job stressors in adulthood. On the other hand, we previously reported the effects of the experience of inappropriate parenting in childhood on job stress, which was influenced by neuroticism.<sup>20</sup> The inappropriate parenting experiences in this previous study caused childhood stress, and hence could be considered as a type of childhood abuse, and the results are similar to those of the present study. Furthermore, our group recently reported that experiencing inappropriate parenting in childhood can exacerbate presenteeism in the workplace in adulthood, by enhancing trait anxiety and depressive rumination.<sup>36</sup> This previous study suggests that inappropriate parenting experiences may have a similar effect on trait anxiety and job stress as peer victimization experiences. Furthermore, trait anxiety may also affect job stress by enhancing depressive rumination. The previous finding that childhood peer victimization experiences augment depressive rumination via trait anxiety strongly supports this idea.<sup>30</sup>

The clinical significance of this study is the elucidation that job stress, an important issue in occupational mental health, is influenced by childhood experiences of peer victimization and the resulting enhancement of trait anxiety. The NIOSH has long noted the importance of the influence of personal factors, such as personality traits, in job stress models.<sup>17</sup> Workplace assessments of the experience of peer victimization in childhood and trait anxiety may provide a more tailored and accurate understanding of job stress in individual workers. In addition, positive administrative policies toward childhood peer victimization are expected to improve labor productivity at the national level.<sup>37</sup>

Because this is a cross-sectional study, it is not possible to confirm causal associations among the factors, and prospective follow-up studies are needed to validate the results of this study. In addition, sampling bias may occur because the subjects were recruited on a voluntary basis. The results of the self-administered questionnaires on childhood experiences of peer victimization, trait anxiety, job stressors, and PPSR may differ from objective assessments. In addition, as the questionnaire is designed for subjects to recall their childhood experiences, there is a possibility of recall bias. In recent year, studies on adverse childhood experiences (ACEs) have gained a large amount of attention in the fields of medicine, psychology, and public health.<sup>38</sup> In most ACE studies, ACEs, including childhood peer victimization, are retrospectively evaluated in adults.<sup>38</sup> It is of note that the retrospective assessment of ACEs has been validated by a prospective study using the Dunedin Study, which is a well-known birth cohort study (correlation of the number of ACEs between the retrospective assessment and prospective assessment was 0.47).<sup>38,39</sup> In addition, more important is that subjective memories rather than actual events are known to influence mental health in psychology and psychiatry. Therefore, the retrospective evaluation of peer victimization in childhood is not only a limitation of the present study, but can also be considered as a strength of this study from a different perspective.

## Conclusions

In this study, we showed that the experience of peer victimization in childhood increases trait anxiety, and indirectly enhances job stressors and PPSR, ie, peer victimization experienced in childhood negatively affects job stress in adulthood. Interventions, such as strengthening education and measures to prevent childhood peer victimization, and providing early psychological support to victims of peer victimization can reduce trait anxiety and adverse responses to job stress in adulthood, resulting in improved occupational mental health and productivity in the workplace.

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## Author Contributions

All authors made a significant contribution to the work reported, whether in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising, or critically reviewing the manuscript; gave final approval of the version to be published; have agreed on the journal to which the manuscript has been submitted; and agree to be accountable for all aspects of the work.

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