

World Journal of *Psychiatry*

World J Psychiatr 2021 November 19; 11(11): 915-1166



Contents

Monthly Volume 11 Number 11 November 19, 2021

FIELD OF VISION

- 915 How does the 'environment' come to the person? The 'ecology of the person' and addiction
Tretter F, Loeffler-Stastka H

EVIDENCE REVIEW

- 937 Therapeutic termination of pregnancy and women's mental health: Determinants and consequences
di Giacomo E, Pessina R, Santorelli M, Rucco D, Placenti V, Aliberti F, Colmegna F, Clerici M

REVIEW

- 954 G-protein coupled receptors and synaptic plasticity in sleep deprivation
Parmar S, Tadavarty R, Sastry BR
- 981 Agmatine as a novel candidate for rapid-onset antidepressant response
Valverde AP, Camargo A, Rodrigues ALS
- 997 Healthy diet, depression and quality of life: A narrative review of biological mechanisms and primary prevention opportunities
Pano O, Martínez-Lapiscina EH, Sayón-Orea C, Martínez-Gonzalez MA, Martínez JA, Sanchez-Villegas A

MINIREVIEWS

- 1017 Neurodevelopmental disorders: An innovative perspective *via* the response to intervention model
Rodríguez C, Areces D, García T, Cueli M, Gonzalez-Castro P
- 1027 How non-rapid eye movement sleep and Alzheimer pathology are linked
Falter A, Van Den Bossche MJA
- 1039 Empirically supported psychological treatments: The challenges of comorbid psychiatric and behavioral disorders in people with intellectual disability
Gómez LE, Navas P, Verdugo MÁ, Tassé MJ
- 1053 Phantom bite syndrome: Revelation from clinically focused review
Tu TTH, Watanabe M, Nayanar GK, Umezaki Y, Motomura H, Sato Y, Toyofuku A
- 1065 Breast cancer in schizophrenia could be interleukin-33-mediated
Borovcanin MM, Vesic K

ORIGINAL ARTICLE**Basic Study**

- 1075** CPEB1, a novel risk gene in recent-onset schizophrenia, contributes to mitochondrial complex I defect caused by a defective provirus ERVWE1

Xia YR, Wei XC, Li WS, Yan QJ, Wu XL, Yao W, Li XH, Zhu F

Retrospective Study

- 1095** Psychiatric hospitalization during the two SARS-CoV-2 pandemic waves: New warnings for acute psychotic episodes and suicidal behaviors

Panariello F, Longobardi S, Cellini L, De Ronchi D, Atti AR

Observational Study

- 1106** Self-compassion and resilience mediate the relationship between childhood exposure to domestic violence and posttraumatic growth/stress disorder during COVID-19 pandemic

Chi XL, Huang QM, Liu XF, Huang LY, Hu MJ, Chen ZJ, Jiao C, Stubbs B, Hossain MM, Zou LY

- 1116** Subgrouping time-dependent prescribing patterns of first-onset major depressive episodes by psychotropics dissection

Chen HC, Hsu HH, Lu ML, Huang MC, Chen CH, Wu TH, Mao WC, Hsiao CK, Kuo PH

SYSTEMATIC REVIEWS

- 1129** New-onset depression after hip fracture surgery among older patients: Effects on associated clinical outcomes and what can we do?

Qin HC, Luo ZW, Chou HY, Zhu YL

META-ANALYSIS

- 1147** Effectiveness of cognitive behavioral therapy-based interventions on health outcomes in patients with coronary heart disease: A meta-analysis

Li YN, Buys N, Ferguson S, Li ZJ, Sun J

ABOUT COVER

Peer Reviewer of *World Journal of Psychiatry*, Li Zhang, MD, PhD, Professor, Department of Geriatric Neurology, Affiliated Brain Hospital of Nanjing Medical University, Nanjing 210029, Jiangsu Province, China.
neuro_zhangli@163.com

AIMS AND SCOPE

The primary aim of *World Journal of Psychiatry* (WJP, *World J Psychiatr*) is to provide scholars and readers from various fields of psychiatry with a platform to publish high-quality basic and clinical research articles and communicate their research findings online.

WJP mainly publishes articles reporting research results and findings obtained in the field of psychiatry and covering a wide range of topics including adolescent psychiatry, biological psychiatry, child psychiatry, community psychiatry, ethnopsychology, psychoanalysis, psychosomatic medicine, etc.

INDEXING/ABSTRACTING

The WJP is now abstracted and indexed in Science Citation Index Expanded (SCIE, also known as SciSearch®), Current Contents/Clinical Medicine, Journal Citation Reports/Science Edition, PubMed, and PubMed Central. The 2021 edition of Journal Citation Reports® cites the 2020 impact factor (IF) for WJP as 4.571; IF without journal self cites: 4.429; 5-year IF: 7.697; Journal Citation Indicator: 0.73; Ranking: 46 among 156 journals in psychiatry; and Quartile category: Q2.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: Xu Guo; Production Department Director: Yu-Jie Ma; Editorial Office Director: Jia-Ping Yan.

NAME OF JOURNAL

World Journal of Psychiatry

ISSN

ISSN 2220-3206 (online)

LAUNCH DATE

December 31, 2011

FREQUENCY

Monthly

EDITORS-IN-CHIEF

Rajesh R Tampi

EDITORIAL BOARD MEMBERS

<https://www.wjgnet.com/2220-3206/editorialboard.htm>

PUBLICATION DATE

November 19, 2021

COPYRIGHT

© 2021 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS

<https://www.wjgnet.com/bpg/gerinfo/204>

GUIDELINES FOR ETHICS DOCUMENTS

<https://www.wjgnet.com/bpg/GerInfo/287>

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

<https://www.wjgnet.com/bpg/gerinfo/240>

PUBLICATION ETHICS

<https://www.wjgnet.com/bpg/GerInfo/288>

PUBLICATION MISCONDUCT

<https://www.wjgnet.com/bpg/gerinfo/208>

ARTICLE PROCESSING CHARGE

<https://www.wjgnet.com/bpg/gerinfo/242>

STEPS FOR SUBMITTING MANUSCRIPTS

<https://www.wjgnet.com/bpg/GerInfo/239>

ONLINE SUBMISSION

<https://www.f6publishing.com>



Observational Study

Self-compassion and resilience mediate the relationship between childhood exposure to domestic violence and posttraumatic growth/stress disorder during COVID-19 pandemic

Xin-Li Chi, Qiao-Min Huang, Xiao-Feng Liu, Liu-Yue Huang, Meng-Jian Hu, Zhi-Jing Chen, Can Jiao, Brendon Stubbs, M Mahbub Hossain, Li-Ye Zou

ORCID number: Xin-Li Chi 0000-0002-3901-8107; Qiao-Min Huang 0000-0003-0870-3125; Xiao-Feng Liu 0000-0002-8971-6624; Liu-Yue Huang 0000-0001-8293-2220; Meng-Jian Hu 0000-0003-0429-845X; Zhi-Jing Chen 0000-0003-2438-120X; Can Jiao 0000-0002-8278-0834; Brendon Stubbs 0000-0001-7387-3791; M Mahbub Hossain 0000-0002-3223-0949; Li-Ye Zou 0000-0001-6411-5710.

Author contributions: Chi XL drafted the manuscript, completed the literature searches, and revised the final version of the manuscript; Huang QM drafted the manuscript and performed the statistical analyses; Liu XF, Huang LY, Jiao C, Stubbs B, and Hossain MM drafted the manuscript; Hu MJ and Chen ZJ revised the manuscript and performed the statistical analyses; Zou LY contributed to the study design.

Institutional review board

statement: The study was reviewed and approved by the Medical Ethics Committee of Medical Department of Shenzhen University (Approval No. 2020005).

Informed consent statement:

Xin-Li Chi, Liu-Yue Huang, Meng-Jian Hu, Zhi-Jing Chen, Can Jiao, Institute of KEEP Collaborative Innovation, School of Psychology, Shenzhen University, Shenzhen 518060, Guangdong Province, China

Qiao-Min Huang, Guangdong Polytechnic, Foshan 528041, Guangdong Province, China

Xiao-Feng Liu, Longhua No. 2 Experimental School Affiliated Hongchuang Kindergarten, Shenzhen 518100, Guangdong Province, China

Brendon Stubbs, Physiotherapy Department, South London & Maudsley NHS Fdn Trust, London WC2R 2LS, United Kingdom

Brendon Stubbs, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London WC2R 2LS, United Kingdom

M Mahbub Hossain, School of Public Health, Texas A&M University, Texas, TX 77843, United States

Li-Ye Zou, Exercise Psychophysiology Laboratory, Institute of KEEP Collaborative Innovation, School of Psychology, Shenzhen University, Shenzhen 518060, Guangdong Province, China

Corresponding author: Li-Ye Zou, PhD, Professor, Exercise Psychophysiology Laboratory, Institute of KEEP Collaborative Innovation, School of Psychology, Shenzhen University, No. 3688 Nanhai Avenue, Nanshan District, Shenzhen 518060, Guangdong Province, China. liyizou123@gmail.com

Abstract

BACKGROUND

Studies have indicated that childhood exposure to domestic violence is a common factor in posttraumatic growth (PTG) and posttraumatic stress disorder (PTSD), but it is unclear whether PTG and PTSD share a common/different underlying mechanism.

AIM

To explore the common/different underlying mechanism of PTG and PTSD.

Informed written consent was obtained from the patient for publication of this report and any accompanying images.

Conflict-of-interest statement: The author(s) declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data sharing statement: Technical appendix, statistical code, and dataset available from the corresponding author at liyezou123@gmail.com. Participants gave informed consent for data sharing

STROBE statement: The authors have read the STROBE statement, and the manuscript was prepared and revised according to the STROBE statement.

Country/Territory of origin: China

Specialty type: Psychology

Provenance and peer review: Invited article; Externally peer reviewed

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): 0
Grade C (Good): C, C
Grade D (Fair): 0
Grade E (Poor): 0

Open-Access: This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

Received: February 11, 2021

Peer-review started: February 11, 2021

First decision: March 16, 2021

METHODS

Between February 12 and 17, 2020, a nationwide cross-sectional online survey was conducted in China among 2038 university students, and a self-administered questionnaire was used for the data collection. The data included demographic characteristics, such as age, gender, and subjective social economic status, and childhood exposure to domestic violence scale that was selected from the Chinese version of revised Adverse Childhood Experiences Question, Self-compassion Scale, Connor-Davidson Resilience Scale, Posttraumatic Growth Inventory, and the Abbreviated PTSD Checklist-Civilian version. A structural equation model was used to test the hypotheses.

RESULTS

Exposure to domestic violence was significantly associated with PTG and PTSD *via* a 1-step indirect path of self-compassion (PTG: $\beta = -0.023$, 95%CI: -0.44 to -0.007; PTSD: $\beta = 0.008$, 95%CI: 0.002, 0.014) and *via* a 2-step indirect path from self-compassion to resilience (PTG: $\beta = -0.008$, 95%CI: -0.018 to -0.002; PTSD: $\beta = 0.013$, 95%CI: 0.004-0.024). However, resilience did not mediate the relationship between exposure to domestic violence and PTG and PTSD.

CONCLUSION

PTG and PTSD are common results of childhood exposure to domestic violence, which may be influenced by self-compassion and resilience.

Key Words: Self-compassion; Resilience; Domestic violence; Posttraumatic growth; Posttraumatic stress disorder; COVID-19

©The Author(s) 2021. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: The present study explored the issue that whether posttraumatic growth (PTG) and PT stress disorder (PTSD) have a common underlying mechanism *via* self-compassion and resilience. This is the first study that examined the mechanisms underlying the association of domestic violence with PTG and PTSD among college students during the coronavirus disease-2019 pandemic, providing insights into the development of PTG and PTSD in the context of a global pandemic, which emphasize unique psychosocial dynamics.

Citation: Chi XL, Huang QM, Liu XF, Huang LY, Hu MJ, Chen ZJ, Jiao C, Stubbs B, Hossain MM, Zou LY. Self-compassion and resilience mediate the relationship between childhood exposure to domestic violence and posttraumatic growth/stress disorder during COVID-19 pandemic. *World J Psychiatr* 2021; 11(11): 1106-1115

URL: <https://www.wjgnet.com/2220-3206/full/v11/i11/1106.htm>

DOI: <https://dx.doi.org/10.5498/wjp.v11.i11.1106>

INTRODUCTION

Domestic violence has always been a serious social problem with a high incidence rate. Data from the World Health Organization[1] indicate that one-third of women worldwide have experienced physical violence, with many of these incidents happening in front of children and adolescents, therefore making it even more disturbing. Previous studies have consistently demonstrated that children who were exposed to domestic violence are significantly associated with an increased risk of psychological problems such as posttraumatic stress disorder (PTSD)[2-4].

Although PTSD symptoms in posttraumatic (PT) adolescent groups have been reported, many researchers found that PT individuals may also show positive psychological changes or posttraumatic growth (PTG)[5-7], which is defined as the positive psychological changes experienced as a result of the struggle with a traumatic event.

PTSD and PTG following trauma are two completely different psychological constructs but may coexist in traumatized individuals, especially individuals who were exposed to domestic violence[8,9]. However, few studies have simultaneously

Revised: May 2, 2021**Accepted:** July 16, 2021**Article in press:** July 16, 2021**Published online:** November 19, 2021**P-Reviewer:** Kurniawan A, Tung TH**S-Editor:** Zhang H**L-Editor:** Wang TQ**P-Editor:** Ma YJ

examined the mechanisms by which domestic violence affects PTG and PTSD. Therefore, it is unclear whether a common mechanism underlies the association between domestic violence and PTG/PTSD. To better understand the process of reactions to stressful events among young adults and to develop prevention or intervention programs, this study aimed to identify factors that mediate the association between physical domestic violence and PTG and PTSD. This study further examined and compared the mechanisms underlying these associations. It may inform future mental health interventions for vulnerable individuals. In addition, this study has critical significance as it was conducted amidst the coronavirus disease 2019 (COVID-19) outbreak, thus it may provide insights into the development of PTG and PTSD in the context of a global pandemic. Such insights emphasize unique psychosocial dynamics, especially among those who experienced trauma in the past and those currently experiencing global psychosocial stressors attributable to the pandemic.

Potential mediating role of self-compassion and resilience

The Kumpfer's resilience framework believes that individuals who encountered the traumatic event would gather their own resources to cope with the stress based on their cultural context. The more risk factors (such as childhood exposure to domestic violence) or the fewer protective factors in the cultural context there are, the higher probability individuals perform maladaptively, and *vice versa*. Hence, the stress would be alleviated or strengthened by the cultural context. Then, interactions between individuals and the environment would happen to handle stress, which may lead to the changes of the internal resources and traits associated with resilience. Consequently, the process of resilience influenced by such traits would bring about the adaption or maladaptation which may reduce the possibility of developing PTG and PTSD[10].

Self-compassion is the ability to treat oneself with the same kindness and compassion as one would treat others in the same situation[11], which was regarded as a trait associated with resilience. Existing literature indicated that self-compassion is an important predictor of resilience and promoting self-compassion may facilitate individual resilience[12-14]. This suggests that individuals with high self-compassion can exhibit a higher level of resilience and better adapt and recover when facing stress or difficulties. In contrast, individuals with a low level of self-compassion are inclined to criticize or reject themselves, which often form negative self-beliefs and low self-esteem, and feel unworthy of love[15]. These eventually lead to a low level of resilience.

Present study

Based on the Kumpfer's resilience framework and empirical evidence, the present study hypothesized that the effect of childhood exposure to domestic violence on PTG and PTSD is significantly mediated by self-compassion (hypothesis 1) and resilience (hypothesis 2), respectively (1-step indirect path). It was also hypothesized that childhood exposure to domestic violence may affect PTG and PTSD *via* self-compassion to resilience (hypothesis 3) (2-step indirect path). Specifically, suffering from the trauma of COVID-19, children and adolescents who were exposed to domestic violence regarded as a risk factor may show a lower level of self-compassion compared with those who were not. It would lead to a lower level of resilience, increased risk of PTSD, and decreased likelihood of PTG.

MATERIALS AND METHODS

Study participants

Between February 12 and 17, 2020, college students who have been or have not been exposed to domestic violence from more than 180 universities in China were recruited to participate in this study. Prior to filling out several self-reported questionnaires, all volunteers signed an online consent form which was opaque about the aim of the study to control the Hawthorn effect. Overall, 2500 students from 29 provinces and cities of China were invited on the basis of the following inclusion criteria: Being at least 18 years of age and fluent in Chinese; however, only 2126 students completed the questionnaire (85.04% response rate). Of these 2126 students, 88 were excluded due to missing or incomplete responses. Finally, data of the remaining 2038 students (755 males and 1283 females, mean age: 20.56 ± 1.90) was analyzed. To ensure the adequate power, we calculated the sample size using the sampling formula $\{N = [(Z^2)p(1-p)]/d^2\}$

[16], which determined that at $\alpha = 0.05$, $P = 0.3$, and $d = 0.03$, the sample size needed was approximately 896 individuals. The sample size of 2038 in the present study should be sufficient.

Procedure

In an attempt to control the pandemic, the government had imposed a nationwide lockdown. Hence, this cross-sectional survey was conducted online, which was also safer and convenient. For 6 d, students were invited to participate in the survey *via* Tencent's QQ, WeChat, Weibo, and college-related websites, such as university association websites and bulletin board system forums. Participants who clicked the survey link would be automatically directed to the questionnaire website page. It would not be proceeded to the next page unless participants completed all the items on the current page so that there was no missing data for those who completed the questionnaire. Participants received 10 RMB *via* online payment (equivalent to USD 1.5 at the time) on completion of the survey, which took approximately 20 min. Recruitment and data collection procedures were approved by the Human Research Ethics Committee (No: 2020005) of Shenzhen University.

Measurement

Dependent variables: The independent variables were PTSD and PTG. PTSD symptoms were assessed using the abbreviated PTSD Checklist-Civilian version (PCL-C)[17,18]. It consists of six items that correspond to six different symptoms. The respondents rated the frequencies of symptoms over the past 1 mo on a 5-point Likert scale that ranges from 1 (not at all) to 5 (extremely). To assess participants' PTSD related to the COVID-19 pandemic, we revised "stressful experience" in this scale to "COVID-19 pandemic" (*e.g.*, "Feeling very upset when something reminded you of COVID-19 pandemic from the past"). Higher total scores indicate more severe PTSD symptoms. The PCL-C possesses good psychometric with a sensitivity of 0.78 and specificity of 0.71[17]. In the present study, the results indicated a good internal reliability (Cronbach's $\alpha = 0.81$) of this scale.

PTG was assessed using the 21-item Posttraumatic Growth Inventory (PTGI)[19]. It includes five dimensions: Relating to others (seven items), new possibilities (five items), personal strength (four items), spiritual change (two items), and appreciation of life (three items). Previous studies conducted by two different research groups indicated that few persons, including Chinese college students, expressed religious beliefs and spiritual change (two items); therefore, these items were deemed not applicable to the local culture and were finally excluded from this study[20,21]. All items were rated on a 6-point scale ranging from 0 (no change) to 5 (complete change). Sum scores were obtained, ranging from 0 to 95, with higher scores representing higher levels of PTG. The inventory in prior studies was found to have good psychometric properties in the Chinese context with an internal reliability of 0.88[22-24]. In this study, the internal reliability of the inventory was 0.95 and the internal reliabilities for the 4 subscales were 0.88, 0.86, 0.81, and 0.82, respectively.

Independent variable: The independent variable was childhood exposure to domestic violence, which was selected from the Chinese version of the revised Adverse Childhood Experiences Question. More specifically, this scale was used to measure domestic violence experienced in the first 18 years of life[25,26]. It contains 4 items and each item was rated on a 5-point scale ranging from 1 to 5 (1 = never, 2 = once or twice, 3 = sometimes, 4 = often, and 5 = very often). The total scores were used, with higher scores representing a higher frequency of exposure to domestic violence. The Chinese version of the revised Adverse Childhood Experiences Question possesses good psychometric properties with an internal reliability of 0.83[26]. In this study, the internal reliability of the scale was good (Cronbach's $\alpha = 0.84$).

Mediation variables: The mediation variables were self-compassion and resilience. Self-compassion was assessed using the Self-compassion Scale, which has 26 items on 6 dimensions: Self-kindness (5 items), self-judgment (5 items), common humanity (4 items), isolation (4 items), mindfulness (4 items), and over-identification (4 items). All items were rated on a 5-point scale ranging from 1 (almost never) to 5 (almost always). Self-judgment, isolation, and over-identification should be scored in reverse, then a grand mean was computed based on the mean of all six subscales, with higher scores reflecting a greater level of self-compassion. This scale was adapted in Chinese, with good reliability (Cronbach's $\alpha = 0.96$) and validity reported among Chinese adolescents and college students[27-29]. In this study, the internal reliability of the scale was good (Cronbach's $\alpha = 0.87$), and the internal reliabilities for the 6 subscales

were 0.81, 0.65, 0.68, 0.75, 0.81, and 0.66, respectively, indicating an acceptable reliability.

Resilience was assessed using a short version of the Connor–Davidson Resilience Scale (CD-RISC). It reflects the ability to tolerate experiences, such as change, personal problems, illness, pressure, failure, and painful feeling[30]. Participants responded to 10 items on a 5-point Likert scale (0 = not true at all to 4 = true nearly all of the time), with total scores ranging from 0 to 40 (higher points indicate greater resilience capacity). This original scale in Chinese was adapted and reported with good reliability (Cronbach's $\alpha = 0.88$) and validity[31,32]. In this study, the results indicated an excellent internal consistency (Cronbach's $\alpha = 0.92$).

Statistical analysis

First, the mean \pm SD or distribution was calculated for all variables. Second, partial correlations were performed to examine the association between domestic violence and PTG, PTSD, self-compassion, and resilience while controlling the age, gender, subjective social economic status, and family structure. Third, to examine the mediating role of self-compassion and resilience in the relationship between domestic violence and PTG and PTSD, a series of structural equation models were built. First, we established a direct model from domestic violence to PTG and PTSD and relational paths among PTG and PTSD were then added. Second, based on the direct model, an indirect model with the mediators (self-compassion and resilience) inserted between domestic violence and PTG and PTSD was built. In this indirect model, the predictive paths from self-compassion to resilience were added. The specific mediation pathways were presented as below: domestic violence \rightarrow self-compassion \rightarrow resilience \rightarrow PTG/PTSD; domestic violence \rightarrow resilience \rightarrow PTG/PTSD; domestic violence \rightarrow self-compassion \rightarrow PTG/PTSD. Finally, a parsimonious model constraining non-significant paths to zero was built to further identify the indirect effect of domestic violence and PTG/PTSD *via* self-compassion and resilience. In the process of path analysis, all aforementioned variables were treated as observed variables in terms of their total scores, with controlling the cofounders as above. For all pathways, standardized direct, specific indirect, total indirect, and total effects were estimated. Standardized values were reported for all estimations. The goodness of fit was assessed using the following fit indices: Comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Thresholds used were as follows: For CFI and TLI, excellent fit > 0.95 and moderate fit > 0.90 ; for RMSEA and SRMR, excellent fit < 0.05 and moderate fit < 0.08 .

RESULTS

Descriptive statistics and correlations of variables

The descriptions of cofounders are as follows: Gender, 755 males and 1286 females; age, 20.56 (SD = 1.90) years; subjective social economic status, 4.85 (SD = 1.38); family structure, 1859 intact families and 179 non-intact families. Table 1 shows the mean \pm SD for all variables, as well as results from partial correlation analyses between every two variables (domestic violence, self-compassion, resilience, PTG, and PTSD). The mean variable values were as follows: PTG, 60.97 (SD = 16.95); PTSD, 11.79 (SD = 4.25); resilience, 35.45 (SD = 6.62); self-compassion, 84.75 (SD = 11.88); and domestic violence, 4.76 (SD = 1.72). Further, the results of partial correlations while controlling the age, gender, subjective social economic status, and family structure, showed that PTG was significantly positively correlated with self-compassion and resilience ($P < 0.001$), but significantly negatively correlated with domestic violence ($P < 0.001$). Moreover, PTSD had a positive association with domestic violence ($P < 0.001$), but negatively correlated with resilience and self-compassion ($P < 0.001$). Similarly, resilience was significantly positively correlated with self-compassion ($P < 0.001$), whereas resilience and self-compassion were negatively correlated with domestic violence ($P < 0.001$).

Indirect effect analysis

First, the results indicated that domestic violence had a direct effect on PTG and PTSD. This model fits the data better ($\chi^2 = 424.026$, $df = 49$, $P = 0.000$, CFI = 0.966, TLI = 0.951; RMSEA = 0.061, 90% CI (0.056, 0.067), SRMR = 0.024), while controlling the age, gender, subjective social economic status, and family structure. Results from the path

Table 1 Descriptive statistics and correlation analyses among posttraumatic growth, posttraumatic stress disorder domestic violence, self-compassion, and resilience

Variable	mean \pm SD	1	2	3	4	5
PTG	60.97 \pm 16.95	1				
PTSD	11.79 \pm 4.25	0.02	1			
Resilience	35.45 \pm 6.62	0.32 ^c	-0.28 ^c	1		
Self-compassion	84.75 \pm 11.88	0.33 ^c	-0.34 ^c	0.56 ^c	1	
Domestic violence	4.77 \pm 1.72	-0.10 ^c	0.09 ^c	-0.08 ^c	-0.56 ^c	1

^a $P < 0.05$.^b $P < 0.01$.^c $P < 0.001$.

analysis showed that domestic violence was negatively associated with PTG ($\beta = -0.100$, 95%CI: 0.147 to -0.052, $P < 0.001$) and positively associated with PTSD ($\beta = 0.083$, 95%CI: 0.033 to 0.135, $P < 0.005$). This indicated that domestic violence was a common factor in PTG and PTSD.

Based on the results of the direct effect model, an indirect effect model was established controlling the cofounders as above. The results indicated a complete model with fit indices as follows: $\chi^2 = 891.522$, $df = 128$, $P < 0.001$, CFI = 0.960, TLI = 0.943; RMSEA = 0.054, 90%CI (0.051-0.057), SRMR = 0.045. The path analysis showed that the paths between domestic violence and resilience were non-significant, and the remaining paths were statistically significant. Next, we removed the non-significant path above; constraining these paths to zero caused no degradation in fit. Using these procedures, a parsimonious model was built (Figure 1) controlling the cofounders as above. The result also indicated a good model with the following fit indices: $\chi^2 = 891.564$, $df = 129$, $P = 0.000$, CFI = 0.960, TLI = 0.943; RMSEA = 0.054, 90%CI (0.051 to 0.057), SRMR = 0.045. The path analysis showed that domestic violence was significantly negatively related to PTG *via* a 1-step indirect path of self-compassion ($\beta = -0.023$, 95%CI: -0.044 to -0.007, $P < 0.01$) and by one 2-step indirect path of self-compassion to resilience ($\beta = -0.008$, 95%CI: -0.018 to -0.002, $P < 0.05$). Domestic violence was significantly positively related to PTSD *via* a 1-step indirect path of self-compassion ($\beta = 0.008$, 95%CI: 0.002 to 0.021, $P < 0.07$) and by one 2-step indirect path of self-compassion to resilience ($\beta = 0.013$, 95%CI: 0.004 to 0.024, $P < 0.01$). The detailed information is listed in Table 2. These findings suggest that self-compassion to resilience mediates the relationship between domestic violence and PTG and PTSD and that the mechanisms underlying the association between domestic violence and PTG and PTSD are similar.

DISCUSSION

This study examined the mechanisms underlying the relationship between childhood exposure to domestic violence and PTG and PTSD among Chinese college students during the COVID-19 pandemic. The findings of this study indicated that childhood exposure to domestic violence was significantly associated with PTG and PTSD[4,20]. Furthermore, these associations were significantly mediated by self-compassion (1-step indirect path) and from self-compassion to resilience (2-step indirect path). These results suggested that there were similar indirect paths from childhood exposure to domestic violence to PTSD and PTG. Possible explanations for these results are elaborated below.

First, childhood exposure to domestic violence was directly associated with PTG and PTSD, which further supports Kumpfer's resilience framework. According to the theory, when individuals are under stress, those with more protective factors can easier get through the crisis, but those with more risk factors may become maladaptive.

Furthermore, this study found that childhood exposure to domestic violence had a positive association with PTSD and a negative association with PTG *via* a 1-step indirect path of self-compassion (supported hypothesis 1). Individuals with high self-compassion are more likely to pay attention to the positive aspects of the struggle with

Table 2 Bootstrapping indirect effect and 95% confidence interval for multiple mediation model

Indirect effect	Estimated effect	95%CI	Relative mediation effect
Dependent variable: PTG			
Total indirect	-0.032 ^b	(-0.055, -0.010)	32.99%
Specific indirect 1	0.000	(-0.006, 0.004)	0%
Specific indirect 2	-0.023 ^b	(-0.044, -0.007)	23.71%
Specific indirect 3	-0.008 ^a	(-0.018, -0.002)	8.25%
Dependent variable: PTSD			
Total indirect	0.022 ^b	(0.007, 0.039)	28.95%
Specific indirect 1	0.001	(-0.007, 0.008)	1.32%
Specific indirect 2	0.008 ^a	(0.002, 0.021)	10.53%
Specific indirect 3	0.013 ^b	(0.004, 0.024)	17.11%

$n = 2038$. Bootstrap sample size = 5000.

^a $P < 0.05$.

^b $P < 0.01$.

^c $P < 0.001$.

Total indirect: domestic violence → posttraumatic growth/posttraumatic stress disorder (PTG/ PTSD); Specific indirect 1: domestic violence → resilience → PTG/PTSD; Specific indirect 2: domestic violence → self-compassion → PTG/PTSD; Specific indirect 3: domestic violence → self-compassion → resilience → PTG/PTSD. PTG: Posttraumatic growth; PTSD: Posttraumatic stress disorder.

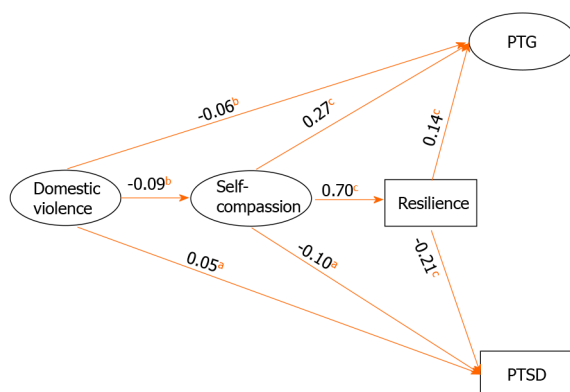


Figure 1 Multiple indirect effects model after controlling age, gender, subjective social economic status, and family structure. ^a $P < 0.05$, ^b $P < 0.01$, ^c $P < 0.001$. PTG: Posttraumatic growth; PTSD: Posttraumatic stress disorder.

trauma and positively reframe their understanding of the PT world[8]. These strategies can be used to help adolescents find meaning, recover from negative emotions, and realize PTG, and *vice versa*[21]. Additionally, we identified a 2-step indirect path from domestic violence to PTG and PTSD *via* self-compassion to resilience, which was consistent with hypothesis 3. When facing challenges, individuals with more exposure to domestic violence in their childhood are less likely to be self-compassionate and lead to lower resilience. By contrast, adolescents who are more self-compassionate tend to be resilient and “bounce back” from challenges[33]. This process may reduce PTSD symptoms and promote PTG[34,35]. During the COVID-19 outbreak, individuals with a lower level of self-compassion and resilience may find it more difficult to cope with the stressful event, compared to those with a higher level of self-compassion and resilience. This may eventually lead to PTSD symptoms and reduce the possibility of PTG[36].

Of note, childhood exposure to domestic violence had non-significant effects on PTG and PTSD using a 1-step indirect path *via* resilience. Taking a closer look, the relationship between childhood exposure to domestic violence and resilience were not significantly correlated, which could be attributed to the fact that resilience is a dynamic development process, accorded with the latest academically accepted definition that it refers to an individual’s efforts to adjust and actively adapt under

stress on the one hand instead of a steady trait[37]. Besides, it emphasizes an individual's adaptive outcome on the other hand. Thereby, the profile of resilience at one measurement time cannot fully represent the dynamic process.

CONCLUSION

This study has several limitations. First, findings from the self-reported scales need further confirmation, using data from clinical interviews that can determine the presence of being diagnosed with PTSD. Second, the study employed a cross-sectional design, and the corresponding data before the COVID-19 outbreak was not available, thus limiting the causal interpretation of the findings. Thus, a latent profile transition analysis may be conducted within a longitudinal study to examine the developmental trajectory and longitudinal predicting mechanism of PTSD and PTG throughout the COVID-19 outbreak. Third, psychopathological impacts of self-compassion and variations of developing self-compassion among individuals were not evaluated, which may have provided further insights on how PTG and PTSD are developed among individuals. However, this warrants future research. Fourth, due to the cross-sectional design, the participants have to recall their childhood experiences instead of reporting existing circumstances, which leads to the potency of recall bias.

Despite these limitations, this is an exploratory study that examined the mechanisms underlying the association of domestic violence with PTG and PTSD among college students during the COVID-19 pandemic. Findings indicate that domestic violence is common to both PTSD and PTG, which may explain the coexistence of PTG and PTSD in young adults. In addition, it suggests that domestic violence affects PTG and PTSD through similar underlying mechanisms. Self-compassion and resilience are individual's internal resources, which may increase the PTG and reduce the PTSD symptoms. From a clinical perspective, the unique roles of self-compassion and resilience in PTSD and PTG should be considered. Psychological services engaged to relieve PTSD and promote PTG should develop the competence of self-compassion and resilience of youth. The government should pay attention to domestic violence with timely and appropriate actions that should be taken: (1) Establish and improve the maternal and child protection system; (2) strengthen the support for community work to reduce the occurrence of domestic violence; (3) provide shelter for victims in the domestic violence during the epidemic period; and (4) form a public opinion environment against domestic violence.

ARTICLE HIGHLIGHTS

Research background

It was reported that domestic violence had a 30 percent incidence, which always happened in front of children or adolescents, causing an increased risk of psychological problems such as posttraumatic stress disorder (PTSD) symptoms. But some people who are exposed to domestic violence perform positive changes in psychology such as posttraumatic growth (PTG). It is unclear whether PTG and PTSD share a common underlying mechanism. The present study is exploratory to reveal it during the coronavirus disease 2019 (COVID-19).

Research motivation

Based on the shattered world assumption theory, the PTG model, and conservation of resources theory, this study hypothesized that the self-compassion and resilience are the common factors for PTG and PTSD. The present study addressed the mediator roles of self-compassion and resilience. It may inform future mental health interventions for certain individuals.

Research objectives

The present study aimed to explore the common mechanism of PTG and PTSD, revealing the mediating role of self-compassion and resilience between exposure to domestic violence and PTG/PTSD.

Research methods

A nationwide cross-sectional online survey was conducted in China during the

COVID-19 pandemic. The data was collected using the Chinese version of revised Adverse Childhood Experiences Question, Self-compassion Scale, Connor-Davidson Resilience Scale, PT Growth Inventory, and the Abbreviated PTSD Checklist-Civilian version. A structural equation model was conducted to analyze the data.

Research results

The path analysis indicated that exposure to domestic violence was significantly correlated with PTG and PTSD *via* a 1-step indirect path of self-compassion and *via* a 2-step indirect path from self-compassion to resilience. The 1-step indirect path of resilience did not reach significance.

Research conclusions

PTG and PTSD share a common mechanism for those who were exposed to domestic violence. Those who perform a lower level of self-compassion would tend to difficultly bounce back to normal, causing an increased risk of PTSD and decreased possibility of PTG, and *vice versa*.

Research perspectives

From a clinical perspective, the intervention study could be considered in investigating the roles of self-compassion and resilience for vulnerable individuals.

REFERENCES

- 1 **World Health Organization.** (2020). COVID-19 and violence against women: what the health sector/system can do, 7 April 2020 (No. WHO/SRH/20.04). Available from: <https://www.who.int/reproductivehealth/publications/emergencies/COVID-19-VAW-full-text.pdf?ua=1>
- 2 **Pan X,** Liu W, Deng G, Liu T, Yan J, Tang Y, Dong W, Cui Y, Xu M. Symptoms of posttraumatic stress disorder, depression, and anxiety among junior high school students in worst-hit areas 3 years after the Wenchuan earthquake in China. *Asia Pac J Public Health* 2015; **27**: NP1985-NP1994 [PMID: 23687258 DOI: 10.1177/1010539513488625]
- 3 **Ying LH,** Wu XC, Lin CD, Chen C. Prevalence and predictors of posttraumatic stress disorder and depressive symptoms among child survivors 1 year following the Wenchuan earthquake in China. *Eur Child Adolesc Psychiatry* 2013; **22**: 567-575 [PMID: 23532400 DOI: 10.1007/s00787-013-0400-3]
- 4 **Levendosky AA,** Bogat GA, Martinez-Torteya C. PTSD symptoms in young children exposed to intimate partner violence. *Violence Against Women* 2013; **19**: 187-201 [PMID: 23420836 DOI: 10.1177/1077801213476458]
- 5 **Wu X,** Zhou X, Wu Y, An Y. The role of rumination in posttraumatic stress disorder and posttraumatic growth among adolescents after the wenchuan earthquake. *Front Psychol* 2015; **6**: 1335 [PMID: 26388826 DOI: 10.3389/fpsyg.2015.01335]
- 6 **Zhou X,** Zhen R, Wu X. Shared and unique mechanisms underlying the association of trauma exposure with posttraumatic stress symptoms and growth among adolescents following the Jiuzhaigou earthquake. *Psychol Trauma* 2019 [PMID: 31697106 DOI: 10.1037/tra0000526]
- 7 **Holtmaat K,** van der Spek N, Cuijpers P, Leemans CR, Verdonck-de Leeuw IM. Posttraumatic growth among head and neck cancer survivors with psychological distress. *Psychooncology* 2017; **26**: 96-101 [PMID: 26918531 DOI: 10.1002/pon.4106]
- 8 **Tedeschi RG,** Calhoun LG. Target Article: "Posttraumatic Growth: Conceptual Foundations and Empirical Evidence". *Psychological Inquiry* 2004; **15**: 1-18 [DOI: 10.1207/s15327965pli1501_01]
- 9 **Wu Z,** Xu J, Sui Y. Posttraumatic stress disorder and posttraumatic growth coexistence and the risk factors in Wenchuan earthquake survivors. *Psychiatry Res* 2016; **237**: 49-54 [PMID: 26921051 DOI: 10.1016/j.psychres.2016.01.041]
- 10 **Kumpfer KL.** Factors and processes contributing to resilience: The resilience framework. In: Glantz MD, Johnson JL. Resiliency and development: Positive life adaptations. New York: Kluwer Academic, 1999
- 11 **Biber DD,** Ellis R. The effect of self-compassion on the self-regulation of health behaviors: A systematic review. *J Health Psychol* 2019; **24**: 2060-2071 [PMID: 28810473 DOI: 10.1177/1359105317713361]
- 12 **Zhong DH,** Xiao W. The impact of stressful life events on adolescent academic achievement: The mediating effects of self-compassion and resilience. *Xinli Yanjiu* 2020; **13**: 82-88 [DOI: 10.3969/j.issn.2095-1159.2020.01.011]
- 13 **Baker DA,** Caswell HL, Eccles FJR. Self-compassion and depression, anxiety, and resilience in adults with epilepsy. *Epilepsy Behav* 2019; **90**: 154-161 [PMID: 30557784 DOI: 10.1016/j.yebeh.2018.11.025]
- 14 **Nery-Hurwit M,** Yun J, Ebbeck V. Examining the roles of self-compassion and resilience on health-related quality of life for individuals with Multiple Sclerosis. *Disabil Health J* 2018; **11**: 256-261 [PMID: 29089214 DOI: 10.1016/j.dhjo.2017.10.010]

- 15 **Neff K.** The Development and Validation of a Scale to Measure Self-Compassion. *Self Identity* 2003; **2**: 223-250 [DOI: [10.1080/15298860309027](https://doi.org/10.1080/15298860309027)]
- 16 **Arya R,** Antonisamy B, Kumar S. Sample size estimation in prevalence studies. *Indian J Pediatr* 2012; **79**: 1482-1488 [PMID: [22562262](https://pubmed.ncbi.nlm.nih.gov/22562262/) DOI: [10.1007/s12098-012-0763-3](https://doi.org/10.1007/s12098-012-0763-3)]
- 17 **Lang AJ,** Stein MB. An abbreviated PTSD checklist for use as a screening instrument in primary care. *Behav Res Ther* 2005; **43**: 585-594 [PMID: [15865914](https://pubmed.ncbi.nlm.nih.gov/15865914/) DOI: [10.1016/j.brat.2004.04.005](https://doi.org/10.1016/j.brat.2004.04.005)]
- 18 **Lang AJ,** Wilkins K, Roy-Byrne PP, Golinelli D, Chavira D, Sherbourne C, Rose RD, Bystritsky A, Sullivan G, Craske MG, Stein MB. Abbreviated PTSD Checklist (PCL) as a guide to clinical response. *Gen Hosp Psychiatry* 2012; **34**: 332-338 [PMID: [22460001](https://pubmed.ncbi.nlm.nih.gov/22460001/) DOI: [10.1016/j.genhosppsych.2012.02.003](https://doi.org/10.1016/j.genhosppsych.2012.02.003)]
- 19 **Tedeschi RG,** Calhoun LG. The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *J Trauma Stress* 1996; **9**: 455-471 [DOI: [10.1002/jts.2490090305](https://doi.org/10.1002/jts.2490090305)]
- 20 **Horn SR,** Miller-Graff LE, Galano MM, Graham-Bermann SA. Posttraumatic stress disorder in children exposed to intimate partner violence: the clinical picture of physiological arousal symptoms. *Child Care in Practice* 2016; **23**: 90-103 [DOI: [10.1080/13575279.2015.1126229](https://doi.org/10.1080/13575279.2015.1126229)]
- 21 **Scoglio AAJ,** Rudat DA, Garvert D, Jarmolowski M, Jackson C, Herman JL. Self-Compassion and Responses to Trauma: The Role of Emotion Regulation. *Journal of Interpersonal Violence* 2018; **33**: 2016-2036 [DOI: [10.1177/0886260515622296](https://doi.org/10.1177/0886260515622296)]
- 22 **Jin Y,** Xu J, Liu D. The relationship between post traumatic stress disorder and post traumatic growth: gender differences in PTG and PTSD subgroups. *Soc Psychiatry Psychiatr Epidemiol* 2014; **49**: 1903-1910 [PMID: [24682472](https://pubmed.ncbi.nlm.nih.gov/24682472/) DOI: [10.1007/s00127-014-0865-5](https://doi.org/10.1007/s00127-014-0865-5)]
- 23 **Xu J,** Liao Q. Prevalence and predictors of posttraumatic growth among adult survivors one year following 2008 Sichuan earthquake. *J Affect Disord* 2011; **133**: 274-280 [PMID: [21684612](https://pubmed.ncbi.nlm.nih.gov/21684612/) DOI: [10.1016/j.jad.2011.03.034](https://doi.org/10.1016/j.jad.2011.03.034)]
- 24 **Ho SM,** Chan CL, Ho RT. Posttraumatic growth in Chinese cancer survivors. *Psychooncology* 2004; **13**: 377-389 [PMID: [15188445](https://pubmed.ncbi.nlm.nih.gov/15188445/) DOI: [10.1002/pon.758](https://doi.org/10.1002/pon.758)]
- 25 **Dong M,** Anda RF, Felitti VJ, Dube SR, Williamson DF, Thompson TJ, Loo CM, Giles WH. The interrelatedness of multiple forms of childhood abuse, neglect, and household dysfunction. *Child Abuse Negl* 2004; **28**: 771-784 [PMID: [15261471](https://pubmed.ncbi.nlm.nih.gov/15261471/) DOI: [10.1016/j.chiabu.2004.01.008](https://doi.org/10.1016/j.chiabu.2004.01.008)]
- 26 **Wang YR,** Lin PZ, Cao FL. Validity and reliability of the Chinese version of the Revised Adverse Childhood Experience Questionnaire. *Zhongguo Xinli Weisheng Zazhi* 2018; **13**
- 27 **Chen J,** Yan LS, Zhou LH. Reliability and Validity of Chinese Version of Self-compassion Scale. *Zhongguo Linchuang Xinlixue Zazhi* 2011; **19**: 734-736 [DOI: [10.16128/j.cnki.1005-3611.2011.06.006](https://doi.org/10.16128/j.cnki.1005-3611.2011.06.006)]
- 28 **Sun XY,** Chan DW, Chan LK. Self-compassion and psychological well-being among adolescents in Hong Kong: Exploring gender differences. *Pers Individ Dif* 2016; **101**: 288-292 [DOI: [10.1016/j.paid.2016.06.011](https://doi.org/10.1016/j.paid.2016.06.011)]
- 29 **Liu AY,** Wang WC, Wu XC, Tian YX. Relationship between Self-Compassion and Posttraumatic Growth among Adolescents: The Moderating Role of Basic Psychological Needs Satisfaction. *Zhongguo Linchuang Xinlixue Zazhi* 2020; **28**: 223-228 [DOI: [10.16128/j.cnki.1005-3611.2020.02.002](https://doi.org/10.16128/j.cnki.1005-3611.2020.02.002)]
- 30 **Campbell-Sills L,** Stein MB. Psychometric analysis and refinement of the Connor-davidson Resilience Scale (CD-RISC): Validation of a 10-item measure of resilience. *J Trauma Stress* 2007; **20**: 1019-1028 [PMID: [18157881](https://pubmed.ncbi.nlm.nih.gov/18157881/) DOI: [10.1002/jts.20271](https://doi.org/10.1002/jts.20271)]
- 31 **Wang L,** Shi Z, Zhang Y, Zhang Z. Psychometric properties of the 10-item Connor-Davidson Resilience Scale in Chinese earthquake victims. *Psychiatry Clin Neurosci* 2010; **64**: 499-504 [PMID: [20923429](https://pubmed.ncbi.nlm.nih.gov/20923429/) DOI: [10.1111/j.1440-1819.2010.02130.x](https://doi.org/10.1111/j.1440-1819.2010.02130.x)]
- 32 **Ye ZJ,** Qiu HZ, Li PF, Chen P, Liang MZ, Liu ML, Yu YL, Wang SN, Quan XM. Validation and application of the Chinese version of the 10-item Connor-Davidson Resilience Scale (CD-RISC-10) among parents of children with cancer diagnosis. *Eur J Oncol Nurs* 2017; **27**: 36-44 [PMID: [28279394](https://pubmed.ncbi.nlm.nih.gov/28279394/) DOI: [10.1016/j.ejon.2017.01.004](https://doi.org/10.1016/j.ejon.2017.01.004)]
- 33 **Bluth K,** Mullarkey M, Lathren C. Self-Compassion: A Potential Path to Adolescent Resilience and Positive Exploration. *J Child Fam Stud* 2018; **27**: 3037-3047 [DOI: [10.1007/s10826-018-1125-1](https://doi.org/10.1007/s10826-018-1125-1)]
- 34 **Breines JG,** McInnis CM, Kuras YI, Thoma MV, Gianferante D, Hanlin L, Chen X, Rohleder N. Self-compassionate young adults show lower salivary alpha-amylase responses to repeated psychosocial stress. *Self Identity* 2015; **14**: 390-402 [PMID: [26005394](https://pubmed.ncbi.nlm.nih.gov/26005394/) DOI: [10.1080/15298868.2015.1005659](https://doi.org/10.1080/15298868.2015.1005659)]
- 35 **Dai Y,** Lei M, Zhou X, Yao M, Jiang LJ, Chen X, Liu Y. The Effect of Trauma Expose on Post-traumatic Stress Disorder after the Wenchuan Earthquake: The Role of Resilience as a Moderator. *Xinli Fazhan Yu Jiaoyu* 2014; **30**: 61-67
- 36 **Ding H,** Han J, Zhang M, Wang K, Gong J, Yang S. Moderating and mediating effects of resilience between childhood trauma and depressive symptoms in Chinese children. *J Affect Disord* 2017; **211**: 130-135 [PMID: [28110160](https://pubmed.ncbi.nlm.nih.gov/28110160/) DOI: [10.1016/j.jad.2016.12.056](https://doi.org/10.1016/j.jad.2016.12.056)]
- 37 **Luthar SS,** Cicchetti D, Becker B. The construct of resilience: A critical evaluation and guidelines for future work. *Child Dev* 2000; **71**(3): 543-62. [DOI: [10.1111/1467-8624.00164](https://doi.org/10.1111/1467-8624.00164)]



Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

Telephone: +1-925-3991568

E-mail: bpgoffice@wjgnet.com

Help Desk: <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

