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Sudden High-Pressure Events and High School Students' Psychological Adaptation: Psychological Resilience, Cognitive Reappraisal, and Social Relationship Quality

Zhiqi Liu

School of Economics and Management, Dalian University of Technology, Dalian, China
3342854171@qq.com

Abstract. Given that sudden high-pressure events may affect adolescents' psychological resources and interpersonal connections, this paper investigates associations among high-pressure event exposure, stress, perceived control, resilience, cognitive reappraisal, and social relationship quality in 187 high school students. With 34 items, the questionnaire measures demographics, high-pressure event exposure, stress impact, perceived control, psychological resilience, cognitive reappraisal, and social relationship quality. Thus, the results showed that 70.05% of respondents had experienced sudden high-pressure events in the past year. The questionnaire showed good internal consistency (Cronbach's $\alpha = 0.859$) and a KMO value of 0.873, with two factors explaining 57.63% of the variance. At the item level, event-exposed respondents showed higher levels of stress impact, loss of control, difficulty accumulation, and interpersonal distress. Moreover, sense of control was negatively related to stress impact ($r=-0.28$, $p<0.05$), while difficulty accumulation was positively correlated with stress impact ($r=0.31$, $p< 0.05$). In terms of psychosocial factors, cognitive reappraisal was positively associated with emotional processing, while relationship closeness, interaction, and satisfaction also showed positive links. This paper discusses the potential relevance of psychological resilience, cognitive reappraisal, and social relationship quality in high school students' adaptation to high-pressure events.

Keywords: Sudden high-pressure events, high school students, stress adaptation, psychological resilience, cognitive reappraisal

1. Introduction

The high school period involves rapid changes in academic demands, peer relationships, family dynamics, and self-identity. In this context, adverse experiences may increase stress and affect perceptions of personal abilities and the external environment. More importantly, stress is shaped by the event itself, its perceived meaning and controllability, and available coping resources. Existing studies have mostly examined the stress adaptation process from the perspective of a single psychological factor, and the associations among sense of control, psychological resilience, cognitive reappraisal, and social relationship quality as multiple psychosocial factors when high school students face sudden high-pressure events requires further investigation. With perceived

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demands exceeding available resources, individuals experience greater stress via their appraisal of environmental challenges and coping capacity [1]. Within this framework, sense of control reflects perceived event control and shapes stress appraisal. Moreover, psychological resilience represents the capacity to recover and adapt to adversity, supporting dynamic adjustment [2-4]. At the cognitive level, cognitive reappraisal contributes to emotion regulation by changing the interpretation of events. At the interpersonal level, social relationship quality provides support, understanding, and connection as an external resource for stress adaptation. This study examines associations among sudden high-pressure event exposure, stress impact, sense of control, psychological resilience, cognitive reappraisal, and social relationship quality in high school students. Using a cross-sectional anonymous questionnaire design, it analyzes event exposure and stress impact through item descriptions, group comparisons, and correlation analyses. The findings are interpreted as associative patterns and discussed in relation to potential school, family, and peer support in stress adaptation.

2. Literature review

2.1. Sudden high-pressure events and high school students' stress adaptation

Under the transactional model of stress and coping, stress reflects appraisals of event demands and coping resources rather than the event itself [1]. Thus, individuals experience higher stress as perceived demands outweigh available resources. For high school students, multiple factors including academic tasks, interpersonal relationships, and family environment jointly constitute their life context; sudden high-pressure events may alter the individual's evaluation of their own abilities and environmental controllability, affecting their subjective stress experience. Among adolescents, the Perceived Stress Scale evaluates perceived unpredictability, lack of control, and overload in everyday life [5]. However, existing studies have focused mainly on stress events and psychological outcomes, leaving the associations among sudden high-pressure event exposure, stress impact, and psychosocial factors insufficiently examined. Thus, this study examines stress impact following sudden high-pressure events and its associations with sense of control, psychological resilience, cognitive reappraisal, and social relationship quality among high school students.

2.2. Psychological resilience and individual recovery capacity

Psychological resilience is generally understood as the individual's capacity to maintain, recover, and adjust functioning following adversity or stressful events, rather than a fixed personality trait. Masten's "ordinary magic" perspective emphasizes that factors such as cognitive abilities, self-regulation capabilities, and social support in an individual's daily life can help them cope with adversity [2]. Luthar et al. pointed out that psychological resilience needs to be understood in conjunction with both the adversity experience and the positive adaptive outcomes, and cannot be judged solely based on the psychological state at a certain point in time to determine whether an individual has resilience [3]. Bonanno further distinguished between stable adaptation after adversity and the recovery process after experiencing fluctuations, showing that individuals may exhibit different adaptation trajectories when facing stressful events [4]. In the context of sudden high-pressure events, psychological resilience reflects individuals' ability to sustain functioning, adjust coping strategies, and recover after stress. This study focuses on recovery, persistence, and positive adjustment as indicators of stress adaptation rather than classifying individuals by high or low resilience.

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2.3. Cognitive regulation and social support resources

Psychological regulation and social support resources serve as internal and external factors in stress adaptation. At the individual level, attribution patterns shape resource identification and use under pressure. Among these regulatory processes, cognitive reappraisal involves modifying emotional responses by reinterpreting event meanings or adjusting perspectives. According to the emotion regulation process model, it operates at the meaning appraisal stage and differs from response-focused strategies like expressive suppression [6, 7]. Besides, cognitive reappraisal is linked to positive affect, social connections, and well-being via multiple pathways [8]. In stress situations, cognitive reappraisal may influence the individual's understanding of events, hence regulating the stress experience. In addition, social support reflects assistance and connection from family, friends, and significant others. The social support buffering hypothesis suggests that external support can reduce the negative impact of stress, with different sources providing distinct functions [9]. This study uses listening, respect, reliance, and harmonious interaction as indicators of social relationship resources. Under sudden high-pressure conditions, stress adaptation involves the interaction between internal regulation and external support resources.

3. Methods

3.1. Study design and participants

This study used a cross-sectional anonymous questionnaire design, with high school students as the research participants. Accordingly, the questionnaire was administered online, yielding 187 valid responses from high school students who provided demographic information and passed the validity screening. In particular, sudden high-pressure event exposure was identified using a screening item assessing whether participants had experienced, within the past year, a sudden and difficult-to-control major life event that resulted in substantial psychological stress or shock. Following the survey instructions, participants completed the questionnaire voluntarily, and the resulting valid sample was used for subsequent analyses.

3.2. Measurement instruments and variable operationalization

The questionnaire consisted of 34 items across six modules: demographic information, sudden high-pressure event exposure and stress impact, sense of control, psychological resilience, cognitive reappraisal, and social relationship quality. Based on the research framework, event exposure and stress impact were treated as stress-related factors; sense of control, psychological resilience, and cognitive reappraisal as internal regulatory factors; and social relationship quality as an external support factor. The measurement content, scoring procedures, and analytical treatment of each variable are presented in Table 1. Specifically, Q4 was rated on a 0–10 scale, Q5–Q24 on a 1–5 frequency scale, and Q25–Q34 on a 1–5 agreement scale.

Table 1. Measurement content and operationalization of research variables

Module	Items	Measurement and Scoring	Variables Used in This Study
Basic Information	Q1–Q2 (2 items)	Gender; only-child status	Descriptive variables

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Table 1. (continued)

Event Exposure and Stress Impact	Q3–Q4 (2 items)	High-pressure event exposure; stress impact rating (0–10 scale)	Event exposure and stress indicators
Sense of Control	Q5–Q8 (4 items)	5-point frequency scale assessing perceived control, loss of control, and difficulty accumulation	Sense of control indicators
Psychological Resilience	Q9–Q18 (10 items)	5-point frequency scale adapted from CD-RISC-10	Psychological resilience indicators
Cognitive Reappraisal	Q19–Q24 (6 items)	5-point frequency scale adapted from the cognitive reappraisal dimension of ERQ	Cognitive regulation indicators
Social Relationship Quality	Q25–Q34 (10 items)	5-point agreement scale assessing listening support, respect, reliance, and relationship experiences	Social support indicators

3.3. Data analysis and quality control

This study analyzes the questionnaire results, focusing on reliability, exploratory factor analysis, item frequencies and percentages, group characteristics, and inter-item correlations. As the data are based on the questionnaire report, this study presents analyses based on the available results and does not conduct further analyses, such as regression or path analysis.

In the data analysis, reliability was assessed using Cronbach's α coefficient, while exploratory factor analysis was based on the KMO test, Bartlett's test of sphericity, and factor analysis results reported in the questionnaire analysis. As the report did not specify the statistical software, factor extraction, or rotation methods, this study only reports the available factor analysis results and does not further assess the factor structure. For variable processing, Q5, Q8, Q18, Q29, and Q33 were reverse-coded, while positively worded items kept their original scores. Gender, only-child status, and event exposure were used as grouping variables, and stress impact (Q4, 0–10 scale) and item scores (1–5 scale) were analyzed using descriptive and correlation analyses. The final analysis included 187 valid responses.

3.4. Ethics and data boundaries

The data were collected anonymously, with participants informed that responses were used only for statistical analysis and no identifying information was collected. Participants completed the questionnaire voluntarily with informed consent, following basic ethical principles of anonymity and voluntary participation.

For data processing, this study analyzes the available data within the scope of the existing research materials. The research content is based on 187 valid questionnaires, 34 items, and the statistical results provided in the questionnaire report, primarily including reliability analysis, factor analysis, item descriptions, and correlation analysis. This paper describes and discusses the existing data results, focusing on the associative characteristics among sudden high-pressure events, psychological resources, and stress adaptation. Content that exceeds the scope of the current data

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support, such as causal relationships, model pathways, and further scale validation, is addressed only as theoretical discussion and future research directions.

4. Results

4.1. High-pressure event exposure and stress impact levels

Figure 1 shows the gender distribution of the sample, with 99 males (52.94%) and 88 females (47.06%), indicating a relatively balanced overall gender ratio.

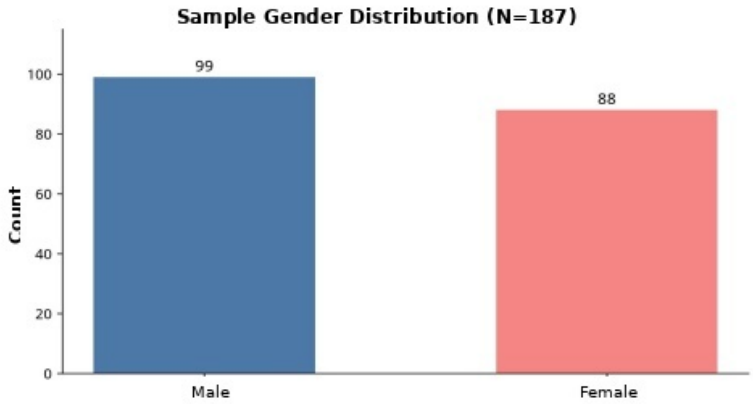

Figure 1. Gender distribution of the sample (n=187)

Further comparison of the stress score distributions between the groups with and without such experiences revealed differences in stress impact levels, as shown in Table 2. For respondents without such experiences, 80.36% reported zero stress impact, and none exceeded a score of 6. In contrast, only 2.29% of respondents with such experiences selected 0, while 83.97% reported scores between 3 and 8, with a score of 7 being the most common (19.85%). These findings suggest that sudden high-pressure event exposure is associated with greater subjective stress impact. Based on the cross-sectional data, this section examines the association between event exposure and stress impact and further explores the roles of sense of control, psychological resilience, cognitive reappraisal, and social relationships in stress adaptation.

Table 2. Sample basic characteristics and stress impact of high-pressure events

Indicator	Result
Valid sample size	187
Male	99 (52.94%)
Female	88 (47.06%)
Reported experiencing sudden high-pressure events	70.05%
Mean stress impact	4.87 (0-10 scale)

4.2. Associations between sense of control and psychological adaptation resource

The questionnaire showed good internal consistency, with an overall Cronbach's α of 0.859. Exploratory factor analysis indicated that the data were suitable for analysis (KMO = 0.873;

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Bartlett's test of sphericity: $\chi^2 = 688.241$, df = 45, $p < 0.001$). Two factors were extracted after rotation, explaining 57.63% of the total variance. As shown in Table 3, Factor 1 included Q9-Q14, reflecting recovery and adjustment under stress, including adaptation to change, positive appraisal of difficulties, setback recovery, focus maintenance, persistence, and emotional regulation. Factor 2 included Q5–Q8, reflecting perceived controllability of stressful situations, including control perception, difficulty accumulation, and confidence in problem management.

Table 3. Exploratory factor analysis results for Q5-Q14

Item	Factor 1	Factor 2	Communality
Q5 Unable to control important matters	0.03	-0.87	0.766
Q6 Confident in handling personal problems	0.37	0.58	0.473
Q7 Things under control	0.34	0.72	0.640
Q8 Difficulties piling up insurmountably	-0.30	-0.61	0.463
Q9 Adapt to change	0.78	0.16	0.632
Q10 See the positive side	0.74	0.20	0.593
Q11 Recover after setback	0.71	0.32	0.605
Q12 Stay focused under pressure	0.72	0.20	0.556
Q13 Not discouraged when facing problems	0.77	0.17	0.618
Q14 Handle unpleasant feelings	0.50	0.41	0.416
KMO	0.873	-	-
Cumulative variance explained	57.63%	-	-

Further item-level correlation analysis showed associations between sense of control indicators and stress impact. As shown in Table 4, sense of control (Q7) was negatively correlated with stress impact ($r = -0.28$, $p < 0.05$), whereas difficulty accumulation (Q8) was positively correlated ($r = 0.31$, $p < 0.05$). In addition, sense of control was negatively correlated with inability to control important matters (Q5) ($r = -0.52$, $p < 0.01$), and difficulty accumulation was negatively correlated with confidence in handling difficulties (Q15) ($r = -0.42$, $p < 0.01$), suggesting consistent relationships among sense of control-related indicators.

Table 4. Reported correlation results for sense of control and psychological resilience items

Item Pair	r Value	Reported Significance	Cautious Interpretation
Q7 Sense of control - Q4 Stress impact	-0.28	$p < 0.05$	Higher sense of control associated with lower impact scores
Q7 Sense of control - Q5 Loss of control	-0.52	$p < 0.01$	Two types of control perception show inverse variation
Q8 Difficulty accumulation - Q4 Stress impact	0.31	$p < 0.05$	Difficulty accumulation and impact show co-directional variation

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Table 4. (continued)

Q8 Difficulty accumulation - Q15 Confidence in handling difficulties	-0.42	$p < 0.01$	Difficulty accumulation and confidence show inverse variation
Q9 Adaptation to change - Q11 Recovery after setback	0.56	N/A	Adaptation and recovery items positively associated
Q13 Not discouraged - Q17 Stress makes one stronger	0.53	$p < 0.01$	Positive coping beliefs related

Psychological adaptation-related items showed consistent associations. Adaptation to change (Q9) was positively correlated with recovery after setback (Q11) ($r = 0.56$), and not being discouraged (Q13) was positively correlated with stress making one stronger (Q17) ($r = 0.53$, $p < 0.01$), suggesting links among recovery, persistence, and positive adjustment. But adaptation to change (Q9) was not significantly correlated with stress impact ($r = -0.10$), indicating that psychological adaptation may relate to stress experience through multiple factors.

4.3. Cognitive regulation and social support resources performance

Cognitive reappraisal and social relationship quality reflected internal and external resources in stress adaptation, respectively. Cognitive reappraisal items indicated that respondents commonly used perspective adjustment, event reinterpretation, and alternative understanding to cope with stress. Item correlation analysis showed strong associations among cognitive reappraisal indicators: "trying to understand stress emotions from different angles" (Q21) was positively correlated with "viewing problems from multiple angles" (Q24) ($r = 0.65$, $p < 0.01$), and "seeing the positive side" (Q10) was positively correlated with Q24 ($r = 0.56$, $p < 0.01$). Regarding social relationship quality, 59.89% of respondents reported having someone to listen and provide support during difficulties. Correlation analysis further showed that relationship closeness (Q27) was positively correlated with harmonious interaction (Q32) ($r = 0.58$, $p < 0.01$), reliance (Q31) was positively correlated with listening support (Q25) ($r = 0.53$, $p < 0.01$), and conflict (Q29) was positively correlated with feeling neglected (Q33) ($r = 0.33$, $p < 0.01$).

Table 5. Item-level correlations for cognitive reappraisal and social relationship quality

Item Pair	r Value	p Value	Interpretation
Q21 Understanding stress emotions from different angles – Q24 Viewing problems from multiple angles	0.65	$p < 0.01$	Cognitive reappraisal consistency
Q10 Seeing the positive side – Q24 Viewing problems from multiple angles	0.56	$p < 0.01$	Positive perspective and flexibility
Q27 Relationship closeness – Q32 Harmonious interaction	0.58	$p < 0.01$	Closeness and harmony
Q30 Being respected – Q34 Relationship satisfaction	0.47	N/A	Respect and satisfaction

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Table 5. (continued)

Q29 Conflict – Q33 Being neglected	0.33	$p < 0.01$	Conflict and neglect
Q31 Being able to rely on – Q25 Listening support	0.53	$p < 0.01$	Reliance and support

In this framework, cognitive reappraisal reflects internal regulation, while social relationship quality reflects external support. Alongside perceived control and psychological adjustment, these factors represent the resources involved in stress adaptation.

5. Discussion

5.1. High-pressure events and subjective stress formation

This study found that respondents who experienced sudden high-pressure events reported higher levels of subjective stress experience, and their stress score distribution was more dispersed than that of non-experienced respondents. Meanwhile, sense of control was negatively correlated with stress impact, and difficulty accumulation was positively correlated with stress impact, indicating that variations in stress experience may be affected by event exposure, perceived controllability, and coping ability. This pattern may be explained by the characteristics of sudden high-pressure events, including suddenness, unpredictability, and reduced controllability, which can influence individuals' appraisal of their circumstances. When individuals perceive insufficient coping resources, events are more likely to be experienced as highly stressful; whereas stronger control and coping confidence may be linked to lower stress levels. This explanation is conceptually consistent with the stress and coping transactional model's view that stress arises from the interactive process between events and individual appraisal [1].

5.2. Psychological resilience and cognitive regulation performance

Psychological resilience-related results showed that respondents exhibited recovery, persistence, and positive adjustment under difficulties, with links among adaptation to change, recovery after setback, and related items. This suggests that some high school students were able to maintain adjustment following stressful events. Aligned with psychological resilience theory, resilience reflects the ability to sustain functioning, adapt, and regain balance in adversity [2-4]. Rather than reflecting no stress impact, resilience represents adaptive responses to stressful experiences.

Meanwhile, cognitive reappraisal items were consistent, reflecting perspective shifts and event reinterpretation under stress. However, cognitive reappraisal was not directly associated with stress impact, suggesting that its relationship with stress adaptation may involve emotional processing and meaning adjustment. This is consistent with its theoretical role in emotion regulation models and the ERQ [6-8]. Thus, psychological resilience and cognitive reappraisal respectively reflect recovery capacity and cognitive regulation capacity, jointly representing the internal psychological factors that high school students may draw upon when facing stress.

5.3. Cognitive regulation and social relationship factors

Regarding social relationships, listening support, closeness, respect, and reliance were associated, while conflict was linked to neglect. This finding is consistent with social support theory. Social

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support may shape individuals' coping experiences when facing stress through emotional support, information exchange, and relational connection [9]. Among high school students, family, peer, and significant-other support may facilitate emotional expression and problem-solving after stress. Meanwhile, social relationships and stress states may have complex connections. On one hand, positive relationship experiences may help buffer the effects of stress; on the other hand, sustained stress may also affect individuals' perceptions of relationships and interaction patterns. Therefore, social relationship quality can serve both as an external resource in stress adaptation and may be influenced by individuals' stress states. This study views cognitive reappraisal and social relationship quality as internal regulation and external support resources, respectively; Along with sense of control and resilience, they reflect students' stress adaptation resources.

6. Conclusion

This study examined high-pressure event exposure, stress impact, control, resilience, cognitive reappraisal, and social relationship quality using 187 anonymous high school questionnaires. Of the participants, 70.05% reported experiencing sudden high-pressure events in the past year, and those with such experiences exhibited higher levels of stress impact, loss of control, difficulty accumulation, and relationship-related difficulties. Sense of control was negatively linked to stress impact, while difficulty accumulation showed a positive link. Cognitive reappraisal items were consistent but not linearly related to stress impact. Social relationship quality showed links among support, respect, and reliance, with variations in conflict and neglect. These findings suggest that stress adaptation involves both resources and their mobilization under pressure. Given the cross-sectional and item-level design, resource availability, mobilization processes, and potential mediating mechanisms were not directly assessed. Therefore, these interpretations remain exploratory. In the future, longitudinal studies on resource accessibility, mobilization, and attribution patterns may clarify differences in stress adaptation.

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