Chinese Adaptation of the Social Pain Questionnaire and Its Reliability and Validity Testing Among College Students

Authors: Dong Yaohua, Yang Xiaofeng, Wang Pai, Cheng Xiangjuan, Bao Hugjiletu, Bao Hugjiltu

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Abstract

Objective: To revise the Social Pain Questionnaire (SPQ) and examine its reliability and validity among Chinese college students. Methods: Items for the Chinese version of the SPQ were determined through item analysis and exploratory factor analysis, its structure was determined through confirmatory factor analysis, and finally the questionnaire' s reliability and validity were tested. Results: The 10 items of the Chinese version of the SPQ showed good discriminability, and results from exploratory and confirmatory factor analyses (2/df=6.65, RMSEA=0.08, CFI=0.98, TLI=0.97, GFI=0.96, NFI=0.98) both supported a single-factor structure; the scale' s reliability and validity met psychometric requirements. Conclusion: The revised Chinese version of the SPQ meets psychometric standards and can serve as a reliable tool for measuring social pain among Chinese college students.

Full Text

Revision of the Chinese Version of the Social Pain Questionnaire and Its Reliability and Validity Test in College Students

DONG Yaohua[1], YANG Xiaofeng[1], WANG Pai[1], CHENG Xiangjuan[2], BAO Hugejiletu[3]

[1]School of Psychology, Inner Mongolia Normal University, Hohhot 010022, China
[2]Center for Mental Health Education, Anhui Polytechnic University, Wuhu 241000, China
[3]School of Physical Education, Inner Mongolia Normal University, Hohhot

010022, China
[Figure 3: see original paper]

Abstract

Objective: To revise the Social Pain Questionnaire (SPQ) and test its reliability and validity among Chinese college students. **Methods:** The Chinese version of the SPQ items was determined through item analysis and exploratory factor analysis. Confirmatory factor analysis was then used to validate its structure, followed by testing the questionnaire' s reliability and validity. **Results:** The 10-item Chinese version of the SPQ demonstrated good differentiation. Both exploratory and confirmatory factor analyses (^{2}/df=6.65, RMSEA=0.08, CFI=0.98, TLI=0.97, GFI=0.96, NFI=0.98) supported a single-factor structure, and the reliability and validity of the scale met psychometric requirements. **Conclusion:** The revised Chinese version of the SPQ meets psychometric standards and can be used as a reliable tool to measure social pain among Chinese college students.

Key words: social pain, college student, reliability, validity

Introduction

As social mobility accelerates and interpersonal interaction patterns diversify, individuals face increasingly complex challenges in social relationships. The negative emotional experience resulting from threatened social relationships or devalued social worth—such as social exclusion, peer rejection, or loss of loved ones—is termed "social pain" (Eisenberger, 2015). Due to its detrimental effects on mental health, social pain has become a focal research topic in psychology.

Although social pain is closely related to social exclusion, the two concepts differ substantially in nature. Social exclusion represents a manifestation of social pain, typically occurring as specific, observable behavioral events that reflect the actions of the excluder and focus on the phenomenon and process of exclusion. In contrast, social pain constitutes a negative emotional experience that reflects the psychological feelings of the excluded individual (Peng et al., 2019). According to the need-threat model, social pain undermines individuals' sense of self-esteem, belonging, control, and meaningful existence, thereby impairing their psychological and physical development (Williams, 2009). Research has shown that individuals who experience social pain exhibit significantly heightened rejection sensitivity (Yao et al., 2020) and increased risk of depressive symptoms (Williams & Nida, 2022). Furthermore, social pain weakens emotional regulation capabilities and reduces self-control, leading to various emotional disorders (Nasso et al., 2022; Reinhard et al., 2020). For instance, social pain correlates with social anxiety, as individuals who experience social pain often feel uneasy and lonely in social situations (Fung & Alden, 2017).

Given these negative impacts on mental health (Mo et al., 2024), accurate measurement of social pain remains a critical challenge in this field. Researchers

have explored two primary approaches: experimental induction and measurement instruments. For experimental induction, paradigms such as the Cyberball virtual ball-tossing task (Lieberman & Eisenberger, 2015), rejection-themed picture viewing tasks (Zhao et al., 2021), and social evaluation tasks (Wang et al., 2023) are commonly used to elicit and assess state social pain experiences. Although these methods can effectively induce social pain in laboratory settings, they have notable limitations. For example, experimental scenarios struggle to fully simulate real-world social situations, resulting in lower external validity, and individual differences may affect the replicability and consistency of results (Mwilambwe-Tshilobo & Spreng, 2021).

To overcome these limitations, researchers have increasingly focused on developing more precise social pain measurement tools, with trait social pain questionnaires emerging as important assessment instruments. These questionnaires quantitatively evaluate individuals' emotional responses to negative situations such as social exclusion and rejection in daily life, providing a standardized and stable measurement approach (Stangier et al., 2021). However, previous measurement tools have primarily focused on exclusionary behavioral contexts or event occurrence. In China, research has explored social exclusion measurement across different populations. Wu et al. (2013) developed the College Student Social Exclusion Questionnaire, which primarily assesses the frequency of social exclusion events or experiences in college students' daily lives. Tong (2015) created the Online Social Exclusion Questionnaire, examining the degree of social exclusion individuals experience in online social interactions. Zhang et al. (2018) revised Gilman' s (2013) adolescent social exclusion scale, focusing more on the degree of neglect in group interactions. Internationally, earlier research commonly used Ferris' s (2008) Workplace Ostracism Scale, which focuses on social exclusion experienced in work settings. Subsequently, Carter-Sowell's (2010) Ostracism Experience Scale assessed the frequency of social exclusion experiences triggered by others' behaviors during social interactions. These measurement tools primarily focus on the frequency of exclusionary situations or events but fail to deeply explore individuals' emotional reactions during the exclusion process, neglecting the emotional characteristics of the excluded and inadequately capturing the complexity of social pain.

Notably, the introduction of trait social pain questionnaires not only addresses the limitations of traditional measurement tools but also helps understand individuals' consistent emotional responses across different situations, providing strong support for developing psychological intervention strategies. Stangier et al. (2021) first developed a unidimensional trait social pain questionnaire based on extensive theoretical and empirical research, which comprehensively measures individuals' negative emotional experiences when facing social rejection and neglect. Moreover, this questionnaire has been widely applied across different research contexts and has demonstrated validity and reliability in measuring social pain across multiple age groups (Schwarz et al., 2021; Sepehrinia et al., 2024).

Given that the Social Pain Questionnaire has not yet been introduced in China, this study aims to adapt this questionnaire (Stangier et al., 2021) and revise the Chinese version to facilitate its application among domestic college students. Additionally, based on the negative emotional response characteristics of social pain, we selected concepts related to the negative impacts of social pain—namely depression, rejection sensitivity, self-control, and social anxiety—as criterion questionnaires to comprehensively evaluate the effects of social pain on individuals' emotional and behavioral regulation capacities. Therefore, revising and promoting the Chinese version of the Social Pain Questionnaire will not only provide domestic scholars with a concise and reliable measurement tool but also further advance social pain research in China.

Methods

2.1 Participants

Sample 1 was used for item analysis and exploratory factor analysis. Using cluster sampling, we distributed 908 questionnaires across five universities in Inner Mongolia, Shandong, Anhui, and Guangdong provinces. After excluding invalid and patterned responses, we obtained 821 valid questionnaires (90.4% response rate). This sample included 440 males and 381 females, with a mean age of 19.97 $\pm$ 1.51 years.

Sample 2 was used for confirmatory factor analysis and criterion validity testing. Using cluster sampling across the same five universities, we distributed 961 questionnaires. After excluding invalid and patterned responses, we obtained 823 valid questionnaires (85.6% response rate). This sample included 383 males and 440 females, with a mean age of 19.69 $\pm$ 1.26 years.

Sample 3 was used for test-retest reliability assessment (four weeks after initial testing). We randomly selected 122 participants from Sample 2 for a second administration of the Chinese version of the Social Pain Questionnaire, yielding 120 valid questionnaires (98.4% response rate). This sample included 65 males and 55 females, with a mean age of 20.02 $\pm$ 1.24 years.

This study was approved by the institutional ethics committee, and all participants provided informed consent during questionnaire administration. All materials used in this study, including scales and questionnaires, have been shared in the Science Data Bank.

2.2 Measures

2.2.1 Social Pain Questionnaire (SPQ) The Social Pain Questionnaire, developed by Stangier et al. in 2021, consists of 10 items rated on a 5-point Likert scale (1 = completely disagree, 5 = completely agree), with higher scores indicating higher levels of social pain.

After obtaining authorization from the original author Stangier, we translated and revised the questionnaire. Two doctoral students in psychology and one doc-

toral student in English translation independently produced initial translations. Subsequently, one professional English translator and two psychology experts reviewed and revised the translations through discussion. We then invited 30 graduate students in psychology to assess item comprehensibility, resulting in the final Chinese version of the Social Pain Questionnaire, which maintains consistent items and scoring with the original.

2.2.2 Criterion Questionnaires Center for Epidemiological Studies Depression Scale (CES-D): Revised by Zhang et al. (2010), this scale comprises 20 items rated on a 4-point Likert scale (0 = less than 1 day, 3 = 5-7 days), with 4 reverse-scored items. Higher scores indicate greater depression severity. In this study, the scale' s Cronbach' s α coefficient was 0.91.

College Student Rejection Sensitivity Questionnaire: Revised by Zhao et al. (2012), this questionnaire contains 32 items rated on a 6-point Likert scale (1 = not at all worried, 6 = very worried). Higher scores indicate greater rejection sensitivity. In this study, the questionnaire' s Cronbach' s α coefficient was 0.96.

Dual Systems of Self-Control Scale: Revised by Xie et al. (2014), this scale includes 21 items rated on a 5-point Likert scale (1 = completely disagree, 5 = completely agree), comprising two dimensions: impulsive system and control system. Higher scores indicate greater impulsivity and control capacity. In this study, Cronbach' s α coefficients for the two dimensions were 0.95 and 0.97, respectively.

Social Anxiety Scale: Revised by Peng et al. (2004), this scale consists of 15 items rated on a 5-point Likert scale (1 = completely disagree, 5 = completely agree), with 4 reverse-scored items. Higher scores indicate higher social anxiety levels. In this study, the scale' s Cronbach' s α coefficient was 0.94.

2.3 Statistical Analysis

We used SPSS 25.0 for item analysis, exploratory factor analysis, and reliability and validity testing, and AMOS 21.0 for confirmatory factor analysis.

Results

3.1 Item Analysis

The item-total correlations for the 10 items of the Chinese version of the Social Pain Questionnaire ranged from 0.77 to 0.86 ($P < 0.001$). We then ranked participants by total score and selected the top 27% and bottom 27% as high- and low-scoring groups, respectively. Independent samples t-tests comparing these groups on each item revealed significant differences on all items, with statistical significance ($t = 27.55$–43.72, $P < 0.001$). Detailed results are presented in Table 1 .

Table 1 SPQ Item Analysis and Exploratory Factor Analysis Results (n = 821)

Item	Factor Loading	Communality	t-value
1. When others reject my request, I feel hurt.	0.77***	0.60	27.55***
2. When I am excluded from a group, I feel very humili-ated.	0.82***	0.67	33.61***
3. When no one pays attention to me at a party, I feel insulted.	0.80***	0.64	31.43***
4. When ignored by others, I feel very hurt.	0.85***	0.72	41.05***
5. When I feel rejected by others, I feel nervous and uneasy inside.	0.84***	0.71	37.03***

Item	Factor Loading	Communality	t-value
6. When I greet an acquaintance and he/she does not respond, I feel rejected.	0.83***	0.69	36.21***
7. When friends distance themselves from me, I feel very frustrated.	0.85***	0.72	40.49***
8. When I feel peers are alienating me, I feel excluded.	0.86***	0.74	43.72***
9. When someone rejects my request or suggestion, I feel snubbed.	0.86***	0.74	39.36***

Item	Factor Loading	Communality	t-value
10. When others cancel appointments without reason, I feel very frustrated.	0.80***	0.64	33.28***

Note: ***P < 0.001

3.2 Factor Structure and Validity

3.2.1 Exploratory Factor Analysis Using Sample 1 (n = 821), we conducted exploratory factor analysis. Results showed a KMO value of 0.95 and a Bartlett' s test of sphericity ^{2} value of 6733.60 (df = 45, P < 0.001), indicating the data were suitable for factor analysis. Without restricting the number of factors, we used principal component analysis to extract common factors and varimax rotation for factor loadings, yielding one common factor with an eigenvalue greater than 1 (eigenvalue = 6.85), which explained 68.52% of the total variance. Factor loadings for the 10 items ranged from 0.77 to 0.87, as detailed in Table 1.

3.2.2 Confirmatory Factor Analysis Using Sample 2 (n = 823), we performed confirmatory factor analysis. Results indicated ^{2}/df = 6.65, RMSEA = 0.08, CFI = 0.98, TLI = 0.97, GFI = 0.96, and NFI = 0.98, with path coefficients ranging from 0.74 to 0.89. These fit indices demonstrate good model fit for the single-factor model, meeting psychometric standards.

3.2.3 Convergent Validity Based on path coefficients from the single-factor model obtained through confirmatory factor analysis, we calculated the average variance extracted (AVE) and composite reliability (CR). Results showed AVE = 0.68 and CR = 0.96. According to the criteria of AVE > 0.5 and CR > 0.7, these results indicate that the Chinese version of the Social Pain Questionnaire demonstrates good convergent validity.

3.2.4 Criterion-Related Validity We selected the Center for Epidemiological Studies Depression Scale, College Student Rejection Sensitivity Questionnaire, Dual Systems of Self-Control Scale, and Social Anxiety Scale as criterion measures to test criterion-related validity in Sample 2. Results revealed that

social pain was significantly positively correlated with depression, rejection sensitivity, both dimensions of self-control (impulsive and control systems), and social anxiety. Detailed correlations are presented in Table 2 .

Table 2 SPQ Criterion-Related Validity Test Results (n = 823)

Variable	Depression	Rejection Sensitivity	Impulsive System	Control System	Social Anxiety
SPQ	0.31**	0.36**	0.48**	0.20**	0.51**

Note: **P < 0.01

3.3 Reliability Analysis

In Sample 2, the Chinese version of the Social Pain Questionnaire demonstrated an internal consistency coefficient of 0.96 and a split-half reliability of 0.93. Four weeks later, test-retest reliability in Sample 3 yielded an internal consistency coefficient of 0.96. These results indicate that the Chinese version of the Social Pain Questionnaire possesses good internal consistency and temporal stability.

Discussion

This study represents the first revision of the Social Pain Questionnaire (SPQ) in the Chinese cultural context and examines its reliability and validity among college students. The Chinese version of the Social Pain Questionnaire provides an effective assessment tool for evaluating individuals' negative emotional experiences in social contexts. Furthermore, the questionnaire' s unidimensional structure has demonstrated stability and validity in cross-cultural research (Sepehrinia et al., 2024). During the revision process, we conducted comprehensibility testing to ensure that translated items were clearly expressed without grammatical errors or ambiguity.

Item analysis results showed that all items in the Chinese version of the Social Pain Questionnaire were significantly correlated with the total score, meeting psychometric standards. Significant differences between high- and low-scoring groups on all items indicate good discriminatory power. Exploratory factor analysis revealed that extracting one factor based on an eigenvalue of 6.85 maintained high consistency with the original questionnaire' s dimensionality. All item factor loadings exceeded 0.77, with the 10 items explaining 68.52% of total variance. Confirmatory factor analysis also supported good fit for the single-factor model. AVE and CR results further verified the questionnaire' s good convergent validity, which aligns closely with the English version (CR = 0.94), demonstrating that the Chinese version effectively measures the intended psychological construct.

Criterion-related validity analysis revealed significant positive correlations between the Chinese version of the Social Pain Questionnaire and depression, rejection sensitivity, self-control, and social anxiety, consistent with previous research (Yu et al., 2022; Sepehrinia et al., 2024). Individuals prone to social pain tend to exhibit more depressive symptoms and heightened rejection sensitivity (Lin et al., 2022). Moreover, these individuals show stronger emotional reactions, higher impulsivity, and weaker sense of control (Li et al., 2024), making them more susceptible to social anxiety (Fung & Alden, 2017). This negative emotional experience of social pain triggers social avoidance and leads to adverse outcomes such as depression, anxiety, and emotional dysregulation (Porcelli et al., 2019). These findings demonstrate good criterion-related validity for the Chinese version of the Social Pain Questionnaire and suggest that depression, rejection sensitivity, self-control, and social anxiety may be potential variables influencing social pain.

Reliability analysis revealed a Cronbach' s α coefficient of 0.96, split-half reliability of 0.93, and four-week test-retest reliability of 0.96 for the Chinese version of the Social Pain Questionnaire, indicating good internal consistency and stability over time.

It should be noted that this study used cluster sampling exclusively among college students, which presents certain limitations. International validation studies of the Social Pain Questionnaire have compared healthy and clinical populations, finding significantly higher social pain scores in clinical samples (Schwarz et al., 2021). Although our study did not include clinical populations, these results provide a reference for future validation across different populations and establish a foundation for psychometric support and cross-cultural research on social pain. Therefore, generalizations about the instrument' s applicability to broader populations should be made cautiously and require further examination in subsequent research. Additionally, future studies should explore the relationship between state and trait social pain, analyzing their interactive effects across different contexts and impacts on individual mental health.

In summary, the Chinese version of the Social Pain Questionnaire demonstrates good reliability and validity, is concise and reliable, and can serve as a scientific measurement tool for assessing social pain in Chinese populations.

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Appendix 1: Chinese Version of the Social Pain Questionnaire (SPQ)

The following questionnaire assesses emotional reactions you may experience in certain social situations. Please select the option that best matches your personal circumstances and experiences; there are no right or wrong answers.

1. When others reject my request, I feel hurt.
2. When I am excluded from a group, I feel very humiliated.
3. When no one pays attention to me at a party, I feel insulted.
4. When ignored by others, I feel very hurt.
5. When I feel rejected by others, I feel nervous and uneasy inside.
6. When I greet an acquaintance and he/she does not respond, I feel rejected.
7. When friends distance themselves from me, I feel very frustrated.
8. When I feel peers are alienating me, I feel excluded.
9. When someone rejects my request or suggestion, I feel snubbed.
10. When others cancel appointments without reason, I feel very frustrated.

Appendix 2: Original English Version of the Social Pain Questionnaire (SPQ)

The following questionnaire refers to emotional reactions in social situations. Please indicate for each of the following statements the extent to which these apply to you. There are no right or wrong answers. Please mark only one box for each statement.

Items:

1. It hurts my feelings if somebody denies a request of me.
2. I feel very humiliated when I am excluded from a group.
3. I feel insulted when being ignored at a party.
4. It hurts me when somebody ignores me.
5. I feel nervous and uneasy inside when I feel rejected by others.
6. I feel rejected when I greet an acquaintance and he/she does not respond.
7. I feel very frustrated when friends distance themselves from me.
8. I feel excluded when I feel peers are alienating me.
9. When somebody declines my request or suggestion, I feel snubbed.
10. If somebody cancels an appointment without a good reason, I feel repulsed.

Note: Figure translations are in progress. See original paper for figures.