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Perceived Stress Profiles, College Adjustment, and Well-being among Freshman in China: A Latent Profile Analysis

Weiyu Chen[1], Hongbo Cui[1], Yankun Ma[1*], Xiaoyan Bi[1], and Juan Yang[2]

[1]*School of Education, Guangzhou University, Guangzhou*

[2]*School of Teacher Education, Lijiang Teachers College, Lijiang*

[*]**Corresponding author:** Yankun Ma, School of Education, Guangzhou University, Guangzhou.

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Abstract

The COVID-19 pandemic poses a major challenge for freshmen' learning and has become a potential stressor, with a profound influence on their college adjustment and well-being. We aimed to determine the effect of perceived stress under the current pandemic on undergraduate freshmen' subject well-being, psychological well-being, and college adjustment. A sample of 909 participants from a Chinese college completed the questionnaires online. We found three distinct profiles of perceived stress: high perceived stress (HPSS), moderate perceived stress (MPSS), and low perceived stress (LPSS). College adjustment and well-being (subject well-being and psychological well-being) were significantly different across the three PSS profiles, with LPSS individuals adjusting the best to college adjustment and having the highest well-being, whereas HPSS individuals adjusted the worst to college adjustment and had the lowest well-being. These findings provide insight into how perceived stress impacts college adjustment and well-being and have implications for the development and assessment of perceived stress-based interventions. Our results could help universities identify systemic and individualized strategies to facilitate students' college adjustment and well-being in this era of challenges and uncertainties.

Keywords: Perceived Stress, Subject Well-being, Psychological Well-being, College Adjustment, Freshmen

Introduction

The coronavirus disease 2019 (COVID-19) outbreak has interrupted and suspended various aspects of university education and posed certain fundamental challenges in this regard (for example, the transition to online learning) [1, 2]. University students, as one of the most active user groups on various social media, pay more attention to and receive more information related to the epidemic and are highly susceptible to various negative messages, and these factors have increased the potential stressors in students' lives beyond the traditional well-documented stressors associated with examinations, course-work and academic study [3, 4]. Especially for first-year college students, who are in a transition period from high school to college, they are more sensitive to threats to their physical health, more profound and persistent in their emotional experiences, more sensitive to perceptions of stress, and relatively more susceptible to external influences [5, 6]. Therefore, this study examined the first semester perceived stress of freshmen in the context of COVID-19 in order to provide scientific and effective support for the mental health of university freshmen.

Perceived Stress and Well-being

The varied pandemic-related impacts on personal and social activities have decreased well-being and increased mental health problems among students. Folkman and Moskowitz (2000) claim research on stress has almost exclusively focused on negative outcomes, and that more attention needs to be devoted to positive outcomes, such as positive affect and well-being [7]. Arguably, without focusing on positive outcomes, research cannot address effectively the factors that help minimize or avoid the adverse health effects of stress. Therefore, it is necessary to focus on the relationship between perceived stress and well-being.

Well-being is a concept that is multifaceted and dynamic, it's defined by a collection of indicators, not a single indicator [8, 9]. Philosophers have long debated about the theoretical and conceptual issues of well-being, and two dominant and well-established perspectives are developed: subject well-being (SWB) and psychological well-being (PWB) [10-13]. SWB refers to satisfaction with life and the presence of positive effect, also referred to as the hedonic well-being [13, 14]. In comparison, PWB

evolved from eudaimonia, focuses on goal pursuits and personal actualization [15, 16]. Despite being highly related factors, hedonic SWB and eudaimonic PWB are distinct and contribute to well-being in unique ways [15, 17, 18]. In this study, the two main dimensions of subjective well-being and psychological well-being are used to characterize individual well-being.

Perceived stress (PSS) has been linked with two prominent models of well-being: subjective well-being and psychological well-being. Research has found that perceived stress relates to lower SWB, as reflected by lower positive affect, life satisfaction, and domain satisfaction, and higher negative affect [19]. During the COVID-19, prolonged home isolation, online learning, and the stress of infection in themselves and their families resulted in first-year college students perceiving greater stress, the more likely they were to experience feelings of tension and loss of control, and their higher levels of negative emotions [20, 21]. Similarly, PSS was found to directly affect the life satisfaction in the medical student group [22]. In addition, judgment theory proposes that individuals perceive the objective environment they are in and make judgments about their experiences in a particular domain according to certain criteria, but this criterion is not fixed, and it includes subjective and objective indicators, so each person makes different judgments based on different indicators, which results in different levels of SWB, and this theory indirectly points out that different levels of PSS by individuals affect the level of SWB [23]. In conclusion, there is a negative correlation between PSS and SWB. Whether the influence of PSS on PWB is consistent with that of SWB? Research has shown that PSS lever is an important factor in the damage to Chinese undergraduate students' PWB, PWB may be diminished if stress levels are too high [24-26]. However, a certain level of stress is necessary and even desirable to obtain an active, engaged response to studies, and to generate a degree of PWB among students [27].

Although studies have confirmed the negative relationship between PSS and SWB (i.e., the positive and negative affect, life satisfaction), the association between PSS and PSW remain controversial. Moreover, the existing studies traditionally investigate the relationship of PSS and well-being outcomes from the variable-centered perspective. Specifically, most studies usually identify the level of PSS ability according to participants' total score or average score, and then analyses the relationship between different levels of PSS and well-being outcomes. This way of grouping tends to ignore the heterogeneity of the groups, thus leading to inaccurate results. Based on person-centered perspective, potential profile analysis (LPA) divided participants into different categories according to their response model for each item. Then, the optimal model is selected by comparing the fitting indexes of different classification models, which maximizes inter-group heterogeneity and minimizes inter-group heterogeneity. Therefore, one purpose of the present study is to adopt LPA method to explore the relationship between PSS and two types of well-being.

The Role of College Adjustment

College is a major life change, and some college students exhibit poor adaptation to college life [28, 29]. Unsuccessful adaptation predicts mental health problems, whereas successful adaptation usually leads to good mental health status and better academic achievements [30]. PSS may play an important role in the adaptation to campus life among first-year college students [31, 32]. However, only scattered studies have addressed this issue to date.

Firstly, PSS can have a series of effects on the individual in the adaptation process [33]. Exploring the relationship between PSS and the SWB, the lower the individual's life satisfaction and the more negative emotions with high perceived stress [34]. Zheng et al. (2019) showed that the amount of PSS has a negative predictive effect on individuals' life satisfaction [35]. A study also found a significant negative relationship between interpersonal and academic stress and life satisfaction among the health adaptation factors [36]. Secondly, PSS can have a significant impact on the social interactions [37, 38]. In a study, PSS was found to be significantly and positively related to social anxiety [39]. For students' college adjustment, social interactions is an important part of achieving good school adjustment, and only the perception of appropriate stress will promote social interactions and will facilitate the development of students' college adjustment. Lastly, PSS triggered by the occurrence of significant external events can also affect students' college adjustment. Li et al. (2017) found that PSS due to major transitory events can inhibit students' levels of positive adjustment through a four-year longitudinal study [40]. In conclusion, students who perceived less stress are generally in a better position in terms of life satisfaction, social interactions, and positive coping levels, and show higher levels of college adjustment. Based on this, we will explore the differences in the effects of different levels of PSS on college adjustment.

The Present Research

The current study examined PSS among college students using a person-oriented approach to obtain a better understanding of how PSS plays a role in freshman' adaptation function and well-being experience. The first aim of this study was to adopt curve-fitting analysis and potential profile analysis to explore the relationship between PSS and two types of well-being. The second aim was to examine the differences in college adjustment and well-being, between different perceived stress subgroups. The last aim was to explore relationships between perceived stress profiles and demographic variables.

Materials and Methods

Participants

Using a cluster sampling method, 1164 online questionnaires were distributed to university freshmen in China, but 255 participants did not complete the study or lost data. Finally, 909 (62.04% female) ranging from 17 to 22 years of age (M=18.89, SD=1.14) provided complete data. All participants were required to answer every question as honestly as possible to minimize the impact of social desirability bias. All participants signed the informed consent document prior to the study and received an honorarium at the end of the study. Ethical approval of this study was granted by the Ethics Committee of the University.

Measures

Perceived stress. Perceived stress was assessed the Perceived Stress Scale (PSS) [41, 42]. The PSS is an established self-report measure used to assess if individuals feel their lives are stressful, overwhelming, and unpredictable. The 5-point Likert scale (1 = never, to 5 = very often) includes ten items to assess the extent to which events in students' lives were perceived as

stressful. The higher the overall (summed) score, the higher the perceived stress level. The overall Cronbach α was 0.81 in the present study.

To assess subjective well-being, we employed the approach previously described by Diener: scores of life satisfaction were added to affect index (positive minus negative) to obtain a composite measure of subjective well-being [43-45]. It should be noted though that a series of experience sampling studies showed that self-reports of subjective well-being are highly correlated with the aggregates of numerous momentary reports (for example, r= 0.62-0.77) [46]. Therefore, we used self-reports for measurement in this study.

Life satisfaction. Life satisfaction was assessed the Satisfaction with Life Scale (SWLS) [14]. Participants were asked to rate their agreement with five statements regarding how satisfied they were with their life (e.g., 'I am satisfied with my life') on a 1 (strongly disagree) to 7 (strongly agree) scale. Higher scores on this scale indicated greater life satisfaction. The Cronbach α was 0.88 in the present study.

The positive and negative affect. Affective well-being was measured using the Positive and Negative Affect Schedule (PANS) [47]. The PANAS is a 20-item self-report scale consisting of 10 items measuring positive affect (e.g., enthusiastic, inspired; α=0.87) and 10 items measuring negative affect (e.g., jittery, distressed; α=0.86). Respondents indicated the extent to which they are currently feeling each of 20 emotions on a 5-point Likert-type scale ranging from 1 (very slightly) to 5 (extremely). Scores on each affect dimension were summed to a total score, ranging from 10 to 50 for each dimension, with high scores indicating a higher level of positive or negative affect. Positive and negative emotions are generally acknowledged to be relatively independent on structural dimensions, and the Chinese version of the PANAS has been demonstrated to be a reliable and valid measure for assessing a person's emotional state [48].

College adjustment. College adjustment was evaluated using a 60-item scale developed by Fang et al., which is suitable for all junior, undergraduate, and graduate students in China [49]. The Chinese College Student Adjustment Scale (CCSAS) reflects seven dimensions of college adjustment: interpersonal relationship adjustment, learning adjustment, campus life adjustment, career choice adjustment, emotional adjustment, self-adjustment, and satisfaction. The students were asked to indicate how much they agreed with the meaning of each sentence and choose an answer. Each item is scored on a five-point Likert scale from 1 (disagree) to 5 (agree). Higher scores represent a better adaptation to college. In the present study, Cronbach's α for the seven dimensions was 0.82, 0.83, 0.70, 0.77, 0.79, 0.75, and 0.70, respectively, and the total Cronbach's α was 0.95.

Psychological Well-being. Psychological well-being was assessed the Flourishing Scale (FS) [50]. Diener et al. integrated the psychological well-being model theory and self-determination theory and developed the FS to measure psychological well-being using college students as subjects [50]. The scale contains four dimensions of interpersonal relationships, self-esteem, goals, and optimism, with eight items, and is rated on a 7-point (from strong disagreement to strong agreement) Likert scale with 8 items. Its sum score ranges from the lowest 8 to the highest 56. The FS does not evaluate each of these single dimensions separately but provides a general overview of the individual's perception of his or her own positive functioning. The Cronbach α was 0.91 in the present study.

Data Analysis

Firstly, descriptive statistics and pearson correlations were computed using SPSS 22.0. Secondly, the pattern of correlation between perceived stress and different types of well-being was explored through curve fitting and its fitting parameters. Thirdly, a latent profile analysis (LPA) was conducted to group individuals into homogenous profiles with regard to their perceived stress ability [51]. Using the statistical software Mplus 8.3, several model fit criteria were gradually generated to help decide which latent profile model (k) best fit the data. More specifically, the Akaike information criterion (AIC), Bayesian information criterion (BIC), and adjusted Bayesian information criterion (aBIC) were checked, and smaller values for these indexes indicated a better model fit [52, 53]. Furthermore, a significant p-value for the LoMendell-Rubin (LMR) likelihood ratio test and Bootstrapped likelihood ratio test (BLRT) implied that the k-profile model fit better than the model with k-1 profiles [54]. Next, entropy index, the clear delineation of classification, whose value is greater than 0.8, the classification accuracy rate is greater than 90% ($p<0.01$), indicating that the variance interpretation rate of model k is higher than that of model k-1 [55]. Lastly, the results of potential profile analysis were used as the basis for categorization, and then we conduct a difference test on the impact of categorization on well-being, college adjustment and demographic.

Results

In order to check and test common method bias derived from the questionnaires, Harman's single-factor test using confirmatory factor analysis was conducted. All items of PSS, SWLS, PANAS, CCSAS, and FS were conducted for factor analysis, and a common factor from these items was extracted. The results showed that the interpretation rate of the first factor was 22.61%, less than 40%, indicating that there was no common method bias in the questionnaires used in this study.

Descriptive Statistics and Correlation Matrix

Descriptive statistics including the means, standard deviations, and correlation coefficients of PSS and well-being variables are shown in Table 1. In particular, the correlation matrix of the variables demonstrated that higher PSS was associated with lower positive affect (r=-0.50), higher negative affect (r=0.54), and lower life satisfaction (r=-0.48), suggesting that there was a moderate correlation between PSS and SWB. And the higher PSS was associated with lower psychological well-being (r=-0.57), indicating that there was a strong correlation between PSS and SWB. Moreover, PSS was also found to be negatively associated with seven subscales of CCSA (r=between 0.40 and 0.62), indicating that there was a strong correlation between PSS and CCSA. Partial correlation analysis further showed that after controlling affect index and life satisfaction scores, PSS and PWB were moderately correlated (r=0.23, p=0.001); and PSS was associated with affect index (r=0.47, p=0.001) and life satisfaction (r=0.25, p=0.001) after controlling PWB scores. These results supported our predictions such that PSS was negatively associated with SWB and PWB.

Table 1: Descriptive statistics and correlations among variables (N=909).

Var	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1PSS	-														
2PA	-.50**	-													
3NA	.54**	-.24**	-												
4AI	-.66**	.76**	-.82**	-											
5LS	-.48**	.59**	-.34**	.54**	-										
6SWB	-.60**	.66**	-.55**	.76**	.96**	-									
7PWB	-.57**	.64**	-.38**	.63**	.54**	.63**	-								
8IRA	-.49**	.58**	-.35**	.58**	.52**	.60**	.55**	-							
9LA	-.40**	.52**	-.28**	.50**	.50**	.55**	.57**	.50**	-						
10CA	-.43**	.56**	-.37**	.58**	.48**	.57**	.53**	.50**	.58**	-					
11CHA	-.42**	.51**	-.30**	.51**	.46**	.53**	.56**	.55**	.69**	.56**	-				
12EA	-.62**	.65**	-.46**	.69**	.62**	.71**	.59**	.67**	.54**	.57**	.55**	-			
13SA	-.54**	.61**	-.42**	.64**	.49**	.60**	.56**	.63**	.53**	.51**	.56**	.68**	-		
14SAT	-.49**	.54**	-.34**	.55**	.72**	.74**	.57**	.58**	.55**	.52**	.53**	.67**	.57**	--	
15CCSA	-.61**	.71**	-.46**	.73**	.68**	.78**	.70**	.80**	.77**	.76**	.79**	.84**	.81**	.80**	-
M	2.76	3.24	3.56	3.40	4.23	3.81	5.02	3.38	3.31	3.43	3.34	3.22	3.42	3.25	3.34
SD	.58	.64	.72	.54	1.21	.78	1.13	.81	.68	.79	.73	.79	.87	.81	.62

Notes: PSS=Perceived Stress; PA=Positive Affect; NA=Negative Affect; AI=Affect Index; LS=Life Satisfaction; SWB=Subject Well-being; PWB=Psychological Well-being; IRA=Interpersonal Relationship Adjustment; LA=Learning Adjustment; CA=Campus Adjustment; CHA=Career Choose Adjustment; EA=Emotional Adaptation; SA=Self Adjustment; SAT=Satisfaction; CCSA=China Colleges Students Adjustment; M=Mean; SD=Standard Deviation. *p<.05, **p<.01.

Curve-fitting Analysis

To explore the relationship between PSS and well-being, it was examined by curve fitting and its fitting parameters. A scatter-plot analysis of the scores for each dimension of perceived stress and well-being was performed, followed by stepwise function fitting with linear, quadratic, multinomial, and logarithmic indices. The results are shown in the red line in Figure 1. and the best-fit equations for perceived stress and life satisfaction (y = -0.23x + 3.7), positive emotion (y = -1.35ln(x) + 4.33), negative emotion (y = 0.43x + 1.7), and psychological well-being (y = -0.02x2 - 0.10x + 3.81). The results of curve fitting show that the relationship between perceived stress and each indicator of subjective well-being (life satisfaction, positive emotion, negative emotion) is not consistent, shows a negative linear relationship or a curvilinear decline, i.e., the greater the perceived stress, the lower the individual's level of subject well-being. Similarly, there is no linear relationship but a curvilinear relationship for individual psychological well-being.

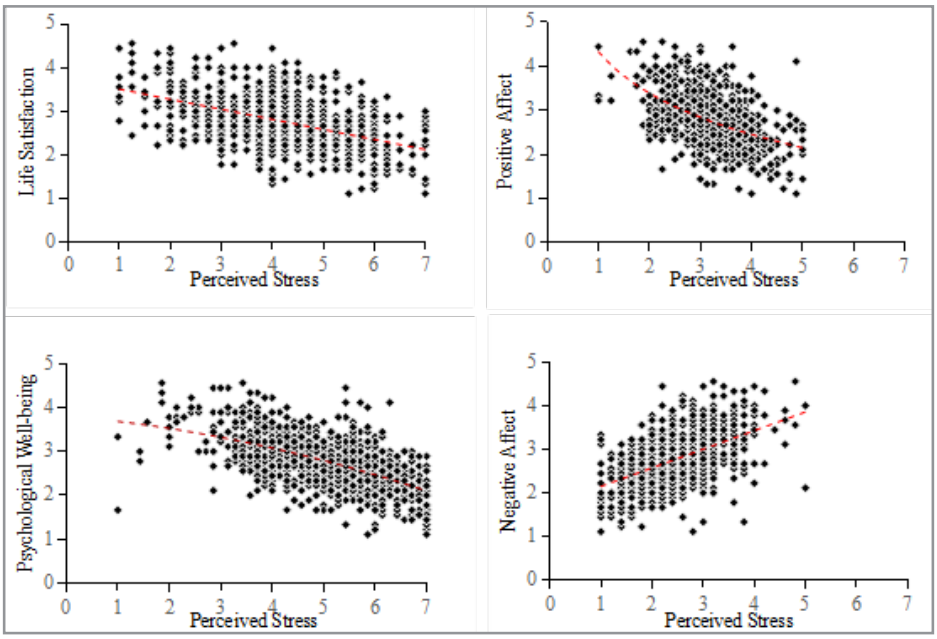

Figure 1: Scatterplot of dimensions of perceived stress and well-being.

Latent Profile Analysis

Latent Profile Analysis. The fit indices of the potential profile analysis model for perceived stress are shown in Table 2, and the potential categories 2-6 are established in turn. The Entropy was highest for the two and three profile model (0.80) among all models, the AIC, BIC, and aBIC showed the large reduction in three-profile model. Furthermore, the LMR and BLRT of three-profile model reached statistical significance. Therefore, class 3 was more accurate than classes 2, 4, 5, and 6, and three-profile model finally is determined as the optimal potential profile model.

Table 2: Fit indices for the potential categories of PSS.

Model	K	AIC	BIC	aBIC	Entropy	LMR	BLRT	Class ratio
2-class	31	22920.88	23070.07	22971.61	.80	.0010	.001	.63/ .37
3-class	42	22414.35	22616.47	22483.09	.80	0.001	.001	.21/ .58 /.21
4-class	53	22109.43	22364.48	22196.16	.78	0.001	.001	.24/ .13/ 0.34/0.31
5-class	64	22003.64	22311.63	22108.38	.77	0.010	.001	.06/ .29/.31/ .24/ .10
6-class	75	21942.56	22303.48	22065.29	.78	0.664	.001	.06/ .25/ .28/.29/.08/ .03

The potential categories of perceived stress scored on each item as shown in Figure 2, Class 1 accounted for 21% of the total population, named as low perceived stress group (LPSS=C1). Class 2, scored higher than in category 1 and lower than in category 3, which accounted for 58% of the total, and named as moderate perceived stress group (MPSS=C2). Category 3, scored higher than those in category 1and 2, which accounting for 21% of the total, and named as high perceived stress group (HPSS=C3).

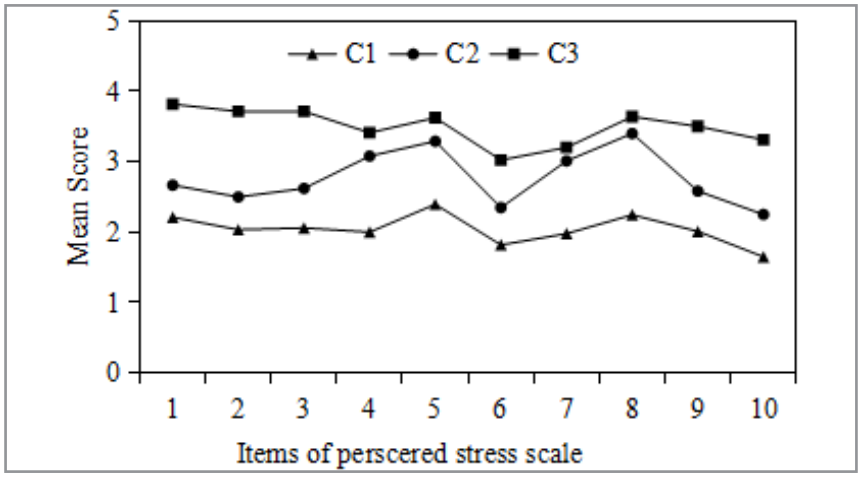

Figure 2: Depiction of the three latent classes defined by pattern of mean score on PSS.

Differences between PSS subgroups for college adjustment and well-being. The ANOVA results are presented in Table 3, and they showed significant differences for SWB, PWB and college adjustment. Post hoc tests were used to detect differences among the three profiles. The findings showed that well-being and college adjustment were significantly different across the three profiles. C1 participants reported the highest levels of and SWB, PWB and college adjustment, which were higher than those of the C2 and C3 profiles. C3 participants reported the lowest levels of SWB, PSW and college adjustment, and C2 participants reported intermediate levels of SWB, PWB and college adjustment.

Table 3: Difference tests of well-being and college adjustment outcomes between three categories of PSS.

Var	C1 (N=197) M(SD)	C2(N=524) M(SD)	C3 (N=188) M(SD)	F	Partial η2
CCSA	3.87(0.49)	3.32(0.53)	2.83(0.53)	192.73***	0.30
IRA	3.88(0.05)	3.40(0.03)	2.78(0.05)	111.57***	0.20
LA	3.74(0.04)	3.28(0.03)	2.96(0.05)	75.96***	0.14
CA	3.94(0.05)	3.37(0.03)	3.04(0.05)	76.02***	0.15
CHA	3.81(0.05)	3.29(0.03)	2.98(0.05)	75.26***	0.14
EA	3.84(0.05)	3.24(0.03)	2.51(0.05)	192.49***	0.30
SA	4.05(0.06)	3.42(0.03)	2.79(0.05)	129.50***	0.22
SAT	3.83(0.05)	3.23(0.03)	2.71(0.05)	115.25***	0.20

PWB	5.90(0.91)	5.01(0.95)	4.12(1.06)	163.98***	0.27
SWB	4.43(0.69)	3.81(0.65)	3.17(0.67)	176.24***	0.28
PA	3.69(0.55)	3.24(0.56)	2.81(0.62)	115.45***	0.20
NA	2.95(0.68)	3.59(0.60)	4.06(0.64)	154.53***	0.25
SWLS	4.99(1.12)	4.22(1.07)	3.45(1.13)	94.92***	0.17

Notes: C1=LPSS profile; C2=MPSS profile; C3=HPSS profile, ***p<.001.

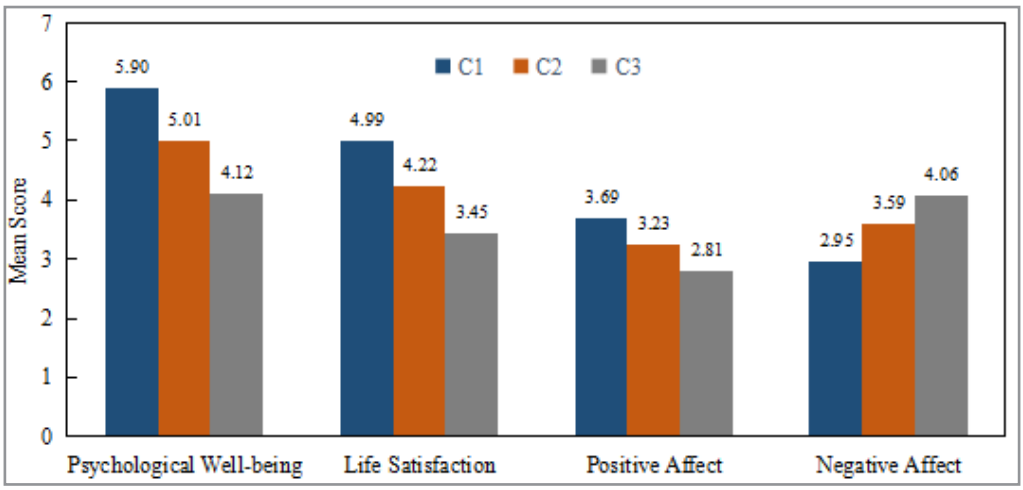

Figure 3: Bar charts of the mean differences in well-being across PSS profile.

Note: The psychological well-being and life satisfaction used 7-point scale, the positive affect and negative affect used 5-point scale.

Differences between PSS subgroups on sociodemographic variables. The differences of demographic variables such as gender, region and sibling relationship in the distribution of three potential categories of perceived stress ability. The results showed that there were gender differences in the three potential categories, and the female was significantly higher than the expected proportion. There was a significant difference in the social hierarchy, the lower the social hierarchy score significantly HPSS, indicating that the perceived stress ability can be influenced by social hierarchy.

Table 4: comparison between latent profiles on demographic.

Demographic	C1 (N, %)	C2 (N, %)	C3 (N, %)	Difference Tests
Gender				
Male	95(10.45)	190(20.90)	60(6.60)	x^2=12.37***
Female	102(11.22)	334(36.74)	128(14.08)	
Residences				
Rural	112(12.32)	314(34.54)	100(11.00)	x^2=2.68
Urban	85(9.35)	210(23.10)	88(9.68)	
Sibling				
Only child	51(5.61)	92(10.12)	40(4.40)	x^2=5.072
More than one children	146(16.06)	432(47.52)	148(16.28)	
Parents' marital status				
Normal	171(18.81)	463(50.94)	165 (18.15)	x^2=1.61
Divorced or others	26(2.86)	61(6.71)	23(2.53)	
Age(M(SD))	19.49(5.98)	18.99(1.52)	18.87(1.30)	F(2,906)=2.44
Social hierarchy(M(SD))	5.59(1.81)	5.23(1.63)	4.85(1.66)	F(2,906)=9.42***

Discussion

The main aim of the present study was to adopt curve-fitting analysis and potential profile analysis to explore the relationship between PSS and two types of well-being. We also examined the associations between perceived stress subgroups and college adjustment and well-being. Finally, the difference between the perceived stress subgroups with regard to demographic variables was also examined to identify potential risk factors of high perceived stress. The results of the curve-fitting analysis indicated that the relationship between PSS and SWB and PWB was consistent, showing mainly a negative linear or curvilinear relationship. The findings are further supported by the results of the person-oriented latent profile analysis. We found a three-profile model of PSS in college students: high perceived stress (21%), moderate perceived stress (58%), low perceived stress (21%). The LPSS group scored significantly higher than the HPSS groups in both categories of well-being. The LPSS group scored significantly higher than the HPSS and MPSS groups in both categories of well-being. The PSS subgroup patterns in our study were consistent with the results of showing that there may be stable subgroup patterns of PSS in different samples [56].

Furthermore, we found that the three perceived stress subgroups reported significantly different levels of college adjustment and well-being, showing that HPSS participants adjusted the best to college life and felt the highest SWB and PSB, and LPSS participants adjusted the worst to college life and felt the lowest SWB and PSB. On the one hand, this supported the validity of our identification for participants based on person-oriented approach of perceived stress. On the other hand, it suggests that PSS is significantly related to college adjustment and two types of well-being, which is consistent with the results of studies using a variable-oriented approach [57-60].

College adjustment differed significantly across the three potential profiles of PSS, which is consistent with previous research findings, that the greater the PSS, the poorer the college adjustment. The accelerated pace of life in today's society has increased the pressure on adolescents to adapt to the environment, interpersonal choices, and learning, which leads to students' college maladjustment [61]. Freshmen are in the transition period, which, together with the external environmental changes of the new crown epidemic, makes this phase itself a period full of potential stress, and when they face stress, if the stress is within tolerable limits, the tension felt is moderate, and they remain in control of the event, they can solve the stress problem and thus achieve school adaptation, and vice versa, they are maladjusted [62]. Lee et al. also suggest that excessive stress can produce a range of emotional disorders and reduced confidence and achievement, which can negatively affect school adjustment [63]. Therefore, schools can help students learn to be normal to adversity and setbacks, vent their emotions reasonably, and release stress to better adapt to college life through thematic group activities and stress relief courses.

There are significant differences in SWB across the three potential profiles of PSS, i.e., life satisfaction and both negative and positive emotions, indicating that PSS has the same pattern of influence on the cognitive and affective dimensions. It indicates that the level of PSS not only affects our good mood, but also has an impact on our cognition, so we can reduce the impact on ourselves and enhance the experience of individual well-being through strategies such as creating entertainment, cognitive adjustment. In addition, the study also found that PWB also differed significantly on the three potential profiles of PSS. According to perceived resource depletion theory, when faced with greater perceptions of stress, individuals need to constantly adjust themselves to meet the requirements in order to complete their work tasks, resulting in more resource depletion [64]. In order to avoid task failure, individuals adopt more negative coping strategies, resulting in lower motivation for personal growth and self-actualization, which affects their psychological well-being.

Concerning the associations between demographic variables and perceived stress subgroups in freshmen, we did not find any differences for residence, sibling, or parents' marital status, but there were significant differences in gender and social hierarchy. Gender showed a significant difference in the three level of PSS. Female had more PSS and this was in consistent with the findings of other studies in which females were more seriously affected by stress and the consequent other psychological problems [65-67]. This difference may be due to biological sex differences in physiological and neurobiological mechanisms underlying every part of the stress process [68-70]. There is also much evidence on gender determined differences in emotional reactions to stress, in particular, that related to establishing and maintaining interpersonal relationships, with females showing higher levels of PSS than males [71]. Similarly, there were significant differences in PSS among the three levels of social hierarchy, i.e., the lower the social hierarchy, the higher the PSS. High social hierarchy entails relative material and social freedom, leading to a different cognitive mindset, one characterized by greater perceptions of control and self-sufficiency, tendency to explain behavior as caused primarily by personal influence [72]. On the contrary, low social hierarchy individuals are likely to be more vigilant to threats, have lower personal sense of control, and be more influenced by external circumstances [73, 74].

Although the present study expands our understanding of the negative effect of PSS on college adjustment and two types of well-being, some limitations should be noted. Due to the cross-sectional design of the present research, one limitation was that we cannot determine whether the associations of PSS with well-being are causal and have changed over time. In the future, we can conduct longitudinal studies to explore the relationship between the PSS and two types of well-being, and explore the role of college adjustment. The sources of PSS are combined and do not differentiate between sources of stress, i.e., whether there are different patterns of PSS arising from different sources of stress. For example, in high social hierarchy groups, PSS may often arise from feelings of time scarcity and the need for achievement, but in low social hierarchy groups, PSS may arise from health problems and concerns about basic needs. Thus, in some cases, PSS may arise from activities that lead to high income, but in other cases, PSS arise from the consequences of lower income, and these patterns should be explored by identifying the sources of stress in different groups in the future. Besides, revealing the potential mechanism underlying the relationship between PSS, college adjustment and two types of well-being is an important and interesting question, and future research is needed to explore the cognitive and behavioral mechanisms [75].

Conclusion

The present study provides evidence that PSS level is an important personal psychological resource for individual multifaceted well-being, suggesting that PSS not only impact one's SWB but also, more importantly, impacts one's PWB. The analysis of potential profiles revealed three profiles of freshmen's PSS, namely, high perceived stress, moderate perceived stress, and low perceived stress. It is noteworthy that there is a significant difference between these profiles, which fully reflects the distribution of PSS levels of freshmen. Furthermore, College adjustment and well-being (SWB and PWB) were significantly different across the three PSS profiles, with LPSS individuals adjusting the best to college life and having the highest well-being, whereas HPSS individuals adjusted the worst to college life and had the lowest well-being. Therefore, the plan is to improve the stress coping skills of freshmen, including various college adjustment behaviors such as strengthening social relationships and increasing emotional communication, as well as creating entertainment (subjective well-being) and building lofty ideals and enhancing the sense of purpose (psychological well-being).

Author Contributions

- **Conceptualization:** Xiaoyan Bi and Yankun Ma.
- **Investigation:** Juan Yang, Weiyu Chen and Hongbo Cui.
- **Date analysis:** Xiaoyan Bi.
- **Writing–review & Editing:** Xiaoyan Bi, Juan Yang, Weiyu Chen, Hongbo Cui and Yankun Ma.

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Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy concerns.

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Conflicts of Interest

The authors declare no conflict of interest.

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