



# Generate Greater Gratitude When Being Help? A Study of the Psychological Mechanism of Gratitude for Chinese Poor College Students

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## Abstract

The Chinese government has invested much money to help poor college students complete their studies, but the gratitude of the recipients remains to be further studied. This study proposed a parallel mediation model and used questionnaires to investigate 260 thousand college students of China to examine the impact of the level of social support on poor college students' gratitude and the mediating role played by social responsibility and relative deprivation. The results showed that social support positively predicted the gratitude level of poor college students; social responsibility and relative deprivation mediated the relationship between social support and gratitude; gender, school type and difficulty level had a significant influence on gratitude level. In short, education to improve the sense of gratitude of poor college students can be summarized as “two increases and one decrease”: increase social support, enhance social responsibility, and reduce relative deprivation.

**Keywords** Gratitude · Social support · Social responsibility · Relative deprivation

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## Introduction

Gratitude is a universal emotion across cultures (Solom et al., 2016). It is defined as the feeling of gratitude that the individual is aware of being the recipient of the good deeds of others and that is highly experienced in that context (Ebi & Demir, 2022; Mcguire et al., 2021). At present, positive psychology advocates the study of people's positive emotions (McCullough et al., 2002). Individuals with high gratitude level tend to have more positive emotional experience (Ma et al., 2022). Study of positive emotion interventions found that 425 Germany adults who wrote thank-you notes had higher levels of gratitude, more positive self-related thoughts, and more positive emotions (Heekerens et al., 2022). Increasing an individual's level of gratitude can also ease stress, get quality sleep, and have healthier social functions (Halberstadt et al., 2016). In addition, gratitude plays an important role not only in mental health and prosocial behavior, but also in moral education (Morgan et al., 2015). However, due to the influence of the family planning policy, many Chinese college students in the twenty-first century are the only child. They are the "emperor" or "princess" of their families since childhood. They are accustomed to being self-centered, giving priority to their own needs and ignoring the efforts of others and society, resulting in lack of appropriate gratitude awareness and behavior (Li, 2015).

Previous research found that college students have strong utilitarian value orientation, weak gratitude consciousness (Dan, 2014; Pu & Zhu, 2012; Wang & Sun, 2020). They are not only ungrateful to society, but also indifferent to their families and teachers. But these studies ignore the effect of an individual's economic level on their gratitude levels, which means that the gratitude levels of college students from poor families are not clear. Liu and Fu (2022) found that compared with ordinary college students, poor college students are deeply affected by family economic pressure, drop-out phenomenon is more common, social comparison leads to low self-esteem, high anxiety and sensitivity, and mental health status is more prone to deviation. In order to reduce the dropout rate of poor college students and promote their physical and mental health, the Chinese government grants them grants and scholarships according to their poverty levels and provides them with certain part-time jobs (Mao et al., 2022). At the same time, as the main body of funding, the state expects such students to complete their studies and grow up healthily, and hopes that students can be grateful to the state and society when receiving funding also, and do not let economic aid only become a material transfer without spiritual elements (Zhao, 2012). However, it is still unknown whether these poor college students can really understand gratitude and what mechanism affects their gratitude level. Therefore, the present study explores these issues next.

## The Relationship Between Social Support and Gratitude

Social support is a kind of social interaction or relationship, which can improve the individual's social adaptability and reduce the harm of adverse external environment (Mishra, 2020). Social support is mainly divided into three categories: objective support, that is, direct material assistance and the existence and participation of social

networks and group relations; Subjective support, namely subjective experience or emotional support, is closely related to individual's subjective emotion; Utilization of social support, that is, the support resources actually used by individuals (Xiao, 1994). With the increasing emphasis on academic qualifications, university degrees have become the key to winning life opportunities in people's minds. The state and the government have paid renewed attention to the differences between various types of students in obtaining higher education, and provided subsidies for children from poor families to enable them to complete university degrees and obtain life opportunities (Goldrick-Rab et al., 2016). In addition, the state and government also provide poor college students with spiritual and emotional support to reduce their sense of inferiority, improve their self-esteem, and help them develop self-confidence, optimism and strong qualities (Liu & Fu, 2022). According to cognitive emotion theory, cognitive processes are key factors in determining the nature of emotions (Weiner et al., 1979). Feelings of gratitude is the result of individual cognitive process. When individuals realize that they have received sincere help from others, they will arouse high gratitude. Therefore, social support may be related to gratitude. A study supports the idea that high social supporters tend to get more positive emotional experiences such as gratitude (An-Ming et al., 2015). Looking up the relevant literature, there are few studies on how social support affects the development of gratitude. Therefore, this study proposes hypothesis 1: social support given by the state positively predicts the level of gratitude of poor college students.

### **Mediating Role of Social Responsibility**

Social responsibility refers to one's civic responsibility and obligation. In addition to learning to be responsible for oneself, one should also learn to be responsible for others, groups and society without seeking reward (Fei, 2020). Cultivating individual social responsibility is the key factor to promote social development, and college students are the motive force source of social development, so it has become an important task for universities to find ways to improve college students' social responsibility (Gallardo-Vazquez et al., 2020). According to social exchange theory, the principle of human society is reciprocity (Gouldner, 1960). If the state gives more social support to individuals, they will contribute to the development of the state and society and assume more social responsibilities. A survey of college students with left-behind experiences found that the more social support they received, the more willing they were to assume social responsibility (Hu, 2016). Accordingly, we speculate that the degree of social support received by poor college students is also closely related to their level of social responsibility. According to the social cognitive theory (Locke, 1987), people's behavior interacts with the external environment and internal psychology (such as cognition, emotion, etc.). Not only the external environment and internal psychology will guide certain behaviors, but also the behavior itself will affect the external environment and internal psychology. In the process of increasing the level of individual social responsibility, their attitude towards others, society and environment has changed, and they can feel the support of the country and society more, so the level of gratitude has been

greatly improved. Lee and Kyung (2018) found that there is a positive correlation between gratitude and social responsibility when studying the relationship between gratitude and altruistic behavior of college students. Therefore, we propose hypothesis 2: Social responsibility plays an intermediary role between social support and gratitude of poor college students. Social support can positively predict the sense of social responsibility of poor college students, and the level of social responsibility can positively predict the degree of gratitude.

### Mediating Role of Relative Deprivation

Relative deprivation refers to the subjective cognition and emotional experience of negative emotions such as anger and dissatisfaction when the individual or the group to which the individual belongs is in a disadvantaged position compared with other people or other groups (Smith et al., 2012). Relative deprivation theory holds that individuals who occupy a disadvantaged position will experience a high degree of inequality when compared with others, further damaging the equilibrium mechanism that regulates individual psychological adaptation (Smith & Pettigrew, 2015). The stronger the sense of relative deprivation experienced by individuals, the more likely it is to increase the prevalence of mental illness, affect physical and mental health, and thus reduce life satisfaction and quality of life (Xia & Ma, 2020). Social support buffer hypothesis suggests that providing social support can alleviate the negative effects of stress on mental health (Cohen & Wills, 1985). Qin et al. (2022) empirical studies support this view that good social support can inhibit negative emotional experiences such as depression, thus reducing relative deprivation. Accordingly, we can infer that social support is closely related to the relative deprivation degree of poor college students. Relative deprivation stems from social comparison, in which individuals consider themselves to be at a disadvantage and experience injustice (Xiong & Ye, 2016). Therefore, individuals with a high sense of relative deprivation often experience a sense of injustice, which leads to their psychology of being owed. According to emotional attribution theory (Weiner, 1985), people's interpretation of events will lead to different emotional experiences. Individuals with a high sense of relative deprivation perceive assistance from the State and society as compensation for their 'deprivation' and therefore feel justified, let alone grateful. Previous surveys have also found that poor college students have a strong sense of relative deprivation and a strong sense of social dissatisfaction, leading to a decline in gratitude (Yu et al., 2018). Based on this, we speculate that relative deprivation is closely related to the gratitude level of poor college students. We propose hypothesis 3: Relative deprivation mediates the relationship between social support and gratitude of poor college students. Social support negatively predicts students' relative deprivation, and relative deprivation negatively predicts students' gratitude.

In addition to the strong associations between the four variables, some demographic variables were also associated with feelings of gratitude, social support, social responsibility, and relative deprivation. On the gender level, women and men have different attitudes towards expressing gratitude. Women tend to see gratitude

as an important part of their lives and express gratitude more positively, whereas men see gratitude as evidence of weakness and tend to avoid expressing gratitude (Levant & Kopecky, 1995; Schwartz & Rubel, 2005; Timmers et al., 1998). At the same time, men and women are socialized differently, resulting in different values. Women are expected to play the role of being taken care of and express more emotions, while men are expected to play the role of a power and status seeker who needs to hide their emotions more often (Brody, 1997, 1999; Kelly & Hutson, 1999; Schwartz & Rubel, 2005). As a result, women tend to receive more social support and experience less relative deprivation than men, but have a lower sense of social responsibility (Eagley & Crowley, 1986). Kashdan et al. (2010) further confirmed that, compared with men, women feel less burden, less sense of responsibility and obligation, express more positive emotions, have a higher degree of gratitude, and have less sense of relative deprivation after receiving gifts. Based on this, we speculate that gender is closely related to feelings of gratitude, social support, social responsibility and relative deprivation. We propose hypothesis 4: Compared with female college students, male college students receive less social support, experience a higher sense of relative deprivation, have a lower level of gratitude, but have a higher sense of social responsibility. At the level of school type, the biggest difference between undergraduates and vocational and technical students lies in their academic background. With the increasingly fierce social competition, educational background inevitably becomes a threshold for employment (Xiong & Li, 2010). Therefore, educational background discrimination also appears, which leads to less emotional social support for vocational and technical college students and more sense of relative deprivation, which leads to their low sense of social responsibility and less experience of gratitude (Du, 2020). Based on this, we speculate that school type is closely related to gratitude, social support, social responsibility and relative deprivation. We propose hypothesis 5: Compared with undergraduates, vocational and technical college students have higher sense of relative deprivation, less social support, and lower level of social responsibility and gratitude. In terms of poverty and financial aid, compared with poor college students who do not receive financial assistance, poor college students who receive financial assistance tend to have less negative emotions, more gratitude, a stronger sense of social responsibility and mission, and want to do their best to contribute back to the society (Liu et al., 2018). Based on this, we speculate that poverty and financial support are closely related to feelings of gratitude, social support, social responsibility and relative deprivation. We propose hypothesis 6: Compared with unsubsidized poor college students, poor college students receive a higher level of social support, have a higher level of gratitude and social responsibility, and experience less sense of relative deprivation.

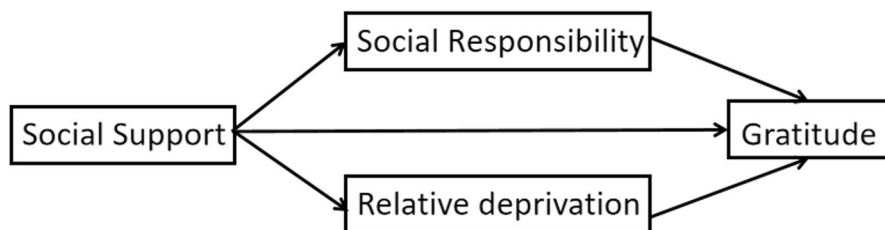
In summary, there are many factors that affect the gratitude for Chinese poor college students, but most previous studies only discussed the influence of social support or social responsibility, or relative deprivation on gratitude. As a matter of fact, these influences are seldomly singular; rather, they appear in groups such that they attract and form building blocks with each other. However, the interaction between them and that interaction's internal relationship remain unclear. Therefore, this study not only considers the influence of demographic variables, but also plans to construct a parallel mediation model to explore the influence

of social support on gratitude of poor college students under the background of education funds (see Fig. 1), including the mediating role of social responsibility and relative deprivation on the relationship between social support and gratitude.

## Method

### Participants

This study included data on 260,060 valid samples. The participants ranged in age from 18 to 21 years ( $M = 19.49$ ,  $SD = 1.39$ ); 101,397 participants (39%) were male students, and 158,663 (61%) were female students; 132,368 participants (50.9%) were undergraduates, and 127,692 (49.1%) were vocational and technical college students. A total of 124,328 participants (47.8%) were poor students, and 135,732 participants (52.2%) were non-poor students. Among the poor college students (124,328), 108,013 participants (86.9%) received financial assistance, while 16,315 (13.1%) did not. The difficulty level captures the level of challenge experienced by these poor students: level 1 (students from poor families confirmed by the Department for Poverty Alleviation by inputting tent card) had 32,193 participants (12.4%), level 2 (students of families with the lowest access to life needs confirmed by the civil affairs department) had 17,984 participants (6.9%), level 3 (students whose families receive relief support for the extremely poor confirmed by the Civil Affairs Department) had 2613 participants (1%), level 4 (orphaned students confirmed by the civil affairs department) had 301 participants (0.1%), level 5 (children of martyrs or disabled soldiers confirmed by the Department of Veterans Affairs) had 275 participants (0.1%), level 6 (disabled students from families experiencing financial difficulty confirmed by the Disabled Persons' Federation) had 5752 participants (2.2%), level 7 (students from families in poor towns confirmed by the Civil Affairs Department, including urban strands personnel, those receiving an urban minimum living guarantee, those receiving poverty spending for low-income families) had 4172 participants (1.6%), level 8 (students from families with other types of economic difficulties) had 61,038 participants (23.5%).



**Fig. 1** A hypothetical path model diagram of social support, social responsibility, relative deprivation, and gratitude

## Instruments

### Social Support Rating Scale

Xiao (1994) developed the social support rating scale, which includes 10 items. The scale includes the following three factors: objective support (i.e., items 2, 6, and 7), subjective support (i.e., items 1, 2, 3, and 5), and utilization of support (i.e., items 8, 9, and 10). For questions 1 to 4 and 8 to 10, the choices numbered 1, 2, 3, and 4 receive a score of 1, 2, 3, and 4 points, respectively. Question 5 has responses labelled as A, B, C, and D, which are each scored from 1–4 to indicate no support to full support. For questions 6 and 7, if the answer is ‘no sources’, the score is 0, and if the answer is ‘the following sources’, the number of sources selected is the score (Xiao, 1994). Overall, a higher total score reflects a higher level of social support. Based on the characteristics of college students, this study modified some items of the scale. In this study, the internal consistency coefficient of the scale was 0.700.

### The Gratitude Questionnaire-6 (GQ-6)

McCullough et al. (2002) developed the Gratitude Questionnaire-6, which includes 6 items (e.g., ‘I have so much in life to be thankful for’). The scale is scored based on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Among them, the third and sixth questions are reverse scored. The higher the score is, the higher the level of gratitude. In this study, the internal consistency coefficient of the scale was 0.783.

### Social Responsibility Scale

The conscientiousness subscale of the Big Five Inventory prepared by John and Donahue (1991) was used to measure college students’ sense of social responsibility (e.g., ‘I am pretty good about pacing myself to get things done on time’). The scale includes 12 items and is scored on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Question 3 is reverse scored. The higher the score is, the higher the social responsibility of the participants. In this study, the internal consistency coefficient of the scale was 0.853.

### Relative Deprivation Scale

Ma (2012) developed the relative deprivation scale. The questionnaire includes 4 items (e.g., ‘Most of the rich in society have made their fortunes by dishonorable means’) and is based on a six-point scale ranging from 1 (strongly disagree) to 6 (strongly agree). The higher the score is, the higher the sense of relative deprivation. In this study, the internal consistency coefficient of the scale was 0.682.

## Procedures

This study was approved by the Ethics Committee of Jiangxi Normal University School of Psychology and the Administrative Department of the Chinese Government Funding Office. Students from 105 colleges were selected for investigation through a stratified random sampling method, and the questionnaire was completed online. Before participating in the survey, they had applied for poverty assistance from the government subsidy department. The participants were required to read and sign informed consent forms before testing. They were informed that they had the right to opt out of the test at any time and that the test results were completely unrelated to personal performance, evaluation, or funding and would not be revealed to any third party. The investigation process lasted for one month.

## Data Analysis

Data were analyzed for only 108,013 of 124,328 poor college students who received financial assistance. The descriptive statistics and correlation analysis were conducted using IBM SPSS 23.0. The mediation analyses were based on 5000 bootstrapped samples using Hayes' PROCESS v3.4. Model 4 was used to examine the parallel mediating effect (Hayes, 2013).

## Results

### Control and Test for Common Method Bias

In this study, data were collected by self-report, which may create common method bias. Therefore, confirmatory factor analysis was used in this study to test for common method bias among all items. The results showed that the model fit was poor,  $\chi^2/df=3787.727$ ,  $GFI=0.596$ ,  $CFI=0.316$ ,  $TLI=0.315$ ,  $RMSEA=0.121$ , so there was no serious common method bias in this study.

### Descriptive Statistics and Correlation Analysis

#### Analysis of Demographic Variables

Through the independent sample t test, the results showed that the gratitude and social support scores of female students were significantly higher than those of male students ( $t_{\text{gratitude}}=-39.04$ ,  $p<0.001$ ,  $d=0.16$ ;  $t_{\text{social support}}=-11.80$ ,  $p<0.001$ ,  $d=0.05$ ) and that males' social responsibility and relative deprivation scores were significantly higher than those of female students ( $t_{\text{social responsibility}}=12.07$ ,  $p<0.001$ ,  $d=0.05$ ;  $t_{\text{relative deprivation}}=76.88$ ,  $p<0.001$ ,  $d=0.31$ )(Hypothesis 4 was verified)(see Table 1). Through the independent sample t test, the results showed that school type had a significant influence on the scores of each scale; specifically,



**Table 1** Differences in scores of gratitude, social support, social responsibility, and relative deprivation by gender and school type (n = 260,060)

Variables	gender			school type		
	male (M ± SD)	female (M ± SD)	<i>t</i>	undergraduate (M ± SD)	vocational and technical col- lege (M ± SD)	<i>t</i>
gratitude	32.11 ± 5.94	33.03 ± 5.81	-39.04***	33.64 ± 5.77	31.67 ± 5.83	86.707***
social support	37.82 ± 7.00	38.13 ± 6.19	-11.80***	38.42 ± 6.39	37.58 ± 6.62	33.042***
social responsi- bility	43.48 ± 6.30	43.18 ± 5.87	12.07***	43.44 ± 6.02	43.15 ± 6.05	12.085***
relative depriva- tion	11.65 ± 3.37	10.66 ± 2.99	76.88***	11.03 ± 3.18	11.06 ± 3.18	-2.586**

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

the gratitude, social support and social responsibility scores of undergraduates were significantly higher than those of vocational and technical college students ( $t_{gratitude} = 86.71, p < 0.001, d = 0.34$ ;  $t_{social\ support} = 33.04, p < 0.001, d = 0.13$ ;  $t_{social\ responsibility} = 12.09, p < 0.001, d = 0.05$ ), and the relative deprivation score of vocational and technical college students is significantly higher than that of undergraduates ( $t_{relative\ deprivation} = -2.59, p < 0.01, d = 0.009$ )(Hypothesis 5 was verified) (see Table 1). Through the independent sample t test, the results showed that the gratitude, social support and social responsibility scores of poor college students were significantly higher than those of non-poor college students ( $t_{gratitude} = 104.77, p < 0.001, d = 0.41$ ;  $t_{social\ support} = 35.83, p < 0.001, d = 0.14$ ;  $t_{social\ responsibility} = 70.33, p < 0.001, d = 0.28$ ), and non-poor college students' relative deprivation scores were significantly higher than those of poor college students ( $t_{relative\ deprivation} = -33.93, p < 0.001, d = 0.13$ )(see Table 2). In China, the term "financial assistance" mainly refers to supporting poor students to live and study normally, which is similar to helping. Therefore, it mainly targets poor college students, and almost no non-poor

**Table 2** Differences in scores of gratitude, social support, social responsibility, and relative deprivation in terms of poverty and financial assistance

Variables	Poor or non-poor (n = 260,060)			financial assistance (n = 124,328)		
	Poor (M ± SD)	non-poor (M ± SD)	<i>t</i>	received (M ± SD)	not received (M ± SD)	<i>t</i>
gratitude	33.90 ± 5.55	31.54 ± 5.95	104.77***	33.85 ± 5.57	31.61 ± 5.95	99.118***
social support	38.49 ± 6.52	37.57 ± 6.49	35.83***	38.62 ± 6.50	37.46 ± 6.48	45.351***
social responsi- bility	44.16 ± 5.96	42.51 ± 6.01	70.33***	44.02 ± 5.96	42.65 ± 6.03	58.138***
relative depriva- tion	10.83 ± 3.14	11.25 ± 3.20	-33.93***	10.85 ± 3.14	11.22 ± 3.20	29.732***

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

college students will receive this type of financial assistance. The data analysis of whether to receive financial assistance in this paper is also aimed at poor college students. The gratitude, social support and social responsibility scores of students who received financial assistance were significantly higher than those of the students who did not receive financial assistance ( $t_{\text{gratitude}}=99.19, p<0.001, d=0.39$ ;  $t_{\text{social support}}=45.35, p<0.001, d=0.18$ ;  $t_{\text{social responsibility}}=58.14, p<0.001, d=0.23$ ), and the relative deprivation scores of college students who did not receive financial assistance were significantly higher than those of students who did receive financial assistance ( $t_{\text{social responsibility}}=58.14, p<0.001, d=0.23$ )(Hypothesis 6 was verified)(see Table 2).

## Correlation Analysis

The correlation analysis results of each variable for the poor college students receiving financial assistance showed that gratitude was significantly positively correlated with social support ( $p<0.01$ ) and social responsibility ( $p<0.01$ ). Social support was positively correlated with social responsibility ( $p<0.01$ ). Relative deprivation was significantly negatively correlated with other variables ( $p<0.01$ ) (see Table 3). In addition, gender, school type and difficulty level were significantly related to the study variables, so they should be treated as control variables in the subsequent mediation analysis.

## Mediation Analysis

Controlling for gender, school type and difficulty level, PROCESS V3.4 was used to test the mediating effects. Regression analysis revealed that social support could positively predict the level of gratitude ( $\beta=0.185, p<0.001$ )(Hypothesis 1 was verified). The results show that the higher the social support given by the state, the higher the degree of gratitude of poor college students. Regression analysis shows that social support can positively predict the level of social responsibility ( $\beta=0.373, p<0.001$ ), and the level of social responsibility can positively predict the level of gratitude of poor college students ( $\beta=0.320, p<0.001$ )(Hypothesis 2 was verified). Regression analysis revealed that social support could negatively predict the relative

**Table 3** Means, standard deviations, and intercorrelations of the study measures ( $n=108,013$ )

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1 gratitude	34.06	5.503							
2 social support	38.68	6.486	0.34**						
3 social responsibility	44.18	5.952	0.41**	0.37**					
4 relative deprivation	10.8	3.134	-0.23**	-0.24**	-0.25**				
5 gender	1.63	0.483	0.07**	0.01**	-0.02**	-0.16**			
6 school type	1.46	0.498	-0.15**	-0.06**	-0.05	0.01	-0.01**		
7 difficulty level	4.89	3.204	0.03**	0.03**	0.06**	0.01**	0.03**	-0.11**	

\*  $p<0.05$ , \*\*  $p<0.01$ , \*\*\*  $p<0.001$

deprivation of poor college students ( $\beta = -0.235, p < 0.001$ ) and the relative deprivation could negatively predict the gratitude level of poor college students ( $\beta = -0.111, p < 0.001$ ) (Hypothesis 3 was verified).

In order to test hypotheses 2 and 3, social responsibility and relative deprivation play a mediating role between social support and gratitude of poor college students respectively. We analyzed the mediating effects of social responsibility and relative deprivation on the relationship between social support and gratitude and found that the indirect effect of social responsibility on the relationship between social support and gratitude was 0.123 (using the percentile bootstrap with deviation correction method to estimate the value of the indirect effect). The bootstrap 95% confidence interval did not contain 0, which indicated that social responsibility played a mediating role between social support and gratitude (Hypothesis 2 was verified). The effect of relative deprivation on the relationship between social support and gratitude was 0.101 (using the percentile bootstrap method with deviation correction to estimate the indirect effect of value). The bootstrap 95% confidence interval did not contain 0, indicating that relative deprivation had a significant mediating effect on the relationship between social support and gratitude (Hypothesis 3 was verified) (See Table 4). In addition, the difference in the mediating effects between social responsibility and relative deprivation was 0.022, and the confidence interval did not contain 0, indicating that

**Table 4** Regression analysis results of the mediating role of social responsibility and relative deprivation (n = 108,013)

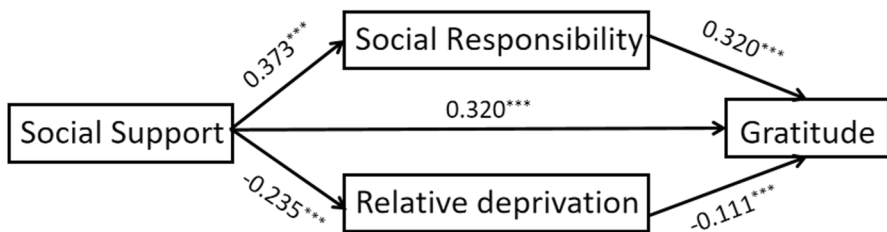
Regression equation		Integral equation		regression coefficient				
Outcome	Predictor	R <sup>2</sup>	F	$\beta$	Boot SE	t	95%CI	
social responsibility	gender	0.143	4486.33	-0.028	0.035	-9.994***	-0.415	-0.277
	school type			0.021	0.034	7.504***	0.188	0.326
	difficulty level			0.047	0.005	16.704***	0.078	0.099
	social support			0.373	0.003	132.251***	0.337	0.348
relative deprivation	gender	0.079	2329.56	-0.153	0.019	-52.434***	-1.032	-0.957
	school type			-0.008	0.019	-2.628**	-0.086	-0.013
	difficulty level			0.018	0.003	6.168***	0.012	0.023
	social support			-0.235	0.002	-80.461***	-0.117	-0.111
gratitude	gender	0.244	5811.78	0.053	0.031	19.804***	0.546	0.666
	school type			-0.138	0.03	-51.609***	-1.578	-1.463
	difficulty level			-0.012	0.005	-4.636***	-0.03	-0.012
	social support			0.185	0.003	63.857***	0.152	0.162
	social responsibility			0.320	0.003	110.706***	0.290	0.301
	relative deprivation			-0.111	0.005	-39.687***	-0.205	-0.184

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Table 5** The mediating effect of social responsibility and relative deprivation on the effect of social support on gratitude (n = 108,013)

Effect type	Effect	Boot SE	Bootstrap 95%CI		Comparison
			Lower	Upper	
total indirect effect	0.123	0.001	0.121	0.126	43.99%
social responsibility	0.101	0.001	0.099	0.104	36.11%
relative deprivation	0.022	0.001	0.021	0.023	7.88%
social responsibility-rela- tive deprivation	0.079	0.002	0.076	0.082	28.23%

Boot SE and Boot 95%CI refer to the standard error and 95% confidence interval of indirect effects estimated by percentile Bootstrap with deviation correction method, respectively

**Fig. 2** Mediating effects of social support, social responsibility, relative deprivation and gratitude

the mediating effect of social responsibility was significantly greater than that of relative deprivation on the relationship between social support and gratitude (see Table 5 and Fig. 2).

## Discussion

We used Social Support Rating Scale, Gratitude Questionnaire-6 (GQ-6), Social Responsibility Scale and Relative Deprivation Scale to investigate the influence of social support on gratitude of poor college students, and the mediating effect of social responsibility and relative deprivation. We find that the degree of social support can positively predict the degree of gratitude and social responsibility of poor college students, and negatively predict their relative deprivation level (hypothesis 1, 2 and 3). In addition, gender, school type, poverty and financial aid have important influence on the degree of social support, relative deprivation, social responsibility and gratitude (hypothesis 4, 5 and 6). At the same time, social responsibility can significantly positively predict their degree of gratitude, while relative deprivation can negatively predict their degree of gratitude. (hypotheses 2 and 3). In addition, Social support can indirectly affect their gratitude to society through social responsibility and relative deprivation level. (hypotheses 2 and 3). The effects of demographic variables and each of the study hypotheses are discussed in detail below.

## Demographic Variables Analysis

In the aspect of gender, the degree of social support and gratitude of male poor college students is lower than that of female, but they have higher social responsibility and relative deprivation. However, a further review of the correlation analysis showed that although gender was significantly correlated with social support and social responsibility, the correlation coefficient was low. Therefore, this article can only speculate on the reasons for this slight gap. This may lie in the fact that society often conveys different role expectations to men and women, acquiescing in women's initiative to seek help when in trouble, while demanding that men be strong, independent and responsible (Zhang & Tao, 2013). Therefore, men have a strong sense of social responsibility, but they have concerns about the use of social support, which in turn hinders their access to social resources, experience more pressure and produce a stronger sense of relative deprivation (Yang, 2015; Zhang & Tao, 2013).

Regarding school type, the level of social support, gratitude and social responsibility of undergraduates is higher than that of vocational and technical college students, while their sense of relative deprivation is lower. Vocational and technical college students mainly cultivate high-quality technical talent for front-line production and service positions (Du, 2020), and thus they pay attention to the cultivation of student skills and may ignore the development of students' mental health. As a result, vocational and technical college students receive less emotional social support, and when they encounter difficulties, they are more likely to digest themselves and less likely to choose to confide in others, thus they are less appreciative of society (Du, 2020). At the same time, colleges and universities ignore the cultivation of inherent characteristics in curriculum setting, reducing the humanistic and scientific nature of college education, thus reducing students' sense of social responsibility and mission (Zhang, 2015). In addition, the long-standing "academic discrimination" in society makes vocational and technical college students feel vulnerable and gives them a stronger sense of relative deprivation (Tian & Zhang, 2021).

In terms of poverty and financial aid, the level of social support, gratitude and social responsibility of the poor college students who receive financial aid is higher than that of the poor college students who do not receive financial aid, while the relative deprivation degree of the poor college students who do not receive financial aid is higher than that of the poor college students who receive financial aid. Fourteen years ago, the Chinese government has implemented a financial aid system for poor college students (Ministry of Education of the People's Republic of China, 2004), and colleges and universities have made great achievements in educational aid. To a great extent, the social support level of poor college students has been improved by constantly improving the financial aid mode and providing maximum material support for the families in need of assistance. In addition, the combination of material support and moral atmosphere in colleges and universities can help cultivate poor students' sense of gratitude and make them have a higher sense of social responsibility (Liu et al., 2018). Therefore, under the education funding system, the social support of poor college students is greatly improved, their level of social responsibility and gratitude is higher, they can experience more positive emotions, and relatively low sense of deprivation.

## Social Support and Gratitude

Although many researchers have discussed the relationship between social support and gratitude before, they mainly focus on the influence of gratitude on social support, and few studies have explored the influence of social support on gratitude from the perspective of social support (Deichert et al., 2019; Fujitani et al., 2017; Lin, 2016; Sun et al., 2014; Wood et al., 2008a, 2008b). This study creatively reveals that social support can significantly and positively predict the degree of gratitude of poor college students. Previous studies have shown that social support is a key factor in achieving greater well-being and improving quality of life (Li & Zhang, 2015). Individuals who received higher social support also had higher levels of gratitude and positive emotional experiences (Yang et al., 2017), which can alleviate the emotional impact of negative life events and support better physical and mental health and higher subjective well-being (Liu et al., 2016; Teoh & Hilmert, 2018). Under the educational funding system, poor college students can obtain material and spiritual support from the society, obtain a higher level of social support, and experience more positive emotions such as gratitude.

## Mediating Role of Social Responsibility and Relative Deprivation

This study found that social responsibility plays a mediating role between social support and the gratitude of poor college students. First, a high level of social support enhances the social responsibility of poor college students. Second, the results show that individuals with higher social responsibility have higher levels of gratitude. In the process of funding for education, in addition to receiving material aid, poor college students also receive mental education (Wang, 2018). In the work of educational funds in China, colleges and universities often carry out responsibility education and honesty education for students to cultivate students' sense of social responsibility. Therefore, students are aware of the country's contribution, and know how to give back to the country and shoulder social responsibilities. In China, learning to be grateful is also a social responsibility (Chen, 2012). In the process of making greater contributions to the country and society, the poor college students who have received financial aid also show more gratitude to the society.

The study also found that relative deprivation played a mediating role between social support and gratitude level of poor college students. The results support the social support buffering hypothesis that the higher the level of social support, the lower the relative deprivation (Cohen & Wills, 1985). The results further reveal that the higher the degree of relative deprivation of poor college students, the lower the degree of gratitude. The explanation for this is that poor college students who receive government subsidies have a reduced sense of injustice and relative deprivation, and are able to reconsider the economic differences between them and others, and believe that the world is fair to everyone. At this point, poor college students are able to re-examine government aid and attribute it to charity, thus increasing their own gratitude.

## Limitations and Directions

This study has the following shortcomings. (1) This study does not distinguish between long-term and short-term poverty. Studies have found that long-term poverty has obvious characteristics of vulnerability, and compared with short-term poverty, is more likely to be characterized by the intergenerational transmission of poverty (Wang, 2017). Therefore, this study does not reveal whether long-term and short-term poverty have different influences on poor college students' levels of gratitude. Future studies can consider exploring the effects of the social support boundary conditions for gratitude from the perspective of long-term and short-term poverty. (2) This study lacks longitudinal research data, so it is difficult to reveal the dynamic influence of government and social support on the gratitude of poor college students under the system of funding for education. (3) In addition to social responsibility and relative deprivation, there may be other moderators, such as general self-efficacy and the concept of a just world, that also play a role in the relationship between social support and gratitude. Future research can consider longitudinal studies and other moderating variables to further improve the psychological mechanism affecting the gratitude of poor college students. (4) Participants in this study were surveyed in the second half of 2020. Having experienced the effects of COVID-19, these poor students may be negatively affected by factors such as stagnant social mobility, and variables such as gratitude and social support may be different from those experienced during more uneventful periods.

## Conclusion

This study uses a parallel mediation model to reveal the mechanism through which social support influences the gratitude level of poor college students under a system of funding for education and provides empirical evidence that can improve the plan for funding college education and improving poor college students' mental health. The following are our conclusions: social support can significantly positively predict poor college students' gratitude level; social responsibility and relative deprivation play a mediating role between social support and the gratitude level of poor college students; and gender, school type and difficulty level have a significant influence on the gratitude level of poor college students.

## Declarations

**Competing Interests** The authors have no financial or proprietary interests in any material discussed in this article.

**Ethics Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the the Ethics Committee of the Psychology College of Jiangxi Normal University and the Administration Department of the Government Funding Office in China.

**Data Transparency** We are ready to provide them if needed.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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