

RESEARCH ARTICLE

Gratitude Problems of College Students in Guizhou Province, The People's Republic of China

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ABSTRACT

Based on Emmons' three-dimensional theory of gratitude (cognition, emotion, behavior), this study focuses on eight core modules: positive emotions, forgiveness, humility, prosocial behavior, psychological well-being, guilt, happiness, and life satisfaction. An empirical analysis was conducted on 452 college students in Guizhou Province using a self-developed three-dimensional scale to explore the specific manifestations and interactions of their gratitude cognition, emotion, and behavior. The results show a consistent pattern across all eight modules: scores in the cognitive and emotional dimensions are significantly higher than the overall average of their respective modules (e.g., in the positive emotions module, cognition = 3.36, emotion = 3.38, both higher than the module average of 3.09; in the forgiveness module, cognition = 3.07, emotion = 3.09, both higher than the module average of 2.81), indicating that students have clear cognitive recognition and strong emotional resonance with "the association between gratitude and the concepts of each module." However, scores in the behavioral dimension are generally lower than the overall average of their respective modules (e.g., in the positive emotions module, behavioral strategy score = 2.94, lower than the module average of 3.09; in the forgiveness module, behavioral strategy score = 2.68, lower than the module average of 2.81), reflecting insufficient practice of specific gratitude-related behaviors. This reveals the core issue in gratitude education for college students in Guizhou: a significant gap between cognitive-emotional recognition and behavioral practice. By systematically analyzing the current situation of gratitude education among college students in Guizhou, this study fills the gap in localized research on this group. Based on the data differences across the eight modules, it provides a precise direction for optimizing college gratitude education, which is of great practical significance for improving the college gratitude education system and promoting the transformation from cognition and emotion to behavior. A limitation is that the sample is only from Guizhou Province; future research could expand the sample scope or conduct follow-up studies to enhance the generalizability of the conclusions, thereby providing references for strengthening behavioral transformation in gratitude education in more regions.

Keywords: gratitude problems; cognitive; emotional; behavioral dimensions; Positive Emotions; Forgiveness; Humility; Prosocial Behavior; Psychological Well-Being; Guilt, Happiness; Life Satisfaction; Guizhou province; People's Republic of China

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1. Introduction

College students, as an important force in social development, the cultivation of their sense of gratitude is crucial for shaping sound personalities and fostering social responsibility. However, at present, some college students have a weak sense of gratitude, specifically manifested in their lack of active perception, response, and feedback to the support and efforts from families, schools, and society. As a culturally diverse province in southwest China, Guizhou still lacks systematic research on the sense of gratitude among local college students, and the specific characteristics of problems in their cognitive, emotional, and behavioral dimensions urgently need to be clarified.

This weak sense of gratitude has had multi-level negative effects: for individual students, it hinders the development of their empathy and sense of responsibility, making it difficult to establish stable and positive social relationships and affecting personal growth and psychological adaptability; for college education, due to the lack of accurate insight into local students' gratitude issues, gratitude education tends to fall into a formalized predicament, failing to effectively achieve the goals of moral education; for the social atmosphere in Guizhou, the weak sense of gratitude among college students will weaken the cultivation and transmission of a social mutual-aid atmosphere, which is not conducive to building harmonious interpersonal relationships and a good social ethos.

In view of the gap in research on college students' sense of gratitude in Guizhou, this study takes college students in Guizhou as the research object and divides gratitude into 8 core modules: Positive Emotions, Forgiveness, Humility, Prosocial Behavior, Psychological Well-Being, Guilt, Happiness, and Life Satisfaction. Empirical analysis will be conducted on each module from the cognitive, emotional, and behavioral dimensions to sort out the current characteristics of the sense of gratitude. The research results can supplement localized empirical evidence for regional gratitude education, help colleges and universities accurately identify weak links, and provide references for optimizing practice and improving the moral literacy of college students in Guizhou.

2. Literature Review

Positive emotions are closely associated with gratitude, as they enhance individuals' sensitivity to kindness and promote the perception of social connections ^[1]. The behavioral strategies in this module (gratitude journaling, mindfulness practice, volunteer service, self-affirmation) are derived from ^[2], who verified their effectiveness in strengthening positive emotions and thereby enhancing gratitude.

Gratitude is inherently linked to forgiveness, which eliminates negative emotions and fosters positive interpersonal interactions ^[3]. The behavioral strategies in this module (forgiveness workshops, empathy exercises, inclusive campus activities, role-playing) are based on ^[4], whose research confirmed that these methods effectively promote forgiveness and, in turn, enhance gratitude.

Humility facilitates gratitude by encouraging recognition of others' contributions and an open attitude ^[5]. The behavioral strategies in this module (reflection exercises, group learning with diverse perspectives, team collaboration, cross-cultural communication) draw on ^[6] and ^[7], who validated their role in improving both humility and gratitude.

Gratitude and prosocial behavior reinforce each other, with gratitude acting as a "booster" for altruism ^[8]. The behavioral strategies in this module (community service, peer mentoring, social responsibility education, ideological and political activities) are supported by ^[9] and ^[2], who demonstrated their effectiveness in strengthening prosocial tendencies and gratitude.

Gratitude is foundational to psychological well-Being, supporting self-acceptance and life satisfaction [10]. The behavioral strategies in this module (campus wellness activities, team sports, peer support groups, positive psychology reading) are derived from [11] and [12], who confirmed that these practices reduce negative emotions and enhance gratitude.

Moderate guilt can inspire gratitude by prompting individuals to reflect on others' kindness [13]. The behavioral strategies in this module (self-compassion exercises, forgiveness training, emotional regulation, guilt-to-gratitude group activities) are based on [14] and [15], whose research validated their role in transforming guilt into gratitude.

Gratitude significantly predicts happiness, helping individuals cope with stress and perceive positive aspects of life [16]. The behavioral strategies in this module (positive psychology courses, friendly social relationships, gratitude practice tasks, group counseling) draw on [17] and [18], who confirmed these approaches enhance both happiness and gratitude.

Gratitude is directly related to life satisfaction, with grateful individuals showing greater acceptance of their lives [19]. The behavioral strategies in this module (teacher guidance, career planning, school feedback mechanisms, community participation) are supported by [20] and [21], who verified their role in improving life satisfaction and gratitude.

The above literature review has examined the associations between the 8 core modules and gratitude, and clarified the empirically validated behavioral strategies under each module. Subsequent analysis will be conducted based on Emmons' three-dimensional theory of gratitude (cognition, emotion, behavior) [22], which provides a framework for exploring the "cognition-emotion-behavior" dynamics of each module and the integration of strategies.

3. Theoretical framework

This research has its foundation in the three-dimensional theory of gratitude by Emmons, which rationalizes gratitude as a dynamic psychology process comprising of cognition, emotion, and behavior. This model can be effectively applied in the current study since it can be used to investigate the gap between the internal recognition of gratitude and the behavioral manifestation of the process an issue that has been noted numerous times but not yet analyzed in relation to the Chinese university student population.

The model by Emmons offers a process-based framework when compared to other frameworks that regard gratitude as one of the personality traits or interpersonal tendencies, which fits the educational objective of converting the internal awareness of students to become visible. Due to this reason, the current study will use this model as the central theoretical ground.

The eight modules applied in this case namely Positive Emotions, Forgiveness, Humility, Prosocial Behavior, Psychological Well-Being, Guilt, Happiness and Life Satisfaction were chosen, having broad empirical evidence as to their conceptual and functional relationship with gratitude. The connection between each of the modules to the cognition-emotion-behavior model is as follows:

- Cognition: The ability of the students to recognize the theoretical relationship between the construct (e.g., forgiveness, humility) and gratitude.
- Emotion: The emotional reflectance or emotional reaction relating to that construct.
- Behavior: Engagement in gratitude enhancing activities that have been backed by psychological and educational studies like journaling, service learning, empathy training or reflective processes.

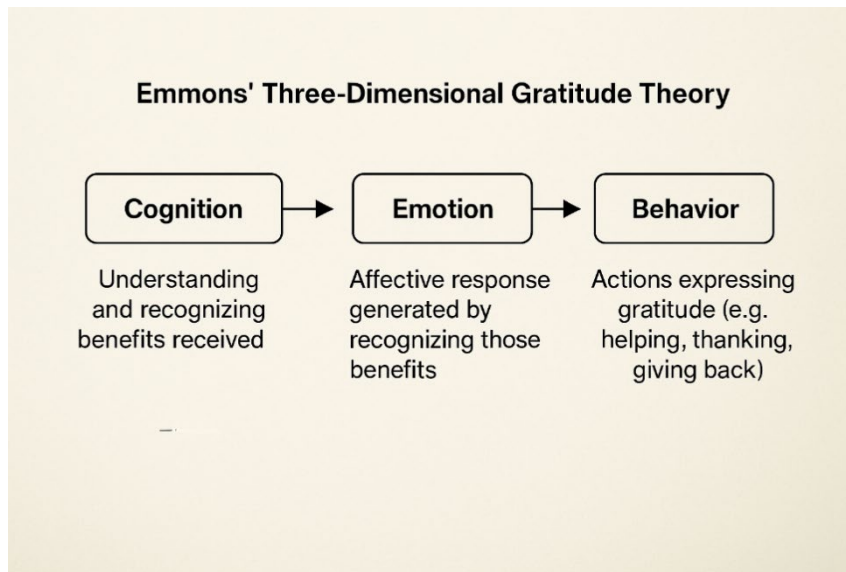


Figure 1. Conceptual diagram of Emmons' Three-Dimensional Gratitude Theory, illustrating the progression from cognitive recognition of benefits to emotional response and finally to behavioral expression of gratitude.

The eight modules are not made arbitrarily, however, since they are theoretically based on positive psychology and moral development studies. Their inclusion is based on two factors: (1) the previous empirical data on the connection of each construct to gratitude, and (2) the fact that Guizhou Province is a multicultural area, and the ethnic diversity in this region affects the manifestation of gratitude and the expectations of relationships between the participants. This theory gives the theoretical justification to the design of the three-dimensional scale of gratitude adopted in this research.

4. Research methodology

This study adopted a questionnaire survey method. A gratitude-related questionnaire was distributed to college students in Guizhou Province, with 500 questionnaires distributed and 452 valid ones recovered, resulting in an effective recovery rate of 90.4%.

Sampling Procedure and Participants

A random sampling method was adopted to ensure sample diversity among college students in Guizhou Province. Participants covered different genders, grade levels, and rural/urban backgrounds, consistent with Guizhou's demographic characteristics. This sample diversity enables a reflection of the overall gratitude status of college students in Guizhou, avoiding biases from single groups or institutions.

5. Scale development and validation

The new three-dimensional gratitude scale was designed due to the fact that there was no tool that offered a sufficient measure of the multicultural nature of the Guizhou. The development of the items was done in a number of phases. To begin with, cognitive and emotional items were designed regarding the theoretical definitions, whereas behavioral items were borrowed on the basis of gratitude-enhancing activities that were already validated, i.e., journaling, mindfulness, empathy training, and service learning.

Sample items include:

- I have learned how good feelings can enhance gratitude.
- I am thankful whenever other people stand up with me.

- I am involved in activities that enable me to show gratitude to other people.

All items were reviewed by three educational psychology specialists in terms of clarity and cultural appropriateness. A pilot test with 2-5 college students optimized questionnaire clarity; all 48 items were valid, no modifications or deletions. Cronbach initial 0.80 of all dimensions was higher than 0.80.

Exploratory Factor Analysis established three factor structure in accordance with cognition, emotion, and behavior. Factor loadings were positive and cumulative variance accounted was 67.3. These findings reveal reasonable original validity. Nevertheless, due to the newness of the instrument, future research will have to perform Confirmatory Factor Analysis (CFA) to make the verification of the psychometric robust.

SPSS 26.0 was used for data analysis. The results showed that the overall Cronbach’s α coefficient of the scale and that of each dimension were all above 0.82, indicating good reliability. Exploratory factor analysis revealed a cumulative variance explanation rate of 53.861%, with factor loadings of all items > 0.5, indicating good validity. Harman’s single-factor test indicated no significant common method bias.

Table 1. Core Indicators of Scale Reliability and Validity

Dimension	Number of Items	Cronbach’s α	CITC Range	Factor Loading Range
Cognitive	8	0.873	0.574–0.681	0.662–0.733
Emotional	8	0.857	0.541–0.671	0.632–0.728
Behavioral	32	0.973	0.640–0.773	0.645–0.759

6. Results

This section presents the score distribution and dimensional characteristics of 8 modules (Positive Emotions, Forgiveness, Humility, Prosocial Behavior, Psychological Well-Being, Guilt, Happiness, Life Satisfaction). Based on 452 valid samples, each module contains 6 items, with consistent calculation rules:

$$\text{Item Average} = (\text{Item total points} \times \text{frequency}) \div \text{Total frequency (452)}$$

$$\text{Module Average} = (Q1 + Q2 + Q3 + Q4 + Q5 + Q6) \div 6$$

The specific analysis of each module is as follows:

Module Name	Dimension	Item	Item Average	Ranking (High→Low)	Criterion:Item < Module (Averages)	Problem Determination
Module 1:Positive Emotions	Cognition	Q1..You believe that enhancing positive emotions can strengthen gratitude toward others.	3.36	1 (Q2)	>3.09	No
	Emotion	Q2.When you have positive emotions, you feel more grateful toward people and things around you.	3.38	2 (Q1)	>3.09	No
	Behavior	Q3.Keeping a gratitude journal to record beautiful moments in life makes you more frequently perceive gratitude for daily details	3	3 (Q3)	<3.09	Yes
		Q4.Mindfulness practices such as deep breathing and meditation bring positive emotions, making you feel grateful for life.	2.89	4 (Q6)	<3.09	Yes
		Q5.Participating in volunteer activities makes you more likely to feel grateful for others' help and the beauty of life.	2.91	5 (Q5)	<3.09	Yes
		Q6.Self-affirmation makes your emotions more positive and willing to be grateful for the beauty in life.	2.97	6 (Q4)	<3.09	Yes
Module Average			(3.36+3.38+3+2.89+2.91+2.97)+6=3.09			

Figure 2. Positive Emotions

The "cognition-emotion-behavior" three-level measurement framework is adopted: The cognitive dimension (Q1) examines the recognition of "the association between positive emotions and gratitude"; the emotional dimension (Q2) measures the intensity of the association between "positive emotional experiences

and feelings of gratitude"; the behavioral dimension (Q3-Q6) focuses on the practice of gratitude-enhancing strategies (gratitude journaling, mindfulness practice, volunteer activities, self-affirmation). The overall module mean is 3.09. Among them, the scores of cognition (Q1=3.36) and emotion (Q2=3.38) are higher than the module mean, while the scores of the 4 items in the behavioral dimension (gratitude-enhancing strategies) (Q3=3.00, Q6=2.97, Q5=2.91, Q4=2.89) are lower than the mean. Mindfulness practice (Q4) scores the lowest, and gratitude journaling (Q3) scores relatively higher. The results show that students have a high level of cognitive and emotional recognition of "the association between positive emotions and gratitude," but the practice of gratitude-enhancing strategies in the behavioral dimension is insufficient, reflecting an obvious gap between "cognitive-emotional recognition" and "behavioral practice."

Module Name	Dimension	Item	Item Average	Ranking (High→Low)	Criterion:Item < Module (Averages)	Problem Determination
Module 2: Forgiveness	Cognition	Q1.You believe that forgiving others can enhance gratitude for life.	3.07	1(Q2)	>2.81	No
	Emotion	Q2.When forgiving others, you feel an increase in gratitude toward them.	3.09	2(Q1)	>2.81	No
	Behavior	Q3.After participating in a forgiveness seminar, your gratitude toward others has increased.	2.73	3(Q3)	<2.81	Yes
		Q4.Through compassion exercises, you find yourself expressing gratitude more often.	2.68	4(Q4)	<2.81	Yes
		Q5.After participating in campus tolerance culture activities (e.g., group discussions, conflict resolution), you feel more grateful toward those around you.	2.64	5(Q6)	<2.81	Yes
		Q6.After role-playing exercises on forgiveness, you better appreciate others' help and feel grateful.	2.66	6(Q5)	<2.81	Yes
	Module Average			(3.07+3.09+2.73+2.68+2.64+2.66)÷6=2.81		

Figure 3. Forgiveness

The "cognition-emotion-behavior" three-level measurement framework is adopted: The cognitive dimension (Q1) examines the recognition of "forgiving others can enhance gratitude in life"; the emotional dimension (Q2) measures the intensity of "enhanced gratitude toward others when forgiving"; the behavioral dimension (Q3-Q6) focuses on the practice of forgiveness-related gratitude-enhancing strategies (participation in forgiveness workshops, empathy exercises, campus inclusive cultural activities, forgiveness role-playing). The overall module mean is 2.81. The scores of cognition (Q1=3.07) and emotion (Q2=3.09) are higher than the module mean, while the scores of the behavioral dimension (gratitude-enhancing strategies) (Q3=2.73, Q6=2.66, Q4=2.68, Q5=2.64) are lower than the mean. Campus inclusive cultural activities (Q5) score the lowest, and forgiveness workshops (Q3) score relatively higher. The results show that students have a relatively high level of cognitive and emotional recognition of "the association between forgiveness and gratitude," but the practice of gratitude-enhancing strategies in the behavioral dimension is insufficient, with a significant gap between "cognitive-emotional recognition" and "behavioral practice."

Module Name	Dimension	Item	Item Average	Ranking (High→Low)	Criterion:Item < Module (Averages)	Problem Determination
Module 3: Humility	Cognition	Q1.You believe that cultivating the quality of humility helps strengthen gratitude toward others and life.	3.04	1(Q2)	>2.78	No
	Emotion	Q2.When you treat others with humility, you clearly feel an increase in gratitude toward them.	3.07	2(Q1)	>2.78	No
	Behavior	Q3.After participating in reflection exercises, your gratitude for others' help has increased.	2.59	3(Q5)	<2.78	Yes
		Q4.In group learning, listening to others' perspectives has made you more humble, and your gratitude toward peers has increased accordingly	2.62	4(Q6)	<2.78	Yes
		Q5.After participating in team collaborations or community services, you feel more grateful for others' help.	2.69	5(Q4)	<2.78	Yes
		Q6.When you engage in cross-cultural exchanges and experience global diversity, you become more inclusive and prone to gratitude.	2.68	6(Q3)	<2.78	Yes
	Module Average			(3.04+3.07+2.59+2.62+2.69+2.68)÷6=2.78		

Figure 4. Humility

The "cognition-emotion-behavior" three-level measurement framework is adopted: The cognitive dimension (Q1) examines the recognition of "cultivating humility can enhance gratitude toward others and life"; the emotional dimension (Q2) measures the intensity of "enhanced gratitude toward others when treating others with humility"; the behavioral dimension (Q3-Q6) focuses on the practice of humility-related gratitude-enhancing strategies (reflection exercises, listening to others' opinions in group learning, team collaboration or community service, cross-cultural communication).The overall module mean is 2.78. The scores of cognition (Q1=3.04) and emotion (Q2=3.07) are higher than the module mean, while the scores of the behavioral dimension (gratitude-enhancing strategies) (Q5=2.69, Q6=2.68, Q4=2.62, Q3=2.59) are lower than the mean. Reflection exercises (Q3) score the lowest, and team collaboration or community service (Q5) score relatively higher. The results show that students have a prominent cognitive and emotional recognition of "the association between humility and gratitude," but the practice of gratitude-enhancing strategies in the behavioral dimension is weak, with an obvious gap between "cognitive-emotional recognition" and "behavioral practice."

Module Name	Dimension	Item	Item Average	Ranking (High→Low)	Criterion:Item < Module (Averages)	Problem Determination
Module 4:Prosocial Behavior	Cognition	Q1.You believe that cultivating prosocial behavior helps strengthen gratitude toward others and society.	3.33	1(Q2)	> 3.06	No
	Emotion	Q2.When you perform prosocial behaviors such as helping others, you feel a stronger sense of gratitude toward others and society.	3.39	2(Q1)	> 3.06	No
	Behavior	Q3.After participating in community service activities, your gratitude toward society and others has increased.	2.92	3(Q3)	<3.06	Yes
		Q4..Participating in campus peer mentoring has made you more grateful for peers' help and willing to give back.	2.89	5(Q4)	<3.06	Yes
		Q5.After participating in "theory + practice" social responsibility education activities, you feel more grateful for society's and others' contributions.	2.92	3(Q5)	<3.06	Yes
		Q6.After establishing correct values through ideological and political education activities, you better appreciate others' and society's care, enhancing gratitude.	2.9	4(Q6)	<3.06	Yes
	Module Average			(3.33+3.39+2.92+2.89+2.92+2.9)+6=3.06		

Figure 5. Prosocial Behavior

The "cognition-emotion-behavior" three-level measurement framework is adopted: The cognitive dimension (Q1) examines the recognition of "cultivating prosocial behavior can enhance gratitude toward others and society"; the emotional dimension (Q2) measures the intensity of "enhanced gratitude toward others and society through helping behaviors and other prosocial acts"; the behavioral dimension (Q3-Q6) focuses on the practice of prosocial-related gratitude-enhancing strategies (community service, campus peer tutoring, "theory + practice" social responsibility education, ideological and political education activities).The overall module mean is 3.06. The scores of cognition (Q1=3.33) and emotion (Q2=3.39) are higher than the module mean, while the scores of the behavioral dimension (gratitude-enhancing strategies) (Q3=2.92, Q5=2.92, Q6=2.90, Q4=2.89) are lower than the mean. Campus peer tutoring (Q4) scores the lowest, and community service and social responsibility education (Q3, Q5) score relatively higher. The results show that students have a prominent cognitive and emotional recognition of "the association between prosocial behavior and gratitude," but the practice of gratitude-enhancing strategies in the behavioral dimension is weak, with a certain gap between "cognitive-emotional recognition" and "behavioral practice."

Module Name	Dimension	Item	Item Average	Ranking (High→Low)	Criterion:Item < Module (Averages)	Problem Determination
Module 5: Psychological Well-Being	Cognition	Q1. You believe that people in good mental health are more likely to feel gratitude toward others.	3.36	1(Q2)	>3.05	No
	Emotion	Q2. When your mental health is good, you clearly feel an increase in gratitude toward things around you.	3.37	2(Q1)	>3.05	No
	Behavior	Q3. After participating in campus health activities, you are more satisfied with your state and grateful for others' support.	2.94	3(Q3)	<3.05	Yes
		Q4. After participating in team sports, you feel increased gratitude for life due to the warmth and companionship from teamwork.	2.89	4(Q4)	<3.05	Yes
		Q5. After joining a peer support group, you feel more grateful for others' companionship and understanding due to emotional support.	2.88	5(Q5)	<3.05	Yes
		Q6. After participating in reading activities themed on positive psychology, your improved mindset makes you more grateful for life.	2.87	6(Q6)	<3.05	Yes
	Module Average			(3.36+3.37+2.94+2.89+2.88+2.87)÷6=3.05		

Figure 6. Psychological Well-Being

The "cognition-emotion-behavior" three-level measurement framework is adopted: The cognitive dimension (Q1) examines the recognition of "individuals with Psychological Well-Being are more likely to feel gratitude toward others"; the emotional dimension (Q2) measures the intensity of "enhanced gratitude toward surrounding things with improved Psychological Well-Being"; the behavioral dimension (Q3-Q6) focuses on the practice of Psychological Well-Being-related gratitude-enhancing strategies (campus health activities, team sports, peer support groups, positive psychology-themed reading). The overall module mean is 3.05. The scores of cognition (Q1=3.36) and emotion (Q2=3.37) are higher than the module mean, while the scores of the behavioral dimension (gratitude-enhancing strategies) (Q3=2.94, Q4=2.89, Q5=2.88, Q6=2.87) are lower than the mean. Positive psychology reading (Q6) scores the lowest, and campus health activities (Q3) score relatively higher. The results show that students have a high level of cognitive and emotional recognition of "the association between Psychological Well-Being and gratitude," but the practice of gratitude-enhancing strategies in the behavioral dimension is weak, with an obvious gap between "cognitive-emotional recognition" and "behavioral practice."

Module Name	Dimension	Item	Item Average	Ranking (High→Low)	Criterion:Item < Module (Averages)	Problem Determination
Module 6: Guilt	Cognition	Q1. You believe that guilt from failing to reciprocate help promptly deepens gratitude for others' kindness.	3.1	1(Q2)	>2.88	No
	Emotion	Q2. Guilt from not repaying help promptly makes people more inclined to feel grateful toward the giver.	3.12	2(Q1)	>2.88	No
	Behavior	Q3. Through self-compassion exercises to cultivate empathy, gratitude toward others can be enhanced.	2.78	3(Q3)	<2.88	Yes
		Q4. Participating in forgiveness training (e.g., forgiving others' mistakes) can improve gratitude for others' kindness.	2.73	3(Q5)	<2.88	Yes
		Q5. Actively regulating emotions and releasing stress can increase gratitude for others' help.	2.78	4(Q6)	<2.88	Yes
		Q6. Participating in group activities to transform guilt into gratitude, focusing on others' tolerance and help, makes people more willing to express gratitude.	2.77	6(Q4)	<2.88	Yes
	Module Average			(3.1+3.12+2.78+2.73+2.78+2.77)÷6=2.88		

Figure 7. Guilt

The "cognition-emotion-behavior" three-level measurement framework is adopted: The cognitive dimension (Q1) examines the recognition of "guilt for failing to repay help in time deepens gratitude toward others' kindness"; the emotional dimension (Q2) measures the intensity of "enhanced gratitude toward helpers when failing to repay in time"; the behavioral dimension (Q3-Q6) focuses on the practice of guilt-related gratitude-enhancing strategies (self-compassion exercises, forgiveness training, emotion regulation, group activities transforming guilt into gratitude). The overall module mean is 2.88. The scores of cognition (Q1=3.10) and emotion (Q2=3.12) are higher than the module mean, while the scores of the behavioral dimension (gratitude-enhancing strategies) (Q3=2.78, Q5=2.78, Q6=2.77, Q4=2.73) are lower than the mean. Forgiveness training (Q4) scores the lowest, and self-compassion exercises and emotion regulation (Q3, Q5)

score relatively higher. The results show that students have a relatively high level of cognitive and emotional recognition of "the association between guilt and gratitude," but the practice of gratitude-enhancing strategies in the behavioral dimension is weak, with an obvious gap between "cognitive-emotional recognition" and "behavioral practice."

Module Name	Dimension	Item	Item Average	Ranking (High→Low)	Criterion:Item < Module (Averages)	Problem Determination
Module 7:Happiness	Cognition	Q1.You believe that improving personal happiness significantly enhances gratitude toward others and life.	3.35	1(Q2)	>3.09	No
	Emotion	Q2.When in a happy state, you spontaneously feel stronger and more lasting gratitude.	3.4	2(Q1)	>3.09	No
	Behavior	Q3.After learning positive psychology courses, you more easily perceive happiness and express gratitude.	2.9	3(Q5)	<3.09	Yes
		Q4.Building friendly social relationships makes people more grateful.	2.93	4(Q6)	<3.09	Yes
		Q5. Completing gratitude practice tasks assigned by teachers promotes the generation of gratitude.	2.98	5(Q4)	<3.09	Yes
		Q6.Participating in group psychological counseling enhances subjective happiness and gratitude experiences.	2.96	6(Q3)	<3.09	Yes
	Module Average			(3.35+3.4+2.9+2.93+2.98+2.96)÷6=3.09		

Figure 8. Happiness

The "cognition-emotion-behavior" three-level measurement framework is adopted: The cognitive dimension (Q1) examines the recognition of "improving happiness significantly enhances gratitude toward others and life"; the emotional dimension (Q2) measures the intensity of "spontaneously stronger gratitude in a state of happiness"; the behavioral dimension (Q3-Q6) focuses on the practice of happiness-related gratitude-enhancing strategies (positive psychology courses, friendly social relationships, gratitude practice tasks assigned by teachers, group psychological counseling).The overall module mean is 3.09. The scores of cognition (Q1=3.35) and emotion (Q2=3.40) are higher than the module mean, while the scores of the behavioral dimension (gratitude-enhancing strategies) (Q5=2.98, Q6=2.96, Q4=2.93, Q3=2.90) are lower than the mean. Positive psychology courses (Q3) score the lowest, and gratitude practice tasks assigned by teachers (Q5) score relatively higher. The results show that students have a relatively high level of cognitive and emotional recognition of "the association between happiness and gratitude," but the practice of gratitude-enhancing strategies in the behavioral dimension is weak, with an obvious gap between "cognitive-emotional recognition" and "behavioral practice."

Module Name	Dimension	Item	Item Average	Ranking (High→Low)	Criterion:Item < Module (Averages)	Problem Determination
Module 8: Life Satisfaction	Cognition	Q1.You believe that improving life satisfaction significantly enhances gratitude toward living environments and others' help.	3.15	1(Q1)	>2.89	No
	Emotion	Q2.When your life satisfaction improves, you spontaneously feel gratitude toward others' support.	3.03	2(Q2)	>2.89	No
	Behavior	Q3.Teachers' instruction helps you make academic progress, improving life satisfaction and gratitude.	2.79	3(Q4)	<2.89	Yes
		Q4. Life satisfaction improvements from career development significantly enhance gratitude.	2.82	4(Q3)	<2.89	Yes
		Q5.The school's emphasis on student feedback and evaluation improves your satisfaction and gratitude toward the school.	2.74	4(Q6)	<2.89	Yes
		Q6. Community participation promotes personal growth and responsibility, fostering gratitude toward society.	2.79	6(Q5)	<2.89	Yes
	Module Average			(3.15+3.03+2.79+2.82+2.74+2.79) ÷6=2.89		

Figure 9. Life Satisfaction

The "cognition-emotion-behavior" three-level measurement framework is adopted: The cognitive dimension (Q1) examines the recognition of "improving life satisfaction significantly enhances gratitude toward the living environment and others' help"; the emotional dimension (Q2) measures the intensity of

"spontaneously enhanced gratitude toward others' support with improved life satisfaction"; the behavioral dimension (Q3-Q6) focuses on the practice of life satisfaction-related gratitude-enhancing strategies (teacher guidance, career development to improve satisfaction, school attention to student feedback, community participation). The overall module mean is 2.89. The scores of cognition (Q1=3.15) and emotion (Q2=3.03) are higher than the module mean, while the scores of the behavioral dimension (gratitude-enhancing strategies) (Q4=2.82, Q3=2.79, Q6=2.79, Q5=2.74) are lower than the mean. School attention to student feedback (Q5) scores the lowest, and career development (Q4) scores relatively higher. The results show that students have a relatively high level of cognitive and emotional recognition of "the association between life satisfaction and gratitude," but the practice of gratitude-enhancing strategies in the behavioral dimension is weak, with an obvious gap between "cognitive-emotional recognition" and "behavioral practice."

Module Name	Dimension	Item	Item Average	Criterion: Item < Module (Averages)	Problem Determination
Module 1: Positive Emotions	Behavior	Q3. Keeping a gratitude journal to record beautiful moments in life makes you more frequently perceive gratitude for daily details	3	<3.09	Yes
		Q4. Mindfulness practices such as deep breathing and meditation bring positive emotions, making you feel grateful for life.	2.89	<3.09	Yes
		Q5. Participating in volunteer activities makes you more likely to feel grateful for others' help and the beauty of life.	2.91	<3.09	Yes
		Q6. Self-affirmation makes your emotions more positive and willing to be grateful for the beauty in life.	2.97	<3.09	Yes
Module 2: Forgiveness	Behavior	Q3. After participating in a forgiveness seminar, your gratitude toward others has increased.	2.73	<2.81	Yes
		Q4. Through compassion exercises, you find yourself expressing gratitude more often.	2.68	<2.81	Yes
		Q5. After participating in campus tolerance culture activities (e.g., group discussions, conflict resolution), you feel more grateful toward those around you.	2.64	<2.81	Yes
		Q6. After role-playing exercises on forgiveness, you better appreciate others' help and feel grateful.	2.66	<2.81	Yes
Module 3: Humility	Behavior	Q3. After participating in reflection exercises, your gratitude for others' help has increased.	2.59	<2.78	Yes
		Q4. In group learning, listening to others' perspectives has made you more humble, and your gratitude toward peers has increased accordingly	2.62	<2.78	Yes
		Q5. After participating in team collaborations or community services, you feel more grateful for others' help.	2.69	<2.78	Yes
		Q6. When you engage in cross-cultural exchanges and experience global diversity, you become more inclusive and prone to gratitude.	2.68	<2.78	Yes
Module 4: Prosocial Behavior	Behavior	Q3. After participating in community service activities, your gratitude toward society and others has increased.	2.92	<3.06	Yes
		Q4. Participating in campus peer mentoring has made you more grateful for peers' help and willing to give back.	2.89	<3.06	Yes
		Q5. After participating in "theory + practice" social responsibility education activities, you feel more grateful for society's and others' contributions.	2.92	<3.06	Yes
		Q6. After establishing correct values through ideological and political education activities, you better appreciate others' and society's care, enhancing gratitude.	2.9	<3.06	Yes

Module 5: Psychological Well-Being	Behavior	Q3. After participating in campus health activities, you are more satisfied with your state and grateful for others' support.	2.94	<3.05	Yes
		Q4. After participating in team sports, you feel increased gratitude for life due to the warmth and companionship from teamwork.	2.89	<3.05	Yes
		Q5. After joining a peer support group, you feel more grateful for others' companionship and understanding due to emotional support.	2.88	<3.05	Yes
		Q6. After participating in reading activities themed on positive psychology, your improved mindset makes you more grateful for life.	2.87	<3.05	Yes
Module 6: Guilt	Behavior	Q3. Through self-compassion exercises to cultivate empathy, gratitude toward others can be enhanced.	2.78	<2.88	Yes
		Q4. Participating in forgiveness training (e.g., forgiving others' mistakes) can improve gratitude for others' kindness.	2.73	<2.88	Yes
		Q5. Actively regulating emotions and releasing stress can increase gratitude for others' help.	2.78	<2.88	Yes
		Q6. Participating in group activities to transform guilt into gratitude, focusing on others' tolerance and help, makes people more willing to express gratitude.	2.77	<2.88	Yes
Module 7: Happiness	Behavior	Q3. After learning positive psychology courses, you more easily perceive happiness and express gratitude.	2.9	<3.09	Yes
		Q4. Building friendly social relationships makes people more grateful.	2.93	<3.09	Yes
		Q5. Completing gratitude practice tasks assigned by teachers promotes the generation of gratitude.	2.98	<3.09	Yes
		Q6. Participating in group psychological counseling enhances subjective happiness and gratitude experiences.	2.96	<3.09	Yes
Module 8: Life Satisfaction	Behavior	Q3. Teachers' instruction helps you make academic progress, improving life satisfaction and gratitude.	2.79	<2.89	Yes
		Q4. Life satisfaction improvements from career development significantly enhance gratitude.	2.82	<2.89	Yes
		Q5. The school's emphasis on student feedback and evaluation improves your satisfaction and gratitude toward the school.	2.74	<2.89	Yes
		Q6. Community participation promotes personal growth and responsibility, fostering gratitude toward society.	2.79	<2.89	Yes

Figure 10. Behavioral Practice

The analysis of the above 8 modules shows that all modules present consistent characteristics: Scores in the cognitive dimension (Q1) and emotional dimension (Q2) are consistently higher than the module mean, reflecting that students have a clear cognitive and emotional recognition of "the association between gratitude and each core concept"; however, scores in the behavioral dimension (Q3 - Q6, i.e., the practice of gratitude - enhancing strategies) are generally lower than the module mean, showing a significant gap with the cognitive and emotional dimensions. Even the relatively higher - scoring items in the behavioral dimension still do not reach the module average, failing to bridge this gap. This indicates that students have established a foundation in the cognitive and emotional recognition of gratitude, but the practice of gratitude - enhancing strategies in the behavioral dimension has not kept up, leading to a universal gap between "cognitive - emotional recognition" and "behavioral practice, which is a core feature shared by all modules. The above summary table shows that all identified gratitude - related problems fall within the behavioral dimension (Q3 - Q6), which clearly validates the analyzed gap.

7. Additional statistical analysis

Paired-sample t-tests were performed to compare in all modules all the cognitive, emotional, and behavioral dimensions. Results showed that:

- The cognitive scores were also a significant difference between behavioral scores in all the modules ($p < .001$).
- Behavioral scores were also much lower than emotional scores ($p < .001$).
- The differences between cognitive and emotional scores were not in most cases significant ($p > .05$).

ANOVA with a repeated measure indicated a high level of variation among the eight modules ($F = 15.324$, $p < .001$) meaning that the experiences of gratitude are not similar across the constructs. These tests verify that the cognitive behavioral and emotional behavioral differences are statistically yielded.

8. Discussion and conclusion

Results indicate a pattern in all modules, that is, students with high understanding of gratitude and emotional awareness but with poor behavioral involvement. The gap in behaviors is especially vivid considering that previous research has continuously demonstrated the relevance of every module towards the improvement of gratitude. As an illustration, gratitude sensitivity is found to be reinforced by positive emotions, forgiveness offers a significant interpersonal basis within which gratitude may be developed, and humility facilitates gratitude awareness of other people. Similarly, behavioral interventions confirmed in previous studies, including gratitude-enhancing exercises in positive emotion programs ^[10], forgiveness-based teaching programs, and humility-related exercises have all been proven effective in gratitude expression. Nevertheless, the students in the current research proved to be relatively less involved in these behavior-oriented strategies.

There are a number of reasons that can justify this gap. As a cultural aspect, most ethnicities in Guizhou focus on the low-key and indirect forms of expression of gratitude, which can heighten the level of emotion response, but curtail direct actions. Educationally, colleges in the area are likely to focus more on theoretical moral education instead of experiential or practice-based education, limiting possibilities of students to express gratitude behaviorally, although the evidence shows that behavior expression can be developed through such activities as journaling or guided reflection. At a psychological level, social anxiety, the absence of habit formation, or the wrong perception of the rules of behavior may also cause students to be reluctant to practice gratitude, despite the fact that prosocial activities, including community participation, have been reported to aid in the development of gratitude.

These findings build on the three-dimensional model proposed by Emmons in which cultural, educational, and psychological backgrounds can intervene between the process of gratitude translation between cognition and emotion and behavior. The results demonstrate that there is a necessity in interventions that have a direct effect on behavior change by the direct reinforcement of gratitude practices that are well-structured and evidence-based on the available literature.

9. Conclusion

This paper validates the high rates of cognitive and emotional awareness of gratitude among the university students in Guizhou yet an ongoing deficiency in behavior practice. This gap underscores the need to stop theory-based moral teaching and move to behavior based interventions.

Such limitations are the use of a single-province sample, self-reported data, and lack of CFA of the newly developed scale. The study needs to be extended on a larger sample area, perform confirmatory factor analysis and develop experimental or longitudinal research in the future to investigate mechanisms that facilitate behavioral change.

Ethical Approval

The approval of this study by Institutional Review Board of IADON University was obtained. The informed consent of all participants was obtained and all data were gathered anonymously in a manner that met the principles of ethical research.

Conflict of interest

The authors declare no conflict of interest

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