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Teacher Attachment, School Engagement, and Prosocial Behavior among Rural Adolescents in China's Southwestern Border Regions

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Abstract

Schools play an important role in adolescent prosocial development, particularly in rural areas where boarding is common. However, evidence regarding school-related factors associated with prosocial behavior among rural adolescents in China's southwestern border regions remains limited. This study examined the independent associations of teacher attachment and school engagement with prosocial behavior among rural adolescents. A cross-sectional survey was conducted among 442 rural adolescents in Honghe Prefecture, Yunnan Province, China. Data were collected using structured self-report questionnaires and analyzed using descriptive statistics, Pearson correlations, and hierarchical multiple regression. Both teacher attachment ($r = 0.366$, $p < 0.001$) and school engagement ($r = 0.503$, $p < 0.001$) were positively correlated with prosocial behavior. After controlling for gender, grade, ethnicity, boarding status, and left-behind status, both teacher attachment ($\beta = 0.143$, $p = 0.005$) and school engagement ($\beta = 0.423$, $p < 0.001$) remained significant predictors of prosocial behavior. Together, these factors explained an additional 25.7% of the variance. Overall, teacher attachment and school engagement were independently associated with prosocial behavior, highlighting the importance of relational resources and participatory experiences in rural school environments.

Keywords: Prosocial Behavior, Teacher Attachment, School Engagement, Southwestern China, Border Regions, Rural Adolescents

Introduction

Prosocial behavior generally refers to voluntary behaviors or tendencies intended to benefit others, including helping, sharing, comforting, and cooperating in social interactions (Eisenberg et al., 2015; Kou & Zhang, 2006). It plays an important role in adolescents' positive developmental trajectories as well as the harmony and prosperity of communities (Hofmann & Müller, 2018; Li et al., 2024). Prosocial behavior is particularly important for adolescents

living in economically and educationally disadvantaged environments, such as rural areas, as it may promote positive development by mitigating the adverse effects of environmental adversity (Armstrong-Carter et al., 2021; Carlo et al., 2011; Flouri & Sarmadi, 2016).

The rural border region of Southwest China is an area with a distinctive context. It is predominantly mountainous (with more than 85% of its area classified as mountainous), inhabited by multiple ethnic minority groups, and relatively lagging in rural economic and educational development, with a relative lack of scientifically informed parenting practices in families (Jiang et al., 2026; Yan et al., 2021; Yunnan Yearbook 2024, 2024). Many parents migrant for work, leaving some children to become left-behind children (Education Department of Yunnan Province, 2022; National Bureau of Statistics of China, 2022). Because of the mountainous terrain and inconvenient transportation, the boarding rate in this region is high. Reportedly, even when urban adolescents are included, the boarding rate among junior high school students in Yunnan Province — located on China's Southwestern border — is as high as 76.39% (Education Department of Yunnan Province, 2022; National Bureau of Statistics of China, 2022). These factors make schools an important socialization setting for rural adolescents' social interaction and prosocial behavior development in China's southwestern border regions. Within schools, adolescents can not only establish meaningful social relationships but also acquire social learning experiences through daily participation. Relational resources and participatory experiences may therefore both be associated with the development of prosocial behavior.

Relational resources play an important role in the development of prosocial behavior. According to Attachment Theory, secure attachment relationships provide individuals with an emotional "secure base," facilitate the internalization of positive interaction patterns, and foster greater comfort and trust in relationships (Gillath et al., 2008; Justo-Núñez et al., 2022). By fostering positive expectations of themselves and others, secure attachment relationships also enable individuals to establish new social relationships with confidence and positive expectations, express greater kindness and support in interpersonal interactions, and engage in more prosocial behavior (Bowlby, 1982; Costa Martins et al., 2022; Simons et al., 2001). As significant others in the school environment, teachers can serve as important attachment figures outside the family (García-Rodríguez et al., 2023). Through care, guidance, and consistent discipline, teachers can establish emotional bonds with students (García-Rodríguez et al., 2023), and the sense of security internalized through these relationships may generalize to peer interactions and broader social contexts.

While teacher attachment reflects the relational dimension of adolescents' school experiences, school engagement captures their behavioral, emotional, and cognitive involvement in school life. Beyond supportive relationship, opportunities for active participation may also be relevant to prosocial behavior. According to Social Learning Theory, observational learning, modeling, and social reinforcement play important roles in behavioral acquisition (Bandura, 1977). As an important setting in which adolescents observe and learn social behaviors, schools can provide prosocial behavioral models and normative social schemas through school activities and education (Crick & Dodge, 1994). Empirical studies involving children and adolescents in Colombia and the United States have shown that school engagement significantly predicts prosocial behavior .

Although previous studies have provided some evidence regarding teacher attachment, school engagement, and prosocial behavior, several research gaps remain. First, prior research on attachment has mainly focused on the relationships between parent-child attachment or peer attachment and prosocial behavior, while teacher attachment has received relatively limited attention. However, for rural adolescents in the border region of Southwest China, schools constitute an important setting for their learning and daily life, and teachers may serve as significant attachment figures. Second, the limited research examining teacher attachment or school engagement in relation to prosocial behavior has primarily focused on urban or general child and adolescent populations, with relatively little attention to rural adolescents from ethnic minority communities in China's southwestern border regions. Third, the limited existing studies have generally examined the associations of teacher attachment and school engagement with prosocial behavior separately, with limited consideration of relational resources and participatory experiences simultaneously within the school context.

To address these research gaps, the present study examines the relationships among teacher attachment, school engagement, and prosocial behavior among rural adolescents in China's southwestern border regions. It extends existing research by focusing on rural adolescents in China's southwestern border regions, a relatively understudied population with distinctive developmental contexts. By simultaneously examining teacher attachment and school engagement, this study provides context-specific evidence on the independent associations of relational resources and participatory experiences with prosocial behavior, thereby broadening our understanding of school-related correlates of prosocial behavior in rural settings.

Specifically, this study aims to (1) assess the levels of teacher attachment, school engagement, and prosocial behavior among rural adolescents in this region; (2) examine the respective correlations of teacher attachment and school engagement with prosocial behavior; and (3) determine whether teacher attachment and school engagement significantly predict prosocial behavior among these adolescents.

Literature Review

Prosocial Behavior among Rural Adolescents in China's Southwestern Border Regions

Existing studies have examined prosocial behavior among rural Chinese adolescents from various perspectives, including general prosocial behavior, prosocial tendencies, and specific behaviors such as helping, sharing, cooperation, and altruism (Cadsby et al., 2020; Hu et al., 2024; Sun et al., 2026). Regarding group differences, previous research has primarily focused on gender, grade, and left-behind status. Among rural Chineses adolescents, most studies support the finding that girls exhibit higher levels of prosocial behavior than boys, although some studies have found no significant differences (Li, 2025; Zhao et al., 2019). Findings regarding grade level and left-behind status are likewise inconsistent (Gao et al., 2019; Guo, 2014; Tang, 2017; Zhao et al., 2019). These findings suggest that prosocial behavior among rural Chinese adolescents may exhibit a certain degree of heterogeneity across individual characteristics and developmental contexts.

Furthermore, existing research has found that prosocial behavior among rural Chinese adolescents is associated with factors at multiple levels, including individual, family, school, peer, and community levels. In comparison, research on school-level factors remains

relatively limited. Nevertheless, available evidence indicates that positive teacher–student relationships, school connectedness, and supportive school environments are positively associated with prosocial behavior among rural adolescents (Cao et al., 2017; Wu & Ding, 2026; Yuan & Liu, 2025). These findings suggest that schools are not only settings for education but also important socialization contexts for the development of prosocial behavior.

However, existing research is unevenly distributed geographically, with studies primarily concentrated in rural areas of eastern and central China, where economic and educational conditions are relatively favorable. Empirical evidence concerning rural adolescents in China's southwestern border regions remains relatively limited. Regional differences in environmental conditions and educational resources may shape adolescents' developmental experiences. Therefore, greater attention should be given to the school experiences of rural adolescents in China's southwestern border regions, particularly the relationships of teacher attachment and school engagement with prosocial behavior.

Teacher Attachment and Prosocial Behavior

Teacher attachment refers to the emotional bond formed between adolescents and their teachers (García-Rodríguez et al., 2023). According to Attachment Theory, secure and stable emotional relationships with significant others help individuals develop positive perceptions of themselves and others and promote their socioemotional development (Kuther, 2023; P. Yang & McGinley, 2023).

Throughout child development, teachers have been recognized as key figures in children's cognitive, social, and emotional development (García-Rodríguez et al., 2023). From an attachment perspective, teacher–student attachment can be viewed as an extension of parent–child attachment. In daily teaching, teachers, through sensitive awareness and responsiveness, promptly meet students' needs and provide a secure base for children to understand their academic and social environments, thereby supporting their exploration of the world and the enhancement of their social, emotional, and cognitive skills (Davis, 2003). In this sense, teachers can also establish emotional bonds with students through care, guidance, and consistent discipline norms (García-Rodríguez et al., 2023).

The limited existing evidence provides some support for a positive association between teacher attachment and prosocial behavior. For example, a study of adolescents in Taiwan, China, found that teacher attachment remained associated with prosocial behavior even after accounting for parent and peer attachment, highlighting school-based relationships as a distinct and significant socialization context for adolescent prosocial behavior (Yang & McGinley, 2023). More research has focused on the relationship between supportive teacher–student relationships and prosocial behavior. For instance, positive or close teacher–student relationships are generally associated with higher levels of prosocial behavior among adolescents, whereas teacher–student conflict is associated with lower levels of prosocial behavior (Liang & Du, 2025; Wu & Zhang, 2022; Xu & Ruan, 2026). However, teacher attachment and teacher–student relationships are not entirely equivalent in their conceptualization or measurement, and these findings should therefore be compared with caution.

Although previous research has emphasized the importance of positive teacher–student relationships for adolescent prosocial development, direct evidence on the association between teacher attachment and prosocial behavior remains limited, particularly among rural adolescents in the border region of southwest China. Moreover, existing studies have often focused on individual aspects of teacher–student relationships, leaving the independent associations of relational resources and participatory experiences within the school environment with prosocial behavior insufficiently explored.

School Engagement and Prosocial Behavior

Beyond relational resources, Social Learning Theory emphasizes the roles of observation, modeling, and reinforcement in behavioral acquisition (Bandura, 1977). Accordingly, participatory experiences within the school context may also be important for the development of prosocial behavior.

School engagement refers to the extent to which students are involved in, attached to, and committed to academic and social activities at school l(Li & Lerner, 2013). It encompasses three dimensions: behavioral engagement (participation in academic, social, and extracurricular activities), emotional engagement (positive and negative reactions to teachers, classmates, academics, and school), and cognitive engagement (thoughtful investment and willingness to exert the effort necessary to understand complex ideas and master difficult skills) (Fredricks et al., 2004). Positive school engagement may provide adolescents with more opportunities to observe prosocial role models, participate in cooperative activities, and receive social feedback, thereby facilitating the development of prosocial behavior.

Previous research has demonstrated associations between school engagement and positive adolescent development. For example, higher levels of school engagement are generally associated with better academic performance, greater subjective well-being, and lower levels of internet addiction (Li et al., 2021; Wong et al., 2024). A limited number of studies have also identified school engagement as a predictor of prosocial behavior. For instance, a study of Colombian adolescents found that adolescents with high levels of perceived positive school climate (including school engagement) at age 12 exhibited higher levels of prosocial behavior in the following year (Luengo Kanacri et al., 2017). Another study of first-year Muslim students (aged 18–19) at three Malaysian universities found that school engagement, together with family, peer, and community engagement, predicted prosocial behavior through the mediating role of purpose in life (Kaur et al., 2019). Furthermore, a recent large-scale, nationally representative longitudinal study in the United States found that children's school engagement was directly associated with their subsequent prosocial behavior and indirectly associated with it through increased parental monitoring (Li et al., 2024).

Overall, existing evidence suggests that school engagement may be an important school-related factor associated with adolescent prosocial behavior. Unlike teacher attachment, which emphasizes emotional bonds between teachers and students, school engagement reflects adolescents' behavioral, emotional, and cognitive investment in school life. These two constructs represent distinct relational and participatory aspects of school experiences. Therefore, examining teacher attachment and school engagement simultaneously may

provide a more comprehensive understanding of their independent associations with prosocial behavior among rural adolescents in China's southwestern border regions.

Materials and Methods

Research Design

This study employed a quantitative, cross-sectional correlational research design. Data were collected from rural adolescents in China's southwestern border region using a structured self-report questionnaire. The study aimed to examine the levels of teacher attachment, school engagement, and prosocial behavior among these adolescents, as well as the associations of teacher attachment and school engagement with prosocial behavior.

Population and sampling

A stratified random cluster sampling method was employed to recruit rural adolescents aged 12–18 years from Honghe Hani and Yi Autonomous Prefecture (hereafter referred to as Honghe Prefecture), located on the southwestern border of China. Based on the 2023 per capita GDP of each county and city, the 13 counties and cities in Honghe Prefecture were classified into three economic development strata: high, medium, and low. One rural junior high school was randomly selected from each stratum. Subsequently, two classes were randomly selected from each of Grades 7 and 8 in each school, resulting in a total of 12 classes. After obtaining permission from the relevant authorities and schools, all students in the selected classes were invited to participate. Following the exclusion of invalid questionnaires, including those with extensive missing responses or patterned responding, 442 valid questionnaires were retained. This sample size exceeded the recommended minimum of 384 respondents calculated using the Krejcie and Morgan formula (Krejcie & Morgan, 1970).

Instrument

Data were collected using a structured questionnaire comprising previously validated measures.

Demographic questionnaire. A demographic questionnaire was designed to collect participants' basic information, including gender, age, grade, ethnicity, boarding status, and left-behind status.

Prosocial Behavior Scale. Prosocial behavior was assessed using the Prosocial Behavior Scale, originally developed for Chinese adolescents by Kou and Zhang (2006) and subsequently revised by Y. Yang et al. (2016). The scale consists of 15 items across four dimensions: altruism, commonweal-social rule, relationships, and traits. Items are rated on a 7-point Likert scale ranging from 1 (completely untrue) to 7 (completely true), with higher scores indicating higher levels of prosocial behavior.

Teacher Attachment. Teacher attachment was assessed using the Inventory of Teacher–Student Relationships (IT-SR) developed by Murray and Zvoch (2011). The instrument was adapted from the Inventory of Parent and Peer Attachment developed by Armsden and Greenberg (1987) and comprises three dimensions: trust, communication, and alienation (reverse-scored). The scale consists of 17 items rated on a 5-point Likert scale ranging from 1

(never) to 5 (always), with higher scores indicating higher levels of teacher attachment. Items 5, 6, 14, and 16 were reverse-scored.

School Engagement. School engagement was measured using the School Engagement Scale developed by Fredricks et al. (2005). The scale comprises 19 items across three dimensions: behavioral engagement, emotional engagement, and cognitive engagement. Items are rated on a 5-point Likert scale ranging from 1 (never) to 5 (always), with higher scores indicating greater school engagement. Items 2, 3, and 11 were reverse-scored.

Reliability and Validity

Prior to the main data collection, the research instruments were reviewed and pilot-tested to ensure their suitability for the study population. A pilot study was conducted with 44 junior high school students in Honghe Prefecture, Yunnan Province, China, who were not included in the final sample. The pilot study assessed the clarity and comprehensibility of the questionnaire items and preliminarily evaluated the reliability of each scale. Cronbach's alpha coefficients ranged from 0.877 to 0.936, indicating good internal consistency and supporting the use of the scales in the main study.

Data Collection and Procedure

After obtaining permission from the relevant educational authorities and schools, the researchers randomly selected two class from each of Grades 7 and 8 at each school and invited all students in the selected classes to participate. Written informed consent was obtained from the parents or legal guardians of all participants, and verbal assent was obtained from the adolescent participants before data collection. Participation was entirely voluntary, and students were informed that they could withdraw at any time without penalty. Confidentiality was maintained throughout the research process.

Data Analysis

Data were analyzed using IBM SPSS Statistics version 26.0. First, the data were screened for missing values and outliers, and reverse-scored items were recoded. Second, descriptive statistics were used to analyze participants' demographic characteristics, and the means and standard deviations of teacher attachment, school engagement, and prosocial behavior were calculated. Pearson correlation analysis was then conducted to assess the bivariate relationships among the three variables. Finally, hierarchical multiple linear regression analysis was performed, with prosocial behavior as the dependent variable and teacher attachment and school engagement as the independent variables. Gender, grade, ethnicity, boarding status, and left-behind status were entered as control variables in the first step, followed by teacher attachment and school engagement in the second step, to examine their independent associations with prosocial behavior after adjusting for these characteristics. Relevant statistical assumptions were assessed prior to regression analysis. Regression coefficients, significance levels, and the proportion of explained variance (R^2) were reported. All statistical tests were two-tailed, with the significance level set at $p < 0.05$.

Ethical Considerations

Ethical approval was obtained from the university's ethics committee before data collection. Permission was subsequently obtained from the relevant educational authorities and participating schools. Informed consent was obtained from the students and their parents or

legal guardians before questionnaire administration. All research procedures and data collection activities were conducted in accordance with ethical requirements to protect the rights and welfare of the participants.

Results

Demographic Characteristics of Participants

A total of 442 rural adolescents were included in this study, and their demographic characteristics are presented in Table 1. Of these, 245 (55.4%) were boys and 197 (44.6%) were girls. Participants ranged in age from 12 to 17 years (M = 13.66, SD = 0.76), with most aged 13 (45.2%) or 14 (39.6%) years. Regarding grade distribution, 274 participants (62.0%) were in Grade 7, and 168 (38.0%) were in Grade 8. Most participants belonged to ethnic minority groups (85.7%) and were boarding students (86.7%). Regarding left-behind status, based on the definition of parental labor migration lasting at least six months (Lv et al., 2024), 129 participants (29.2%) were classified as left-behind children, while the remaining 313 (70.8%) were classified as non-left-behind children.

Table 1
The Demographic Characteristics of Participants

Variable	Category	Frequency	Percentage (%)
Gender	Female	197	44.6%
	Male	245	55.4%
Age	12 years old	8	1.8%
	13 years old	200	45.2%
	14 years old	175	39.6%
	15 years old	56	12.7%
	16 years old	2	0.5%
	17 years old	1	0.2%
	Mean=13.66, SD=0.76		
Grade	First year of junior middle school	274	62.0%
	Second year of junior middle school	168	38.0%
Ethnicity	Han ethnic	63	14.3%
	Ethnic minority	379	85.7%
Boarding	Non-boarding students	59	13.3%
	Boarding students	383	86.7%
Left-behind Status	Left-behind children (parental labor migration≥6 months)	129	29.2%
	Non-left-behind children	313	70.8%

Reliability of the Measures

The internal consistency of the three study measures—prosocial behavior, teacher attachment, and school engagement—was assessed using Cronbach's α, as presented in Table 2. All three scales demonstrated good internal consistency. Cronbach's α coefficients were 0.860 for prosocial behavior, 0.867 for teacher attachment, and 0.911 for school engagement. These results indicate that the scales exhibited good internal consistency in the current sample.

Table 2
Reliability Analysis of Variables

Variable	Number of Items	Cronbach's α
Prosocial Behavior	15	0.860
Teacher Attachment	17	0.867
School Engagement	19	0.911

Descriptive Statistics and Normality Assessment

The descriptive statistics for the study variables are presented in Table 3. The mean score for prosocial behavior was 5.138 (SD = 0.859) on a 7-point Likert scale. Teacher attachment and school engagement had mean scores of 3.133 (SD = 0.650) and 3.003 (SD = 0.685), respectively, on 5-point Likert scales. Skewness values ranged from −0.257 to 0.152, while kurtosis values ranged from −0.243 to −0.056. All values fell within the commonly accepted range of −2 to +2, suggesting no substantial deviations from normality for the three variables.

Table 3
The Descriptive Statistics of Study Variables

Variable	Likert scale range	Minimum	Maximum	Mean	S.D.	Skewness	Kurtosis
Prosocial Behavior	1-7	2.333	7.000	5.138	0.859	-0.257	-0.243
Teacher Attachment	1-5	1.235	5.000	3.133	0.650	0.129	-0.155
School Engagement	1-5	1.368	5.000	3.003	0.685	0.152	-0.056

Pearson Correlation Analysis

Pearson correlation analysis was conducted to examine the relationships among teacher attachment, school engagement, and prosocial behavior. As shown in Table 4, both teacher attachment ($r = 0.366$, $p < 0.001$) and school engagement ($r = 0.503$, $p < 0.001$) were significantly and positively correlated with prosocial behavior. Additionally, teacher attachment was significantly and positively correlated with school engagement ($r = 0.557$, $p < 0.001$).

Table 4
Pearson Correlation Among Study Variables

Variable	1	2	3
1. Prosocial behavior	—		
2. Teacher Attachment	0.366**	—	
3. School Engagement	0.503**	0.557**	—

Note. **p < 0.01 (two-tailed). All three reported correlations have p < 0.001.

Hierarchical Multiple Regression Analysis

Hierarchical multiple regression analysis was conducted to examine the independent associations of teacher attachment and school engagement with prosocial behavior after controlling for demographic characteristics. Visual inspection of the residual histogram and normal P–P plot indicated that the residuals were approximately normally distributed. Multicollinearity was not a concern, with all variance inflation factors (VIFs) below 2.

As shown in Table 5, Model 1 included gender, grade, ethnicity, boarding status, and left-behind status as control variables. The model was not statistically significant, $F(5, 436) = 1.145$, $p = 0.336$, explaining 1.3% of the variance in prosocial behavior ($R^2 = 0.013$). None of the control variables was significantly associated with prosocial behavior.

In Model 2, teacher attachment and school engagement were added, resulting in a significant improvement in model fit, $\Delta R^2 = 0.257$, $\Delta F(2, 434) = 76.483$, $p < 0.001$. The final model explained 27.0% of the variance in prosocial behavior ($R^2 = 0.270$, adjusted $R^2 = 0.258$) and was statistically significant, $F(7, 434) = 22.954$, $p < 0.001$. Both teacher attachment ($\beta = 0.143$, $p = 0.005$) and school engagement ($\beta = 0.423$, $p < 0.001$) were positively associated with prosocial behavior after adjusting for the control variables and each other. School engagement showed a larger standardized regression coefficient than teacher attachment, while none of the control variables was statistically significant in the final model.

Table 5
Hierarchical Multiple Regression Analysis Predicting Prosocial Behavior

Variable	B	SE	β	p	95% CI for B	
					Lower	Upper
Model 1: Control Variables						
Gender	-0.079	0.083	-0.046	0.339	-0.242	0.084
Grade	-0.110	0.086	-0.062	0.199	-0.279	0.058
Ethnicity	0.037	0.119	0.015	0.753	-0.197	0.272
Boarding	0.116	0.121	0.046	0.340	-0.123	0.354
Left-behind Status	0.102	0.091	0.054	0.263	-0.077	0.281
Model 2: Full Model						
Gender	-0.094	0.074	-0.054	0.204	-0.238	0.051
Grade	-0.068	0.074	-0.038	0.363	-0.214	0.078
Ethnicity	0.152	0.103	0.062	0.141	-0.050	0.355
Boarding	-0.019	0.105	-0.008	0.854	-0.226	0.187
Left-behind Status	0.003	0.079	0.002	0.970	-0.152	0.158
Teacher Attachment	0.189	0.067	0.143	0.005	0.056	0.322
School Engagement	0.531	0.064	0.423	＜0.001	0.404	0.657
Model statistic	**Molde 1**			**Model 2**		
R^2	0.013			0.270		
Adjusted R^2	0.002			0.258		
ΔR^2	0.013			0.257		
F	F (5, 436) = 1.145			F (7, 434) = 22.954		
ΔF	ΔF (5, 436) = 1.145			ΔF (2, 434) = 76.483		
p for ΔF	0.336			＜0.001		

Note. B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient; CI = confidence interval. All confidence intervals refer to B. Categorical predictors should be interpreted according to their reference categories.

Discussion

This study examined the relationships among teacher attachment, school engagement, and prosocial behavior in a sample of 442 rural adolescents from Honghe Prefecture, Yunnan Province, China. It further investigated the independent associations of the two school-related factors with prosocial behavior after controlling for gender, grade, ethnicity, boarding status, and left-behind status. The findings revealed that both teacher attachment and school

engagement were significantly and positively correlated with prosocial behavior, and both remained significantly associated with prosocial behavior when simultaneously included in the regression model. School engagement had a larger standardized regression coefficient than teacher attachment. Adding these two school-related factors increased the explained variance by 25.7 percentage points. These findings highlight teacher–student relationships and school engagement as important school-related factors associated with prosocial behavior among rural adolescents in China's southwestern border regions. They also provide empirical evidence regarding the roles of relational resources and participatory experiences within rural school environments.

Teacher Attachment and Prosocial Behavior

This study found a significant positive correlation between teacher attachment and prosocial behavior among rural adolescents. Teacher attachment remained positively associated with prosocial behavior after controlling for gender, grade, ethnicity, boarding status, left-behind status, and school engagement, consistent with previous findings (Liang & Du, 2025; Xu & Ruan, 2026). This result suggests that positive teacher attachment represents an important school-based relational resource associated with prosocial behavior among rural adolescents in China's southwestern border regions.

Attachment Theory emphasizes that secure, stable, and supportive relationships with significant others help individuals develop positive interpersonal expectations and provide support for emotional regulation and social adjustment (Bowlby, 1999). Within the school environment, teachers are important adults with whom adolescents interact regularly (García-Rodríguez et al., 2023). Positive teacher–student relationships may help adolescents feel cared for and supported, then develop positive interpersonal attitudes through daily interactions, thereby being associated with more helping, cooperation, and caring behaviors toward others (Davis, 2003; Yang & McGinley, 2023).

For rural adolescents in China's southwestern border regions, the significance of teacher attachment should also be understood within their specific developmental contexts. In the present sample, approximately 86.7% of students were boarding students, indicating that schools were important settings for daily life and social interactions for most participants. In this context, teachers not only fulfill instructional responsibilities but may also serve as important sources of emotional communication and social guidance. Particularly for adolescents with limited family companionship, positive teacher–student relationships may provide additional socioemotional support (Jones et al., 2026; Zukhrufa & Kurniawati, 2026). Therefore, the positive association between teacher attachment and prosocial behavior further highlights the importance of school-based relational resources for positive social development among rural adolescents in China's southwestern border regions.

School Engagement and Prosocial Behavior

This study found a significant positive correlation between school engagement and prosocial behavior among rural adolescents. School engagement remained positively associated with prosocial behavior after controlling for demographic characteristics and teacher attachment. This finding is consistent with previous research (R. Li et al., 2025). It suggests that, beyond the quality of teacher–student relationships, students' active engagement in school life is another important school-related factor associated with prosocial behavior.

This finding can be understood from the perspective of Social Learning Theory, which emphasizes that individuals acquire and develop behavioral patterns through observing others, participating in social interactions, and receiving behavioral feedback (Bandura, 1977). School engagement encompasses cognitive, emotional, and behavioral dimensions, reflecting students' overall investment in school learning and activities (Fredricks et al., 2005). Adolescents with higher levels of school engagement are more likely to be exposed to prosocial modeling by teachers and peers and to participate more frequently in cooperative learning and group activities, thereby reinforcing the acquisition of prosocial behaviors through ongoing social interactions (Li et al., 2024). Finn's participation–identification model also suggests that successful engagement in school strengthens students' sense of identification with the school, which in turn motivates them to adhere to school norms and care for collective interests (Finn & Zimmer, 2012; Reschly & Christenson, 2022).

This finding has implications for understanding adolescent development in rural boarding schools. In the present sample, most students were boarding students, indicating that schools served not only as educational settings but also as important environments for their daily life. School engagement may therefore reflect adolescents' opportunities to encounter social norms, participate in collective interactions, and practice prosocial behavior in their everyday school life (Li et al., 2023).

Notably, when teacher attachment and school engagement were simultaneously included in the regression model, school engagement had a larger standardized regression coefficient ($\beta = 0.423$) than teacher attachment ($\beta = 0.143$). This indicates that school engagement had a larger standardized independent association with prosocial behavior in the present model. One possible explanation is that teacher attachment primarily reflects the quality of specific teacher–student relationships, whereas school engagement encompasses students' cognitive, emotional, and behavioral investment in school life, representing a broader range of school experiences (Fredricks et al., 2005; García-Rodríguez et al., 2023). School engagement may therefore be associated with prosocial behavior through a wider range of school experiences. This also suggests that establishing positive relationships alone may not be sufficient, translating these relationships into students' identification with and engagement in school may also be important. However, the present study did not directly test whether the difference between the two standardized regression coefficients was statistically significant. Therefore, it cannot be concluded that school engagement was significantly more strongly associated with prosocial behavior than teacher attachment.

Practical Implications

The hierarchical regression results showed that adding teacher attachment and school engagement significantly increased the explained variance in prosocial behavior by 25.7 percentage points after controlling for gender, grade, ethnicity, boarding status, and left-behind status. This finding suggests that, beyond demographic characteristics, the quality of students' relationships and their participatory experiences within schools should be considered when understanding prosocial behavior among rural adolescents in border regions of Southwest of China.

The findings offer two practical implications for promoting positive adolescent development in rural schools. First, schools should emphasize the development of positive and supportive

teacher–student relationships by fostering effective communication, respect, and trust, thereby providing students with a supportive interpersonal environment. Second, schools could create more opportunities for active participation in school life through cooperative learning, group activities, and student-led initiatives, allowing adolescents to observe and practice prosocial behavior through daily interactions.

For rural schools with high boarding rates, the importance of the school environment in students' daily lives deserves particular attention. Promoting positive teacher–student relationships and school engagement may therefore represent promising directions for future educational practice. However, given the cross-sectional design of this study, these recommendations require further validation through longitudinal and intervention research.

Limitations and Future Research Directions

This study has several limitations. First, the cross-sectional design does not allow conclusions about the temporal ordering or causal relationships among teacher attachment, school engagement, and prosocial behavior. Future research could employ longitudinal or intervention designs to further examine the developmental relationships and potential bidirectional associations among these variables.

Second, all core variables were measured through student self-reports, which may be subject to common method bias and social desirability bias. Future studies could incorporate multiple sources of data, including teacher reports, peer assessments, and behavioral observations, to enhance the robustness of the findings.

Third, the sample was drawn exclusively from rural schools in Honghe Prefecture, Yunnan Province, and the generalizability of the findings to other rural regions remains to be established. Furthermore, as students were nested within different classes and schools, future research could employ multilevel analyses to better account for variation at the classroom and school levels.

Finally, this study used overall scores for teacher attachment, school engagement, and prosocial behavior without further examining their specific dimensions or potential mediating mechanisms. Future research could explore different dimensions of teacher attachment, various forms of school engagement, and potential pathways involving socioemotional competencies and school belonging.

Conclusion

This study found that both teacher attachment and school engagement were significantly and independently associated with prosocial behavior among rural adolescents in Honghe Prefecture, Yunnan Province, China, with school engagement showing a larger standardized regression coefficient. These findings highlight the importance of positive teacher–student relationships and school engagement in understanding prosocial behavior among rural adolescents and provide empirical evidence supporting greater attention to relational resources and students' participatory experiences within rural school environments.

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