



## OPEN ACCESS

## EDITED BY

Claudio Longobardi,  
University of Turin, Italy

## REVIEWED BY

Ika Kristiana,  
Diponegoro University, Indonesia  
Jati Ariati,  
Diponegoro University, Indonesia

## \*CORRESPONDENCE

Gao Wang

✉ wanggaoedu@163.com

Guiyun Chen

✉ chenguiyunedu@163.com

RECEIVED 28 August 2023

ACCEPTED 20 December 2023

PUBLISHED 08 January 2024

## CITATION

Wang G, Chen G and Li B (2024) The effects of teacher–student reciprocity on students' sense of belonging to the university; a moderated mediation model.  
*Front. Educ.* 8:1284177.  
doi: 10.3389/educ.2023.1284177

## COPYRIGHT

© 2024 Wang, Chen and Li. This is an open-access article distributed under the terms of the [Creative Commons Attribution License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

# The effects of teacher–student reciprocity on students' sense of belonging to the university; a moderated mediation model

Gao Wang\*, Guiyun Chen\* and Bichun Li

Management college, Changsha Medical University, Changsha, China

Developing a pleasant and supportive emotional bond with teachers might help students feel more at home at school. However, research on the relationship between positive teacher–student relationships and students' feelings of belonging in university settings is scarce. Using data from 426 student surveys, this study estimated the moderated mediation model which is generated based on attachment theory and reciprocity theory. As a result, teacher–student reciprocity increases students' sense of belonging to the university, and teacher–student attachment moderates this effect. The effects of teacher–student reciprocity and teacher–student attachment on students' sense of belonging to the institution are positively moderated by social group attachment. This work contributes to the study of the sense of belonging by expanding on the applications of attachment theory and reciprocity theory. This research has a practical application.

## KEYWORDS

teacher–student reciprocity, teacher–student attachment, social group attachment, sense of belonging, emotional bond

## 1 Introduction

Establishing a positive and supportive emotional relationship with teachers is beneficial for promoting students' sense of belonging to the school (Farmer et al., 2019; Korpershoek et al., 2020). Baumeister and Leary (1995) published a commentary article on the human need for belonging, proposing the “belonging hypothesis,” which states that “humans are universally motivated by the need for belonging, the strong desire to form and maintain lasting interpersonal attachments.” Subsequent research has shown that this strong desire is more likely to form high-quality interpersonal relationships, significantly influencing human motivation, social abilities, and well-being (Neuhaus et al., 2019). Establishing a positive relationship with teachers and gradually developing a sense of school belonging helps students maintain emotional stability and a positive mindset (Braun et al., 2020).

The teacher–student relationship is considered one of the most powerful predictors of student development, learning, and well-being (Phan and Ngu, 2020; Greenier et al., 2021). Ye et al. (2022) believes that a positive teacher–student relationship is the most important factor in promoting youth development. Research results have shown that the teacher–student relationship contributes significantly to students' academic, social, and emotional development (Poulou, 2017; Longobardi et al., 2021). In recent years, scholars have conducted research on the teacher–student relationship in secondary school classroom environments (Wanders et al., 2020a,b; Civitillo et al., 2021), but there is limited research analyzing the relationship between

positive teacher–student relationship and students’ sense of belonging in university settings. This study will focus on higher education or university contexts and one particularly important relationship: the teacher–student relationship. In research on kindergarten, primary, and secondary education, the importance of interpersonal relationships between students and teachers for successful school adaptation has been widely recognized (Li and Lau, 2019; King and Bailey, 2021), but there is relatively little research on university students of Chinese context. Therefore, this study focuses on the changes in students’ sense of belonging under the influence of teacher–student reciprocity, which has important research value in the field of education. The reciprocal relationship brings individuals closer psychologically, increases mutual trust and collaboration, and enhances the closeness between teachers and students, ultimately reaching the threshold of teacher–student attachment (Wentzel, 2022). Teachers strengthen the development of students’ attachment to social groups, which influences the development of their sense of school belonging (Karim and Hue, 2023). The reciprocal and attachment relationship between teachers and students positively affects university students’ sense of belonging.

Today, many schools are driven more by grades and standardized assessments than by learning itself, and by external accountability rather than internal responsibility (Camphuijsen, 2021). In this task-oriented atmosphere, teachers are overwhelmed by the demands of “teaching to the test,” neglecting their core business of promoting learning, understanding students, and building relationships with them (Cho and Chan, 2020). This teaching environment fosters negativity and division as teachers adopt a pessimistic attitude towards their work, feeling frustrated and demoralized (Bradford and Braaten, 2018), while students become disengaged, distant, and unable to see their goals when they feel abandoned (Kenyon, 2017), resulting in insufficient student engagement, recognition, and support in the school learning environment. Therefore, the purpose of this study is to explore the impact of positive teacher–student interaction and its effect on students’ sense of school belonging in the microsystem of schools. In addition, this paper creatively explores the role of teacher–student reciprocity in students’ sense of belonging, mainly in the following aspects: firstly, in terms of the research subjects, most studies have not focused on the teacher–student relationship in universities (Asikainen et al., 2018). Secondly, this study conducts research based on attachment theory and reciprocity theory, exploring the role of teacher–student reciprocity in students’ sense of belonging. Finally, this study introduces the moderating variable of group attachment, making the framework more complete and further deepening the understanding of the impact mechanism of teacher–student reciprocity on university students’ sense of belonging, this study proposed the conceptual research model, as Figure 1.

This study mainly addresses how teacher–student attachment affects students’ sense of belonging and how teacher–student reciprocity affects students’ sense of school belonging. The research on the teacher–student relationship in this study is mainly based on reciprocity theory. Gouldner (1960) initially introduced the concept of reciprocity, which generally refers to a set of socially accepted rules of exchange where one party provides resources to another and expects something in return (Huang and Li, 2017). Whether it is interpersonal exchanges or exchanges between organizations, reciprocity is the basic principle, meaning that in exchange relationships, actors can provide valuable behaviors for each other

(Melamed et al., 2020). The school environment requires reciprocal interactions with friends, classmates, and teachers. Due to the highly positive influence of teachers on students, they can share power and provide reciprocity, involving students in such relationships and promoting their development (Moghavvemi et al., 2017). A sense of school belonging helps students maintain emotional stability, enjoy the learning experience, cultivate an optimistic learning attitude, and establish connections with peers who have similar stability and positive spirits, making them happier and more satisfied, and subsequently their academic performance and motivation may increase (Lam et al., 2015; Pedler et al., 2022). The establishment of a positive teacher–student reciprocity relationship is crucial for fostering a sense of belonging.

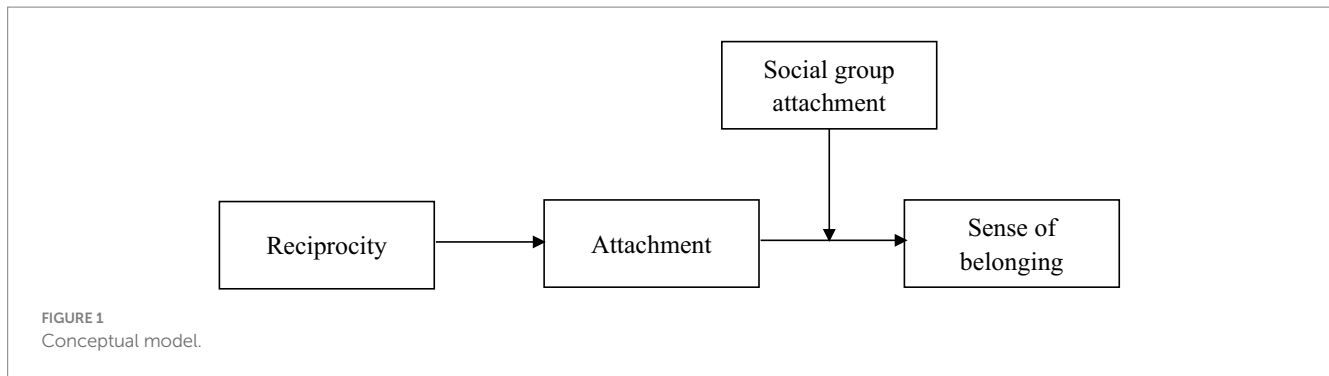
Students’ sense of belonging to the university is an important topic in educational research because it constitutes a structure that is distinct from frequently discussed topics in educational research, such as teacher–student reciprocity and attachment relationships. The contribution of this article can be seen from both theoretical and practical perspectives. Firstly, this study provides theoretical evidence through empirical analysis of how teacher–student reciprocity and attachment relationships affect students’ sense of belonging, providing a theoretical basis for the relationship between good teacher–student relationships and a sense of belonging. In addition, this study provides research insights from the perspective of a higher education population – university students’ sense of belonging, which has been a research gap in the manifestation of teacher–student reciprocity over the years. Secondly, a pleasant relationship and positive interactive experience between teachers and students contribute to students developing a stronger sense of belonging to the school, as well as having more positive performance in academic efficacy and self-evaluation. Furthermore, establishing a good interactive relationship with teachers helps weaken the impact of differences between home and school on students, making it easier for them to adapt to and accept the school culture.

## 2 Theoretical background

### 2.1 Attachment theory

Attachment theory originated from Bowlby’s (1982) study on parent–child relationships. The core idea is that individuals seek closeness to attachment figures from birth, establishing emotional connections for defense and increasing opportunities for survival (Pillhofer et al., 2015). Therefore, Bowlby defined attachment as “a strong emotional bond between an individual and a specific person in their life” (Bowlby, 1982).

Initially, research on adult attachment patterns was based on three typical attachment patterns of infants: secure, anxious-ambivalent, and avoidant (Widom et al., 2018). Subsequent research indicated that attachment patterns are better described using two dimensions: attachment anxiety and attachment avoidance (Waring et al., 2019). Attachment anxiety is defined as “fear and anxiety of rejection and abandonment” (Sakman et al., 2021). It has been found that individuals with high attachment anxiety lack a sense of security and often fear potential losses, requiring additional support and comfort from others (Parent and Shapka, 2020). Another dimension is attachment avoidance. Attachment avoidance refers to the suppression



of attachment needs (Korpershoek et al., 2020). Individuals with avoidant attachment have been rejected or excluded by early attachment figures, leading them to mistrust others and tend to maintain emotional distance from others by suppressing their need for closeness and intimacy (Leenders et al., 2019). Avoidant individuals are considered to be afraid of intimacy, and their discomfort with touch and intimacy often contributes to emotional distance and independence (Sher-Censor et al., 2019; Egozi et al., 2023).

Since the proposal of attachment theory, psychologists have often used it to study interpersonal relationships or explore the states of individuals during interactions (Yip et al., 2018). By examining the sub-dimensions of attachment theory, it can be understood that individuals form a sense of place attachment by connecting to a specific location, which promotes a sense of belonging (Sebastien, 2020). Researchers have studied place identity and place attachment based on their research topics, resulting in a sense of belonging to the place (Dang and Weiss, 2021). Attachment theory provides a psychological explanation for the influence of teacher-student relationship. Securely attached individuals demonstrate greater trust, satisfaction, commitment, and interdependence in romantic relationships compared to individuals with other attachment styles. However, Read et al. (1994) and Baldwin et al. (1996) proposed more advanced models in which individuals cannot be characterized by a single attachment pattern. Instead, individuals have psychological representations (including memories, emotional reactions, skills, and strategies) that apply to various types of relationships, both general and specific. This study focuses on the reciprocal relationship between university students and teachers, which can increase intimacy and promote attachment in the relationship. This extends attachment theory's focus from family and romantic relationships to school social relationships.

## 2.2 Reciprocity theory

Reciprocity theory originated from social exchange theory and provides a good explanation for motivation and identification behaviors of employees within organizations (Cropanzano et al., 2017). The theory was first proposed by Gouldner (1960) and has since been widely applied in the field of organizational management. Parzefall (2008) categorized the reciprocity relationships formed by actors in exchange activities into three specific types: generous reciprocity, equal reciprocity, and negative reciprocity. Generous reciprocity is defined as a reciprocity relationship formed by actors in

exchange activities with the main characteristics of uncertain feedback time, uncertain feedback value, and a focus on the interest of others. Equal reciprocity is a reciprocity relationship formed by actors in exchange activities with the main characteristics of immediate feedback, equal-value feedback, and mutual benefit. Negative reciprocity is a reciprocity relationship formed by actors in exchange activities with the main characteristics of immediate feedback, equal-value feedback, and a focus solely on one's own interests.

This study mainly discusses the model of promoting students' sense of school belonging through the formation of a good reciprocal relationship between teachers and students, hence equal reciprocity is effective in this model. With the deepening of theoretical research, reciprocity theory has become increasingly rich in various research fields. Many researchers have explained individual cognition, psychological processes, attitudes, and behavioral changes based on social exchange and reciprocity rules. Many scholars have interpreted the mechanism of reciprocity in interpersonal relationships from the perspective of Confucian culture when explaining relationships between individuals. Conducting research on reciprocal relationships in teacher-student relationships is very valuable, as it can promote attachment in teacher-student relationships and enhance students' sense of belonging to college. However, there is a lack of research on how reciprocity promotes students' sense of belonging in interpersonal relationships.

## 3 Literature review and hypothesis development

Gouldner (1960) defines reciprocity as the "moral norm of constructing obligations of help and return." Reciprocity refers to the cooperation that should exist in a relationship, with members working together in a particular activity. In this context, members refer to teachers and students (Ibrahim and El Zaatari, 2019). According to attachment theory, the quality of the teacher-student relationship is closely related to the quality of parent-child attachment. The more secure the parent-child attachment, the more harmonious the relationship between students and teachers. Attachment is defined as "enduring emotional bond with substantive intensity" (Armsden and Greenberg, 1987). Manosalvas et al. (2021) argue that reciprocity can stabilize social systems and is applicable to all social cultures. For a long time, anthropologists and sociologists have considered reciprocity to be an important component in maintaining social exchange relationships (Cropanzano et al., 2017). For students, reciprocity includes effective classroom participation, loyalty in front

of peers, and sustained academic effort (Ferguson, 2018). Therefore, reciprocity can not only maintain social exchange relationships but also have important effects in interpersonal relationships, particularly in teacher-student relationships.

Reciprocity positively influences the attachment in interpersonal relationships, overall affecting trust and cohesion in teacher-student relationships. Scholars have found through survey research that reciprocity can enhance trust, emotional respect, and cohesion in interpersonal relationships, thereby promoting communication (Jakovljevic et al., 2020). In a study by Goodyear and Dudley (2015), reciprocal communication played a critical integrative role in teacher-student guidance, strengthening trust, affinity, and cohesion between them. This conclusion has also been validated in related research in the fields of social communication and social support (Koprowska, 2023), all of which have positive effects on trust and cohesion in interpersonal relationships, thus promoting interactive communication. Therefore, the mutual assistance and cooperation between teachers and students have significant response mechanisms for the positive factors in their relationship.

Teacher-student relationships are influenced by reciprocity, particularly in terms of intimacy and dependence. When studying reciprocity between teachers and students, weak significant binary reciprocity and non-significant generalized reciprocity theories are mainly used. These two theories indicate that teachers and students perceive the quality of their binary relationship in different ways, particularly in terms of intimacy and dependence (Timmermans et al., 2019). Teacher-student relationships are premised on dependence, which supports mutual support and cooperation between them. Surveys have found that students may attribute positive value to dependence and recognize it as an aspect of closeness to teachers in order to receive support (Tsigilis et al., 2018) and emotional support (Vatou et al., 2020). Teacher characteristics, such as sensitivity or behavioral expectations, influence the emotional relationship between teachers and students (Hafen et al., 2015). Good cooperation in teacher-student relationships can increase intimacy between them. Researchers have concluded from attachment theory (Wan et al., 2023) that warm and supportive teacher-student relationships can provide children with a sense of security, promoting their free and active participation in classroom learning activities (Huang et al., 2022), thus reduced the sense of distance between teachers and students. At the same time, teacher behavior can elicit different responses from students (Assuncao Flores and Gago, 2020), which can also affect the level of intimacy. According to Chetty et al. (2022), without reciprocity, teachers may struggle or give up on their relationships with students.

In conclusion, significant research has proved that reciprocal aid and cooperation between teachers and students has a favorable effect on their attachment. This is most visible in the communication and cooperation between teachers and students, which fosters trust and cohesiveness in their relationship while also emphasizing intimacy and dependency. Based on this, this study proposes the following hypotheses:

*Hypothesis 1 (H1):* Teacher-student reciprocity positively affects the teacher-student attachment.

Sense of belonging is an individual's psychological experience of belonging to a certain group, emphasizing self-perception. It is one of

the basic human needs that influences human behavior and motivation (Hirsch and Clark, 2019). School belongingness refers to students' subjective sense of being an important part of the school, being accepted, respected, and supported by teachers and peers (Booker, 2023). Multiple attachment theory suggests that individuals have different roles and attachment objects at different stages, and different attachment relationships at different stages are inconsistent (Fraleay et al., 2015). School belongingness is influenced by many factors, with teacher-student relationships being one of the most important factors (Uslu and Gizir, 2017).

A good and positive teacher-student relationship brings them closer psychologically, resulting in student attachment and promoting the development of a sense of belonging to the school. Teacher-student attachment focuses on the psychological relationship and emotional interaction between teachers and students, representing a more intimate emotional connection. Teacher-student relationships are multi-structural, multi-type, and multi-perspective stable interpersonal relationship systems between teachers and students (Aldrup et al., 2018). There is evidence that a good relationship between students and teachers is crucial for the development of all students in the school (Samodra et al., 2023), but teacher-student relationships and school belongingness are unclearly related. Child attachment research and adult attachment research focus on categories and objects, while adolescent attachment research focuses on attachment quality (Waters et al., 2018). Research has confirmed that teacher-student attachment has a profound impact on the personality development and social adaptation of children (Ye et al., 2022). The support and positive relationship between teachers and students ultimately promote school belongingness and encourage student involvement in classroom activities (Byrd, 2016). Burke and Larmar (2021) found that interactions with teachers are crucial for the motivation and sense of belonging of all students, especially "instructional care" (rather than general interpersonal care). The results of the study suggest that teachers who meet students' needs by caring, respecting, and praising them increase students' sense of belonging to the school (Sun, 2015).

In conclusion, based on attachment theory, teacher-student attachment positively influences students' sense of belonging to the university. Therefore, this study proposes the following hypothesis:

*Hypothesis 2 (H2):* Teacher-student attachment positively affects the sense of belonging to the university.

According to attachment theory, attachment is a cognitive structure or working model that represents individuals' dependence on important figures in their lives (Reizer, 2015). The concept of reciprocity, first proposed by Gouldner (1960), specifically defines it as the moral norm of constructing obligations of help and return. Reciprocity plays an important role in trust, emotional respect, and cohesion in interpersonal relationships, producing significant effects on communication and cooperation (Prouska et al., 2023). Teachers become a safe base and shelter for students to explore the social environment and seek refuge during difficult times, to some extent promoting an intimate relationship with students (Verschuere, 2015). Teacher-student relationships are the most important relationships in the school environment, and their nature should be highly emotional, democratic, and supportive. Salavera and Usan (2021) found that students' happiness and their happiness in

interpersonal relationships are crucial for developing positive relationships between teachers and students. School belongingness refers to the extent to which students feel accepted, respected, included, and supported by others in the school social environment (Goodenow, 1993), which is a psychological attachment. Teacher-student attachment plays a role in promoting students' school belongingness by actively encouraging and positively supporting students (Allen et al., 2018). Wentzel et al. (2016) found that support from teachers, peers, and parents directly affects school belongingness, but the influence of support from teachers and peers is more direct. Chen et al. (2023) found in their study on school belongingness that students who receive support and encouragement from teachers have higher levels of school belongingness. Sanin (2019) found that for Latin American university students, school belongingness is associated with perceived professor care, involvement in school organizations, and non-hostile racial climate. Al-Obaydi et al. (2023) found that encouragement from teachers for student participation in university classrooms makes students feel warm, friendly, and beneficial, and makes them feel that teachers have done a good job organizing and preparing for the class, which enhances students' school belongingness.

Finally, according to attachment theory, positive interaction between instructors and students influences students' sense of belonging at school. Therefore, this study proposes the following hypothesis:

*Hypothesis 3 (H3):* Teacher-student attachment mediates the effect between reciprocity and the sense of belonging to the university.

Social group attachment is a special emotional connection established between group members and the group they belong to, where members are cared for, respected, and helped in group activities. The group provides a stage for members to showcase themselves, leading to a special sense of belongingness and security (Marlin et al., 2022). Zou et al. (2022) divided social group attachment into two dimensions: attachment anxiety and attachment avoidance. Attachment anxiety refers to the fear and anxiety of rejection and abandonment. Attachment avoidance refers to the inhibition of attachment needs. In terms of teacher-student relationships, students with high levels of attachment anxiety or avoidance are influenced by social group attachment, causing changes in their attachment to teachers (Kim et al., 2021). As mentioned earlier, students may transfer their attachment emotions to teachers when their attachment to social groups is weakened, as teachers are generally seen as trustworthy and close (Mitchell et al., 2018). Students have lower resistance to teachers, and when they experience avoidance or anxiety in social interactions, attachment psychology enhances their attachment to teachers, thereby influencing their sense of belongingness to the school (Amitay and Rahav, 2018).

In summary, the diminished attachment of student groups to social circles occurs when they encounter anxiety or avoidance during social interactions. This decrease in attachment is attributed to the principles of transfer and attachment psychology, as students compensate by strengthening their bond with teachers, consequently regulating their overall sense of belongingness within the educational institution.

Therefore, this study proposes the following hypothesis:

*Hypothesis 4 (H4):* Social group attachment enhances the effect between attachment and the sense of belonging to the university.

## 4 Materials and methods

### 4.1 Participants and procedure

This study investigated 426 students of university from Hunan province, China. Convenient sampling is applied to collect data during a week in June 2023. Online survey is applied when student in classroom and at their class breaktime. The questionnaires were anonymous and the data only be used for this research. Four hundred and twenty-six students participated our research, 58 of them are male (13.6%) and 368 of them are female (86.4%). Their average age was 20.29 years old (standard deviation is 1.491) which range from 17 to 26. 32.9% of them in first year of university; 41.8% of them in second year; 23.9% of them in third year; others in fourth or fifth year. Three hundred and ninety two students are medical student (92%) and others' major are management, education, or science.

### 4.2 Measurements

In this study, most of the measurement scales used were mature scales that had been used in previous studies. When translating the English items into Chinese, appropriate modifications were made based on the specific context of the study participants, while keeping the original meaning intact. The questionnaires were all in the form of a 7-point Likert scale (e.g., 1 = strongly disagree; 7 = strongly agree). This study was based on attachment theory and reciprocity theory to investigate the impact of teacher-student reciprocity on college students' sense of belonging. The independent variable was reciprocity, the mediating variable was attachment, the moderating variable was social group attachment, and the dependent variable was sense of belonging. This study accepted Cronbach's Alpha to test internal consistency coefficient.

#### 4.2.1 Reciprocity

This scale was based on a 16-item template from Wu et al. (2015), which was divided into generalized reciprocity, balanced reciprocity, and negative reciprocity based on factor analysis. Reasonable modifications were made to tailor the scale to the specific research context of teacher-student reciprocity. For example, "My teacher helps me develop myself, even if they cannot make more contributions at the moment." Additionally, the reliability and validity of the questionnaire were tested through a series of pre-tests. The pre-tests helped modify the problems of the survey tool and improve the validity and reliability of the instrument. The early results showed that the Cronbach's alpha scores of the overall scale were sufficient. The reliability estimates of all three subscales were satisfactory, with an internal consistency coefficient of 0.845 for the generalized reciprocity subscale, 0.824 for the balanced reciprocity subscale, and 0.843 for the negative reciprocity subscale.

### 4.2.2 Attachment

This study referred to a 7-item scale by Paulssen (2009) and made reasonable modifications to make it more suitable for the specific context. Example items included “I rely on my teacher with confidence” and “I feel nervous when my teacher gets too close to me.” The consistency of this scale was 0.879.

### 4.2.3 Social group attachment

For this aspect, this study used a scale by Smith et al. (1999) and divided social group attachment into two dimensions: attachment avoidance and attachment anxiety. This study used a 10-item scale for attachment avoidance and an attachment anxiety scale to measure social group attachment. The modified subscales included items such as “I often worry that my class does not truly accept me” and “I find it difficult to depend on my class.” The overall consistency of this scale was 0.899.

### 4.2.4 Sense of belonging

This study used a scale by Ma (2003) that utilized a Likert scale proposed by Lynn (1986). The items were adjusted without affecting the validity of the variables. Example items included “I feel like I belong to this school” and “I feel liked by my teachers.” The consistency of this scale was 0.864.

## 4.3 Statistical analysis

This study applied SPSS24 to analysis the descriptive statistics, the consistency of variables (Cronbach’s alpha), and correlations among variables. And then this study applied AMOS23 to run confirmatory factor analysis (CFA) for estimating the constructive validity of scales. At the end, this study applied SPSS PROCESS macro to test the hypotheses of this study, and the PROCESS model is 4 (as model1 & model2), 14 (as model3), and 15 (as model4), as models in Table 1. Using bootstrapping<sub>5000</sub> bias-corrected confidence intervals (95%) for

the indirect effects were produced. If zero does not fall within an indirect effect’s 95% confidence interval (CI), it is deemed significant.

## 5 Result analysis

### 5.1 Preliminary analyses

This study estimates the means, standard deviations, and the correlations of variables and demographic characteristic, as Table 2. There are correlations among Reciprocity (NOR), Attachment (ATR), Social group attachment (SGA), and Sense of belonging (SEB) except the relations between social group attachment (SGA) and Reciprocity (NOR) or Attachment (ATR). Reciprocity ( $r=0.459$ ,  $p<0.01$ ), attachment ( $r=0.539$ ,  $p<0.01$ ), social group attachment ( $r=0.111$ ,  $p<0.01$ ) positively related to Sense of belonging. This result preliminarily consistent to the hypotheses.

As Table 3, the result of confirmatory factor analysis (CFA) indicates the four-factor model has better model fit (e.g.,  $\chi^2/df$ , CFI, SRMR, RMSEA) than three, two, and one factor models. The model fit gradually improved from 1-factor model to 4-factor model. The variables of this study have reliable construct validity and discrimination validity.

### 5.2 Hypothesis testing

Hypothesis 1 (H1) proposed that teacher-student reciprocity positively affects the teacher-student attachment. As model1 in Table 1, reciprocity positively affect the attachment ( $B=0.425$ ,  $SE=0.044$ ,  $p<0.001$ ). It supported hypothesis 1.

Hypothesis 2 (H2) proposed that teacher-student attachment positively affects the sense of belonging to the university. As model2 in Table 1, attachment positively affect the sense of belonging ( $B=0.421$ ,  $SE=0.044$ ,  $p<0.001$ ). It supported hypothesis 2. In addition,

TABLE 1 Regression coefficients and moderated-mediation effect.

	Attachment (ATR)		Sense of belonging (SEB)					
	Model1		Model2		Model3		Model4	
	B	SE	B	SE	B	SE	B	SE
Grade	-0.078	0.058	0.039	0.052	0.063	0.049	0.036	0.048
Age	0.033	0.031	-0.003	0.028	-0.008	0.026	-0.008	0.025
Gender	-0.048	0.130	0.059	0.116	0.057	0.109	-0.002	0.107
Major	-0.008	0.034	0.007	0.031	0.010	0.029	0.011	0.028
Reciprocity (NOR)	0.425***	0.044	0.282***	0.044	0.276***	0.041	0.243***	0.041
Attachment (ATR)			0.421***	0.044	0.413***	0.041	0.426***	0.040
Social group attachment (SGA)					0.127***	0.038	0.128***	0.037
ATR*SGA					0.228***	0.032	0.178***	0.036
NOR*SGA							0.158***	0.034
R2	0.188		0.356		0.432		0.464	
F	19.447***		38.522***		39.672***		40.001***	

N = 426; \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

TABLE 2 Means, standard deviations, and correlations among variables.

	Mean	SD	Grade	Age	Gender	Major	NOR	ATR	SEB	SGA
Grade	1.94	0.796	–							
Age	20.29	1.491	0.290**	–						
Gender	1.86	0.343	–0.081*	–0.124**	–					
Major	3.36	1.286	0.041	0.010	0.005	–				
NOR	4.073	1.274	–0.071	–0.059	–0.073	0.010	–			
ATR	3.497	1.024	–0.077	0.008	–0.049	–0.008	0.428**	–		
SEB	4.046	1.025	–0.024	–0.011	–0.023	0.010	0.459**	0.539**	–	
SGA	3.246	0.960	–0.041	0.048	0.023	0.063	0.054	0.023	0.111*	–

\*\* Means significant at the 0.01 level; \* Means significant at the 0.05 level.

TABLE 3 Confirmatory factor analysis.

Models	Variables	$\chi^2$	df	$\chi^2/df$	$\Delta\chi^2/df$	CFI	SRMR	RMSEA
4-factor model	NOR, ATR, SGA, SEB	1495.585	458	3.265	1.102	0.868	0.054	0.073
3-factor model	NOR+ATR, SGA, SEB	2012.983	461	4.367	3.490	0.803	0.067	0.089
2-factor model	NOR+ATR+SGA, SEB	3637.581	463	7.857	0.948	0.597	0.137	0.127
1-factor model	NOR+ATR+SGA+SEB	4085.505	464	8.805		0.540	0.142	0.136

reciprocity positively affect the sense of belonging ( $B=0.282$ ,  $SE=0.044$ ,  $p<0.001$ ) too.

Hypothesis 3 (H3) proposed that teacher-student attachment mediates the effect between reciprocity and the sense of belonging to the university. At model2 in Table 1, with bootstrapped indirect effects test, reciprocity positively affect the sense of belonging via attachment ( $B=0.179$ ,  $SE=0.027$ , 95%CI [0.130, 0.236]). Hypothesis 3 is supported.

Hypothesis 4 (H4) proposed that social group attachment enhances the effect between attachment and the sense of belonging to the university. As model 3 in Table 1, the interaction value (ATR\*SGA) is significant which means the social group attachment moderate the effect of attachment on the sense of belonging ( $B=0.228$ ,  $SE=0.032$ ,  $p<0.001$ ).

Further, as Figure 2, simple slope analysis indicates that the positive relationship between attachment and sense of belonging was stronger with high social group attachment ( $B=0.636$ ,  $SE=0.051$ ,  $p<0.001$ ) than low social group attachment ( $B=0.079$ ,  $SE=0.023$ ,  $p<0.001$ ). As Figure 3, the positive relationship between reciprocity and sense of belonging was stronger with high social group attachment ( $B=0.422$ ,  $SE=0.050$ ,  $p<0.001$ ) than low social group attachment ( $B=0.065$ ,  $SE=0.059$ ,  $p<0.001$ ).

As the bootstrapping result of indirect effect (at model4 in Table 1), indication in Table 4, the indirect effect of reciprocity on sense of belonging via attachment is stronger with high social group attachment than low social group attachment. Hypothesis 4 is supported.

## 6 Conclusion and discussion

### 6.1 Discussion

Based on the reciprocity theory and attachment theory, this study researched close relationship between student's sense of belonging to

the university and the mutual reciprocity of teachers and students. Teacher and student attachment and the social group (class) attachment is also essential, the student sense of attachment plays a mediating role, social group attachment plays a moderating role. According to the findings of this study, teacher–student reciprocity has a favorable effect on teacher–student attachment. The sensation of belonging to the university is positively influenced by teacher–student attachment. Teacher–student reciprocity improves students' feelings of belonging to the university. The positive connection between attachment and sense of belonging was regulated by social group attachment, which also moderated the positive relationship between reciprocity and sense of belonging. The moderated mediation model, with attachment as the mediator and social group attachment as the moderator, has been tested satisfactorily.

### 6.2 Theoretical contribution

This study expands on the reciprocity theory and attachment theory academically, as well as improving the research system on students' sense of belonging. On one hand, this study extended the reciprocity and attachment theories to the relationship between college teachers and students. Positive teacher-student relationships can promote students' development and support their sense of belonging to the school (Ibrahim and El Zaatari, 2019). When teachers and students engage in reciprocal behaviors related to academics, it enhances students' identification and attachment to their teachers, which in turn strengthens their sense of belonging to the school. However, teachers should not continue teaching without students' understanding. They also need to differentiate their teaching based on students' academic needs (Mulyawati et al., 2022). Otherwise, students' disruptive behaviors will have a negative impact on the situation and result in punishment for teachers, which could lead to the rupture of the teacher-student relationship. A relationship characterized by high reciprocity and collaboration on meaningful

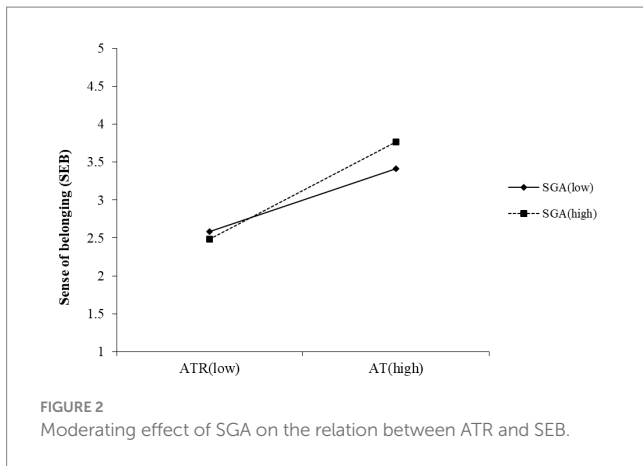


FIGURE 2 Moderating effect of SGA on the relation between ATR and SEB.

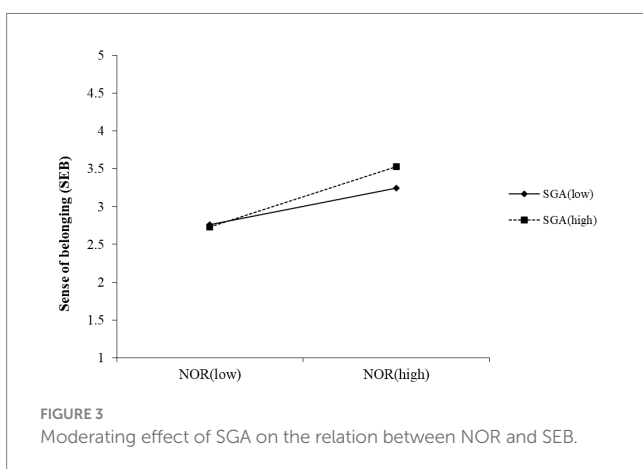


FIGURE 3 Moderating effect of SGA on the relation between NOR and SEB.

TABLE 4 Conditional indirect effect(s) of reciprocity on sense of belonging.

	SGA	Effect	SE	95%CI
NOR-> ATR -> SEB	-SD	0.114	0.025	[0.068; 0.166]
	M	0.181	0.026	[0.133; 0.232]
	+SD	0.248	0.035	[0.182; 0.320]

tasks will lead to students’ development being replaced by a relationship characterized by different goals. If teachers only aim to fulfil academic requirements while students seek both academic and psychological support, reciprocity will be lacking, creating an unfavorable learning environment and affecting students’ sense of belonging to the school.

On the other hand, this study contributes to the research system on students’ sense of belonging by introducing teacher-student attachment as a mediating variable and social group attachment as a moderating variable. Transmitting positive information about campus atmosphere is an important initial driving force for the development of students’ sense of belonging to the university. This positive information about campus atmosphere includes friendly teacher-student relationships and friendly relationships within the campus community. Although most research on attachment types has been conducted in the field of interpersonal relationships, attachment theory has also been applied to understanding the relationship between group members and their in-group. Smith et al. (1999) divided group attachment into attachment anxiety and attachment

avoidance dimensions, and attachment insecurity was defined based on the underlying dimensions of anxiety and avoidance (Haslam et al., 2020; Zhang et al., 2022). Group attachment insecurity reflects a negative perception of the nature of current relationships with the in-group, namely low levels of group attachment, including low intimacy (anxious attachment) or excessive intimacy (avoidant attachment). Our findings suggest that to enhance students’ sense of belonging to the school, it is important to consider increasing attachment heterogeneity. Individuals who have higher levels of attachment with teachers and higher levels of attachment anxiety or avoidance with the entire group will have a stronger sense of belonging to the school. Conversely, if the levels of attachment anxiety or avoidance with the entire group are low, the effect on increasing the sense of belonging to the school will not be significant.

### 6.3 Practical contribution

Students’ sense of belonging to the school has positive effects on students, teachers, and the school as a whole, it can be enhanced via attachment, reciprocity, or social group attachment. First, students’ sense of belonging to the school positively predicts academic achievement (Liu et al., 2022). Sense of belonging to the school can promote positive learning attitudes, improve academic performance, or facilitate the development of non-cognitive factors, thereby promoting academic development. It can also promote academic resilience and directly impact a college student’s performance by improving sense of belonging through attachment, reciprocity, or social group attachment. Second, the pleasant relationship and positive interaction experience between teachers and students make it easier for students to develop respect, understanding, and identification with their teachers. In turn, teachers can influence students through their noble professional ethics and conduct, creating a good educational atmosphere to university and mitigating the impact of differences between home and school on students, allowing them to focus better in class. Finally, the attention given to students’ sense of belonging by the school provides substantial recommendations for the school. The school should strive for humanized management, continuously strengthen the construction and development of the teaching staff, make the self-owned teaching staff the main force, hire high-level experts and scholars, and encourage young teachers to improve their teaching methods (Rodriguez, 2020). At the same time, universities should improve teachers’ welfare, provide clear career promotion channels, and ensure that teachers enjoy equal treatment as public-school teachers, thereby reducing the attrition rate of key teachers with high titles and degrees. The school should wholeheartedly serve teachers and students, increase investment in education, and create a strong bond with students, enhancing their sense of belonging to the school.

In conclusion, building a good relationship between teachers and students can promote the establishment of students’ sense of belonging to the school (Vaccaro et al., 2015). After a positive teacher-student relationship is formed, students will feel comfortable sharing their daily learning experiences and issues with teachers, and these problems can be resolved properly, making students feel like active participants and promoting a win-win situation among students, teachers, and the school. It is important to acknowledge that the development of a good teacher-student relationship is a process that requires meaningful social interactions with individuals (teachers) and groups (the educational environment), leading to transformation



and deepening of the sense of belonging established with the university. This study also expands the depth and breadth of research on students' sense of belonging. This study found that the positive impact of teacher-student reciprocity on teacher-student attachment is consistent with the literature (Ibrahim and El Zaatari, 2019), which suggests that teacher-student relationships play a role in the microsystem of the school and should not be considered independent of the overall atmosphere or direction of the education system. Attachment's mediating role in students' sense of belonging is consistent with the findings of Chen and Zhou (2019), who suggest that the quality of teacher-student relationships in schools can counteract the negative effects of the school atmosphere. The moderating role of social group attachment in the relationship between teacher-student attachment and sense of belonging is also supported by relevant literature (Korpershoek et al., 2020). Based on the paths through which teacher-student reciprocity influences students' sense of belonging, this study offers useful insights for the future prosperity and well-being of schools and students.

## 7 Limitations and future research directions

This study has several limitations, and based on these limitations, this study offers the following suggestions for future research. First, all the measurements in our study were self-reported questionnaires, which may be subject to individual bias and result in data deviations. In future research, it would be necessary to compare these longitudinal relationships from multiple data sources, including classroom observations and reports from teachers or peers.

Second, the sample in our study was limited, and the research results may not be sufficient. The participants in our study were students from an outstanding university that had undergone substantial educational reforms to promote students' personalized development, so the research may differ from others. Additionally, this study only surveyed a specific group of college students in a certain region, and the sample size was limited, so the research results may not be generalizable and may not apply to students of other age groups. Therefore, the universality of the research results is still unclear. Future research should explore the relationship between students' engagement and interpersonal relationships in different school contexts. Future research should also try to avoid the fragmentation of research subjects and include the sense of belonging of primary and secondary school students to further improve the research field of students' sense of belonging.

Third, this study provides limited research on the factors influencing students' sense of belonging to the school. This study only measured students' positive emotional relationships peers and teachers. It would be necessary to further investigate students' willingness to engage in other school relationships, such as acceptance or rejection by peer groups, as well as support for autonomy, relatedness, and competence through complex teacher-student interactions (Geng et al., 2019). Future research should include more stakeholders, such as parents and other family members, principals, teachers, counselors, and other students, as well as school and classroom culture, to obtain a more comprehensive profile of student engagement and study their sense of belonging to the school in those contexts. Future research can also examine how different factors may affect students' "sense of belonging to the school" at different levels,

such as studying the different effects of school extracurricular activities, club activities, and spring outings on students' sense of belonging to the school.

Fourth, this study focused on investigating students' sense of belonging to the school. Future researchers can explore the sense of belonging in different domains of life to consider how they interact to produce an overall sense of belonging. For example, studying students' sense of belonging to the locality where the school is located and analyzing its impact on students' sense of belonging to the school, as well as studying students' sense of belonging to their families and analyzing its influence on their sense of belonging to the school.

Overall, our study provides insights into the factors that promote students' sense of belonging to the school. The limitations of this study suggest areas for future research, and this study hope that our findings contribute to the understanding and improvement of students' sense of belonging in educational settings.

## Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## Ethics statement

Ethical approval was not required for the studies involving humans in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants in accordance with the national legislation and institutional requirements.

## Author contributions

GW: Funding acquisition, Writing – original draft, Writing – review & editing. GC: Data curation, Investigation, Resources, Writing – review & editing. BL: Formal analysis, Writing – review & editing.

## Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. This article was supported by the General Project of Scientific Research of the Education Department of Hunan Province, China. The project is titled "Mechanisms of Teacher Developmental Feedback on Student Creativity" with project number 21C0899. It is also supported by a research project from Changsha Medical University titled "Research on digital enabling to stimulate ambidexterity innovation of traditional Chinese medicine agriculture from multiple theoretical perspectives."

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated

organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

## References

- Aldrup, K., Klusmann, U., Ludtke, O., Gollner, R., and Trautwein, U. (2018). Student misbehavior and teacher well-being: testing the mediating role of the teacher-student relationship. *Learn. Instr.* 58, 126–136. doi: 10.1016/j.learninstruc.2018.05.006
- Allen, K., Kern, M. L., Vella-Brodrick, D., Hattie, J., and Waters, L. (2018). What schools need to know about fostering school belonging: a meta-analysis. *Educ. Psychol. Rev.* 30, 1–34. doi: 10.1007/s10648-016-9389-8
- Al-Obaydi, L. H., Shakki, F., Tawafak, R. M., Pikhart, M., and Uгла, R. L. (2023). What I know, what I want to know, what I learned: activating EFL college students' cognitive, behavioral, and emotional engagement through structured feedback in an online environment. *Front. Psychol.* 13:1083673. doi: 10.3389/fpsyg.2022.1083673
- Amitay, G., and Rahav, G. (2018). Attachment and pedagogical relevant practices as elements of a successful alternative school through the narratives of its students. *Psychol. Sch.* 55, 1239–1258. doi: 10.1002/pits.22200
- Armsden, G. C., and Greenberg, M. T. (1987). The inventory of parent and peer attachment: individual differences and their relationship to psychological well-being in adolescence. *J. Youth Adolesc.* 16, 427–454. doi: 10.1007/BF02202939
- Asikainen, H., Blomster, J., and Virtanen, V. (2018). From functioning communality to hostile behaviour: students' and teachers' experiences of the teacher-student relationship in the academic community. *J. Furth. High. Educ.* 42, 633–648. doi: 10.1080/0309877x.2017.1302566
- Assuncao Flores, M., and Gago, M. (2020). Teacher education in times of COVID-19 pandemic in Portugal: national, institutional and pedagogical responses. *J. Educ. Teach.* 46, 507–516. doi: 10.1080/02607476.2020.1799709
- Baldwin, M. W., Keelan, J. P. R., Fehr, B., Enns, V., and Koh-Rangarajoo, E. J. J. (1996). Social-cognitive conceptualization of attachment working models: availability and accessibility effects. *J. Pers. Soc. Psychol.* 71:94.
- Baumeister, R. F., and Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychol. Bull.* 117, 497–529. doi: 10.1037/0033-2909.117.3.497
- Booker, K. C. (2023). Praise publicly, correct privately: how secondary teachers cultivate school belonging and classroom community. *Teach. Teach.* 26, 1–17. doi: 10.1080/13540602.2023.2225434
- Bowlby, J. (1982). Attachment and loss-retrospect and prospect. *Am. J. Orthopsychiatry* 52, 664–678. doi: 10.1111/j.1939-0025.1982.tb01456.x
- Bradford, C., and Braaten, M. (2018). Teacher evaluation and the demoralization of teachers. *Teach. Teach. Educ.* 75, 49–59. doi: 10.1016/j.tate.2018.05.017
- Braun, S. S., Schonert-Reichl, K. A., and Roeser, R. W. (2020). Effects of teachers' emotion regulation, burnout, and life satisfaction on student well-being. *J. Appl. Dev. Psychol.* 69:101151. doi: 10.1016/j.appdev.2020.101151
- Burke, K., and Larmar, S. (2021). Acknowledging another face in the virtual crowd: reimagining the online experience in higher education through an online pedagogy of care. *J. Furth. High. Educ.* 45, 601–615. doi: 10.1080/0309877x.2020.1804536
- Byrd, C. M. (2016). Does culturally relevant teaching work? An examination from student perspectives. *SAGE Open* 6:215824401666074. doi: 10.1177/2158244016660744
- Camphuijsen, M. K. (2021). Coping with performance expectations: towards a deeper understanding of variation in school principals' responses to accountability demands. *Educ. Assessment Eval. Account.* 33, 427–453. doi: 10.1007/s11092-020-09344-6
- Chen, Y., He, H., and Yang, Y. (2023). Effects of social support on professional identity of secondary vocational students major in preschool nursery teacher program: a chain mediating model of psychological adjustment and school belonging. *Sustainability* 15:5134. doi: 10.3390/su15065134
- Chen, J., and Zhou, G. (2019). Chinese international students' sense of belonging in north American postsecondary institutions: a critical literature review. *Brock Educ. J.* 28, 48–63. doi: 10.26522/brocked.v28i2.642
- Chetty, R., Jackson, M. O., Kuchler, T., Stroebel, J., Hendren, N., Fluegge, R. B., et al. (2022). Social capital I: measurement and associations with economic mobility. *Nature* 608:108. doi: 10.1038/s41586-022-04996-4
- Cho, E. Y. N., and Chan, T. M. S. (2020). Children's wellbeing in a high-stakes testing environment: the case of Hong Kong. *Child Youth Serv. Rev.* 109:104694. doi: 10.1016/j.chilyouth.2019.104694
- Civitillo, S., Gobel, K., Preusche, Z., and Jugert, P. (2021). "Disentangling the effects of perceived personal and group ethnic discrimination among secondary school students: the protective role of teacher-student relationship quality and school climate" in *Impact of migration on child and adolescent development: The role of socialization experiences in family and school*. eds. K. Eckstein and E. Crocetti, (Learning and Instruction), vol. 177, 77–99.
- Cropanzano, R., Anthony, E. L., Daniels, S. R., and Hall, A. V. (2017). Social exchange theory: a critical review with theoretical remedies. *Acad. Manag. Ann.* 11, 479–516. doi: 10.5465/annals.2015.0099
- Dang, L. S., and Weiss, J. (2021). Evidence on the relationship between place attachment and behavioral intentions between 2010 and 2021: a systematic literature review. *Sustainability* 13:13138. doi: 10.3390/su132313138
- Egozi, S., Talia, A., Wiseman, H., and Tishby, O. (2023). The experience of closeness and distance in the therapeutic relationship of patients with different attachment classifications: an exploration of prototypical cases. *Front. Psych.* 14:1029783. doi: 10.3389/fpsyg.2023.1029783
- Farmer, T. W., Hamm, J. V., Dawes, M., Barko-Alva, K., and Cross, J. R. (2019). Promoting inclusive communities in diverse classrooms: teacher attunement and social dynamics management. *Educ. Psychol.* 54, 286–305. doi: 10.1080/00461520.2019.1635020
- Ferguson, S. (2018). Ask not what your Mentor can do for you...: the role of reciprocal exchange in maintaining student-teacher mentorships. *Sociol. Forum* 33, 211–233. doi: 10.1111/socf.12406
- Fraley, R. C., Hudson, N. W., Heffernan, M. E., and Segal, N. (2015). Are adult attachment styles categorical or dimensional? A Taxometric analysis of general and relationship-specific attachment orientations. *J. Pers. Soc. Psychol.* 109, 354–368. doi: 10.1037/pspp0000027
- Geng, L., Zheng, Q., Zhong, X., and Li, L. (2019). Longitudinal relations between students' engagement and their perceived relationships with teachers and peers in a Chinese secondary school. *Asia Pac. Educ. Res.* 29, 171–181. doi: 10.1007/s40299-019-00463-3
- Goodenow, C. (1993). Classroom belonging among early adolescent students: relationships to motivation and achievement. *J. Early Adolesc.* 13, 21–43. doi: 10.1177/0272431693013001002
- Goodyear, V., and Dudley, D. (2015). "I'm a facilitator of learning!" understanding what teachers and students do within student-centered physical education models. *Quest* 67, 274–289. doi: 10.1080/00336297.2015.1051236
- Gouldner, A. W. (1960). The norm of reciprocity: a preliminary statement. *Am. Sociol. Rev.* 25, 161–178. doi: 10.2307/2092623
- Greenier, V., Derakhshan, A., and Fathi, J. (2021). Emotion regulation and psychological well-being in teacher work engagement: a case of British and Iranian English language teachers. *System* 97:102446. doi: 10.1016/j.system.2020.102446
- Hafen, C. A., Ruzek, E. A., Gregory, A., Allen, J. P., and Mikami, A. Y. (2015). Focusing on teacher-student interactions eliminates the negative impact of students' disruptive behavior on teacher perceptions. *Int. J. Behav. Dev.* 39, 426–431. doi: 10.1177/0165025415579455
- Haslam, N., McGrath, M. J., Viechtbauer, W., and Kuppens, P. (2020). Dimensions over categories: a meta-analysis of taxometric research. *Psychol. Med.* 50, 1418–1432. doi: 10.1017/S003329172000183X
- Hirsch, J. L., and Clark, M. S. (2019). Multiple paths to belonging that we should study together. *Perspect. Psychol. Sci.* 14, 238–255. doi: 10.1177/1745691618803629
- Huang, J. W., and Li, Y. H. (2017). Green innovation and performance: the view of organizational capability and social reciprocity. *J. Bus. Ethics* 145, 309–324. doi: 10.1007/s10551-015-2903-y
- Huang, J., Sang, G., and Chao, T. (2022). Self-worth as a mediator and moderator between teacher-student relationships and student engagement in rural schools. *Front. Psychol.* 12:777937. doi: 10.3389/fpsyg.2021.777937
- Ibrahim, A., and El Zaatari, W. (2019). The teacher-student relationship and adolescents' sense of school belonging. *Int. J. Adolesc. Youth* 25, 382–395. doi: 10.1080/02673843.2019.1660998
- Jakovljevic, M., Bjedov, S., Mustac, F., and Jakovljevic, I. (2020). COVID-19 INFODEMIC and public trust from the perspective of public and global mental health. *Psychiatr. Danub.* 32, 449–457. doi: 10.24869/psyd.2020.449
- Karim, S., and Hue, M. T. (2023). Determinants of ethnic minority students' sense of belonging in Hong Kong: teachers' narratives and perspectives. *Asian Ethnicity* 24, 221–242. doi: 10.1080/14631369.2022.2122397
- Kenyon, E. A. (2017). Lived experience and the ideologies of preservice social studies teachers. *Teach. Teach. Educ.* 61, 94–103. doi: 10.1016/j.tate.2016.10.006

- Kim, S., Crooks, C. V., Bax, K., and Shokoohi, M. (2021). Impact of trauma-informed training and mindfulness-based social-emotional learning program on teacher attitudes and burnout: a mixed-methods study. *Sch. Ment. Heal.* 13, 55–68. doi: 10.1007/s12310-020-09406-6
- King, C. S. T., and Bailey, K. S. (2021). Intercultural communication and US higher education: how US students and faculty can improve international students' classroom experiences. *Int. J. Intercult. Relat.* 82, 278–287. doi: 10.1016/j.ijintrel.2021.04.007
- Koprowska, J. (2023). Why group therapy works and how to do it: a guide for health and social care professionals. *J. Soc. Work. Pract.* 37, 487–489. doi: 10.1080/02650533.2023.2185214
- Korpershoek, H., Canrinus, E. T., Fokkens-Bruinsma, M., and de Boer, H. (2020). The relationships between school belonging and students' motivational, social-emotional, behavioural, and academic outcomes in secondary education: a meta-analytic review. *Res. Pap. Educ.* 35, 641–680. doi: 10.1080/02671522.2019.1615116
- Lam, U. F., Chen, W. W., Zhang, J. Q., and Liang, T. (2015). It feels good to learn where I belong: school belonging, academic emotions, and academic achievement in adolescents. *Sch. Psychol. Int.* 36, 393–409. doi: 10.1177/0143034315589649
- Leenders, M., Buunk, A. P., and Henkens, K. (2019). Attachment avoidance and attachment anxiety as individual characteristics affecting job search behavior. *J. Career Dev.* 46, 487–501. doi: 10.1177/0894845318772091
- Li, J. B., and Lau, E. Y. H. (2019). Teacher-student conflict and Preschoolers' adjustment in the transition to primary school: the role of child self-regulation and Parents' positive relations with others. *Early Educ. Dev.* 30, 423–437. doi: 10.1080/10409289.2018.1535227
- Liu, Y.-B., Hou, X.-Y., and Chen, B.-B. (2022). Links between Chinese vocational school students' perception of parents' emotional support and school cooperation climate and their academic performance: the mediating role of school belonging. *Front. Psychol.* 13:952001. doi: 10.3389/fpsyg.2022.952001
- Longobardi, C., Settanni, M., Lin, S. Y., and Fabris, M. A. (2021). Student-teacher relationship quality and prosocial behaviour: the mediating role of academic achievement and a positive attitude towards school. *Br. J. Educ. Psychol.* 91, 547–562. doi: 10.1111/bjep.12378
- Lynn, M. R. (1986). Determination and quantification of content validity. *Nurs. Res.* 35, 382–386.
- Ma, X. (2003). Sense of belonging to school: can schools make a difference? *J. Educ. Res.* 96, 340–349. doi: 10.1080/00220670309596617
- Manosalvas, R., Hoogesteger, J., and Boelens, R. (2021). Contractual reciprocity and the re-making of community Hydrosocial territories: the case of La Chimba in the Ecuadorian paramos. *Water* 13:1600. doi: 10.3390/w13111600
- Marlin, L., Lewis, C., and McLaren, S. (2022). "Being able to be yourself": a qualitative exploration of how queer emerging adults experience a sense of belonging in rural Australia. *J. Homosex.* 70, 3306–3327. doi: 10.1080/00918369.2022.2092806
- Melamed, D., Simpson, B., and Abernathy, J. (2020). The robustness of reciprocity: experimental evidence that each form of reciprocity is robust to the presence of other forms of reciprocity. *Sci. Adv.* 6:eaba0504. doi: 10.1126/sciadv.aba0504
- Mitchell, R. M., Kensler, L., and Tschannen-Moran, M. (2018). Student trust in teachers and student perceptions of safety: positive predictors of student identification with school. *Int. J. Leadersh. Educ.* 21, 135–154. doi: 10.1080/2374068x.2016.1157211
- Moghavvemi, S., Sharabati, M., Paramanathan, T., and Rahin, N. M. (2017). The impact of perceived enjoyment, perceived reciprocal benefits and knowledge power on students' knowledge sharing through Facebook. *Int. J. Manage. Educ.* 15, 1–12. doi: 10.1016/j.ijme.2016.11.002
- Mulyawati, Y., Zulela, M., and Edwita, E. (2022). Differentiation learning to improve students potential in elementary school. *Pedagonal* 6, 68–78. doi: 10.55215/pedagonal.v6i1.4485
- Neuhaus, E., Webb, S. J., and Bernier, R. A. (2019). Linking social motivation with social skill: the role of emotion dysregulation in autism spectrum disorder. *Dev. Psychopathol.* 31, 931–943. doi: 10.1017/s0954579419000361
- Parent, N., and Shapka, J. (2020). Moving beyond addiction: an attachment theory framework for understanding young adults' relationships with their smartphones. *Human Behav. Emerg. Technol.* 2, 179–185. doi: 10.1002/hbe2.180
- Parzefall, M. R. (2008). Psychological contracts and reciprocity: a study in a Finnish context. *Int. J. Hum. Resour. Manag.* 19, 1703–1719. doi: 10.1080/09585190802295272
- Paulssen, M. (2009). Attachment orientations in business-to-business relationships. *Psychol. Mark.* 26, 507–533. doi: 10.1002/mar.20285
- Pedler, M. L., Willis, R., and Nieuwoudt, J. E. (2022). A sense of belonging at university: student retention, motivation and enjoyment. *J. Furth. High. Educ.* 46, 397–408. doi: 10.1080/0309877x.2021.1955844
- Phan, H. P., and Ngu, B. H. (2020). Schooling experience and academic performance of Taiwanese students: the importance of psychosocial effects, positive emotions, levels of best practice, and personal well-being. *Soc. Psychol. Educ.* 23, 1073–1101. doi: 10.1007/s11218-020-09569-9
- Pillhofer, M., Spangler, G., Bovenschen, I., Kuenster, A. K., Gabler, S., Fallon, B., et al. (2015). Pilot study of a program delivered within the regular service system in Germany: effect of a short-term attachment-based intervention on maternal sensitivity in mothers at risk for child abuse and neglect. *Child Abuse Negl.* 42, 163–173. doi: 10.1016/j.chiabu.2014.07.007
- Poulou, M. S. (2017). Students' emotional and behavioral difficulties: the role of teachers' social and emotional learning and teacher-student relationships. *Int. J. Emot. Educ.* 10, 146–153.
- Prouska, R., Nyfoudi, M., Psychogios, A., Szamosi, L. T., and Wilkinson, A. (2023). Solidarity in action at a time of crisis: the role of employee voice in relation to communication and horizontal solidarity behaviour. *Br. J. Manag.* 34, 91–110. doi: 10.1111/1467-8551.12598
- Read, M. A., Whitley, M. Z., Williams, A. J., and Collins, T. (1994). NF-kappa-B and I-kappa-B-alpha: an inducible regulatory system in endothelial activation. *J. Exp. Med.* 179, 503–512. doi: 10.1084/jem.179.2.503
- Reizer, A. (2015). Influence of Employees' attachment styles on their life satisfaction as mediated by job satisfaction and burnout. *J. Psychol.* 149, 356–377. doi: 10.1080/00223980.2014.881312
- Rodriguez, G. (2020). Suburban schools as sites of inspection: understanding Latinx youth's sense of belonging in a suburban high school. *Equity Excell. Educ.* 53, 14–29. doi: 10.1080/10665684.2020.1758245
- Sakman, E., Urganci, B., and Sevi, B. (2021). Your cheating heart is just afraid of ending up alone: fear of being single mediates the relationship between attachment anxiety and infidelity. *Personal. Individ. Differ.* 168:110366. doi: 10.1016/j.paid.2020.110366
- Salavera, C., and Usan, P. (2021). Relationship between social skills and happiness: differences by gender. *Int. J. Environ. Res. Public Health* 18:7929. doi: 10.3390/ijerph18157929
- Samodra, Y. T. J., Suryadi, D., Wati, I. D. P., Supriatna, E., Santika, I. G. P. N. A., Suganda, M. A., et al. (2023). Analysis of gross motoric analysis of elementary school students: a comparative study of students in hill and coastal areas. *Pedag. Physical Cult. Sports* 27, 139–145. doi: 10.15561/26649837.2023.0206
- Sanin, J. R. (2019). "I Don't belong Here": understanding hostile spaces. *J. Women Polit. Policy* 40, 112–121. doi: 10.1080/1554477x.2019.1563417
- Sebastien, L. (2020). The power of place in understanding place attachments and meanings. *Geoforum* 108, 204–216. doi: 10.1016/j.geoforum.2019.11.001
- Sher-Censor, E., Nahamias-Zlotolov, A., and Dolev, S. (2019). Special education Teachers' narratives and attachment style: associations with classroom emotional support. *J. Child Fam. Stud.* 28, 2232–2242. doi: 10.1007/s10826-019-01440-6
- Smith, E. R., Murphy, J., and Coats, S. (1999). Attachment to groups: theory and management. *J. Pers. Soc. Psychol.* 77, 94–110. doi: 10.1037/0022-3514.77.1.94
- Sun, R. C. F. (2015). Teachers' experiences of effective strategies for managing classroom misbehavior in Hong Kong. *Teach. Teach. Educ.* 46, 94–103. doi: 10.1016/j.tate.2014.11.005
- Timmermans, A. C., van der Werf, M., and Rubie-Davies, C. M. (2019). The interpersonal character of teacher expectations: the perceived teacher-student relationship as an antecedent of teachers' track recommendations. *J. Sch. Psychol.* 73, 114–130. doi: 10.1016/j.jsp.2019.02.004
- Tsigilis, N., Gregoriadis, A., and Grammatikopoulos, V. (2018). Evaluating the student-teacher relationship scale in the Greek educational setting: an item parcelling perspective. *Res. Pap. Educ.* 33, 414–426. doi: 10.1080/02671522.2017.1353675
- Uslu, F., and Gizir, S. (2017). School belonging of adolescents: the role of teacher-student relationships, peer relationships and family involvement. *Educ. Sci. Theory Pract.* 17, 63–82. doi: 10.12738/estp.2017.1.0104
- Vaccaro, A., Daly-Cano, M., and Newman, B. M. (2015). A sense of belonging among college students with disabilities: an emergent theoretical model. *J. Coll. Stud. Dev.* 56, 670–686. doi: 10.1353/csd.2015.0072
- Vatou, A., Gregoriadis, A., Tsigilis, N., and Grammatikopoulos, V. J. J. (2020). Patterns of teacher-child relationships quality: young children's perspectives. *J. Early Child. Educ. Res.* 9, 498–521.
- Verschueren, K. (2015). "Middle childhood teacher-child relationships: insights from an attachment perspective and remaining challenges" in *Attachment in middle childhood: Theoretical advances and new directions in an emerging field*. eds. G. Bosmans and K. A. Kerns. (Learning and Instruction), vol. 148, 77–91.
- Wan, S., Lin, S., Yirimuwun, L., and Qin, G. (2023). The relationship between teacher-student relationship and adolescent emotional intelligence: a chain-mediated mediation model of openness and empathy. *Psychol. Res. Behav. Manag.* 16, 1343–1354. doi: 10.2147/prbm.S399824
- Wanders, F. H. K., Dijkstra, A. B., Maslowski, R., and van der Veen, I. (2020a). The effect of teacher-student and student-student relationships on the societal involvement of students. *Res. Pap. Educ.* 35, 266–286. doi: 10.1080/02671522.2019.1568529
- Wanders, F. H. K., van der Veen, I., Dijkstra, A. B., and Maslowski, R. (2020b). The influence of teacher-student and student-student relationships on societal involvement in Dutch primary and secondary schools. *Theory Res. Soc. Educ.* 48, 101–119. doi: 10.1080/00933104.2019.1651682
- Waring, A., Kernes, J. L., and Bui, N. H. (2019). The role of attachment anxiety, attachment avoidance, and grit on life satisfaction and relationship satisfaction. *J. Humanist. Psychol.* 63, 631–659.

- Waters, T. E. A., Raby, K. L., Ruiz, S. K., Martin, J., and Roisman, G. I. (2018). Adult attachment representations and the quality of romantic and Parent-child relationships: an examination of the contributions of coherence of discourse and Secure Base script knowledge. *Dev. Psychol.* 54, 2371–2381. doi: 10.1037/dev0000607
- Wentzel, K. R. (2022). Does anybody care? Conceptualization and measurement within the contexts of teacher-student and peer relationships. *Educ. Psychol. Rev.* 34, 1919–1954. doi: 10.1007/s10648-022-09702-4
- Wentzel, K. R., Russell, S., and Baker, S. (2016). Emotional support and expectations from parents, teachers, and peers predict adolescent competence at school. *J. Educ. Psychol.* 108, 242–255. doi: 10.1037/edu0000049
- Widom, C. S., Czaja, S. J., Kozakowski, S. S., and Chauhan, P. (2018). Does adult attachment style mediate the relationship between childhood maltreatment and mental and physical health outcomes? *Child Abuse Negl.* 76, 533–545. doi: 10.1016/j.chiabu.2017.05.002
- Wu, J. B., Hom, P. W., Tetrick, L. E., Shore, L. M., Jia, L., Li, C., et al. (2015). The norm of reciprocity: scale development and validation in the Chinese context. *Manag. Organ. Rev.* 2, 377–402. doi: 10.1111/j.1740-8784.2006.00047.x
- Ye, Y. J., Wang, C. X., Zhu, Q. Y., He, M. X., Havawala, M., Bai, X. F., et al. (2022). Parenting and teacher-student relationship as protective factors for Chinese adolescent adjustment during COVID-19. *Sch. Psychol. Rev.* 51, 187–205. doi: 10.1080/2372966x.2021.1897478
- Yip, J., Ehrhardt, K., Black, H., and Walker, D. O. (2018). Attachment theory at work: a review and directions for future research. *J. Organ. Behav.* 39, 185–198. doi: 10.1002/job.2204
- Zhang, X., Li, J., Xie, F., Chen, X., Xu, W., and Hudson, N. W. (2022). The relationship between adult attachment and mental health: a meta-analysis. *J. Pers. Soc. Psychol.* 123, 1089–1137. doi: 10.1037/pspp0000437
- Zou, Y., Yang, X., Li, J., Li, Y., and Wei, M. (2022). Differences in automatic emotion regulation after social exclusion in individuals with different attachment types. *Personal. Individ. Differ.* 185:111296. doi: 10.1016/j.paid.2021.111296