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Perceived Teacher Autonomy Support, Academic Self-efficacy and Academic Performance: The Moderating Role of Competitiveness and Gender

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Abstract

The present study examined the link between perceived teacher autonomy support, academic self-efficacy, and academic performance and investigated how competitiveness and gender influence this relationship. Specifically, we hypothesized that a significant positive relationship would exist between perceived teacher autonomy support and academic self-efficacy, and between academic self-efficacy and academic performance. Next, we assumed that competitiveness would moderate the link between perceived teacher autonomy support and academic self-efficacy, and we examined the potential moderating role of gender on the relationship between academic self-efficacy and academic performance. Findings indicate that perceived teacher autonomy support is positively associated with academic self-efficacy, which, in turn, predicts higher academic performance. However, competitiveness moderates this relationship, with highly competitive students exhibiting a weaker link between autonomy support and self-efficacy, suggesting that they may thrive in more structured, performance-driven environments. Additionally, gender moderates the association between academic self-efficacy and academic performance, with male students demonstrating a stronger positive effect of self-efficacy on academic achievement compared to their female peers. These results highlight the importance of considering individual differences when designing autonomy-supportive teaching strategies to optimize academic outcomes for diverse student populations. Future research should explore tailored pedagogical interventions to enhance both self-efficacy and academic performance across different student profiles.

Keywords: academic performance; academic self-efficacy; competitiveness; students; teacher autonomy support

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1. Introduction

In recent years, institutions of higher education have increasingly focused on strategies to boost student academic performance (Agustiani et al., 2016). This growing interest is driven by the understanding that student academic performance is a multifaceted construct influenced by a range of academic, psychological, and environmental factors (Kuh et al., 2011b). Also, student retention and increased dropout rates have become critical issues for universities worldwide (Tinto, 2012). Among the various strategies to enhance retention, boosting student academic performance has emerged as particularly effective (Meng & Zhang, 2023). Higher education institutions are keenly aware that improved student performance can lead to higher retention rates, which in turn positively impacts financial stability and institutional rankings (Tinto, 2006). Moreover, as performance metrics are increasingly used to evaluate institutional effectiveness, colleges and universities are incentivized to adopt best practices that support student achievement (Kuh et al., 2011a). Consequently, identifying the key factors that influence students' academic outcomes is an objective that always preoccupies teachers, researchers, and educational psychologists. However, while understanding the factors that influence academic performance in higher education has long been a central focus for researchers and educators alike (Meng & Zhang, 2023), studies examining the link between perceived teacher autonomy support, academic self-efficacy, and academic performance are not as abundant. Thus, the purpose of our study was twofold. The first purpose was to investigate the potential relationship between perceived teacher autonomy support and academic self-efficacy, examining the moderating role of competitiveness. The second purpose was to investigate the potential relationship between academic self-efficacy and academic performance, examining the moderating role of gender.

Among the various theories that seek to explain the mechanisms driving and regulating behavior, Social Cognitive Theory (Bandura, 1977) stands as one of the most influential. This theory suggests that behavior is motivated and regulated by a combination of external social systems and internal self-influences (Schunk & Pajares, 2002). Within these self-influences, self-efficacy (SE) plays a central role, defined as an individual's judgment of their ability to organize and execute the actions necessary to achieve specific outcomes (Bandura, 1997). In the academic setting, self-efficacy (SE) is often conceptualized as Academic Self-Efficacy (ASE), which refers to learners' perceptions of their ability to achieve specific academic goals, such as mastering course content, performing well on exams, and completing assignments (Elias & MacDonald, 2007). This belief in one's academic abilities influences not only how students approach learning tasks but also their persistence in the face of challenges, ultimately affecting their overall academic performance (Robbins et al., 2004).

Students with high Academic Self-Efficacy (ASE) are more likely to engage in self-regulated learning (Pintrich, 2004; Richardson et al., M., 2012), which includes setting goals, monitoring progress, and adjusting strategies to overcome obstacles (Zimmerman, 2000). These students tend to exhibit greater motivation, resilience, and a willingness to take on difficult tasks, which translates into better academic outcomes (Chemers et al., 2001). Conversely, students with low Academic Self-Efficacy (ASE) may doubt their abilities, leading to decreased motivation, avoidance of challenging tasks, and higher susceptibility to academic stress and failure (Pajares, 2002).

In the context of higher education, where students often encounter more complex and demanding academic environments, ASE plays a pivotal role in shaping their educational experiences and outcomes. Research has indicated that ASE is a significant predictor of academic performance across various domains, including STEM fields, humanities, and social sciences (Lent et al., 1994). Additionally, research has explored the impact of ASE on academic performance at varying levels of specificity, including self-efficacy for completing subject-specific tasks, such as algebra or geometry problems (Zimmerman & Martinez-Pons, 1990), and self-efficacy for achieving a particular grade in a subject (Neuville et al., 2007). Furthermore,

academic self-efficacy has been linked to important non-cognitive outcomes, such as student engagement, persistence, and satisfaction with the educational experience (Schunk & Pajares, 2002).

The development of academic self-efficacy is influenced by several factors, including past academic experiences, feedback from instructors, peer support, and personal goal-setting. Positive reinforcement and constructive feedback from educators are particularly crucial in building students' self-efficacy beliefs (Bandura, 1997). Additionally, creating a supportive and inclusive learning environment can enhance students' confidence in their academic abilities, especially for those from underrepresented or disadvantaged backgrounds (Usher & Pajares, 2008).

1.1. Perceived Teacher Autonomy Support and Academic Self-efficacy among University Students

The concept of autonomy support is rooted in self-determination theory (Deci & Ryan, 1985), which indicates that teachers, in the affective relationships with their students, recognize their emotions, offer relevant information, and present various options for solving problems in their way, thereby reducing pressure and demands. Therefore, perceived teacher autonomy support (PAS) refers to the extent to which students believe their teachers provide an environment that encourages self-directed learning, offers choices, and acknowledges their perspectives (Deci & Ryan, 2013).

According to Stefanou et al. (2004), there are three areas in which teacher support can manifest: 1) *procedural autonomy support* – which encourages active student participation in classroom activities; 2) *organizational autonomy support* – which focuses on creating a comfortable and positive classroom environment, and 3) *cognitive autonomy support* – which aims to deepen students' engagement with the learning material and promote sustained psychological involvement. Also, examples of teacher's autonomy-supportive behaviours include: guiding students through their learning processes and assisting them in achieving their personal goals and interests (Reeve et al., 2004); encouraging students to engage in thinking, responding, collaborating, and reflecting on the subject matter (Duchatelet & Donche, 2019); employing language that supports autonomy and fostering students' internal motivation mechanisms (Núñez & León, 2016); listening to students' perspectives on educational processes, allowing students to manipulate learning materials and teaching objects; providing rationales for learning activities; fostering independent work; or offering social rewards for positive behaviors (Jang et al., 2010; Su & Reeve, 2011). In higher education, where students are expected to engage in complex and self-regulated learning, the perception of autonomy support from teachers can play a pivotal role in shaping academic self-efficacy—the belief in one's ability to succeed in academic tasks (Ryan & Deci, 2000).

Previous studies have consistently shown that perceived teacher autonomy support positively influences students' academic self-efficacy (e.g., Gutiérrez & Tomás, 2019; Reeve et al., 2012; Zhao & Qin, 2021). Autonomy-supportive teaching practices, such as offering meaningful choices in learning activities, providing rationales for assignments, and encouraging self-initiation, have been shown to enhance students' sense of control over their learning (Reeve, 2002). When students perceive that their teachers support their autonomy, they are more likely to feel competent and confident in their ability to manage academic tasks, which directly contributes to higher levels of academic self-efficacy (Ryan & Deci, 2000). For instance, research has found that students who perceive high levels of autonomy support from their teachers tend to report greater self-efficacy, which in turn predicts better academic performance (Jang et al., 2012) and increased persistence in their studies (Zimmerman, 2000; Vansteenkiste et al., 2004). This relationship is particularly significant in the context of higher education, where students often face challenges that require self-regulation, such as time management, independent study, and critical thinking.

Moreover, perceived teacher autonomy support not only bolsters academic self-efficacy but also influences how students approach learning. Students who feel supported in their autonomy are more likely to adopt mastery-oriented goals, seek out challenging tasks, and persist in the face of difficulties (Patrick et al., 2011). These behaviors, indicative of high self-efficacy, further reinforce their belief in their academic capabilities, creating a positive feedback loop that enhances both their immediate and long-term academic outcomes. However, the potential moderators that could influence the relationship between perceived teacher autonomy support and academic self-efficacy, as well as the educational implications of these factors, have been less explored in research.

Our study aimed to address this specific relationship. Previous literature examining the role of perceived teacher autonomy support in academic contexts has primarily focused on how positive teacher-student relationships and emotional support from teachers can amplify the effects of autonomy support on students' psychological well-being (Ryan & Deci, 2000; Vansteenkiste et al., 2004), concentration in class (Standage et al., 2005), academic effort (Ntoumanis, 2010), learning motivation and satisfaction (Vansteenkiste et al., 2004), as well as student self-efficacy and academic outcomes (Gutiérrez & Tomás, 2019; Jang et al., 2012; Patrick et al,, 2011; Reeve et al., 2012; Ryan & Deci, 2000; Zhao & Qin, 2021). We believe that there are some variables (i.e., personality traits, prior academic experiences, external pressures, cultural norms) that can potentially weaken or negatively influence this link. For instance, if students feel that they lack the necessary skills or knowledge to succeed, even in an autonomy-supportive environment, their self-efficacy may not improve, and they may experience increased anxiety or frustration instead (Skinner et al., 1990). Furthermore, previous research suggested that in some cultures, where hierarchical and teacher-centered models of education are prevalent, students may not be accustomed to or comfortable with autonomy-supportive teaching practices (Chirkov et al., 2003). In these contexts, students may interpret autonomy support as a lack of guidance or authority, which could lead to confusion, anxiety, or lower self-efficacy. This is especially true for students who expect structured, directive teaching styles and may feel unsupported in more autonomy-focused environments. In addition, other studies indicated that in the presence of external pressures, such as high-stakes testing or competitive academic environments, students may perceive autonomy support as insufficient to counterbalance the stress and pressure they experience, leading to a potential decline in their self-efficacy (Assor et al., 2002). In the present study, we focused on the role of competitiveness and its moderating effect in explaining the influence of perceived teacher autonomy support on academic self-efficacy.

1.2. Competitiveness and Perceived Teacher Autonomy Support

Competitiveness is regarded as an essential characteristic linked to a set of personal qualities that influence the effectiveness of professional performance within the psychological framework of professional-personal development (Mitina, 2002). An individual's competitiveness refers to their social capability to be sought after across various domains —public, personal, and professional—based on their psychophysiological and personal attributes, as well as their ability to showcase these qualities in situations of limited demand (Zakharova et al., 2018).

In the context of higher education, competitiveness often refers to students' drive to outperform themselves (i.e., personal improvement) or their peers in academic settings (Baumann & Harvey, 2018; Shimotsu-Dariol et al., 2012). The desire to succeed can manifest in various forms, such as striving for higher grades, seeking academic recognition, or competing for limited resources like scholarships or prestigious internships (Shimotsu-Dariol et al., 2012). While competitiveness can serve as a motivating factor that drives students to excel, it may also have complex interactions with other aspects of the educational environment, particularly with perceived teacher autonomy support. Competitiveness in higher education can influence how students perceive and respond to autonomy-supportive teaching practices. For some students,

particularly those with high levels of intrinsic motivation, perceived autonomy support may enhance their sense of agency and confidence in achieving personal academic goals, even within a competitive environment. These students may view autonomy-supportive practices as aligning with their desire for mastery and self-improvement, thus reinforcing their academic self-efficacy and engagement (Elliot & Dweck, 1988).

As previous studies suggested, competitiveness might also have a negative impact on academic self-efficacy. Highly competitive students, who are more focused on outperforming their peers rather than personal mastery, may prioritize external rewards, such as grades or recognition, over the intrinsic benefits of autonomy-supportive environments. In such cases, the perceived autonomy support might be viewed as insufficiently structured or directive, leading to potential conflicts between the desire for clear performance metrics and the autonomy provided by the teacher (Vansteenkiste et al., 2004). However, these findings are often inconsistent (Baumann & Harvey, 2021), emphasizing the need for additional research, such as the present one.

1.3. Academic Self-efficacy and Academic Performance

Academic performance, a measurable outcome reflecting students' achievement in educational settings, such as examination results, Grade Point Average (GPA), or final course grades (Honicke & Broadbent, 2016), serves as a critical indicator of educational effectiveness and equity. Research on academic performance has highlighted the complex interplay between individual, environmental, and instructional factors (Hattie, 2008). Moreover, understanding the predictors of academic performance is essential for monitoring educational progress, evaluating the effectiveness of educational reforms, and informing accountability systems (Hanushek et al., 2023).

An extensive body of literature highlights the significance of academic self-efficacy (ASE) for learning and further academic performance. This relationship has been explored across various educational contexts and varying levels of specificity (Honicke & Broadbent, 2016). There are numerous meta-analytic studies indicating moderate effect sizes (i.e. Richardson et al., 2012; Robbins et al., 2004), despite the educational context in which academic self-efficacy was measured, on the positive correlation between ASE and academic performance. Moreover, a large number of studies have investigated possible factors that mediate or moderate the relationship between academic self-efficacy and academic performance, such as personality, past performance, and self-regulatory learning strategies (Honicke & Broadbent, 2016). Therefore, academic self-efficacy not only affects students' performance directly but also indirectly through its impact on other psychological and behavioral factors. For example, students who perceive themselves as self-efficacious tend to have higher levels of intrinsic motivation, which drives them to learn for the sake of knowledge and personal growth, rather than for external rewards (Pintrich & De Groot, 1990). This intrinsic motivation often leads to a more engaged and active learning process, which further improves academic performance. However, some potential moderators could influence the relationship between perceived teacher autonomy support and academic self-efficacy which has been less explored in research. As far as we know, gender is one of them. Our study aimed to address this specific relationship.

1.4. Gender, Academic Self-efficacy and Academic Performance

In the field of education, gender differences in academic self-efficacy are important to understand, as they may be essential for addressing disparities in academic achievement, promoting equitable educational practices, and examining their influence on the choice of academic fields and persistence in educational pursuits. Thus, previous studies examining the gender differences in academic self-efficacy indicate inconsistency in results. Research has shown that in several subjects, female students have a lower level of self-efficacy than male

students (Huang, 2013; Kassaw & Astatke, 2017; Satici & Can, 2016). Female students often report higher self-efficacy in the humanities sciences, like language arts (Huang, 2013), which are more closely aligned with feminine stereotypes of communication and empathy (Meece et al., 2009). In contrast, male students generally report higher self-efficacy in mathematics, and computer sciences, which are traditionally associated with masculine traits like analytical thinking and problem-solving (Huang, 2013). However, according to Choi (2005), there are no gender differences in academic self-efficacy of undergraduates and Sachitra & Bandara (2017) established that females displayed higher self-efficacy than males. These differences in self-efficacy are not merely reflective of actual ability but are shaped by socialization processes, which influence how students perceive their competencies and the academic fields they feel confident pursuing (Eccles, 2009). Moreover, gender differences in academic self-efficacy can contribute to the persistence of gender imbalances in certain academic disciplines, and to the enrollment and attrition rates in these disciplines (Cheryan et al., 2009; Sax, 1994; Zeldin & Pajares, 2000).

In addition, although the positive relationship between academic self-efficacy and academic performance is well-established (Hattie, 2008; Schunk & Pajares, 2002; Yusuf, 2011), gender differences have been reported in this association (Skaalvik & Skaalvik, 2004). For male students, higher academic self-efficacy in STEM fields often translates into better academic performance in these areas. Their confidence in their abilities leads them to engage more deeply with the material, seek out challenging tasks, and persist even in the face of difficulties (Sax, 1994). Female students, on the other hand, may experience the opposite pattern. While they often excel in fields where they have higher self-efficacy, such as the humanities and social sciences, their lower self-efficacy in STEM disciplines can lead to underperformance, even when they can succeed (Zeldin & Pajares, 2000). However, there is still a need for further research to better understand how the relationship between academic self-efficacy and academic performance can be influenced by gender, to achieve greater equity in academic outcomes and ensure that all students, regardless of gender, can reach their full potential.

1.5. The present study

Considering that fostering students' academic performance can be an effective strategy to enhance students' retention in higher education (Meng & Zhang, 2023), that positively impacts financial stability and institutional rankings (Tinto, 2006), there are several reasons why it is important to study this concept in educational settings. First, students' academic performance is an important indicator of educational quality (Muhonen et al., 2018). Second, learning outcomes, especially at the university level, serve as a key predictor of both the future success of young individuals and the nation as a whole (Dev, 2016). Furthermore, academic performance has become an essential factor in students' careers, in job selection in today's world and also plays a significant role in decisions regarding further studies (Agustiani et al., 2016).

Although understanding the factors that influence academic performance in higher education has long been a central focus for researchers and educators alike (Meng & Zhang, 2023), there is a relative paucity of studies exploring the link between perceived teacher autonomy support, academic self-efficacy, and academic performance. Moreover, the potential moderators that could influence this relationship, as well as the educational implications of these factors, have been less explored in research.

Our study aimed to address the following research questions (RQs):

RQ1. How is perceived teacher autonomy support linked to academic self-efficacy?

RQ2. What role does competitiveness play within this relationship?

RQ3. How is academic self-efficacy linked to academic performance?

RQ4. What role does gender play within this relationship?

The main assumptions of our research, for answering these questions, were the following:

H1. Perceived teacher autonomy support would be significantly related to student's academic self-efficacy;

H2. Students' academic self-efficacy would be significantly related to student's academic performance;

H3. Competitiveness would moderate the link between perceived teacher autonomy support and academic self-efficacy;

H4. Gender would moderate the link between academic self-efficacy and academic performance.

2. Method

2.1. Participants and Procedure

Participants in this study were 458 students, 13.8 % males (63) and 86.2 % females (395), with ages ranging from 18 to 41 (M = 20.93, SD = 3.03). Participation in the study was voluntary and rewarded with course credits. After providing informed consent, participants completed a web-based self-report questionnaire. Invitations to participate were distributed via email and social media platforms. All students were informed of the anonymity and confidentiality of their responses, as well as their right to withdraw from the study at any time. They were also assured that their responses would be used solely for this research. Completing the questionnaire took approximately 15 minutes. Data collection occurred in 2023. The research protocol was approved by the Ethics Committee of the Faculty where the authors are affiliated and adhered to the guidelines of the 2013 Helsinki Declaration.

2.2. Measures

Perceived Teacher Autonomy Support. We used the five-item short version of the Learning Climate Questionnaire (LCQ; Williams & Deci, 1996) to assess students' perceived teacher autonomy support. Learning Climate Questionnaire (LCQ) measures teacher autonomy support in the educational context and various versions of the LCQ that are available (i.e., a 15-item full-scale version and a 6-item shortened version) have been widely used in classroom-based investigations of autonomy support (Black & Deci, 2000; Jang et al., 2009). We chose to use the 5-item version of the LCQ because recent research indicates that it is a more effective measure of teacher autonomy support than the alternative versions (Simon & Salanga, 2021). In the version of the LCQ that we used the following five items are included: "I feel that my teacher provides me with choices and options"; "I feel understood by my teacher"; "My teacher listens to how I would like to do things"; "My teacher conveys confidence in my ability to do well in the course"; and "My teacher tries to understand how I see things before suggesting a new way to do things." Participants answered on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). LCQ scores were calculated by getting the average of the individual item scores. Higher scores indicated a higher level of perceived autonomy support from the teacher. The scale was used in previous similar studies, demonstrating good psychometric properties (e.g., Simon & Salanga, 2021; Yu et al, 2018). In the present study, Cronbach's alpha was .94.

Academic Self-efficacy. We used the perceptions of self-efficacy subscale (8 items) from the Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich et al. (1991, 1993). MSLQ is one of the most commonly reported measures (self-reported questionnaire) of academic self-efficacy (Honicke & Broadbent, 2016), and one of the most widely used instruments to measure students' motivation and self-regulated learning (Wang et al., 2023). MSLQ comprises 81 Likert-scale items with five sets designed to measure: 1) motivational beliefs, including expectancy, value, and affect; 2) students' cognitive and metacognitive strategies and 3) resource management. Expectancy refers to students' beliefs in accomplishing the given tasks, represented by self-efficacy (i.e., students' judgment on their ability to perform a

task) and control beliefs for learning (i.e., students' beliefs about whether their effort can result in positive outcomes). The perceptions of self-efficacy subscale, that we chose to use, one of the two expectancy-related subscales, comprises 8 items. Example items included "I believe I will receive an excellent grade in this class" and "Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class.". Participants answered on a 7-point Likert scale, ranging from 1 (not at all true) to 7 (very true). Higher scores indicated a higher level of perceived academic self-efficacy. The scale was used in previous similar studies, demonstrating good psychometric properties (e.g., Meijs et al., 2019; Wong et al., 2013). In the present study, Cronbach's alpha was .96.

Competitiveness. We used the Competitiveness Orientation Measure (COM; Newby & Klein, 2014) to assess participants' competitiveness. Participants answered on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire comprises four dimensions of competitiveness: general competitiveness, dominant competitiveness, competitive affectivity, and personal enhancement competitiveness. In the present study, we used only the general competitiveness scale (12 items) and the personal enhancement competitiveness (4 items), with high scores indicating high participants' competitiveness. Example items included „Competition motivates me" and „I can improve my competence by competing". In the present study, Cronbach's alpha was .92.

Academic Performance. Participants reported the average academic score for the previous semester of the academic year (which ended three months before the data collection). For example, in the Romanian academic system, these scores might range from 1.00 to 10.00, with 10.00 being the highest possible score (i.e., the highest academic achievement). Students received these scores some weeks before beginning the study. The higher the number, the higher the academic performance. Finally, a demographic scale assessed participants' gender (self-reported), age, faculty, specialization, and academic year.

The scales assessing perceived teacher autonomy support, academic self-efficacy and academic performance were translated from English into Romanian using a forward-backward translation method (Hambleton & Li, 2005). Only a few discrepancies were found between the original and back-translated versions, which were resolved, leading to the final versions of each instrument.

2.3. Overview of Statistical Analysis

All the statistical analyses were carried out using the Statistical Package for Social Sciences (SPSS) version 24 for Windows and Process macro. Cronbach's alphas were computed to estimate the internal consistency of all instruments used. Descriptive statistics including means and standard deviations were calculated for the continuous variables and an independent samples t-test was used to compare means between genders. Pearson product-moment correlation was used to test bivariate associations between variables in the study. Multiple regressions in macro PROCESS for SPSS were used to evaluate the influence of the interactions between the predictor variable perceived teacher autonomy support and competitiveness on academic self-efficacy and the influence of the interactions between the predictor variable academic self-efficacy and gender on academic performance. The data analyses were conducted using IBM SPSS 24.0 and the macro PROCESS. First, we calculated descriptive statistics, Cronbach's alpha and correlations between measures. For moderation analyses, we used bootstrapping with 5000 bootstrap resamples to examine interaction effects in moderation models (Hayes, 2013). Confidence intervals that do not contain zero indicate a significant indirect effect (mediation).

3. Results

3.1. Preliminary Analyses

The means and standard deviations for all variables considered in the study are included in Table 1. Results show that female students had significantly higher mean scores on academic performance than their male peers ($t = 3.92$, $p < .001$). There are no significant gender differences regarding perceived teacher autonomy support, competitiveness, and academic self-efficacy.

3.2. Associations among Main Variables

Results (Table 1) show a significant and positive correlation between perceived teacher autonomy support, competitiveness, academic self-efficacy, and academic performance and a nonsignificant correlation between competitiveness and academic performance.

Table 1. Correlations between perceived teacher autonomy support, competitiveness, academic self-efficacy and academic performance

Variables	1	2	3	4
1. Perceived teacher autonomy support	-			
2. Competitiveness	.26**	-		
3. Academic self-efficacy	.56**	.36**	-	
4. Academic performance	.13*	.06	.32**	-
Mean	4.37	3.27	4.65	8.61
SD	1.51	.86	1.52	.81

Note: $p^* < .01$; $p^{**} < .001$

3.3. Moderating effect of competitiveness on the relationship between perceived teacher autonomy support and academic self-efficacy

A multiple regression model in the macro PROCESS for SPSS was tested to investigate whether the relationship between perceived teacher autonomy support and academic self-efficacy was moderated by competitiveness. Results (Table 2) indicate that the interaction between perceived teacher autonomy support and competitiveness was significant, suggesting that the effect of perceived teacher autonomy support on academic self-efficacy depended on students' competitiveness.

Table 2. Results of regression analysis of perceived teacher autonomy support and Competitiveness on academic Self-efficacy

Variables	B	SE B	p	95 % C. I.	
				Lower	Upper
Perceived teacher autonomy support	.51	.04	.00	.44	.59
Competitiveness	.37	.07	.00	.24	.50
Perceived teacher autonomy support x Competitiveness	- .17			- .25	- .10

Simple slopes for the association between perceived teacher autonomy support and academic self-efficacy were tested for low (- 1 SD), moderate (mean), and high (+ 1 SD) levels of competitiveness. Results revealed that perceived teacher autonomy support was significantly positively related to academic self-efficacy when students' competitiveness was low ($B = .66$, $p < .001$), average ($B = .51$ $p < .001$), or high ($B = .36$, $p < .001$) and that competitiveness attenuate

positive relationship between perceived teacher autonomy support and academic self-efficacy. The interaction is ilustrated in Figure 1.

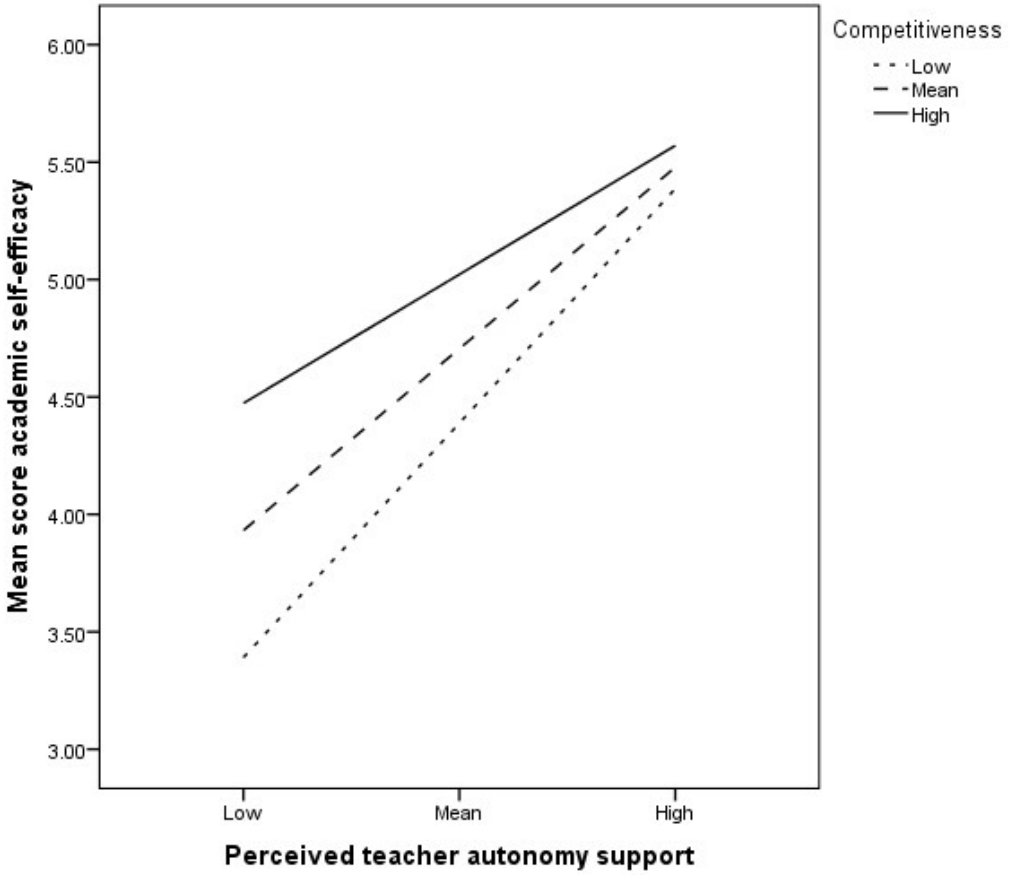

Figure 1. Competitiveness moderated the relationship between perceived teacher autonomy support and academic self-efficacy

3.4. Moderating effect of gender on the relationship between academic self-efficacy and academic performance

A multiple regression model in the macro PROCESS for SPSS was tested to investigate whether the relationship between academic self-efficacy and academic performance was moderated by gender. Results (Table 3) indicate that the interaction between academic self-efficacy and gender was significant, suggesting that the effect of academic self-efficacy on academic performance depended on students' gender.

Table 3. Results of regression analysis of academic self-efficacy and gender on academic performance

Variables	B	SE B	p	95 % C. I.	
				Lower	Upper
Academic self-efficacy	.15	.02	.00	.11	.20
Gender	- .42	.10	.00	- .62	- .22
Academic self-efficacy x Gender	.15			.01	.28

Simple slopes for the association between academic self-efficacy and academic performance were tested for females and males. Results revealed that academic self-efficacy was

significantly positively related to academic performance for both females (B = .15, p < .001) and males (B = .30 p < .001) and that this positive effect of academic self-efficacy on academic performance was bigger for males than for females. The interaction is illustrated in Figure 2.

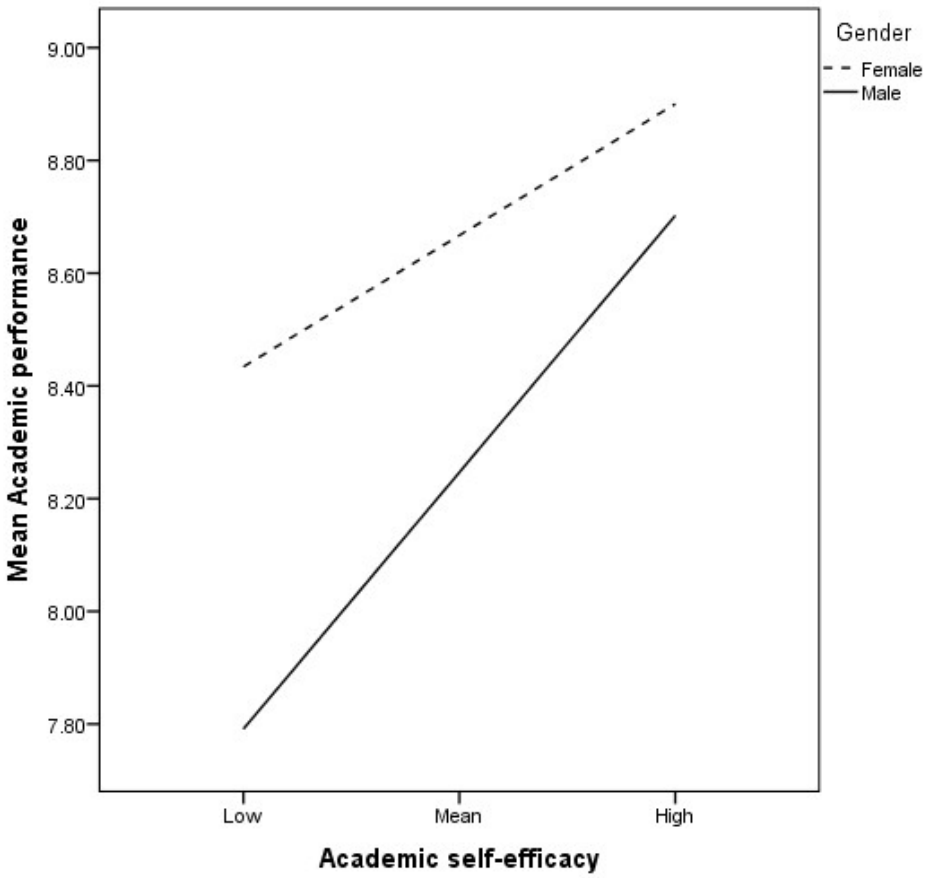

Figure 2. Gender moderated the relationship between academic self-efficacy and academic performance

4. Discussions

The present study examined the relationship between perceived teacher autonomy support and academic self-efficacy. We were also interested in exploring the link between academic self-efficacy and academic performance. Based on previous studies, our initial assumptions were that a significant positive relationship would exist between perceived teacher autonomy support and academic self-efficacy, and between academic self-efficacy and academic performance. The results supported this assumption, with data indicating that students who perceive greater support for autonomy from their teachers have a higher sense of self-efficacy. Similarly, students with a higher sense of self-efficacy reported high academic performance.

This positive relationship where suggested by prior studies that emphasized the link between perceived teacher autonomy support and academic self-efficacy (Gutiérrez & Tomás, 2019; Jang et al., 2012; Reeve et al., 2012; Zhao & Qin, 2021). Another possible explanation for these findings could be the fact that teacher autonomy support can improve student motivation and engagement (Assor et al., 2002; Schiefele, 2017), which in turn fosters a more proactive approach to learning (Reeve, 2002). For instance, we know that when students perceive that their teachers respect their autonomy, they are more likely to take ownership of their learning, set

personal academic goals, and employ effective learning strategies (Reeve, 2006), which might result in fostering academic self-efficacy, because students who feel empowered by their teachers are more likely to believe in their competence (Ryan & Deci, 2000).

Previous research also indicates a positive link between academic self-efficacy and academic performance (Hattie, 2008; Richardson et al., 2012; Robbins et al., 2004; Schunk & Pajares, 2002; Yusuf, 2011). One explanation for this relationship is that students with high academic self-efficacy are more likely to set challenging goals, engage in deep learning strategies, and exhibit resilience when encountering obstacles (Zimmerman, 2000). Another reason can be the fact that these students are also more likely to persist in difficult tasks, as they believe in their capacity to succeed, which enhances their academic outcomes (Chemers et al., 2001).

Next, we assumed that competitiveness would moderate the link between perceived teacher autonomy support and academic self-efficacy. This assumption was confirmed. More specifically, our results indicate that the effect of perceived teacher autonomy support on academic self-efficacy depends on students' competitiveness. In this regard, the positive effect of perceived teacher autonomy on academic self-efficacy decreases while the level of competitiveness increases. Thereby, as the level of competitiveness increases (from low, to medium and then to high), the positive influence of perceived teacher autonomy on academic self-efficacy decreases more and more.

While perceived teacher autonomy support generally bolsters self-efficacy by promoting a sense of competence and motivation (Bandura et al., 2001), highly competitive students may experience attenuated benefits. This attenuation could stem from competitive students' preference for structured environments with clear benchmarks, which align more closely with their goal-oriented nature. Consequently, in autonomy-supportive settings that emphasize self-directed learning, these students might perceive a lack of external standards, potentially diminishing their academic self-efficacy. These findings align with the notion that excessive competitiveness can create a performance-oriented climate that undermines students' self-beliefs (Ames, 1992).

Finally, we examined the potential moderating role of gender on the relationship between academic self-efficacy and academic performance. Our findings reveal that the interaction between academic self-efficacy and gender was significant, suggesting that the effect of academic self-efficacy on academic performance depended on students' gender. Specifically, academic self-efficacy was significantly positively related to academic performance for both, male students and female students, reinforcing the notion that belief in one's abilities plays a crucial role in achievement (Schunk & DiBenedetto, 2021). However, this positive effect of academic self-efficacy on academic performance was bigger for male students than for female students, suggesting that self-efficacy plays a more prominent role in predicting academic success among males (Usher & Pajares, 2008).

Our study is subject to several limitations when interpreting the present findings. First, the participants' sample was one of convenience. The characteristics and attitudes of students included in the current study may not represent the diversity of the academic population. Further research may examine the proposed relationships in extended, more largely in geographic distribution samples. Second, by its nature, our study is a cross-sectional one, examining the relationships between variables at a single point in time. A longitudinal design might be needed to examine the dynamic nature of perceived teacher autonomy support, academic self-efficacy, and competitiveness over time, especially regarding how students' perceptions about the support for autonomy received from their teachers can be positive or negative in relationship with their sense of self-efficacy according to their level of competitiveness. Last, but not least, future studies can focus on additional variables in explaining the link between, perceived teacher autonomy supports academic self-efficacy and academic performance, like students' academic buoyancy, social support, parental pressure, or learning engagement, to better understand the complex factors that can influence academic performance in the context of higher education.

5. Conclusions and implications for educational practice

The present study highlights a specific link between perceived teacher autonomy support, academic self-efficacy, and academic performance, moderated by competitiveness and gender. Our results suggest, thereby, that the positive influence of perceived teacher autonomy support on academic self-efficacy diminishes as the level of competitiveness increases. Moreover, the relationship between academic self-efficacy and academic performance is stronger for girls than for boys.

These findings might have relevance to several practical implications. First, while autonomy-supportive teaching practices generally enhance students' self-efficacy, high levels of competitiveness may undermine this effect. In educational settings where competitiveness is prevalent, such as in high-stakes academic environments or highly competitive programs, teachers might need to adopt strategies that mitigate the negative effects of competitiveness. For instance, they might aim to create an environment that supports autonomy while managing competitive pressures. On the other hand, recognizing competitiveness as a moderating factor is crucial for teachers aiming to tailor instructional strategies that effectively enhance self-efficacy across diverse student profiles.

This could involve promoting a growth mindset, encouraging self-reflection, and celebrating individual achievements. In addition, Tinto (1975, 1982, 1987) indicates that students who feel connected to and supported by their peers, their teachers, and the faculty, being academically and socially integrated into the higher education institution, are more likely to persist in college and graduate (Samoila & Vrabie, 2023).

Second, the study also demonstrates that the relationship between academic self-efficacy and academic performance is stronger for boys than for girls. This gender difference suggests that self-efficacy plays a more critical role in academic success for male students compared to female students. These findings highlight the need for gender-sensitive approaches in fostering academic self-efficacy and the necessity for teachers to consider gender-specific interventions that bolster self-efficacy, particularly among male students, to further enhance academic achievement.

To address this, teachers might implement targeted interventions designed to reinforce self-efficacy for both genders. For example, mentoring programs or workshops could be tailored to address specific barriers that female students may face in building academic self-confidence. Additionally, promoting diverse role models and providing equitable opportunities for all students to engage in success-building experiences could help bridge the self-efficacy gap.

Authors' contribution

All authors equally contributed to the present research.

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