



The influence of perceived social support on academic engagement among adolescents: the mediating role of self-efficacy

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Título: La influencia del apoyo social percibido en el compromiso académico entre adolescentes: el papel mediador de la autoeficacia.

Resumen: El compromiso académico se ve influenciado por factores ambientales y personales, como el apoyo social percibido y la autoeficacia. Ambos factores se han convertido en unos de los elementos más importantes en el contexto académico, debido a sus relaciones con el ajuste escolar de los adolescentes. El objetivo de este estudio fue analizar la influencia del apoyo social percibido de los amigos y de la familia sobre el compromiso académico, así como comprobar si la autoeficacia juega un papel mediador en la relación entre ambas variables. Se realizó un estudio descriptivo transversal. La muestra constaba de 802 estudiantes de secundaria, con una edad media de 13.65 años (SD = 1.24) (donde el 50.6% eran mujeres y el 49.4% hombres). Los resultados mostraron la existencia de relaciones positivas entre apoyo social percibido y las dimensiones del compromiso académico. Los modelos de mediación mostraron el efecto directo del apoyo social percibido en el compromiso académico y el efecto indirecto del apoyo social percibido en el compromiso académico cuando la autoeficacia media en esta relación. En conclusión, se recomienda promover la autoeficacia y una trayectoria académica positiva, debido a la implicación del apoyo social percibido de amigos y familiares en la trayectoria escolar y compromiso hacia los estudios.

Palabras clave: Apoyo social percibido. Compromiso académico. Autoeficacia. Adolescentes. Modelos de mediación.

Abstract: Academic engagement is influenced by environmental and personal factors, such as perceived social support and self-efficacy. Both factors have become one of the most important elements in the academic context, due to their relationships with the school adjustment of adolescents. The objective of this study was to analyze the influence of the perceived social support of friends and family on academic engagement, as well as to check whether self-efficacy plays a mediating role in the relationship between both variables. A cross-sectional descriptive study was performed. The sample consisted of 802 secondary school students, with an average age of 13.65 years (SD = 1.24) (where 50.6% were women and 49.4% men). The results showed the existence of positive relationships between perceived social support and the dimensions of academic engagement. The mediation models showed the direct effect of perceived social support on academic engagement and the indirect effect of perceived social support on academic engagement when self-efficacy mediates in this relationship. In conclusion, it is recommended to promote self-efficacy and a positive academic path, due to the involvement of the perceived social support of friends and family in the school path and engagement to studies.

Keywords: Perceived social support. Academic engagement. Self-efficacy. Adolescents. Mediation models.

Introduction

The concept of adolescence in the field of education has changed from focusing on disruptive behaviors and limitations to paying more attention to research and promotion of adaptive and healthy behaviors (Sadegh et al., 2024). Therefore, the study of positive qualities of students has led to a boom in educational psychology (Waters & Loton, 2021).

Among these qualities is academic engagement, which presents a fundamental meaning to understand the positive development of the adolescent (Zhao et al., 2021), being considered a key element for adaptation to the school context, learning and academic success (Motti-Stefanidi & Masten, 2013). According to the model of academic engagement of Fredricks et al. (2004), being the base model of this study since it is one of the most used models by the scientific community and the only one that takes into account the multidimensionality of the construct, academic engagement can be defined from three perspectives due to its multidimensional nature: behavioral, cognitive and emotional engagement (Fredricks et al., 2004; Hiver et al., 2024; Tortosa et al., 2023; Tortosa & Pérez-Fuentes, 2024; Yazzie-Mintz & McCormick, 2012). Behavioral engagement refers to student

participation and involvement in academic activities that reflect effort, persistence, and attention (Fredricks et al., 2004). Cognitive engagement refers to the active participation of students in learning with a positive psychological state (Nguyen et al., 2016; Yang et al., 2021). Emotional engagement refers to the student's attitude, positive feeling, and perception of academic activities (Park & Yun, 2017; Tvedt et al., 2019). Among them, behavioral engagement demonstrates the substantive connotation of student engagement (Newmann, 1992) and, relatively, it is easier to measure thanks to its observable characteristics (Nguyen et al., 2016). Based on previous literature, academic engagement refers to a behavioral-cognitive-emotional state of satisfaction, interest and motivation that allows students to participate in the academic context, learning and curricular activities, mediating other relevant relationships within the academic environment or even beyond (Fredricks et al., 2004; Rigo & Donolo, 2019; Salmela-Aro et al., 2021; Wang et al., 2019). In addition, this variable is unstable, that is, it changes over time, diminishing at the beginning of adolescence, specifically in male adolescents (Engels et al., 2019; Wang et al., 2014).

Studies of positive student qualities, such as academic engagement, have provided empirical evidence of environmental and personal influences on adolescents' academic engagement (Motti-Stefanidi & Masten, 2013; Zhen et al., 2020). Several theoretical models focused on this psychosocial paradigm provide an explanation for this type of in-

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fluences. On the one hand, *Bronfenbrenner's Ecological Theory* holds that individual behaviors are influenced by students' own social environment, such as family and school (Bronfenbrenner, 1979). On the other hand, the *Social Cognitive Theory* (SCT) (Bandura, 1997) is based on a psychosocial model that explains the sociocognitive constructions of behaviors (Komendantova et al., 2018) and has emerged as an essential theoretical framework for explaining human behaviors (Yazdanpanah et al., 2015; Hou et al., 2021). The SCT states that both environmental and personal factors influence human behaviour, that is, human behaviors are motivated and regulated by a relationship between environmental, personal and behavioral factors (Bandura, 2012). Environmental factors are social support and barriers to people's behaviour. Personal factors include expectations of outcomes related to behavior adoption, self-efficacy and knowledge (Komendantova et al., 2018). On the one hand, from environmental factors, perceived social support is essential for improving mental health (Liu et al., 2021). The *thriving through relationships* model suggests that researchers should pay more attention to the role of perceived social support in promoting psychological development (Feeney & Collins, 2015). Furthermore, many studies have confirmed the association between organizational support and work engagement (Mérida-López et al., 2020). However, insufficient attention has been paid to the academic engagement of adolescent students and their relationship with their perceived social support. As academic engagement is crucial for school success (Wong & Liem, 2022), further research on this matter is needed. On the other hand, personal factors such as self-efficacy, understood as people's beliefs about their abilities to organize and successfully fulfill their responsibilities and objectives (Bandura, 2012; Fife et al., 2011), is essential in school adjustment, especially in men, as they report higher levels of self-efficacy compared to women (Allari et al., 2020; Doménech-Betoret et al., 2017; Vogel & Human-Vogel, 2016).

Relationship between perceived social support and academic engagement

In *Ecological Theory*, Bronfenbrenner (1979) emphasizes that an environmental variable that predicts adaptive behaviors in the adolescent stage is perceived social support, understood as the individual perception of the adolescent that the social network values and cares for him, establishing private relationships with the adolescent in times of need (Casel, 1976; Goodenow, 1993). It is a malleable variable (Pierce & Quiroz, 2019) and multidimensional that encompasses a set of interacting elements and evolves throughout adolescence (Anderman et al., 2011). Following this same line, Gremmen et al. (2018) and Xin (2022) show that perceived social support can influence academic engagement. Similarly, Fredericks et al. (2019) and Kiefer et al. (2015) point out that the support of friends is associated with greater academic engagement, especially with emotional engagement (Estell &

Perdue, 2013). When students perceive the support of their friends, they are more likely to feel safe during the learning process. On the contrary, when students perceive less support of their friends, they are more likely to feel insecure when doing school work, decreasing their academic engagement (Juvonen et al., 2012; Geven et al., 2013; Shin & Chang, 2022). Furthermore, Estell & Perdue (2013) point out that the support of the family perceived by students plays a fundamental role in academic engagement, especially associated with higher levels of behavioral engagement. In the same way, Garcia-Reid et al. (2015) corroborate that adolescents who perceive the support of their family are more likely to get involved and interested in academic activities. Therefore, it could be argued that adolescents who perceive support from friends and family are likely to show higher levels of academic engagement. However, Rueger et al. (2008) and Tam et al. (2011), as regards sex, they have stated that no significant differences in perceived social support have been found and Wang & Eccles (2012) have found that different sources of support are not equally relevant in their impact on academic engagement, being the support of the family that most strongly predicts the academic engagement of adolescents. Based on these findings, the following hypotheses are proposed:

H1: *Perceived social support of family and friends is positively associated with academic engagement, especially the first with behavioral engagement and the latter with emotional engagement.*

Self-efficacy and academic engagement

In SCT, the learning environment and personal factors influence student's engagement (Bandura, 1986). One of the personal factors affecting student's engagement is self-efficacy (Shao & Kang, 2022; Wu et al., 2020). Bandura (1997) focuses on the construction of self-efficacy and its impact on learning. There is a strong association between self-efficacy and academic engagement of students. Students with higher self-efficacy level tend to have a greater engagement in the learning process, they are more likely to set higher goals and address more challenging tasks. Moreover, even when faced with academic difficulties, they are more likely to be more persistent and work harder on learning rather than dropping out (Allari et al., 2020; Doménech-Betoret et al., 2017; Kuo et al., 2021; Masud et al., 2016). On the contrary, if they have low self-efficacy, they will not spend time or energy on the task. Some authors corroborate that self-efficacy can help develop positive beliefs about one's own abilities, allowing students to become more involved in their learning (Ahmed et al., 2018; Zhen et al., 2017). Other authors take a major step and confirm that self-efficacy is a significant predictor of the dimensions of academic engagement (Olivier et al., 2019; Zhen et al., 2017). According to this study, behavioral and emotional engagement is shaped by their level of self-efficacy. Zhen et al. (2017), in its study with 605 adolescent students, confirm a positive association between self-efficacy and academic en-

agement. Other studies show that students with high levels of self-efficacy report higher academic aspirations (Adams et al., 2020) and they are more energetic to use learning strategies compared to those who have low or medium self-efficacy (Mizumoto, 2013). Based on these findings, the following hypothesis is proposed:

H2: *Self-efficacy is positively associated with the dimensions of academic engagement.*

Self-efficacy and perceived social support

As described in the existing literature, self-efficacy beliefs are formed through four sources of information: (a) personal experiences, which refer to the expectations of effectiveness that have been consolidated by means of repeated achievements or failures; (b) vicarious learning, which refers to the ideas about performance that are constituted from the observation of foreign experiences; (c) verbal persuasion, referred to the attempt to influence human behavior through suggestion; and, finally, (d) physiological states, which are caused by anxiety, stress or fear, and can cause the individual to be judged as a person with poor abilities (Bandura, 1987; Rossi et al., 2020). It has also been found in previous studies that self-efficacy is influenced by perceived social support (Shyr et al., 2021; Sökmen, 2019). Perceived social support is important for establishing a positive relationship and increasing levels of self-confidence (Chu & Chu, 2010; Hossain et al., 2024). Furthermore, social relations have an influence on self-efficacy (Lee et al., 2021). Therefore, the relationship between this environmental factor and the self-efficacy of adolescents is a question beyond doubt, because students who perceive that school, family and friends can help them solve difficulties in life or study, present a greater self-confidence to face challenges (Zhang, 2018). In this regard, empirical evidence indicates that high school students who perceive high social support from their family, friends and teachers, as opposed to none, one or two, present greater satisfaction, self-efficacy and academic engagement. As well as, higher school performance (Sivandani et al., 2013). In particular, some authors claim that the greater perceived family support and friends during early adolescence, the higher the level of self-efficacy during late adolescence (Adler-Constantinescu et al., 2013). Thus, it is confirmed that the perceived social support of family and friends is an essential factor that determines the self-efficacy of adolescents (Surjadi et al., 2011). Based on this evidence, the following hypothesis is proposed:

H3: *Self-efficacy is positively associated with the perceived social support of family and friends.*

Self-efficacy as a mediating factor

In addition to the empirical evidence obtained on each of the variables of the present study and on their interrelationships, there are also empirical indications of the effect of

perceived social support on the variable of academic engagement, having self-efficacy as a mediating variable of such effect (Sahil & Hashim, 2011; Yang & Wang, 2019). Specifically, Yang & Wang (2019) measure family support, that of friends and that of teachers, finding that social support has direct positive effects, mediated by self-efficacy, on academic engagement. That is, perceived social support can not only directly affect academic engagement, but also indirectly by improving students' academic self-efficacy. Therefore, self-efficacy is an effective mediation mechanism for students to engage to their studies (Zhang, 2018). Carmeli et al. (2020) and Liem et al. (2008) affirm that perceived social support plays an important role in the self-efficacy of students, affecting their academic engagement, there being evidence of the direct effect of family relations, friends and faculty with students on academic engagement (García-Bacete et al., 2014; Lam et al., 2012). Similarly, Llorca et al. (2017) also report that adolescents who perceive social support have a greater academic self-efficacy, which plays a key role in their academic engagement. Previous empirical evidence indicates that perceived social support can affect adolescent academic engagement through the indirect role of self-efficacy. In any case, Yang & Wang (2019) indicate that while there are some studies that have analyzed the relationship between perceived social support, academic engagement and self-efficacy in adolescent population, this should be further investigated because of its importance in the positive development of adolescents. Moreover, there seems to be no agreement on what explanatory capacity the perceived social support and self-efficacy may have on academic engagement. Although increasingly the variable of academic engagement plays an essential role in the academic context, this being the most accepted term, in no previous structural model has this variable been taken as the axis of analysis, but other related as the adjustment, involvement or school well-being. Based on these findings, the following hypotheses are proposed:

H4: *Self-efficacy has an indirect effect and a mediating role in the relationship between the perceived social support of family and friends and academic engagement.*

H5: *There are significant sex differences among adolescents in the variables of self-efficacy and academic engagement. However, there are no significant sex differences in the perceived social support variable.*

Present study

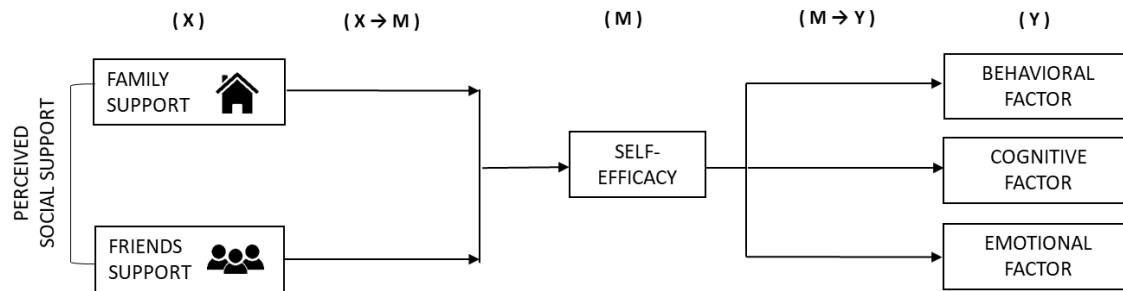
Previous research has focused on the relationship between organizational support and work engagement. However, few studies have focused on the role of perceived social support in strengthening the academic engagement of adolescents. Therefore, the objective of this study is to analyze the influence of the perceived social support of family and friends on academic engagement, differences by sex, as well as to check whether self-efficacy plays a mediating role in this relationship. After the review of previous studies and the hypotheses proposed,

a hypothetical model of simple mediation is proposed to verify the proposed objective (Figure 1).

This study analyzes in depth the link between perceived social support and academic engagement among adolescent students. Meanwhile, self-efficacy was tested as a possible intermediate variable to explain how perceived family and friends support influences academic engagement. The role of the intermediary was corroborated by the assumption that adolescents with higher levels of perceived social support

can trigger greater self-efficacy compared to other students (Adler-Constantinescu et al., 2013; Surjadi et al., 2011), because they believe they can successfully complete academic assignments, which in turn affects their academic engagement (Zhang, 2018). To determine the correlation model and simple mediation between perceived social support, self-efficacy and academic engagement, correlation analysis and mediation analysis were used.

Figure 1
Hypothesized mediation models



Method

Study Design and Participants

This quantitative study was based on a cross-sectional descriptive design and, therefore, followed the STROBE guidelines for cross-sectional studies (Vandenbroucke et al., 2007), in title, introduction, method, results and discussion. This study was conducted using convenience sampling. The sample was made up of 802 students from six high schools in the province of Almería (Spain), aged 12 to 17 with a mean age of 13.65 years ($SD = 1.24$). The gender distribution was 50.6% girls ($n = 406$) and 49.4% boys ($n = 396$), with mean ages of 13.68 ($SD = 1.14$) and 13.63 ($SD = 1.24$), respectively. Overall, 27.4% of these students were in first grade ($n = 220$), 31.9% of these students were in second grade ($n = 56$), 24.8% of these students were in third grade ($n = 199$) and 15.8% in fourth grade ($n = 127$).

Measures

A booklet containing the instruments already validated was prepared by the authors together with an ad hoc questionnaire that revealed sociodemographic aspects of the participants such as sex, age, nationality or academic year.

Perceived social support

Questionnaire of Family Support and Friends (AFA-R; González & Landero, 2014). This instrument consists of 14 items to measure the perception of social support of adolescents (support of family and friends). It contains 7 items that evaluate the family support factor (e.g. "You have someone

in your family to talk to when you need them") and 7 items that measure the support factor of friends (e.g. "You have a friend who shows affection"), with a 5-point Likert response scale ranging from 1 (never) to 5 (always). The internal consistency obtained for the scale with the sample of the present study was $\alpha = 0.91$. The reliability for the family support factor is $\alpha = 0.91$ and for the friends support factor is $\alpha = 0.89$.

Academic engagement

General Scale of Academic Engagement for Spanish Adolescents (CAADE; Tortosa & Pérez-Fuentes, 2024). This scale consists of 17 items to measure adolescents' sense of academic engagement. It consists of six items that evaluate the affective-emotional factor, six items that measure the cognitive factor and five items that measure the behavioral factor. With a 4-point Likert response scale ranging from 1 (never) to 4 (always). The affective-emotional factor refers to the level of emotional response of the student towards their learning process (e.g. "I am interested in the work I have to do"), the cognitive is related to the use of management strategies, cognitive and metacognitive for learning and persistence to perform school tasks (e.g. "I reorganize my tasks in case of unforeseen events") and behavioral concerns the student's interactions and responses within the educational center and in extracurricular environments (e.g. "In general, I behave well"). The internal consistency achieved with this scale with the sample of the present study was $\alpha = 0.90$. The reliability for the behavioral factor is $\alpha = 0.71$; for the cognitive factor it is $\alpha = 0.87$ and for the emotional factor it is $\alpha = 0.83$.

Self-efficacy

General Self-efficacy Scale (Baessler & Schwarzer, 1996). This instrument has 10 items that evaluate the general self-efficacy, that is, the perception of the person in terms of their personal competence for the effective management of different stressful situations (e.g. "I can solve difficult problems if I try hard enough"). Thus, the literature has shown that its construct validity generally refers to a single factor. Responses should be given using a 4-point Likert scale ranging from 1 (incorrect) to 4 (true). The internal consistency obtained for the scale with the sample of the present study was $\alpha = 0.84$.

Procedure

Once the booklet was prepared with the instruments of the variables that were to be examined, several educational centers of different municipalities in the province of Almería were contacted. A total of six secondary schools agreed to participate in this study, so, it was agreed with the management of the high school one day to attend and the students completed the paper booklet in person and in a single session. Before starting the data collection, all students and their legal guardians were informed of the purpose of the study and gave their written informed consent to participate in it (according to the Declaration of Helsinki). The data collection was carried out during the months of January to April 2023. A total of 834 questionnaires were collected, of which 32 questionnaires were removed due to control questions, leaving 802 questionnaires to be able to carry out the study in a representative sample. The research was approved by the Committee of Bioethics of the University of Almería with reference UALBIO2020/046.

Analysis of data

First, for the interpretation of the magnitude of the Pearson correlation coefficient, we follow the suggestions of Cohen (1988), where: $r_{xy} < 0.3$ weak correlation, $0.3 < r_{xy} < 0.5$ moderate correlation, $0.5 < r_{xy}$ strong correlation, and descriptive ones are presented. Correlation analysis was used to explore the relationships between perceived social support, self-efficacy and dimensions of academic engagement. Since, in this case, we seek to understand how these factors interact with each other, correlation analysis offers us a first approximation to examine associations without assuming causality. In addition, it will evaluate the premise of positive associations of perceived social support and self-efficacy with academic engagement, which is essential to establish the basis for further analysis, such as mediation.

On the other hand, for the comparison of the groups by sex, a Student *t* test is made, with the statistic of Cohen *d* (1988) for the estimation of the size of the effect. *T*-tests were performed to compare the means of self-efficacy, academic engagement and perceived social support between

groups defined by the sex of the participants. The identification of possible differences in the study variables will allow establishing guidelines in the application of assumptions or statistical tests that deepen the moderating effect of sex, for example with a moderate medication analysis. The statistical package SPSS version 24.0 for Windows (IBM Corp., 2016) was used for data processing and analysis.

Subsequently, the estimation of simple mediation models is carried out, where the independent variable will be in each case perceived social support (family and friends), as a mediating variable the self-efficacy and, for each model, each of the factors of academic engagement (behavioral, cognitive and emotional) is introduced as a dependent variable. For the calculation of mediation models, the macro PROCESS (v. 4.0) is used for SPSS (Hayes, 2013), applying the bootstrapping technique with coefficients estimated from 5000 bootstrap samples, and a 95% confidence interval.

On the other hand, to determine whether the mediation process was conditioned to other variables (in this case, the sex of the participants), moderate mediation analyses were performed. Mediation models were used to examine whether self-efficacy mediated the relationship between perceived social support and academic engagement. This methodological choice is consistent with the objectives of identifying direct relationships between variables, and also discovering the mechanisms underlying the relational dynamics established between social support and academic engagement. Moderate mediation focuses on estimating the degree to which an indirect effect of an independent variable *X* on a result variable *Y*, through a mediator *M*, depends on a moderator *W*. For this, parameters were estimated with the macro PROCESS. Specifically, Model 59 was applied (moderate mediation with moderation of path *a* and *b*, and *c*'path/direct effect). This model has a path *a* (independent variable to mediator) and a path *b* (mediator to dependent variable) that are moderate (Hayes, 2017).

Specifically, we investigated the moderating effect of participants' sex on the relationships of the two segments or paths of the mediation pattern: (a-path: $X \rightarrow M$) perceived social support (family and friends) and self-efficacy; and (b-path: $M \rightarrow Y$) self-efficacy and engagement (behavioral, cognitive and emotional factors).

Results

Self-efficacy, academic engagement and perceived social support: Correlations and descriptive analysis

As shown in Table 1, self-efficacy correlates positively with the three factors of academic engagement (behavioral, cognitive and emotional) and also with perceived social support, both with family and friends. Similarly, perceived social support, in turn, establishes associations with factors of academic engagement, with positive results in all cases.

Table 1
Bivariate Correlation Matrix and Descriptive Data (N = 802).

	1	2	3	4	5	6
1. Self-efficacy	–					
2. F. Behavioural	0.32	–				
3. F. Cognitive	0.34	0.56	–			
4. F. Emotional	0.36	0.63	0.60	–		
5. Family support	0.33	0.32	0.27	0.32	–	
6. Friends support	0.26	0.19	0.20	0.22	0.51	–
M	28.73	3.10	2.66	2.76	27.10	27.09
SD	5.56	0.55	0.75	0.66	7.32	6.64
Min.- Max.	10-40	1-4	1-4	1-4	7-35	7-35

Note. All correlations with significance level $p < .001$.

Table 2 shows the mean scores obtained in the study variables for each of the groups by sex. As can be seen, from the results of the Student’s *t*-test for independent samples, there are statistically significant differences in self-efficacy, with the male sex obtaining a higher average score. As for

the factors of academic engagement, there are no significant differences by sex. Finally, in view of the perceived social support, it is men who obtain a significantly higher average score than women. Regarding the support received by friends, there are no differences between the sexes.

Table 2
Self-Efficacy, Academic Engagement and Perceived Social Support. Descriptive and *t*-test by Sex (N = 802).

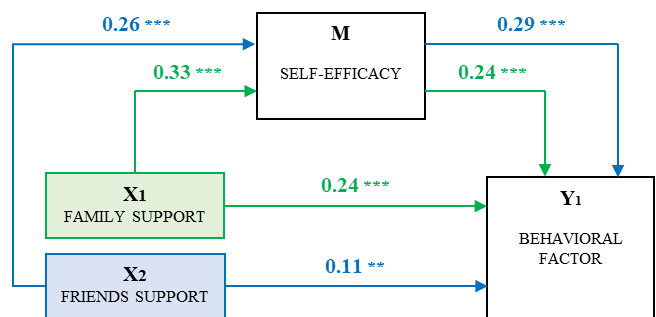
	Sex						<i>t</i>	<i>p</i>	<i>d</i>
	Male			Female					
	<i>N</i>	<i>Media</i>	<i>SD</i>	<i>N</i>	<i>Media</i>	<i>SD</i>			
Self-efficacy	396	29.42	5.31	406	28.04	5.72	3.53***	0.000	0.25
F. Behavioural	396	3.07	0.55	406	3.12	0.55	-1.16	0.244	-0.08
F. Cognitive	396	2.62	0.75	406	2.70	0.74	-1.51	0.129	-0.10
F. Emotional	396	2.76	0.71	406	2.76	0.61	0.14	0.888	0.01
Family support	396	27.75	6.80	406	26.45	7.75	2.51*	0.012	0.17
Friends support	396	26.62	6.43	406	27.54	6.82	-1.96	0.050	-0.13

Note. *** $p < .001$; * $p < .05$.

Mediation models: The role of self-efficacy in the relationship between perceived social support and academic engagement

Figure 2 corresponds to the simple mediation model for the behavioral factor of academic engagement. First, taking the result variable self-efficacy (M), an estimate of the effect of family support (X_1 : $B = 0.250, p < .001$) and of the friends support is made (X_2 : $B = 0.216, p < 0.001$). With the following regression analysis, taking as a result variable the behavioral factor of academic engagement (Y_1), an estimate of the direct effect of the independent variable in each case is made (X_1 : $B = 0.018, p < .001$ and X_2 : $B = 0.009, p < .01$). As for the total effect of the model, it is significant in relation to family support ($B = 0.023, SE = 0.002, 95\% CI 0.019, 0.028$) and friends ($B = 0.015, SE = 0.002, 95\% CI 0.009, 0.021$). Finally, with the analysis of indirect effects using the bootstrapping technique, a significant effect was obtained both in family support ($B = 0.005, SE = 0.001, 95\% CI 0.003, 0.008$) and in relation to the friends support ($B = 0.006, SE = 0.001, 95\% CI 0.003, 0.008$). The standardized coefficients are shown in the figure.

Figure 2
Simple Mediation Model of Self-efficacy on the Relationship Between Perceived Social Support (Family, Friends) and the Behavioural Factor of Academic Engagement.

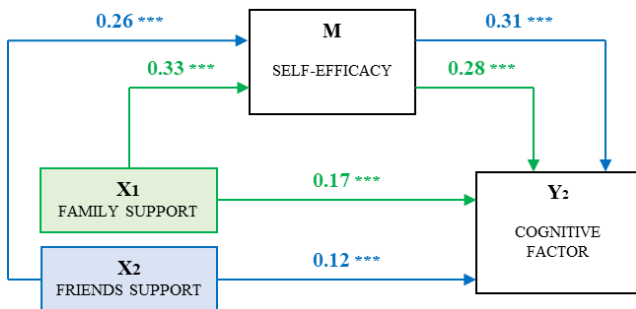


Note. Total effect of X_1 on Y_1 : $\beta = 0.32, p < .001$; Total effect of X_2 on Y_1 : $\beta = 0.19, p < .001$; Indirect effect of X_1 on Y_1 through M: $\beta = 0.08, SE = 0.016, 95\% CI (0.046, 0.112)$. Indirect effect of X_2 on Y_1 through M: $\beta = 0.07, SE = 0.015, 95\% CI (0.044, 0.106)$. Standardized coefficients are presented.

In Figure 3, in the proposed mediation model for the cognitive factor of academic engagement, it is noted that the direct effect of the independent variable in each case

(X_1 : $B = 0.018, p < 0.001$ and X_2 : $B = 0.013, p < .001$) is significant. Regarding the total effect of the model, it has significance in relation to family support ($B = 0.027, SE = 0.003, 95\% CI 0.020, 0.034$) and friends support ($B = 0.022, SE = 0.003, 95\% CI 0.015, 0.030$). Finally, with the analysis of indirect effects using the bootstrapping technique, a significant effect is obtained both on family support ($B = 0.009, SE = 0.001, 95\% CI 0.006, 0.013$) as in relation to friends support ($B = 0.009, SE = 0.001, 95\% CI 0.005, 0.012$). The standardized coefficients are shown in the figure.

Figure 3
Simple Mediation Model of Self-efficacy on the Relationship Between Perceived Social Support (Family, Friends) and the Cognitive Factor of Academic Engagement



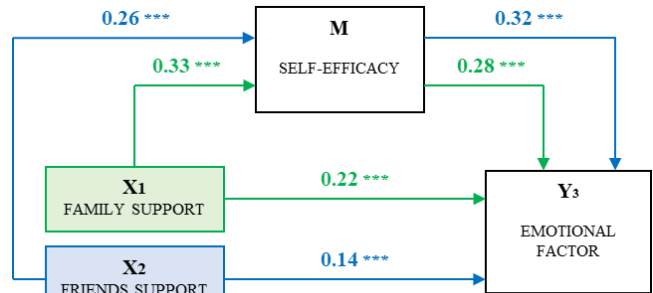
Note. Total effect of X_1 on Y_2 : $\beta = 0.27, p < .001$; Total effect of X_2 on Y_2 : $\beta = 0.20, p < .001$; Indirect effect of X_1 on Y_2 through M : $\beta = 0.09, SE = 0.017, 95\% CI (0.062, 0.128)$; Indirect effect of X_2 on Y_2 through M : $\beta = 0.08, SE = 0.016, 95\% CI (0.050, 0.112)$. Standardized coefficients are presented.

Finally, Figure 4 shows the mediation model for the emotional factor of academic engagement. Thus, taking this factor as a result variable (Y_3), the direct effects of the independent variable in each case are estimated (X_1 : $B = 0.020, p < .001$ y X_2 : $B = 0.014, p < .001$). And with a total effect of the model that also has significance in both estimates: in relation to family support ($B = 0.028, SE = 0.003, 95\% CI 0.022, 0.034$) and friends support ($B = 0.022, SE = 0.003, 95\% CI 0.015, 0.029$). Finally, from the analysis of indirect effects, a significant effect is obtained both in family support ($B = 0.008, SE = 0.001, 95\% CI 0.005, 0.011$) as in friends support ($B = 0.008, SE = 0.001, 95\% CI 0.005, 0.011$). The standardized coefficients are shown in the figure.

Moderate mediation analysis: Examining differences by sex

As previously mentioned, we analyzed the moderating role that the gender of the participants in the mediation model, using the macro PROCESS (Model 59).

Figure 4
Simple Mediation Model of Self-efficacy on the Relationship Between Perceived Social Support (Family, Friends) and the Emotional Factor of Academic Engagement.



Note. Total effect of X_1 on Y_3 : $\beta = 0.32, p < .001$; Total effect of X_2 on Y_3 : $\beta = 0.22, p < .001$; Indirect effect of X_1 on Y_3 through M : $\beta = 0.09, SE = 0.017, 95\% CI (0.061, 0.129)$. Indirect effect of X_2 on Y_3 through M : $\beta = 0.08, SE = 0.015, 95\% CI (0.054, 0.115)$. Standardized coefficients are presented.

First, it was observed that the interaction between family support (X_1) and sex (W) in self-efficacy (M) was significant ($B = -0.138, p < .01$). That is, sex moderated the relationship between family support and self-efficacy, with the following results obtained to probe the route a, conditioned by the sex variable: $b = 0.322, p < .001$ for the male sex and $b = 0.185, p < .001$ in the female. In relation to the segment or pathway b of the mediation, the interaction between self-efficacy (M) and sex (W) in behavioral factor Y_1 ($B = -0.012, p = .076$) and in cognitive factor Y_2 ($B = -0.006, p = .538$) were not significant, while significance for X_1*W interaction was obtained in the emotional factor Y_3 of engagement ($B = -0.017, p < .05$). In the latter case, conditional effects are obtained with similar values in both sexes: $b = 0.044, p < .001$ for males and $b = 0.026, p < .001$ in females.

On the other hand, the interaction between the support of friends (X_2) and sex (W) in self-efficacy (M) was not significant ($B = -0.098, p = .085$). That is, sex did not moderate the relationship between friend support and self-efficacy. In addition, regarding the segment or pathway b of the mediation, the interaction between self-efficacy (M) and sex (W) in cognitive factor Y_2 ($B = -0.009, p = .328$) was not significant, while significance for interaction X_2*W was obtained in the case of behavioral factor Y_1 ($B = -0.015, p < .05$) and emotional factor Y_3 ($B = -0.022, p < .01$) of engagement. Specifically, for the behavioral factor Y_1 , conditional effects are obtained with similar values in both sexes: $b = 0.038, p < .001$ for the male and $b = 0.023, p < .001$ in the female. While for the emotional factor Y_3 , the conditional effects, being significant in both groups, we obtained $b = 0.051, p < .001$ for the male sex and $b = 0.029, p < .001$ in the female.

Finally, in all the models examined, the existence of significant sex interactions as a moderator of direct effect ($X_1, X_2 \rightarrow Y_1, Y_2, Y_3$) was ruled out. This suggests that, while the sex of the participants plays a moderating role in how perceived social support, specifically family type (X_1), influences self-efficacy and some factors of engagement, does not affect in the same way the direct relation of the proposed model $X \rightarrow Y$ (c').

Discussion

This study attempts to probe the influence of the perceived social support of family and friends on academic engagement, and further explore the mediating effect of self-efficacy on this association among adolescent students and differences by sex. The correlation analysis showed a significant positive association among perceived social support, academic engagement and self-efficacy. The mediation effect analysis showed that perceived social support could have a direct effect on the academic engagement of adolescents and an indirect effect on the academic engagement of adolescents when self-efficacy was used as a mediating variable. The findings supported H1, H2, H3, H4 and H5.

Perceived social support and academic engagement

First, perceived social support can have a direct and significant influence on students' academic engagement, supporting H1, which is in line with previous studies (Gremmen et al., 2018; Juvonen et al., 2012). In response, students who scored higher in perceived social support from friends felt safer during the learning process, increasing their levels of academic engagement, especially emotional engagement (Estell & Perdue, 2013; Fredericks et al., 2019; Fiefer et al., 2015; Shin & Chang, 2022). On the other hand, the studies by Estell & Perdue (2013) and Garcia-Reid et al. (2015) demonstrated that perceived social support of the family is strongly correlated with academic engagement, especially behavioral engagement. Therefore, adolescent students who perceived support from their family members were more likely to engage in academic activities. The study confirmed that perceived social support influences academic engagement of adolescent students (Wang & Eccles, 2012). Thus, students who perceive high levels of social support feel more confident in doing academic tasks and thus achieve a high level of academic engagement. Regarding sex, differences were found in perceived social support. Specifically, it is men who obtained a significantly higher average score than the female sex, unlike studies of Rueger, Malecki, & Demaray (2008) and Tam, Lee, Har & Pook (2011). These results may be due to the fact that men need more social support because they have lower levels of academic engagement (Engels et al., 2019; Wang et al., 2014). Finally, according to the data extracted, no gender differences were found in the academic engagement, unlike the studies of Engels et al. (2019) and Wang et al. (2014), disapproving H5. This difference

may be due to the fact that the biological and physical differences of each sex influence their development differently, especially in adolescence (Pinel-Martínez et al., 2019).

Relationship between self-efficacy and academic engagement

Self-efficacy has a positive predictive effect on the dimensions of academic engagement (Olivier et al., 2019; Shao & Kang, 2022; Zhen et al., 2017), supporting H2. The study by Zhen et al. (2017) reported that self-efficacy was strongly correlated with academic engagement. Therefore, if students had confidence in their ability to perform a task, they had a higher level of engagement to it, especially male students (Allari et al., 2020; Doménech-Betoret et al., 2017), supporting H5. On the contrary, if students have little confidence in completing a task, they will not spend time or make an effort with it, and consequently, they will not engage in the task (Allari et al., 2020; Doménech-Betoret et al., 2017; Masud et al., 2016). Self-efficacy helps develop positive beliefs about one's own abilities. Thus, students with a high sense of self-efficacy adopted effective problem-solving strategies, enabling students to become more involved in their learning (Ahmed et al., 2018; Mizumoto, 2013; Zhen et al., 2017). The study by Oliver et al. (2019) reported that self-efficacy is a significant predictor of the dimensions of academic engagement. For these reason, the enhancement of self-efficacy may be a prerequisite for the improvement of students' academic engagement.

Relationship between self-efficacy and perceived social support

The findings of this study showed some parallels to previous research, in which self-efficacy was influenced by perceived social support (Sökmen, 2019; Shyr et al., 2021), supporting H3. On the one hand, Lee et al. (2021) reported that social relations have an influence on self-efficacy. As a result, students who perceive social support from friends and family have higher levels of confidence when facing challenges (Zhang, 2018). Similarly, Sivandani, Ebrahimi, & Vahidi (2013) reported that high school students who perceived high social support from their family, friends and teachers showed greater satisfaction, self-efficacy, academic performance and academic engagement. Perceived social support of family and friends is an essential factor that determines the self-efficacy of adolescents (Surjadi et al., 2011). Therefore, improving perceived social support may be a prerequisite for improving the self-efficacy of adolescents.

Mediating role of self-efficacy in the relationship between perceived social support and academic engagement

Finally, it was found that self-efficacy is an important mediator between perceived social support and academic en-

agement, supporting H4. The higher the level of perceived social support, the higher the level of students' self-efficacy, which, in turn, will have a high positive influence on students' academic engagement. Perceived social support has a positive and significant influence on academic engagement through the intermediary role of self-efficacy (García-Bacete, Coll, Casares, & Perrin, 2014; Lam, Wong, Yang, & Lui, 2012; Yang & Wang, 2019). Thus, students with high perceived social support have more confidence in their ability to face challenges (Zhang, 2018). This positive emotional experience will encourage students to spend more time and energy on their academic assignments, which will encourage academic engagement (Llorca et al., 2017). For these reasons, perceived social support increases the levels of self-efficacy, thus improving the self-confidence to face school tasks, which produces an increase in the levels of academic engagement.

Based on the results of the moderate mediation analysis, the mediating role of self-efficacy is demonstrated in both sexes, although the strength and significance of this mediation vary. Specifically, family support seems to have a more significant impact on the self-efficacy of men than women. However, the lack of significant moderation by sex in some relationships (e.g., between friend support and self-efficacy) suggests that self-efficacy mediation does not differ significantly between men and women. What really varies is how the mediator (self-efficacy) is influenced by social support according to sex, rather than a change in the role of the mediator *per se*. This suggests a complex interaction between the type of social support (family or friends), the sex of the participants and its effect on self-efficacy and, by extension, on the components of engagement.

It can therefore be concluded that it is important for adolescent students to have confidence in their abilities in order to be able to face academic challenges. In other words, improving self-efficacy among adolescent students is a useful strategy for improving academic engagement, in order to improve the positive qualities of students.

Limitations and practical implications of the study

There are several limitations of the study to be acknowledged. First, environmental factors that may have been affecting participants were not considered, since the analyzed variables were individual. Therefore, as future lines of research, a deeper study of the relationship between perceived social support, academic engagement and self-efficacy in high school students would be favorable in this area, taking into account other contextual variables, such as exposure to stressful situations. Secondly, a cross-sectional design was used to obtain the evidence in this study that corroborated the causal link between perceived social support, academic engagement and self-efficacy. The main limitation of this cross-sectional study design is that it was difficult to present the continuous process of individual psychology (Carlson &

Morrison, 2009). Therefore, future studies should implement a longitudinal research design to establish the cause and effect nexus between perceived social support, academic engagement and self-efficacy. In addition, we consider only the direct effect of perceived social support and the indirect effect of self-efficacy on academic engagement and do not consider other educational elements, such as teacher support and curriculum. Future research could discuss variables more deeply and comprehensively.

All of the above shows the importance of perceived social support and self-efficacy in the development of academic engagement in the secondary stage. The practical implications and research results can provide theoretical support to educational centers to effectively improve the learning contribution of adolescents by including families in school activities, in order to increase levels of academic engagement. Therefore, designing projects and intervention programs to improve social and emotional skills in high school is suggested as an effective measure to help students in their struggle with the challenges they face in adolescence. As well as, promote self-efficacy and a positive academic trajectory, due to the involvement of the perceived social support of family and friends in the school trajectory and the engagement to studies.

Conclusion

Social support perceived in the academic context is a vital environmental factor, due to its involvement in other behaviors that favor a better adaptation and individual academic trajectory in the long term. The results of this study show the involvement of the perceived social support of friends and family in increasing the levels of academic engagement of adolescents, where self-efficacy acts as a mediator in this relationship, being men who show significantly higher scores in self-efficacy and perceived social support than women. Therefore, the inclusion of families in academic activities and the promotion of social and emotional skills in secondary education can be an effective measure to increase adolescents' interest, enthusiasm and energy in studies. And, in turn, generating higher levels of self-efficacy will help build feelings of confidence to face the challenges that arise in the academic context.

Complementary information

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