



## Emotional Intelligence and Academic Achievement Relationship: Emotional Well-being, Motivation, and Learning Strategies as Mediating Factors

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### ABSTRACT

Emotional intelligence has been associated with academic achievement, which entails that improving emotional intelligence could lead to better academic achievement. However, the mechanisms of this relationship are not well known. This paper focuses on assessing relevant factors associated with academic achievement (emotional well-being, motivation, and learning strategies) as potential mediators of this link. A cross-sectional study with a sample of 96 high school students was conducted. They were assessed using the Mayer-Salovey-Caruso Emotional Intelligence Test, the Psychological Well-being Questionnaire, the Learning Strategies and Motivation Questionnaire, and their final grades. Results of a serial mediation analysis revealed that emotional intelligence is not directly associated with academic achievement but through mediating factors. Serial indirect effects show that emotionally intelligent students have higher levels of emotional well-being, which predicts better learning strategies and is, in turn, associated with academic achievement. Emotional intelligence also predicts greater motivation and better learning strategies (without the mediation of emotional well-being), which is ultimately also associated with academic achievement. Theoretical and instructional implications are discussed.

### La relación entre la inteligencia emocional y el rendimiento académico: el bienestar emocional, la motivación y las estrategias de aprendizaje como mediadores

### RESUMEN

La inteligencia emocional se ha relacionado con el rendimiento académico, asumiéndose que la mejora de la inteligencia emocional podría conducir a un mejor rendimiento académico. Sin embargo, los mecanismos de esta relación no son bien conocidos. Este trabajo se centra en evaluar ciertos factores relevantes asociados a un buen rendimiento académico (bienestar emocional, motivación y estrategias de aprendizaje) como potenciales mediadores de este vínculo. Se ha realizado un estudio transversal con una muestra de 96 estudiantes de secundaria, a los que se evaluó con el Test de Inteligencia Emocional de Mayer-Salovey-Caruso, el Cuestionario de Bienestar Psicológico, el Cuestionario de Estrategias de Aprendizaje y Motivación y sus notas finales. Los resultados de un análisis de mediación serial señalan que la inteligencia emocional no se asocia directamente con el rendimiento académico sino a través de los mediadores. Los efectos seriales indirectos indican que los estudiantes emocionalmente inteligentes tienen un mayor bienestar emocional, lo que predice mejores estrategias de aprendizaje, que a su vez anticipa un mejor rendimiento académico. La inteligencia emocional también predice una mayor motivación y mejores estrategias de aprendizaje (sin la mediación del bienestar emocional) lo que, en última instancia, también se asocia al buen rendimiento académico. Se discuten las implicaciones teóricas y didácticas.

Last century's emphasis on purely cognitive and academic aspects as key factors of success in the different contexts we deal with (e.g., school, work, sport, etc.) has been replaced by more socio-emotional approaches, in which emotional intelligence is considered essential. Emotional intelligence refers to the ability to monitor one's own emotions, to discriminate among them, and to use this information to guide one's thinking and actions (Mayer & Salovey, 1997). Although di-

fferent models have been proposed, most of them share the idea of it being a construct that reveals the important and necessary relationships between cognition and emotion. The literature makes a differentiation between "trait" and "ability" models. Under ability models, emotional intelligence is considered a mental ability. Specifically, one's actual ability to recognize, process, and use emotion-laden information. It is a general cognitive-emotional ability that includes a

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set of skills such as perception, expression, understanding, and regulation of one's emotions. This conceptualization is mainly represented by Salovey and Mayer's model (Mayer et al., 1999; Mayer et al., 2002). Trait (or mixed) models conceptualize emotional intelligence as a cluster of psychological constructs that include emotional skills, personality traits, motivational factors, and social factors (Bar-On, 2006; Petrides et al., 2007). Rather than just a cognitive ability, it is shown as a set of emotion-related self-perceptions, referring to one's competence to use, understand, and regulate emotions, and such perceptions are linked to other psychological constructs such as personality traits, motivational, or social factors. Both models rely on sufficient empirical support and coexist side by side in the areas of both empirical and applied research (Qualter et al., 2011). In this study, emotional intelligence is conceptualized in accordance with the ability model, as we consider the actual "competence" with a multi-dimensional measure based on performance on various tasks.

Emotional intelligence, which is essential for the good processing and managing of emotional information, can be regarded as a psychological resource (Di Fabio & Saklofske, 2014; Görgens-Ekermans et al., 2015; Sánchez-Álvarez et al., 2020). These resources refer to positive psychological variables that foster positive states and reduce negative ones, protecting against the detrimental impact of threatening or stressful situations (Hobfoll et al., 2003). According to the scientific literature, emotional intelligence promotes the psychological well-being, adjustment, and mental health of students as it provides them with the necessary skills to deal with daily challenging situations (Fernández-Berrocá & Extremera, 2016; Molero et al., 2020; Sánchez-Álvarez et al., 2015). Moreover, the beneficial effects of emotional intelligence extend beyond health and emotional well-being. At the academic level, several studies (MacCann et al., 2020; Perera & DiGiacomo, 2013; Sánchez-Álvarez et al., 2020; Van Rooy & Viswesvaran, 2004) have found emotional intelligence to be positively associated with academic achievement, suggesting that greater emotional intelligence entails increased academic success. In an attempt to understand the mechanisms that could explain this relationship, some variables have been studied (e.g., resilience, flourishing, the teacher-student relationship, self-directed learning, etc.), all of which would be mediators of this relationship (Chamizo-Nieto et al., 2021; Droppert et al., 2019; Trigueros et al., 2019; Zhou et al., 2020). However, such mechanisms are complex, and their logic remains unclear. Determining what factors are involved, as well as their interrelationships would be useful to understand the emotional intelligence-academic achievement link and develop specific instructional measures to reinforce such factors, ultimately leading to (potentially) better educational outcomes.

The most common approach to the emotional intelligence-academic achievement relationship appeals to the positive impact of emotional intelligence on the management of stress and other negative emotions, favoring students' adaptive capacity as well as promoting their social skills (Chamizo-Nieto et al., 2021; MacCann et al., 2020; Molero et al., 2020; Sánchez-Álvarez et al., 2020). However, emotional intelligence also has positive effects on the cognitive and motivational processes involved in learning that have, to date, been neglected when interpreting such relationships. Specifically, individuals with high emotional intelligence exhibited greater motivation to achieve goals (Kumar et al., 2013; Tam et al., 2021), also using more and better learning strategies (Hasanzadeh & Shahmohamadi, 2011; Inglés et al., 2017; Nieto et al., 2024; Vega-Hernández et al., 2017), which are fundamental factors for academic achievement.

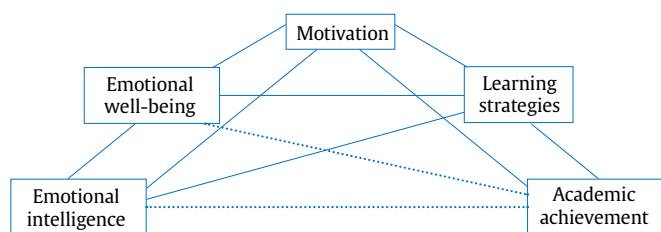
Traditionally, the assessment of academic achievement has been approached using exams and a variety of evaluation tests for the different subjects throughout the academic year. It is usually expressed as average scores of the grades obtained in different subjects (e.g., GPA, SAT, etc.), reflecting a student's relative position

with regard to his or her peers (Richardson et al., 2012). It is considered a good predictor of an individual's functioning both in other contexts and throughout life (e.g., better employment rates, greater success in life) (Droppert et al., 2019), which has made efforts to learn the factors that promote it a constant object of psychological research (Winne & Nesbit, 2010). Although it was initially only linked to variables of an intellectual nature (e.g., IQ), it is currently well acknowledged that other personal factors (e.g., cognitive, motivational, etc.) and contextual aspects (e.g. family, school, etc.) are also involved in it (MacCann et al., 2020; Richardson et al., 2012). As regards personal factors, academic achievement results from a combination of intellectual (e.g., IQ) and non-intellectual variables (e.g., personality traits, motivational factors, self-regulatory learning strategies, etc.). Among non-intellectual predictors, motivation and learning strategies are highlighted as essential constructs for academic work (Zimmerman, 2008). "Motivation" precedes and accompanies learning; it is key to establishing learning goals and trying to achieve them (Everaert et al., 2017; Pintrich, 2003; Zimmerman, 2008). The expectancy-value theory (Eccles & Wigfield, 1995, 2020), one of the most empirically supported models (Musu-Gillette et al., 2015; Pintrich & Groot, 1990), focuses on students' success expectancies (individuals' perceptions about how well they will perform in a future achievement task) and the value (the importance a student assigns to a task and is defined by intrinsic motivation, interest, and attainment) they attach to a task to examine the differences in motivation and subsequent academic outcomes. "Learning strategies" are the cognitive and metacognitive activities that students consciously and intentionally apply to the material they are learning and to the cognitive processes they are using to assimilate it (Broadbent & Poon, 2015; Puzifferro, 2008). It comprises rehearsal, organization, elaboration, and metacognitive strategies (Richardson et al., 2012). Rehearsal entails shallow processing of information (e.g., rote learning), while the others involve a growing deepness in processing and learning. "Emotion" is another important personal factor in explaining academic achievement (Pekrun, 1992, 2006; Pekrun et al., 2017; Pekrun & Stephens, 2010). Emotions are multifactorial processes that encompass different response subsystems such as affective, cognitive, motivational, expressive, and physiological response subsystems (Scherer, 2005). Although with different degrees of intensity, value, or duration, emotions constantly accompany the person, and their presence is not trivial. Regarding the academic context, when completing tasks and working towards goals, students experience a broad variety of emotions (e.g., boredom, anxiety, helplessness, hope, etc.) that have several effects. While positive emotions (e.g., joy, pride, hope, etc.) predict good academic achievement, negative ones (e.g., boredom, anxiety, etc.) do the opposite. However, most of the studies available have assessed the effect of discrete emotions (e.g., joy, hope, etc.), whereas the impact of "emotional well-being" on academic achievement remains unknown (Pekrun et al., 2017).

These factors have a complex effect on academic achievement, which manifests itself in various forms of interrelationships during academic work. Thus, the influence of emotions on academic achievement is associated with motivational and cognitive mechanisms. Emotions affect cognitive, motivational, and regulatory processes, mediating learning, and achievement (Pekrun, 1992, 2006; Pekrun et al., 2002), which means that emotions would not have a direct effect on academic achievement (Mega et al., 2014; Pekrun, 1992, 2006; Villavicencio & Bernardo, 2013) self-regulated learning, and motivation to academic achievement. This model was tested with 5,805 undergraduate students. They completed the Self-Regulated Learning, Emotions, and Motivation Computerized Battery (LEM-B. Similarly, motivation comes from and accompanies goal setting and the use of learning strategies (Everaert et al., 2017; Zimmerman, 2008), which would show a rich interrelation among these factors during the learning process. However, despite

its relevance, the mediating effect that emotions (emotional well-being), motivation, and learning strategies might have on the emotional intelligence-academic achievement relationship in students has not yet been studied.

The main purpose of this study is to delve into the mechanisms behind the emotional intelligence-academic achievement relationship, jointly assessing the potential mediating effect of emotional well-being (as a parsimonious construct of general positive affect), motivation, and learning strategies on such relationship. To achieve this objective, we have proposed an “exploratory conceptual model” (Figure 1), according to which emotional intelligence would not be directly associated with academic achievement, but via certain mediators (emotional well-being, motivation, and learning strategies), which would be related to each other, and would have an impact on academic achievement. The order of the mediators is based on different theoretic suppositions that we have tried to tentatively explore. Assumptions such as that emotions (emotional well-being) are mediators of the motivational and cognitive factors (motivation and learning strategies) involved in learning (Pekrun, 2006; Pekrun et al., 2002) that do not have a direct effect on academic achievement (Mega et al., 2014); and on the presupposition that motivation is a factor that precedes and accompanies learning strategies (Everaert et al., 2017; Pintrich, 2003; Zimmerman, 2008). This implies that the effect of these mediators on academic achievement would mainly take place via other mediators (serial mediation) rather than directly (specific mediation).



**Figure 1.** Conceptual Model Proposed for the Emotional Intelligence-Academic Achievement Relationship with Emotional Well-being, Motivation, and Learning Strategies as Mediating Factors.

The hypotheses associated with the proposed model were that 1) the relationship between emotional intelligence and academic achievement will not be direct, but “serially mediated” by emotional well-being, motivation, and learning strategies; more specifically 2) emotional intelligence would be positively associated with greater emotional well-being, which would, in turn, be related to greater motivation and better learning strategies, and, ultimately, improved academic achievement; and 3) emotional intelligence (without the emotional well-being effect) would also be positively associated with greater motivation and better learning strategies as predictors of improved academic achievement.

## Method

### Participants

The sample consisted of students in their 4<sup>th</sup> year of compulsory secondary education at a high school located in a Spanish city. Sampling was incidental and comprised 96 teenagers – 45 girls (46.87%) and 51 boys (53.12%) – with an average age of 15.54 ( $SD = 0.66$ ). Participation in the study was voluntary in all cases. The participants were informed of the characteristics, development, and timing of the study, as well as of the possibility to withdraw from it

at any time during its course. Parents were provided with the same information in writing prior to the beginning of the study. They were also informed of the confidential nature of the results and of the possibility of being informed of them upon the conclusion of the assessment and analysis of the data. All the students signed a written consent form prior to the beginning of the study.

### Measures

**Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT V.2.0)** (Mayer et al., 2002; Spanish version by Extremera & Fernández-Berrocal, 2002)

The MSCEIT is based on Salovey and Mayer’s (Mayer et al., 1999; Mayer et al., 2002) EI ability model and consists of 141 items. It provides an overall emotional intelligence measure (EI) and four branch scores as indicators for the EI abilities: perceiving emotions, facilitating emotions, understanding emotions, and managing emotions. The Spanish version has revealed good internal consistency and a high level of convergence between scoring methods. The Cronbach’s  $\alpha$  values observed in this study were .92, .82, .80, and .81 for the abilities of perceiving, facilitating, understanding, and managing emotions, respectively.

**Psychological Well-being Scale** (Cánovas, 2013)

The scale is made up of four subscales: emotional well-being, material well-being, job satisfaction, and partner relationship satisfaction. In this study, only the emotional well-being scale was used since the information from the rest of the subscales was not relevant to our aims. The scale refers to emotional well-being as happiness and positive affect. Using a 30-item subscale (e.g., “I feel able to do my work”, “I find everything interesting”), students were asked to assess their emotional well-being on a Likert-type scale that ranged from 0 (*never*) to 5 (*always*). The maximum score was 150 and the minimum was 30. The internal consistency observed was  $\alpha = .92$ .

**Learning Strategies and Motivation Questionnaire** (Ayala et al., 2004)

It has two subscales: the Motivational scale and the Learning scale with 100 items altogether that students must rate on a Likert scale ranging from 0 (*never*) to 5 (*always*). The Learning scale measures learning strategies as a cognitive dimension based on four factors: Rehearsal (e.g., “When I can’t understand something, at least I learn it by rote”), Organization (e.g., “I find making diagrams and summaries useful”), Elaboration (e.g., “I try to find relationships between what I’m learning and what I already know”) and Metacognitive Regulation (e.g., “While I’m studying, I try to somehow organize the ideas in my mind”). The internal consistency of the factors in this study (Cronbach’s  $\alpha$ ) was .65 (Rehearsal), .86 (Organization), .79 (Elaboration), and .84 (Metacognition). The Motivational scale is made up of six factors: Value of Learning (e.g., “Studying is what matters the most to succeed in my future career”), Intrinsic Motivation (e.g., “I study because I like to learn new things”), Self-efficacy (e.g., “I have sufficient capacity to do the work set by my school or secondary school”), Internal Locus of Control (e.g., “Grades depend primarily on how hard you work and the efforts you make”). The Motivation for Group Work and Need for Recognition factors were not used in this study because they were not relevant to our aims. The highest score was 50 and the lowest was 10 points for each factor. The reliability (Cronbach’s  $\alpha$ ) of all these scales was .82, .80, .72, and .71, respectively.

**Table 1.** Descriptive Statistics and Correlations between Emotional Intelligence, Emotional Well-being, Motivational Factors, Learning Strategies, and Academic Achievement

	1	2	3	4	5	6	7	8	9	10	11
1. Emotional intelligence											
2. Academic Achievement	.19										
3. Emotional well-being	.43**	.17									
4. Rehearsal	-.27**	-.11	.01								
5. Organization	.30**	.09	.23*	-.17							
6. Elaboration	.39**	.19	.40**	-.08	.46**						
7. Metacognitive regulation	.21*	.35**	.30**	-.14*	.44**	.63**					
8. Value	.30**	.44**	.24*	-.24*	.30**	.25*	.33**				
9. Intrinsic motivation	.24*	.17	.31**	-.06	.28**	.45**	.46**	.25*			
10. Self-efficacy	.25*	.13	.30**	-.43**	.11	.16	.08	.10	.07		
11. Internal locus of control	.23*	.23*	.06	-.25*	.27**	.19	.32**	.54**	.06	.06	
Mean	104.01	6.37	108.73	28.50	33.84	31.14	34.50	40.68	28.16	30.94	36.27
SD	12.36	1.15	16.69	5.37	7.93	6.40	6.28	6.45	5.60	6.18	5.37

\* $p < .05$ , \*\* $p < .01$ .

### Academic Achievement

There has not been a consistent approach to assessing academic achievement in previous research, which covers different types of measures (Droppert et al., 2019), having in common that they include the average grade in different school subjects over a period of academic life. In keeping with this, the measure used in this study to assess students' academic achievement was their average grade in all the subjects taken at the end of the course.

### Procedure

The school's Department of Orientation and Guidance was contacted prior to data collection. When the research objectives and the collaboration required had been explained, a formal request detailing more specific aspects was sent. Once they expressed consent for data collection and participation in the research, they were contacted again to arrange a suitable date for the data gathering to be conducted.

The high school was visited on three days, using 60-90 minutes for the administration of the tests in the different classrooms. The same procedure was followed in each of them. First, an explanation of the purposes of the research and the questionnaires they were to complete was given. They were also informed of the conditions of their voluntary participation: they could withdraw at any point during the process, participation was anonymous and confidential, and they had the right to be informed of the results obtained, giving them a contact email address. They were told to respond to all questions with sincerity, that there were no correct or incorrect answers, and that it was very important for them to answer all the questions, leaving no blanks. The questionnaires were then handed out, each of them with an allocated code to associate their scores with their grades. The instructions were read before each test and certain sections that could give rise to doubts were clarified. After the relevant explanations, students proceeded to individually answer the questionnaires.

### Statistical Analyses

The statistical analyses were carried out using IBM Statistical Package for the Social Sciences (SPSS) software, version 28.0 for Mac, and the Hayes' (2017) Process macro. Normality and homoscedasticity were tested using the Kolmogorov-Smirnov and Levene's statistics, respectively. First, means and standard deviations were estimated as descriptive statistics, and Pearson's correlation analyses were performed as a measure of the association between variables. Next, we used the Hayes' Process macro to conduct different mediation analyses. We had previously assessed which motivational factors and which learning

strategies mediated the emotional intelligence-academic achievement relationship. For this, we performed two mediational analyses with Model 4 for mediators in parallel entering emotional intelligence as the independent variable, academic achievement as the dependent variable, and motivational factors (e.g., value, self-efficacy, intrinsic motivation, etc.) or learning strategies (rehearsal, organization, elaboration, and metacognitive regulation) as mediators, respectively. Only the motivational factors and learning strategies that mediated such relationship would be included in the model proposed (Figure 1). Then, a "serial mediation model" (Figure 1) was conducted with emotional well-being, motivation, and learning strategies as mediators in the emotional intelligence-academic achievement relationship, running Model 6 with three serial mediators. In serial mediation, the independent variable (emotional intelligence) can be directly related to the dependent variable (academic achievement) – "direct effect"; it could have an effect on each mediator, which can have a direct impact on the dependent variable (academic achievement) – "specific indirect effect"; and/or it could serially influence other mediators – "serial indirect effect". The completely standardized coefficients of the direct and indirect effects observed were estimated as the measure of the effect size found (Preacher & Kelley, 2011).

## Results

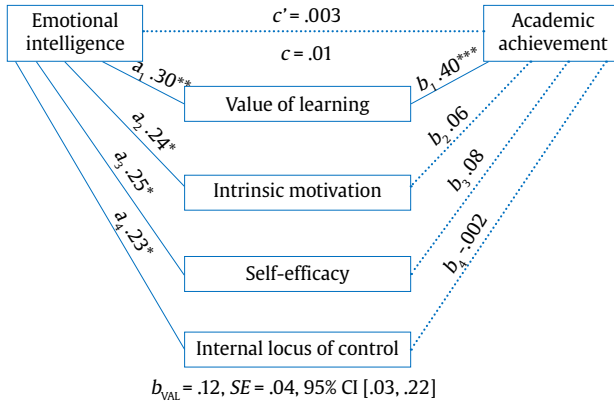
### Descriptive Statistics and Association between the Main Variables Studied

Table 1 shows descriptive statistics (means and standard deviations) and the correlations between the main variables in our study. Emotional intelligence and academic achievement were positively but not significantly correlated ( $r = .19$ ,  $p = .06$ ). However, emotional intelligence was positively and significantly correlated with emotional well-being ( $r = .43$ ,  $p < .01$ ) and with the four motivational factors ( $r = .30$ ,  $r = .24$ ,  $r = .25$ ,  $r = .23$ , for value, intrinsic motivation, self-efficacy expectancy, and internal locus of control, respectively). Finally, considering learning strategies, emotional intelligence positively correlates with organization ( $r = .30$ ,  $p < .01$ ), elaboration ( $r = .39$ ,  $p < .05$ ), and metacognitive regulation ( $r = .21$ ,  $p < .05$ ), but negatively with rehearsal ( $r = -.27$ ,  $p < .01$ ).

### Motivational Factors as Mediating Factors of the Emotional Intelligence-academic Achievement Relationship

Regarding motivational factors as mediating factors (Figure 2) in the relationship between emotional intelligence and academic achievement, the results of the mediational analysis show that the

relationship was neither direct, ( $c'$ ) ( $b = .03$ ,  $SE = .009$ , 95% CI [-.01, .02]), nor total ( $c$ ) ( $b = .19$ ,  $SE = .009$ , 95% CI [-.0008, .03]), taking place only through motivational factors ( $ab$ ) ( $b = .015$ ,  $SE = .06$ , 95% CI [.03, .20]). Particularly, this relationship happens mainly via the “value factor”, but not through the other motivational factors considered as mediators ( $a, b_1$ ) ( $b = .12$ ,  $SE = .04$ , 95% CI [.03, .22]).



**Figure 2.** Results of Parallel Mediation Model for the Relationship between Emotional Intelligence and Academic Achievement with Motivational Factors as Mediators.

Beta coefficients completely standardized for direct and indirect effects. 10,000 bootstrap samples. Dashed lines mean no significance. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

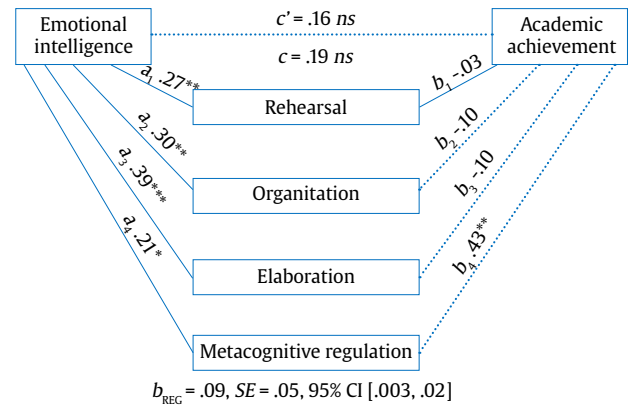
### Learning Strategies as Mediating Factors of the Emotional Intelligence-academic Achievement Relationship

When learning strategies were analyzed as mediating factors (Figure 3), there was neither a direct relationship between emotional intelligence and academic achievement, ( $c'$ ) ( $b = .16$ ,  $SE = .01$ , 95% CI [-.009, .03]) nor a total effect ( $c$ ) ( $b = .19$ ,  $SE = .009$ , 95% CI [-.008, .03]). The total indirect effect was not significant either ( $ab$ ) ( $b = .002$ ,  $SE = .006$ , 95% CI [-.009, .014]). The relationship between emotional intelligence and academic performance, considering learning strategies as mediating factors, only happens through metacognitive regulation as a strategy ( $a_4 b_4$ ) ( $b = .09$ ,  $SE = .05$ , 95% CI [.003, .02]). The rest of the learning strategies were not significant mediators in this relationship.

### Emotional Well-being, Motivation, and Learning Strategies as Serial Mediators of the Emotional Intelligence-Academic Achievement Relationship

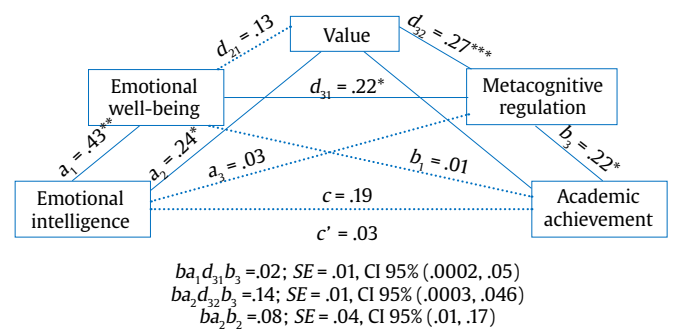
Since only value (as a motivational factor) and metacognitive regulation (as a learning strategy) proved significant mediators, they were the only ones included in the “exploratory serial mediational model” proposed (Figure 1) to explain the emotional intelligence-academic achievement relationship. Figure 4 displays the results obtained using Model 6 with three serial mediating variables.

The results show that emotional intelligence has neither a direct nor a total effect on academic achievement, ( $c'$ ) ( $b = .03$ ,  $SE = .009$ , 95% CI [-.01, .02]) and ( $c$ ) ( $b = .19$ ,  $SE = .009$ , 95% CI [-.0008, .03]), respectively. The relationship between emotional intelligence and academic achievement only took place via mediators ( $abc$ ) ( $b = .16$ ,  $SE = .06$ , 95% CI [-.03, .27]), yielding a total mediation effect. Besides, several “indirect effects” (serial and specific) were observed.



**Figure 3.** Results of Parallel Mediation Model for the Relationship between Emotional Intelligence and Academic Achievement with Learning Strategies as Mediators.

Beta coefficients completely standardized for direct and indirect effects. 10,000 bootstrap samples. Dashed lines mean no significance. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .



**Figure 4.** Results of Serial Mediation Analysis for the Emotional Intelligence-Academic Achievement Relationship with Well-being, Value of Learning, and Metacognitive Regulation as Mediators.

Beta coefficients completely standardized for direct and indirect effects of relationships between emotional intelligence-academic achievement and well-being, value, and metacognitive regulation as mediators. 10,000 bootstrap samples. Dashed lines mean no significance. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

One of the serial indirect effects showed that students' emotional intelligence predicts their emotional well-being, which is associated with better learning strategies and, ultimately, better academic achievement ( $a_1 d_{31} b_3$ ) ( $b = .02$ ,  $SE = .01$ , 95% CI [.0002, .05]). Another serial indirect effect reflected that students' emotional intelligence predicts greater motivation (value of learning), which is associated with better learning strategies (metacognitive regulation) and this, in turn, with greater achievement ( $a_2 d_{32} b_3$ ) ( $b = .014$ ,  $SE = .01$ , 95% CI [.0003, .046]). Finally, a significant specific indirect effect was also found, the relationship between emotional intelligence and academic achievement could also happen through greater motivation of emotionally intelligent students ( $a_2 b_2$ ) ( $b = .008$ ,  $SE = .004$ , 95% CI [.002, .019]), motivation being, therefore, a specific mediator in such relationship.

## Discussion

The purpose of this study was to explore the mechanisms involved in the emotional intelligence-academic achievement relationship,

assessing an “exploratory model” to evaluate the “serial mediation effect” of emotional well-being, motivation, and learning strategies on such association. In a general way, the results support the exploratory conceptual model proposed. The positive effect of emotional intelligence on academic achievement takes place via greater emotional well-being, greater motivation, and better learning strategies, which, positively associated with emotional intelligence, predict improved academic achievement. The relationship was not direct, taking place only through the mediators between which there were several serial indirect effects. These results are discussed in detail below.

Emotionally intelligent students show high levels of emotional well-being, which is associated with better learning strategies and, in turn, with academic success (first serial indirect effect). Similarly, emotionally intelligent students have higher levels of motivation, which predict better learning strategies and, therefore, academic achievement (second serial indirect effect). These indirect effects support the first hypothesis. The relationship between emotional intelligence and academic achievement is not direct but serially mediated by emotional, motivational, and cognitive factors. Also, in line with this serial mediation, only motivation (value) was a specific mediator in the emotional intelligence-academic achievement relationship. Emotionally intelligent students show greater motivation (value), which predicts academic achievement. But neither emotional well-being nor learning strategies (metacognitive regulation) were specific mediators, showing that they act with and across other processes. This result would prove an interconnection among emotional, motivational, and cognitive processes during academic performance, rather than the isolated involvement of each of them. It seems more likely that students use better learning strategies when they are motivated than when they are not (Everaert et al., 2017). In addition, if they feel emotionally well, they would be more prone to learn using better cognitive skills. At the same time, this effect reinforces previous literature by proving that emotional, motivational, and learning factors are essential to academic achievement (Pekrun, 1992; Richardson et al., 2012; Zimmerman, 2002), as well as being linked to emotional intelligence (Inglés et al., 2017; Kumar et al., 2013; Nieto et al., 2024; Tam et al., 2021; Vega-Hernández et al., 2017).

As regards the second hypothesis, according to the results, the well-being of students with emotional intelligence was associated with a more effective use of learning strategies but not with greater motivation, which means that it is only partly fulfilled. This result reflects that emotionally intelligent students can be motivated to learn even when they are not emotionally well, which is coherent with the concept of emotional intelligence itself (Mayer & Salovey, 1993). Partially considered, these indirect effects are consistent with previous studies that appeal to the benefits of emotional intelligence over emotional well-being to explain its relationship with academic achievement (Sánchez-Álvarez et al., 2020). But it also adds to them by linking the emotional well-being of emotionally intelligent students to improved learning processes, which ultimately increases the probability of academic success. This result also shows that students' emotional well-being works in a similar way to discrete positive emotions (enjoyment, anger, pride, etc.). In a similar way to the mediator effect of “positive emotions” on academic achievement (Mega et al., 2014), “emotional well-being” was also a mediator between emotional intelligence and learning strategies in academic achievement. This clearly reinforces Pekrun's cognitive and motivational model (Pekrun, 1992, 2006; Pekrun et al., 2002), which emphasizes the effect of positive emotions on cognitive, motivational, and regulatory processes, mediating learning, and achievement. However, this study adds new insights to the model by replacing discrete positive emotions (e.g., joy, pride, etc.) with students' emotional well-being as a parsimonious construct. According to our findings, a “positive emotional state” works in the same way as discrete positive emotions, mediating the cognitive processes that

are involved in learning. Besides, our study goes one step further by incorporating emotional intelligence as an independent variable that predicts students' emotional well-being, motivation, and learning strategies in connection to academic achievement.

Finally, in keeping with our third hypothesis, the benefits of emotional intelligence in academic achievement extended beyond the emotional well-being students since they are also associated with “better cognitive functioning”. Traditionally, the benefits of emotional intelligence in academic achievement have been explained by invoking emotionally intelligent students' better emotional regulation and adaptive and coping capacity when facing the difficulties and stress involved in academic tasks (MacCann et al., 2020; Petrides et al., 2004; Sánchez-Álvarez et al., 2020). This study shows that emotional intelligence may have another channel of action on academic performance related to cognitive processes. In this way, students with emotional intelligence are more motivated and display better learning strategies (e.g., metacognitive regulation), which makes the improvement of academic performance easier. This result reinforces other studies where high emotional intelligence is claimed to be associated with enhanced academic motivation (Kumar et al., 2013) and a greater use of more sophisticated learning strategies such as metacognitive regulation (Hasanzadeh & Shahmohamadi, 2011; Inglés et al., 2017; Nieto et al., 2024; Vega-Hernández et al., 2017). Moreover, it expands them by including these variables in a broader relationship such as that between emotional intelligence and academic achievement to better understand its mechanisms. This is a very interesting result because it implies that emotional well-being would not always be necessary for students with emotional intelligence to find motivation and use adequate strategies when it comes to learning. Emotionally intelligent people show an effective capacity to manage and regulate their cognitive and motivational processes (Fernández-Berrocal & Ruiz, 2008; Qualter et al., 2012) even when they are not feeling emotionally well.

However, there are certain limitations to this study. Its cross-sectional nature precludes the possibility of establishing causal relationships among the studied variables. We cannot assure that emotional intelligence is the reason for students' enhanced performance but only establish a positive association. It would be necessary to conduct longitudinal or prospective studies where not only covariance but also that cause precedes effect may be observed. The sample size is not very big. Nevertheless, the use of a bootstrap-based statistical process (Hayes, 2017) involving repeated resampling of the original data to draw multiple sample simulations reduces the impact of this limitation. According to the results, the size of the indirect effects was not very large, probably due to the number of predictor variables with regard to sample size. It would be interesting to replicate this study using a larger sample of students and verify whether the variables work in the same way. It could even be useful to extend the work from only secondary school to other student groups to achieve representativeness of the student population and thus guarantee the feasibility of generalizing results. There is also scientific skepticism as to the type of assessment instruments used, namely self-report measures, which could undermine internal validity. Nonetheless, there are contexts in the field of psychology where this is the only means to access certain psychological constructs, which legitimates the use and value of such tools. Another possible limitation concerns the use of the grade point average (GPA) of the academic year as the only measure of academic achievement; perhaps using other indicators could provide relevant complementary information. Although some mediating factors have been addressed, they are neither exclusive nor exclusionary. There are probably other factors that may also mediate in such relationship (e.g., personality, resilience, or IQ). The order of mediators is based on models (e.g., Pekrun et al., 2006; Pintrich, 2003; Zimmerman, 2008) that suggest how these variables could be related during the learning process, but the relationship is probably not one-way. It may also occur that good cognitive regulation reinforces

motivation and its factors, such as self-efficacy or internal locus of control; this is an aspect that could be addressed in future research. Likewise, it would be interesting to assess the conceptual model proposed by introducing other variables that are relevant to academic achievement (e.g., personality, intelligence, etc.), and to evaluate their effect at different times. Despite these and other possible limitations, we believe that this study provides new insights into the emotional intelligence and academic performance link, the factors involved, and its interplays in secondary education students.

The findings of this study have several theoretical and practical implications. At the theoretical level, certain mechanisms that can help to understand why emotionally intelligent secondary education students can obtain better academic achievement are introduced. The effect of emotional intelligence on academic achievement seems to take place mainly through its positive relationship with other emotional and cognitive processes (emotional well-being, motivation, and learning strategies) that are involved in academic achievement. Secondly, students' emotional well-being (as a parsimonious construct representing positive affect) works similarly to discrete positive emotions, mediating the cognitive processes that are involved in learning. Likewise, the benefits of emotional intelligence in its association with academic achievement go beyond the affective to the cognitive dimension by predicting greater motivation and better learning strategies. And finally, emotional, motivational, and cognitive processes are largely interconnected rather than working in isolation.

At the practical level, this study highlights the need to improve students' emotional competences. The school context is full of academic, personal, and social situations that trigger many emotions in students (e.g., frustration over not being able to accomplish a task, sadness because of a bad result, anxiety before an exam, hope to pass, etc.). It is therefore an ideal setting for the development of one's own and others' emotional awareness and emotional intelligence. Students should learn how to correctly identify, admit, name, express, and regulate their emotions. However, while there are clearly many who are successful, evidence shows that improving it results in major benefits. Emotional intelligence is not only beneficial for health, emotional well-being, and academic performance, but its advantages also extend to other contexts and longer-term situations (Klare et al., 2014; Vasudevan et al., 2017). Whereas teaching children and youth is a big current and future challenge, finding how to do so is even harder. Some of the ways to reach them could involve providing parents with the appropriate tools for good emotional education, as well as trying to reach students' families, who are probably eager to learn how to manage their children's emotions, and even their own, so that they can become good emotional role models. Another is to train future education professionals in the most appropriate teaching strategies to address the subject of emotional intelligence within and outside the curriculum. Universities' curricula for undergraduate degrees in education should include subjects on emotional intelligence and its enhancement so that future teachers may acquire knowledge about the world of emotions and their development, thus learning how to teach their students to recognize and manage their negative emotions and build positive affective states. This is, unquestionably, a worthwhile effort because of the countless personal, academic, work-related, social, and health benefits that it can provide.

## Conclusions

Emotional intelligence and academic achievement do not directly correlate but their relationship is serially mediated by emotional well-being, as well as motivational and cognitive factors which are ultimately associated with academic achievement. Among the mediating factors assessed, there is a serial, and to a lesser extent specific, effect, which suggests an interrelationship between emo-

tional and cognitive processes during learning. To conclude, the benefits attributed to emotional intelligence in academic achievement can go beyond favoring greater emotional well-being as a result of better emotional regulation, also entailing better functioning in motivational and cognitive processes.

## Conflict of Interest

The authors of this article declare no conflict of interest.

## Note

The dataset of this work is available at the following address: <http://hdl.handle.net/10366/151235>

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