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Emotional intelligence profiles at the end of primary education and academic performance

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KEYWORDS

Academic performance, emotional intelligence, primary education, students

Abstract Emotional intelligence (EI) has been one of the topics with the most repercussion in the last decades in the fields of psychology and education, but its relationship with the academic performance of students has generated a lot of controversy in scientific research. The objective of the present study was to check the EI profiles of students when they finished primary school, and if there were any differences in the grade point average (GPA) between the EI profiles. The sample consisted of 1253 students (681 males; 572 females) from Tenerife (Spain) in the 6th grade of primary education, with an age range between 10 to 13 years old. The students' EI was evaluated with the Emotional Quotient Inventory Young Version (EQi-YV). Academic performance was obtained from end-of-course grades. Cluster analysis identified the existence of five EI profiles at the end of primary education. There were no statistically significant differences in the GPA between the five groups of students, and trait EI had no influence on performance. These findings are in line with other research that questions the existence of a significant positive relationship between trait EI and academic performance.

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Perfiles de inteligencia emocional al finalizar la educación primaria y rendimiento académico

PALABRAS CLAVE

Rendimiento académico, inteligencia emocional, educación primaria, estudiantes

Resumen La inteligencia emocional (IE) ha sido uno de los tópicos con más repercusión en las últimas décadas en los campos de la psicología y la educación, pero su relación con el rendimiento académico de los estudiantes ha generado mucha controversia en la investigación científica. El objetivo del presente estudio fue comprobar cuáles son los perfiles de IE de los estudiantes cuando terminan la educación primaria, y si existían diferencias en el rendimiento académico promedio entre los distintos perfiles de IE. La muestra fue de 1253 estudiantes (681 niños; 572 niñas) de Tenerife (España) de 6º curso de educación primaria, con un rango de edad de 10 a 13 años. La IE de los estudiantes fue evaluada con el Inventario de Cociente Emocional Versión Joven (EQi-YV). El rendimiento académico fue obtenido de las calificaciones de final de curso. El análisis de conglomerados identificó la existencia de cinco perfiles de IE al finalizar la educación primaria. No existían

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diferencias estadísticamente significativas en el rendimiento académico promedio entre los cinco grupos de estudiantes, y la IE de rasgo no tuvo influencia en el rendimiento. Estos hallazgos van en la línea de otras investigaciones que cuestionan la existencia de una relación positiva significativa entre la IE de rasgo y el rendimiento académico.

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Emotional Intelligence (EI) has been a construct that has generated great interest in the fields of education and psychology, due to its influence on the well-being of students and their learning process (Martins, Ramalho, & Morin, 2010; Viquer, Cantero, & Bañuls, 2017). The first definition of EI was elaborated by Salovey and Mayer (1990), who defined it as “the ability to monitor one’s own and others’ feelings and emotions, to discriminate among them and to use this information to guide one’s thinking and actions” (p. 189). EI was presented as a way to conceptualize the relation between cognition and affect. Historically, emotion and intelligence were viewed as being in opposition to one another (Lloyd, 1979).

Later, Goleman (1995) popularized EI, conceptualizing it as the ability to know and manage your own emotions, motivate yourself, recognize the emotions of others, and establish social relationships. Research has shown the positive relationship between EI and other variables such as academic performance (Corcoran, Cheung, Kim, & Xie, 2018), psychosocial adjustment (Salguero, Fernández-Berrocal, Ruiz-Aranda, Castillo, & Palomera, 2015), and subjective well-being in children and adolescents (Prado, Villanueva, & Górriz, 2018). Furthermore, there is no doubt about the importance of the development of social and emotional skills in children throughout their growth for their proper psychosocial progress and in order for them to achieve the greatest possible success in adult life (Goleman, 1995; Ramos-Díaz, Rodríguez-Fernández, Axpe, & Ferrara, 2019).

Historically, in the study of EI there have been two theoretical currents: ability and trait EI models. Ability models consider that EI is composed of specific emotional abilities, understanding EI as a set of abilities to perceive, express, understand, regulate and control emotions in oneself and in others (Mayer & Salovey, 1997; Salovey & Mayer, 1990). This ability-based approach concerns the actual cognitive processing of emotional information as measured through maximal performance tests (Mayer, Salovey, & Caruso, 2008). Several limitations of these models have been noted. The most prominent among these is that the inherent subjectivity of emotional experience precludes the maximal-performance assessment of EI with respect to objective criteria (Brody, 2004; Petrides, 2011). In this regard, EI cannot be a true intelligence given that it is not amenable to veridical assessment (Petrides, 2011).

Trait models consider that EI elements are personality traits that determine how people behave in emotional situations (Petrides, Pita, & Kokkinaki, 2007). For this research we start from a model of this second group, the socio-emotional competence model by Bar-On (2006) which identifies in EI the dimensions of intrapersonal competence, interpersonal competence, stress management and general mood. Consistent with this model, to be emotionally and socially intelligent is to effectively understand and express oneself, to understand and relate well with others, and

to successfully cope with daily demands, challenges and stressful situations (Broc Cavero, 2019; Sarrionandia & Garai-gordobil, 2017). This is based, first and foremost, on one’s intrapersonal ability to be aware of oneself, to understand one’s strengths and weaknesses, and to express one’s feelings and thoughts non-destructively. On the interpersonal level, being emotionally and socially intelligent encompasses the ability to be aware of others’ emotions, feelings and needs, and to establish and maintain cooperative, constructive and mutually satisfying relationships (Herrera, Buitrago, & Cepero, 2019). Ultimately, being emotionally and socially intelligent means to effectively manage personal, social and environmental change by realistically and flexibly coping with the immediate situation, solving problems and making decisions (Bar-On, 2006).

School-based research on EI and academic performance has been conducted in different ways and with mixed results. In the field of primary education, the study of EI as a key competence to improve school success has been the subject of many studies (Howard & Cogswell, 2018). However, it is important to keep in mind that the scientific production that has investigated the relationship between EI and academic performance has focused overall on the tertiary level, followed by the secondary level and finally the primary level (MacCann et al., 2020), so further study of the influence of EI on academic performance is necessary. Ferrando et al. (2011), with a sample of students in their last years of primary education, found a positive correlation ($r = .29$) between trait EI and academic performance. Perera and DiGiacomo (2013) performed a meta-analysis examining rating scales of trait EI. They included primary, secondary and tertiary academic level studies. On a general level, they found a corrected correlation of $.20$ with academic performance. But, when specifically analysing the relationship between trait EI and academic performance according to educational level, the results indicated that the highest correlation was in primary education ($r = .28$) and the lowest in tertiary education ($r = .18$). Along these same lines, Andrei, Mancini, Mazzoni, Russo and Baldaro (2015), with a sample consisting of primary and secondary education students, between 8-13 years old, showed the existence of a positive correlation between trait EI and maths ($r = .27$) and language and literacy ($r = .27$).

In contrast, Mavroveli and Sánchez-Ruiz (2011), when studying the relationship between EI and performance in math, reading and writing, with a sample of English primary school students, only found a positive relationship between EI and performance in mathematics for third-year students, although they found a relationship between trait EI and other variables that might be important for school adjustment, such as higher prosocial behaviours and lower antisocial behaviours (Petrides, 2009, 2011). Regarding the importance of EI, specifically at the end of primary education, which can be considered as the transition between

preadolescence and adolescence, different studies argue that it is relevant in predicting fundamental aspects such as mental functioning (Cobos-Sánchez, Flujas-Contreras, & Gómez-Becerra, 2017) and scholastic achievement (Agnoli et al., 2012).

The relationship between trait EI and academic performance has also been studied in other educational stages. Specifically, in secondary education, Mancini et al. (2017) found that trait EI had a positive relationship with grades in literature, but not in maths. Broc Cavero (2019), with a sample of students from all secondary education courses, found that some factors of trait EI, interpersonal competence, and stress management had a low but positive correlation that explained the low level of academic performance variance. In university education, results have been mixed. On the one hand, Saklofske, Austin, Mastoras, Beaton and Osborne (2012) found a slightly negative relationship between the EI component, interpersonal competence, with academic performance. On the other hand, Sánchez-Ruiz, Mavroveli and Poullis (2013) found a positive correlation ($r = .35$) between trait EI and the grade performance average with a sample of university students in Cyprus.

Some researchers argue that EI is redundant and has little incremental validity above and beyond the effects of intelligence and personality (Schulte, Ree, & Carretta, 2004). Indeed, in a few studies where EI has been related to positive outcomes, the positive effect of EI disappears after controlling for intelligence and personality (Walter, Cole, & Humphrey, 2011). Therefore, researchers have discussed the need to establish, not only the main effect of EI, but also the incremental validity of EI relative to intelligence and personality (Miao, Humphrey, & Qian, 2017). Ferragut and Fierro (2012), in a study with primary education students, did not find a positive relationship between EI and academic performance, or that EI had a direct predictive capacity on academic performance.

Regarding the influence of EI on academic performance, its indirect incidence should also be highlighted, since students who have better emotional management are perceived by their teachers to be less conflictive, more adapted to school, and have a better predisposition to carry out activities associated with learning (Di Fabio & Palazzeschi, 2015). Students scoring higher in EI are less likely to develop negative attitudes toward the school and its teachers (Rivers, Brackett, & Salovey, 2008). It should also be taken into account that there are educational positions that affirm that many cases of low academic performance have their origin in emotional problems and not in the lack of capacity, so it would be of utmost importance that EI be incorporated into the educational curriculum (Ibarrola, 2015). In any case, evidence supporting the role of EI in academic settings is mixed, so more research is needed in order to discover if and how EI relates to academic performance.

A study perspective that until now has been little used, is to check the EI profile of students, which can help clarify the relationship between EI and academic performance, highlighting which EI profiles are associated with school success, especially relevant in a transition stage such as the completion of primary education and the start of secondary education (Evans, Borriello, & Field, 2018). In this research, special interest has been placed on the end of the primary education, since the transition to secondary education sets the beginning of adolescence and represents one of the most complex changes that students experience

during their academic trajectory (González-Rodríguez, Vieira, & Vidal, 2019). With respect to emotional traits, Qualter, Whiteley, Hutchinson, and Pope (2007) found that, compared to students with below average EI, those with average or higher levels of EI received better grades in school, and had fewer teacher concerns regarding effort following the transition to secondary education.

The few times that this perspective of EI profiles has been used, it has been focused on university students (Sánchez-Ruiz, Pérez-González, & Petrides, 2010), so research must be carried out at other educational levels in order to check its level of importance on academic performance. Moreover, the identification of profiles by statistical methods such as 'quick cluster analysis' offers better information on how students are distributed than using only descriptive statistics (Martínez-Monteagudo, Inglés, Granados, Aparisi, & García-Fernández, 2019). Furthermore, in educational contexts, students are distributed into natural groups based on the variables analysed, but they are heterogeneous between the different groups, which makes it correct when we want to check how students are distributed according to a series of variables, in this case trait EI. This fact allows us to represent the phenomenon of interest in a large number of participants with a small number of profiles and enables us to make comparisons between them (Aldenderfer & Blashfield, 1984; Pérez-Gil & Moreno, 1991). Unfortunately, in the meta-analysis that different authors have made regarding the relationship between trait EI and academic performance, they have not found studies that address this relationship using trait EI profiles (MacCann et al., 2020; Perera & DiGiacomo, 2013).

Accordingly, the current study has three aims: to analyse the EI profiles of students completing primary education, to check the differences in academic performance between existing EI profiles, and to verify the predictive capacity of trait EI in academic performance at the end of primary education.

Method

Participants

The student sample was selected through non-probability sampling. The initial sample was 1458 students. After the elimination of invalid cases, applying the *inconsistency index* of the EQj-YV, the final sample consisted of 1253 students (681 males; 572 females) in 6th grade of primary education and from 34 public schools in Tenerife, Spain. The age range of the students was 10 to 13 years old, with a mean age for boys of 11.43 ($SD = .68$) and 11.35 ($SD = .71$) for girls. Therefore, with respect to the initial sample, 195 cases were eliminated.

Instruments

EI was evaluated with the Emotional Quotient Inventory (Young Version) EQj-YV (Bar-On & Parker, 2000). It is intended for students aged between 7 and 18 years old. The questionnaire consists of 60 statements on a four-point Likert scale, with 1 being very seldom or not true of me and 4 being very often or true of me, in which the following dimensions are assessed: general mood (14 items), adaptability

(10 items), stress management (12 items), interpersonal competence (12 items) and intrapersonal competence (6 items). Finally, it also has two scales that control the validity of the test. The positive impression scale, consisting of six items, allows spotting cases with an exaggerated positive perception (cases with standard scores above 130 are invalidated); and the inconsistency index (cases that reach a value equal to or greater than 10 are invalidated), by reflecting a high number of random responses. The reliability of the scale was evaluated with the present study sample using Cronbach's alpha and composite reliability index. Cronbach's alpha (α) for the total of the scale was .85, and for the subscales it was .77 for general mood, .91 for adaptability, .71 for stress management, .86 for interpersonal, and .77 for intrapersonal. Regarding the results of the composite reliability index (CR), they were also acceptable, with values higher than .70. CR was .84 for total scale, .79 for general mood, .89 for adaptability, .73 for stress management, .83 for interpersonal, and .75 for intrapersonal.

The academic performance was obtained from the final grades of the students in the 2018/2019 academic year. A GPA was extracted from the core subjects of Mathematics, Spanish Language and Literature, Natural Sciences, Social Sciences, and English (Costa & Faria, 2015). In Spain, school grades in secondary education range from 1 to 10, with a grade higher than 5 being considered as 'passed'.

Procedure

A letter explaining the objectives of the study was sent to all public schools in the metropolitan area of Tenerife. From a total of 67 public schools from this area, 34 responded affirmatively, participating in the research. Interested schools signed a consent form granting permission for the study. Parents or legal guardians were informed of the purpose of the study and their rights as participants in it and signed the informed consent provided.

The EQi-YV questionnaire was administered during school hours in each of the classes evaluated. Before it was carried out, the students were informed that there were no good or bad answers, thus they could respond with total sincerity since the evaluation was anonymous.

In order to relate the results of the EI assessment and the academic grades, the teacher of each class assigned a number to each student. This number was recorded both in the ratings provided by the student and on the first page of each of the administered questionnaires.

Statistical analysis

The IBM SPSS 24 and EQS 6.1 statistical programs were used to carry out the statistical analysis. First, the normality of the data was verified with the Kolmogorov-Smirnov test. Descriptive and correlational analyses were done. The correlations between the different factors of the EQi-YV and the GPA were measured using the Pearson correlation coefficient. Interpretation of the correlations was carried out using the criteria proposed by Cohen (1988).

In order to identify the profiles, the method 'quick cluster analysis' was used. This non-hierarchical method was chosen because it enables reassignment, which allows an

individual who has been assigned to a particular group at a certain stage of the process to be reassigned to another group if this optimizes the selection criteria. This method of conglomerate analysis is a suitable procedure for establishing profiles when a large sample of subjects is used (Hair, Anderson, Tatham, & Black, 1998).

The profiles have been defined from the different combinations of the five EI factors that assess the EQi-YV: general mood, adaptability, stress management, interpersonal competence, and intrapersonal competence. The criteria followed in choosing the number of clusters was used in order to maximize the inter-cluster differences in order to be able to establish the largest possible number of groups with different combinations in the dimensions of EI. After obtaining the five groups of EI through cluster analysis, the inter-class differences in the GPA were analysed using analysis of variance.

Finally, a hierarchical regression analysis was carried out to check if the trait EI factors predict academic performance.

Results

The normal distribution of the data for general mood, adaptability, stress management, intrapersonal competence, interpersonal competence, and GPA in the students' sample was verified with the Kolmogorov-Smirnov test of normality ($p > .05$). The correlation coefficients, the means and the standard deviations between EI factors and GPA are shown in Table 1. The results allow us to appreciate that GPA and stress management do not correlate with any variable, and moreover, the rest of EI factors, general mood, adaptability, interpersonal, and intrapersonal competences are positively and significantly related to each other with a magnitude ranging between moderate and low scores.

Table 1 Correlations, means and standard deviation for EI factors and GPA

	1	2	3	4	5	6
1. General mood	1					
2. Adaptability	.38**	1				
3. Stress management	-.01	-.04	1			
4. Interpersonal	.37**	.43**	-.04	1		
5. Intrapersonal	.30**	.25**	-.03	.28**	1	
6. GPA	-.04	-.03	-.04	-.04	-.03	1
<i>M</i>	3.24	2.83	2.41	3.19	2.38	6.60
<i>SD</i>	.42	.50	.39	.43	.49	1.88

** $p < .01$.

EI profiles were defined based on the different combinations of EI factors (see Figure 1). The five-cluster solution consisted of a group (profile 1) made up of 203 (16.20%) students with high scores in interpersonal competences and medium scores in general mood, adaptability, stress management, and intrapersonal competences. The second group (profile 2),

composed of 124 (9.90%) students, was characterized by low scores in intrapersonal competence and medium scores in general mood, adaptability, stress management and interpersonal competence. The third group (profile 3) had 300 (23.94%) students, who were characterized by very high scores in general mood and interpersonal competence, high scores in adaptability, and medium scores in stress management and intrapersonal competence. The fourth group (profile 4), with 329 (26.26%) students, was characterized by high scores in general mood and interpersonal competence, and medium scores in adaptability, stress management and intrapersonal competence. Finally, the last group (profile 5), composed of 297 (23.70%) students, was characterized by high scores in general mood, adaptability and interpersonal competence, medium scores in stress management and low scores in intrapersonal competence.

Analysis of variance was used to confirm possible differences among the EI profiles in GPA (see Table 2). The results show that there were no statistically significant differences between EI profiles in GPA.

Table 2. Mean and standard deviation in GPA for EI profiles

	<i>M</i>	<i>SD</i>	<i>F</i>	<i>Sig.</i>
Profile 1	6.64	1.88		
Profile 2	6.48	1.62		
Profile 3	7.05	1.86	2.057	.084
Profile 4	6.68	1.91		
Profile 5	6.43	1.97		

To quantify the predictive capacity of the trait EI factors in the academic performance of the students at the end of primary education, a hierarchical regression analysis was carried out with GPA as the criterion. The results showed

that a significant model $F(5, 1247) = .981, p = .428, R^2 = .004$ did not emerge. Therefore, trait EI factors do not explain the significant amount of variance in the academic performance of students who complete primary education.

Discussion

There were three main objectives in this research: To analyse the EI profiles of the students at the end of primary education, to check if there were significant differences in academic performance according to the EI profiles, and to verify the predictive capacity of trait EI in academic performance at the end of primary education.

Regarding the first objective, the results indicated the existence of five different EI profiles in students completing primary education. One group had very high scores for interpersonal competence and average scores for the other factors. A second group had low values for intrapersonal competence and average values for the other factors. A third group had very high values for general mood and interpersonal competence, high values for adaptability, and average values for stress management and intrapersonal competence. A fourth group had high scores for general mood and interpersonal competence, and medium scores for adaptability, stress management and intrapersonal competence. The fifth group had high scores for general mood, adaptability and interpersonal competence, medium scores for stress management, and low scores for intrapersonal competence. These results show the diversity in the EI presented by the students, but if we compare the results obtained in the different profiles, we see that there are mainly two domains in which they score the most: general mood and interpersonal competence; and two domains in which they generally score less: stress management and intrapersonal competence. The study of the EI from the cluster analysis allows us to really know what the EI of each student is, since it clearly identifies the different existing

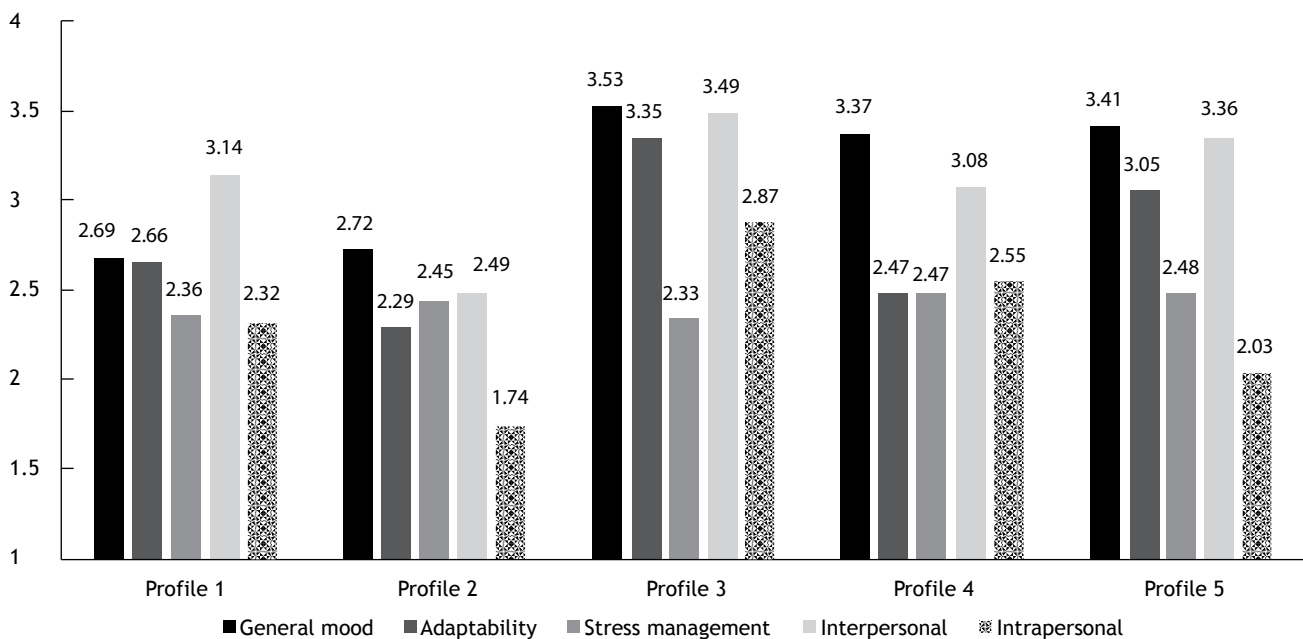


Figure 1. Emotional Intelligence profiles

groups, beyond making a general and biased analysis of the EI of the entire class as a group, when it is verified that there really are different patterns within the classroom that must be considered.

Regarding the second objective, evidence in the scientific literature has been inconsistent with respect to the relationship between trait EI and academic performance, suggesting the need for research to investigate this topic. We do not know about studies that would have approached the relationship between trait EI and academic performance from the position of the different profiles that may exist at the end of a school stage as important as primary education. The results obtained showed that there were no statistically significant differences in academic performance between the five EI profiles. These results do not question the importance of the development of social and emotional competences in children, given that they are known to be crucial for their development and adaptation to society throughout their growth, as well as being crucial for their ability to lead successful adult lives (Acosta-Prado & Zárata, 2019; Morón, 2020); however, they do delve into the nature of the relationship between EI and academic performance.

As for no profile having a better GPA than another, there are at least two explanations for this. The first is that EI factors do not really have an impact on academic performance (Hansenne & Legrand, 2012). Second, that the relationship may occur at younger ages than the completion of primary education, but as students progress through school, this relationship is lost. This explanation may be plausible, given that other authors have found that in post-primary stages there is no relationship between EI and academic performance, but there is when students are younger (Agnoli et al., 2012; Mavroveli & Sánchez-Ruiz, 2011; Perera & DiGiacomo, 2013). Future studies should extend on this work, particularly examining the relationship between EI profiles and academic performance in earlier educational stages, where the less cognitive restriction of the sample could lead to a stronger relationship between the two factors.

Prior to the analysis of the relationship between profiles and academic performance, the correlational analysis was carried out as has been done in previous studies. In the present study, none of the trait EI factors had a significant positive correlation with GPA. The results of other research on this relationship in primary education have been very diverse. For example, Ferrando et al. (2011) found a significant positive correlation, but it had a small sample of 290 students from a semi-public school, so it is difficult to generalise. In another study, Andrei et al. (2015) also found a positive significant correlation, but the study sample was too heterogeneous, since it included primary and secondary school students. Finally, Mavroveli and Sánchez-Ruiz (2011) found a significant positive correlation in a sample of English students which is considered the equivalent of the first year of primary education in Spain, with an average age of 7 years old, while in more advanced courses of primary education there was no significant correlation. This last result is in line with the present study, and as commented above, it is possible that this relationship between trait EI and academic performance is only significant at the beginning of primary education, and with the passing of the courses, it is lost.

Regarding the last objective, the results showed the non-existence of predictive capacity of trait EI factors in academic performance. This result is in line with those

obtained during the development of this research, given that the trait EI factors did not have a significant correlation with GPA, and no differences were found in GPA according to the trait EI profiles of the students, so it could be considered normal that hierarchical regression analysis revealed that trait EI is a non-predictor of academic performance at the end of primary education. Similar results have been found by other authors for the primary education level, who reported that trait EI does not predict school performance in children. (Hansenne & Legrand, 2012; Mavroveli, Petrides, Sangareau, & Furnham, 2009).

In conclusion, the findings show that there seems to be no relationship between trait EI and academic performance, as has been reported previously by Hansenne and Legrand (2012) and Mavroveli and Sánchez-Ruiz (2011) in different studies with primary school children. Perhaps the positive influence of trait EI on the school adjustment of children in primary education should be sought as a moderating factor for other variables, such as socialization, self-esteem or well-being.

This study has several limitations. The selection of the student sample was not carried out randomly, although a considerable number of students were obtained from a wide variety of schools. Also keep in mind that the study is based on cross-sectional data. It would be advisable to be able to do a longitudinal study with different evaluations throughout the academic years to check the variation of the EI profiles and their relationship with academic performance.

In future research, it would be interesting to establish the different profiles of EI in other primary education courses and in other educational stages such as secondary education or university studies, and to research the differences with academic performance in specific subjects, and not only with the GPA.

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