

Emotional Intelligence and its Relationship with Gender, Academic Performance and Intellectual Abilities of Undergraduates

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Abstract

Introduction. Emotional intelligence has been linked to several variables, such as gender, and academic performance. In the area of high intellectual abilities, the literature shows controversy, without a unanimous result on the relationship between both variables. In the present study we analyzed the modulatory effect has academic performance in a sample of college students, one group with normal intelligence and other one with superior intelligence, and gender.

Method. The sample consisted of 129 students who admitted in health sciences careers, 64 students had high intelligence and 65 students had normal intelligence. To measure emotional intelligence was used Mayer, Salovey and Caruso Emotional Intelligence Test (MSCEIT) and grade point average for academic performance.

Results. The results show that the performance differential plays a role in some of the branches assessed by the instrument. Similarly, there are differences between the groups in emotional Facilitation, Strategic Emotional Intelligence and Emotional Understanding, being in all cases higher the score in the more intelligent and woman.

Discussion. The results indicate relationship between emotional intelligence and performance, although it differs depending on the performance indicator is taken. In addition, we note a relationship between emotional intelligence and intellectual capacity, the results partially support the hypothesis that women and the most able have more emotional intelligence.

Keywords: Emotional intelligence, high capacity, academic performance, undergraduates.

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La Inteligencia Emocional y su Relación con el Género, el Rendimiento Académico y la Capacidad Intelectual del Alumnado Universitario

Resumen

Introducción. La inteligencia emocional se ha relacionado con diversas variables, como el género y el rendimiento académico. En el ámbito de la capacidad intelectual, la literatura muestra controversia, sin que exista un resultado unánime sobre la relación que existe entre estas variables. En el presente estudio se analiza el efecto modulador que tiene el rendimiento académico, en una muestra de estudiantes universitarios recién ingresados, comparando por grupos, uno con inteligencia promedio y otro con inteligencia superior, y el género.

Método. La muestra estuvo constituida por 129 estudiantes que ingresaron al centro universitario de ciencias de la salud en el curso escolar 2011-2012, de los cuales 64 presentaban inteligencia superior y 65 promedio. Para medir la inteligencia emocional se utilizó el Mayer, Salovey and Caruso Emotional Intelligence Test (MSCEIT), el test de Matrices Progresivas Escala Avanzada para la medida de la inteligencia y como indicador de rendimiento académico, el promedio de calificaciones.

Resultados. Los resultados muestran que el rendimiento juega un papel diferencial en algunas de las ramas apesadas por el instrumento. Igualmente, aparecen diferencias entre los grupos en *Facilitación emocional*, *Inteligencia Emocional Estratégica* y en *Comprensión Emocional*, siendo en todos los casos mayor la puntuación de las mujeres y de los más inteligentes.

Discusión. Los resultados señalan relación entre inteligencia emocional y rendimiento, si bien difieren, en función del indicador de rendimiento que se tome. Además, se comprueba una relación entre inteligencia emocional, género y capacidad intelectual, apoyando los resultados parcialmente la hipótesis de que las mujeres y las personas con mayor capacidad intelectual presentan más inteligencia emocional.

Palabras Clave: Inteligencia emocional, capacidad intelectual, rendimiento académico, universitarios.

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Introduction

Emotional intelligence is a matter that has been gaining relevance since Salovey and Mayer's work (1990), once the term was popularized by Goleman (1995), even though this concept refers to different conceptions, incorporating different components. Brackett and Mayer (2003) distinguish between two kinds of models: mixt, which includes the ones of Bar-On (1997) or Schutte et al. (1998), and the model of mental ability (Brackett and Mayer, 2003), corresponding to the one of Mayer and Salovey, which can be considered as a more rigorous measuring and analysis form (Valls, 2007). In a recent research carried out by academics and professionals of the Spanish Psychology, they pointed out that this model was the best known and accepted (Lorenzo, 2012).

Mayer and Salovey (1997) propose a hierarchic model, known as the *Four Branches Model* (Ruvalcaba and Gallegos, on print), composed of four abilities: a) to perceive and value the emotion exactly, b) to access and/or generate feelings when they facilitate thought, c) to understand emotion and emotional knowledge, and d) to regulate emotions promoting emotional and intellectual growth. The authors state these four abilities or branches are arranged, showing a growing progression on its acquisition (Mayer, Salovey and Carusso, 2004). The approach of ability, as it can be acquired, allows it to be learnt and taught, also allowing its application on the educational field, in order to improve people's well-being and life quality (Ruvalcaba and Gallegos, on print).

Emotional intelligence has been linked to subjective well-being (Bar-On, 2005), happiness (Bar-On, 2010), mental health (Bhullar, Shutte and Malouff, 2012; Martínez, Piqueras and Ramos, 2010), prevention of risk behaviours, (Brackett and Mayer, 2003), social competence (Brasseur and Gregoire, 2011; Zavala, Valadez and Vargas, 2008), strength of family relationships (Chan, 2005), as well as to locus of control and self-efficacy (Bellamy, Gore and Sturgis, 2005), and the socio-academic adjustment of the students (Pena and Repetto, 2008).

The relationship between EI and gender is a controversial topic, since several researches have found out differences depending on the gender, which generally benefit women (Extremera, Duran and Rey, 2007); Extremera, Fernández-Berrocal and Salovey, 2006; Valadez, Pérez and Beltrán, 2010; Thompson, Waltz, Croyle and Pepper, 2007), or otherwise they do it differentially: women get higher scores when it comes to the relationship with oth-

ers, while men get them in problem resolution (Sánchez, Fernández-Berrocal, Montañes and Latorre, 2008). However, results are not unanimous, and there may be no differences (Chan, 2005; Prieto-Rincón, Inciarte-Mundo, Rincón-Prieto and Bonilla, 2008), or finding modulating variables, such as age (Cabello, Fernández-Berrocal, Castillo and Extremera, 2011), socialization patterns of the parents (Sánchez, Rodríguez and Padilla, 2007), or the locus of control and self-efficacy (Bellamy et al., 2005).

Academic performance is one of the most researched aspects, but the obtained findings are far from concluding. On one hand, some researches show a relationship between EI and performance (Bar-On, 2007; Extremera and Fernández-Berrocal, 2009; Gil-Orarte, Palomera and Bracket, 2006; Jiménez and López, 2013; Lee and Olszewski-Kubilius, 2006; Woitaszewski and Aalsma, 2004; Pérez-Pérez and Castejón, 2006), and on the other hand it has been observed that it has a mediator role on academic success (MacCann, Fogarty and Zeidner, 2011). On other cases, it appears as an adequate predictor of the academic performance (López, Mestre and Abellán, 2011; Parker, Summerfeldt, Hogan and Majeski, 2004), or there is a significant relationship, but without too big of an effect (Mayer et al., 2004).

Other researches, however, don't clearly support the relationship between performance and EI. In the work of Sánchez et al., (2007), the relationship appears in a single factor, so a higher emotional attention entails a lower academic performance. In other cases there is a relationship when cognitive and personality variables are controlled (Barchard, 2003), or the opposite: the signification of the correlation disappears controlling intelligence (Bracket and Salovey, 2006). Newsome, Day and Catano (2000), failed to find a positive relationship between emotional intelligence, measured with the EQ-i, and academic performance in Canadian undergraduates.

In the area of intellectual abilities, relationships between cognitive and emotional intelligence have been found (Gil et al., 2006). When the researches are focused on people with a high intellectual ability, the relationship with aspects such as interpersonal relationships and social and personal adjustment has been an ancient matter of debate which is still open, even though recent investigations point at an absence of difference in these aspects with respect to normative groups (Borges, Hernández-Jorge and Rodríguez-Naveiras, 2011; López and Sotillo, 2009). Regarding differences in emotional intelligence between groups of different intellectual abilities, Brasseur and Gregoire (2011) didn't find any difference between the highly

intelligent and teenagers of average intelligence when it comes to emotional intelligence, while both Prieto et al. (2008) as Valadez et al. (2010) show that the highly intelligent have a higher competence in emotional intelligence.

In brief, emotional intelligence is an extremely promising heading, but it requires a rigorous and broad investigation in order to throw light on the role it plays in fields where its relevance is postulated. Little concluding results may be due to the little homogeneity of the concept of emotional intelligence or the way to measure it. Works of Valadez et al. (2010) and Zeidner, Shani-Zinovich and Matthews (2005), unsurprisingly, show that findings depend on the kind of instrument used to measure emotional intelligence. Because of that, investigation on emotional intelligence and related factors is of great importance.

Goal and hypothesis

The goal of this work is to determine the relationship existing between intellectual abilities and emotional intelligence, taking into account gender and academic performance. Thus, three hypotheses are set out: a) emotional intelligence is related to academic performance, b) the most intelligent show a higher emotional intelligence, and c) women, regardless of their intellectual abilities, show a higher emotional intelligence.

Method

Participants

129 students from different degrees of the Health Sciences University Centre during the academic year 2011/2012 took part in the research. Their ages ranged from 17 to 20 years old (mean: 18.26, SD=0.6), and they were 49 males and 80 females, studying degrees in the knowledge field of Health Sciences: Dental Surgeon (14), Nursing (14), Medicine (63), Nutrition (12) and Psychology (26).

Two groups were established depending on the scores obtained in Raven's Advanced Progressive Matrices Test. The first consisted of students with superior intelligence, with a percentile of 90 or more in said test (n=64), and a group of average intelligence, with marks corresponding to a percentile of 50 (n=65).

Instruments

Raven's Advanced Progressive Matrices Test (Raven, Cort and Raven, 2001). The Progressive Matrices tests are a test of intellectual abilities, and are considered "culture free". The Advanced scale measures intellectual efficiency, allowing to differentiate people with a higher aptitude. It consists of two different sets: Set I and Set II. Set I consists of 12 items, it is generally used so the evaluated becomes familiar with the nature of the problems presented in Set II. Set II consists of 36 items of increasing difficulty. On every item, the correct figure which completes the matrix must be chosen between 8 options.

Authors (Raven et al., 2001), inform of a test-retest reliability of 0.91 in the case of British adults with intellectual abilities above average. For the construct validity, in the factorial analysis a saturation of "g" of 0.82 was obtained. In Mexico, in the research effected by Méndez-Sánchez and Palacios-Salas (2001), in order to obtain the scales in the City of Aguascalientes, they found scores similar to those of Raven et al. (2001). The test can be applied individually or collectively, with or without a time limit. In this research, Set II was applied in groups and without a time limit.

Spanish Adaptation to the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) (Extremera and Fernández-Berrocal, 2009). It evaluates emotional intelligence measuring people's execution of tasks and emotional problems resolution in two areas: Experiential Intelligence and Strategic Emotional Intelligence, unfolded in four branches: a) emotional perception; b) emotional facilitation; c) emotional understanding; and d) emotional management. Each branch has two associate tasks: *Faces and Pictures*, *Facilitation and Sensation*, *Changes and Blends*, *Emotion Management and Emotional Relationships*, respectively.

The Spanish version has a reliability of 0.95 in the total score, and in the experiential and strategic fields, a 0.93 and 0.90 respectively, all similar to the original version. Factorial validity of the Spanish adaptation of the MSCEIT fit in with the structure of the original test, obtaining a four-factor model according to Mayer and Salovey's theory.

Criterion variables

Pre-university average: Average grades obtained when finishing high school.

Academic Aptitude Test (Prueba de Aptitud Académica, PAA¹): Test taken by Mexican students in order to enter a degree offered by the university, measuring three cognitive areas: mathematic logic reasoning; verbal reasoning; and critic reading and writing.

Admission points: Average between the grades obtained in high school and the aptitude test.

Present average: It's the average grades reached by the students in the present school year.

Procedure

The head of the department of basic psychology asked the professors teaching in the aforementioned degrees for permission to evaluate the students. Once their consent was obtained, the students were explained what the instruments to apply consisted of, and were invited to participate voluntarily. The tests were applied collectively.

Design and data analysis

There was an ex post facto retrospective design, comparing groups of cases and controls. The relationship between academic performance and scores in the scales of the MSCEIT was analysed by Pearson correlation coefficient. Differences due to abilities and gender were determined by a covariance analysis, ANCOVA, of two factors, controlling the effect of the academic performance using the Aptitude Test as a covariant.

Results

Relationships between different scores in the scales of the MSCEIT and criterial measures of performance (see table n° 1) were analysed. As it can be observed, grades obtained during the year (present average) are independent of the measures of emotional intelligence. The most related criterial variable is the Academic Performance Test, which also happens to be the one with the higher component both cognitive and of knowledges acquired during high school, reaching significant correlations with the Emotional Intelligence Quotient, in the Field of *Strategic Emotional Intelligence* and in one of its branches, *Emotional Understanding*, and its corresponding tasks. Surprisingly, the variable Admission Points reaches

¹<http://escolar.udg.mx/sites/default/files/Guia%20de%20estudios%20PAA.pdf>

significant correlations in the same scales that the Aptitude Test. The task *Emotions Management*, however, is significant with the Pre-University Average and the Admission Points.

Table 1. Pearson's Correlation Quotients between MSCEIT scales and criterial measures of performance

| | High School Average | PAA | Admission Points | Present Average |
|-------------------------|------------------------|--------|---------------------|--------------------|
| EI Quotient | .035 | .201* | .177 | -.035 |
| Experiential EI | -.035 | .140 | .097 | -.134 |
| Emotional Perception | -.041 | .042 | .015 | -.088 |
| Faces | -.010 | -.016 | -.017 | -.012 |
| Pictures | -.045 | .062 | .030 | -.094 |
| Emotional Facilitation | .000 | .133 | .106 | -.106 |
| Facilitation | -.009 | .143 | .111 | -.098 |
| Sensations | .081 | .044 | .071 | -.015 |
| Strategic IE | .072 | .193* | .186* | .061 |
| Emotional Understanding | .093 | .314** | .293** | .119 |
| Changes | .151 | .253** | .269** | .109 |
| Blends | -.043 | .290** | .214* | .057 |
| Emotion Management | .115 | .110 | .139 | .082 |
| Emotion management | .192* | .175 | .225* | .091 |
| Emotional relationships | -.040 | -.014 | -.029 | .042 |

Note: N = 129. EI= Emotional Intelligence * $p < 0.05$. ** $p < 0.01$

In order to determine differences between average-intelligence students and superior-intelligence students in the different scales of Emotional Intelligence, a covariance analysis with two factors, gender and abilities, was calculated, taking as a covariant the Academic Aptitude Test. In table n° 2 the averages and deviations typical on each scale of the MSCEIT are presented based on abilities and gender.

Table 2. Averages and deviations typical on each scale of the EI by gender

| Scales | Superior Intelligence | | Average Intelligence | |
|------------------------------|-----------------------|---------------|----------------------|---------------|
| | Men | Women | Men | Women |
| EI | 105.54 (11.6) | 107.89 (8.4) | 98.28 (11.6) | 103.5 (10.7) |
| Experiential EI | 102.50 (12.0) | 104.18 (9.2) | 96.36 (12.3) | 99.84 (18.9) |
| Emotional Perception | 106.08 (12.7) | 107.87 (10.2) | 102.84 (14.5) | 107.05(12.5) |
| Faces | 102.21 (12.9) | 108.21 (8.9) | 100.12 (13.3) | 106.34 (9.9) |
| Pictures | 106.58 (12.3) | 104.95 (10.0) | 102.92 (13.8) | 104.97 (13.4) |
| Emotional Facilitation | 97.00 (9.8) | 98.74 (10.3) | 90.56 (9.9) | 96.53 (11.6) |
| Facilitation | 93.42 (10.9) | 95.21 (11.4) | 87.00 (10.2) | 92.05 (12.9) |
| Sensations | 102.58 (10.8) | 103.82 (10.8) | 98.68 (11.1) | 104.63 (11.3) |
| Strategic EI | 107.88 (11.8) | 109.42 (8.6) | 101.08 (11.8) | 101.24 (18.0) |
| Emotional Understand- ing | 110.92 (10.3) | 111.71 (9.9) | 105.40 (13.2) | 105.16 (10.7) |
| Changes | 109.21 (10.7) | 111.45 (9.7) | 104.80 (11.9) | 105.82 (13.3) |
| Blends | 110.79 (12.0) | 107.95 (10.1) | 104.52 (15.6) | 103.16 (9.0) |
| Emotional Manage- ment | 102.75 (12.9) | 104.61 (8.8) | 97.44 (11.5) | 101.92 (11.6) |
| Management | 101.38 (11.3) | 102.26 (9.1) | 95.24 (10.1) | 99.11 (12.6) |
| Relationships | 103.38 (9.1) | 106.26 (11.0) | 100.08 (9.1) | 104.37 (10.2) |

In every case with significant differences, the higher scores correspond to women, in the variable gender, and to the most intelligent students, in the variable abilities.

In the Emotional Intelligence Quotient the, the covariant is significant, $F(1.117) = 5.37$, $p = 0.022$, $\eta^2 p = 0.044$, which indicates there is no effect due to the aptitude test. It is confirmed the most intelligent score higher, $F(1.117) = 6.24$, $p = 0.014$ $\eta^2 p = 0.051$ as well as women $F(1.117) = 6.18$, $p = 0.014$, $\eta^2 p = 0.050$.

In the field of Experiential Emotional Intelligence and one of its branches, *Emotional Perception*, there are no significant differences, as well as in one of its tasks, *Pictures*. In the other task, *Faces*, women score significantly higher, $F(1.117) = 8.20$, $p = 0.005$, being the

size of the effect $\eta^2p = 0.066$, although these data must be considered carefully, since the groups are heteroscedastic, $F(3.18) = 2.91, p = 0.038$. In the other branch, *Emotional Facilitation*, women also score higher, $F(1.117) = 4.58, p = 0.03, \eta^2p = 0.038$, as well as the most intelligent, $F(1.117) = 4.06, p = 0.046, \eta^2p = 0.034$. When it comes to associated tasks, there are no differences in *Facilitation* or *Sensations*.

In Strategic Emotional Intelligence there are effects due to the variable ability, $F(1.129) = 7, 16, p < 0.01, \eta^2p = 0.058$, in favour of the most intelligent students. In the associated branch *Emotional Understanding*, the effect of the aptitude test, $F(1.117) = 10.80, p = 0.001, \eta^2p = 0.085$, is controlled, and there are differences in favour of the most intelligent, $F(1.117) = 5.82, p < 0.01, \eta^2p = 0.047$. In the associated task, while on *Change, controlled* the aptitude test $F(1.117) = 7.61, p < 0.010, \eta^2p = 0.061$, there are no differences due to neither gender nor abilities, on *Blends*, once controlled the effect of the covariant, $F(1.117) = 4.84, p < 0.05, \eta^2p = 0.040$, this result must, as in the case of *Faces*, be considered carefully, because it shows heteroscedasticity, ($F(3.18) = 4.05, p < 0.01$). There are no differences in the branch of *Emotional Management* or its related tasks (*Emotional Management* and *Emotional Relationships*).

Discussion and conclusions

The results here obtained state the existence of a relationship between emotional intelligence and performance, even though it is not consistent and depends on the performance indicator considered. Scores obtained in the present year are not significant, and practically neither are the average performance regarding the grades obtained in the High School Average. On this criterial score some abilities intervene other than knowledge (attitude, cleanness in the presentation of tasks and activities), so the scores are a multidimensional construct, formed by a variety of factors, which may even be unconnected to the students (Ruvalcaba and Gallegos, on print), which states that emotional intelligence measured through the MSCEIT has more weight on cognitive factors.

Relationships obtained with the Academic Aptitude Test confirm this assertion, since of the four performance indicators, this is the one which presents the most relevant correlations, but only in one of the branches of Strategic Emotional Intelligence, the *Emotional Understanding*, which can be explained as this field is precisely the one mainly linked to the

cognitive, that is, the ability to label emotions, understand their meaning, their causes and their transitions, Thus, the first considered hypothesis is corroborated only partially, and it coincides with the observed in different investigations (Bar-On, 2007; Extremera and Fernández-Berrocal, 2009; Gil-Olarte et al., 2006; Jiménez and López, 2013; Lee and Olszewski-Kubilius, 2006; Woitaszewski and Aalsma, 2004, Pérez-Pérez and Castejón, 2006). However, it is exposed that the heading “emotional intelligence”, as captured by the MSCEIT, is a complex construct, and its relationship with academic performance must be established clearly, analysing other variables that may help to explain it.

The variable Admission Points, in the extent that is formed by the first two, the Academic Aptitude Test and the Present Average, show significant correlations where the starting variables do. The relationship found in a relational level between emotional intelligence and performance shows the interest in employing said indicator as a covariant. Thus, it plays a relevant role in tasks related to emotional understanding, so in *Changes* the differences of the effect of abilities are produced by academic performance.

Results here presented allow to corroborate the existence of differences due to gender in emotional intelligence, corroborating the third considered hypothesis. Scores obtained on every scale favour women, being significant the difference between both sexes in the Emotional Intelligence Quotient, which coincides with the informed results in several researches (Extremera et al., 2007; Extremera et al., 2006; Valadez et al., 2010; Thompson, Waltz, Croyle y Pepper, 2007), if when the subsequent scores are analysed there are significant differences only in *Emotional Facilitation* and the task of *Faces*, which shows the necessity to include modulating variables which allow to understand the relationship between emotional intelligence and gender.

Facing other researches, where a relationship between intellectual abilities and emotional intelligence hasn't been obtained, present results partially support the hypothesis that states the more able have a higher emotional intelligence, with differences always favouring the most intelligent, confirming findings by Prieto et al. (2008) and Valadez et al. (2010), even though the significance of these differences doesn't appear generally in every scale, and in those that it does appear, the size of the effect is scarce. In the global score of the General Intelligence Quotient, once the influx of performance is controlled, an effect due to the intellectual abilities is also observed. In the associated tasks there are no significant differences,

with the exception of *Blends*. There seems to be differences in the broader structures (*Strategic Emotional Intelligence, Emotional Facilitation and Emotional Understanding*), but these differences aren't kept in the task, with the exception of, as we have said, *Blends*.

The field of emotional intelligence continues to demand a serious and rigorous investigation that establishes what really is included under the *umbrella* of the heading. Not only the diverse models concurring in present time and competing to defend the denomination should be separated, it is also important to elucidate in the clearest way possible which variables are related to emotional intelligence, and what role they play.

Given the relevance of discovering what contributes and to what extent to academic performance, it is important to try to establish the variables which may predict said performance. The form of determining learning results is not easy, as it has been stated in this work. It is clear that depending on the form said academic performance is put into operation, some results or others may happen. However, the way to measure it is far from the reach of this research.

Regarding its relationship with intellectual abilities, the problem with the definition of the concept related to high intelligence, high abilities and other related words, is also similar to the one of emotional intelligence, since conceptualization of what it is understood by it gets through the model ascribed by the researcher. This is the reason why there are also difficulties in determining which characteristics are associated with this ability, which also entails practical problems, such as who can be included in the group and, thus, benefit from the introduced measures, specifically in the educational field (Borges, 2011). In this research, avoiding ascription to a specific model referring to superior intellectual abilities, a simple psychometric model has been chosen, considering higher intelligence when the percentile 90 is surpassed in the very used Raven's Matrices, Advanced scale.

Relationship between emotional intelligence and intellectual abilities, as this research shows, even though it seems to be partially confirmed, it is only associated to some branches, and, inside them, just to determinate tasks. Since defenders of the model state that ability acquisition happens in a level of growing progression (Mayer et al., 2004), results here obtained seem to show that cognitive abilities are relevant in some aspects and not others, regardless of the progression of its acquisition.

This research has been circumscribed to a sample of students from the University of Guadalajara, specifically newcomers. It would be convenient to replicate this research in other samples of undergraduates, as well as a group of non-student adults, in order to analyse and be able to generalize the reach of the influence of emotional intelligence in intellectual abilities. On the other hand, partial fulfilment of the hypothesis doesn't allow to reach a clear position in the complex debate of the relationships between gender, performance, cognitive intelligence and emotional intelligence. It thus seems relevant, as it has been previously mentioned, to keep on delving into this question and including other variables that allow to clear up these relationships, as well as the validity emotional intelligence can have in the prediction of academic performance, as proposed in the model of Mayer et al. (2004).

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