

# Music education's contribution to the development of EI in adolescents and its effect on the gender variable<sup>1</sup>

## Contribución de la educación musical en el desarrollo de la IE de los adolescentes y su efecto en la variable género

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### Abstract:

Emotional intelligence is a psychological variable that affects personal well-being and transcends the educational field. It is known that learning music provides emotional benefits for people and that emotional intelligence varies by age and gender. Based on these principles, we propose this research with the following objectives: to measure the perceived emotional intelligence of adolescent students of obligatory secondary education from Valencia, to compare by the variables of *musician-non-musician* and *gender*; and to explore the effect of music on the perceived emotional intelligence of young musicians considering *gender* as a variable. The final sample comprised a total of 409 adolescents of between 11 and 16 years of age. The data collection tools were an ad hoc sociodemographic questionnaire and the Trait Meta-Mood Scale (TMMS-24). The results of the statistical analyses displayed significant differences by *gender* in emotional *attention*; a positive correlation between *age* and *attention*, which increases with progress through adolescence; and a significant effect that reveals greater emotional *clarity* in musicians. This effect occurs independently of the gender of the subject, and so it benefits boys and girls equally.

**Keywords:** emotional intelligence, adolescence, music education, music, gender, educational research, emotional well-being, emotional attention, academic performance, education, music training, emotional repair.

### Resumen:

La inteligencia emocional es una variable psicológica que afecta al bienestar personal y trasciende al ámbito educativo. Se sabe que el aprendizaje de la música aporta beneficios emocionales a las personas y que la inteligencia emocional varía en función de la edad y el género. A partir de estos principios, planteamos esta investigación con los siguientes objetivos: medir la inteligencia emocional percibida de adolescentes valencianos estudiantes de Educación Secundaria Obligatoria, establecer una comparativa según las variables músico-no músico y género, así como explorar el efecto que la música ejerce en la inteligencia emocional percibida de los jóvenes músicos en función de la variable género. La muestra final estuvo compuesta por un total de 409 adolescentes de entre 11 y 16 años. Las herramientas de recogida de datos fueron un cuestionario sociodemográfico confeccionado *ad hoc* y la Trait Meta-Mood Scale (TMMS-24). Los resultados de los análisis estadísticos presentaron diferencias significativas de *género* en *atención* emocional; una correlación positiva entre la *edad* y la *atención*, que aumenta según la persona se adentra en la adolescencia; y un efecto significativo que revela una mayor *claridad* emocional a favor de los músicos; tal beneficio se produce con independencia del género del sujeto, lo que significa que afecta por igual a chicas y a chicos.

**Palabras clave:** inteligencia emocional, adolescencia, educación musical, música, género, investigación educativa, bienestar emocional, atención emocional, rendimiento académico, educación, formación musical, reparación emocional.

Date of reception of the original: 2023-09-01.

Date of approval: 2023-10-23.

Please, cite this article as follows: Botella-Nicolás, A. M.<sup>a</sup>, & Retamero-García, I. (2024). Music education's contribution to the development of EI in adolescents and its effect on the gender variable [Contribución de la educación musical en el desarrollo de la IE de los adolescentes y su efecto en la variable género]. *Revista Española de Pedagogía*, 82 (287), 55-65. <https://doi.org/10.22550/2174-0909.3927>

## 1. Introduction

Emotional intelligence (EI) is the ability to handle one's own emotions and those of others, to differentiate between them, and to make use of that information to guide one's own thought and actions (Mayer et al., 2011). Experts consider emotion to be one of the basic mental operations. Two simultaneous mechanisms are at work in it: the sensory and the cognitive (Bisquerra, 2015), and EI stands out within this field. This construct developed from the concept *social intelligence*, defined by Thorndike (1920) as the ability to act consciously in human relations (Molero et al., 1998). Gardner (2016) took up this idea, identifying two forms of emotional intelligence: interpersonal, which considers the behaviour, feelings, and motivations of others; and intrapersonal intelligence, principally involved in the examination and knowledge of one's own feelings. Goleman later popularised the concept in his book *Emotional intelligence*.

Three factors are differentiated in the intrapersonal form of this model of perceived EI.

Attention to feelings is the degree to which people believe they pay attention to their emotions and feelings (i.e., "I constantly think about my emotional state"); emotional clarity refers to how people think they perceive their emotions (i.e., "I am frequently wrong about my emotions"); finally, emotional repair alludes to the subjects' belief in their capacity to interrupt and regulate negative emotional states and prolong positive ones (i.e., "Although I sometimes feel sad, I usually have an optimistic outlook"). (Fernández-Berrocal & Extremera, 2005, pp. 74-75)

From an intrapersonal perspective on EI, it is known that people with moderate-low scores in emotional attention and high scores in emotional clarity and repair achieve better levels of adaptation. In contrast, extremely high levels in emotional attention are related to emotional maladjustment. If the people who display this do not have an adequate level of clarity and repair, they could enter an emotional spiral resulting in a ruminative process (Extremera & Fernández-Berrocal, 2005), including the creation of symptoms of anxiety, depression, and stress (Delhom et al., 2023).

In turn, there is a clear significant correlation between the ability to recognise emotions in performances of classical music and EI (Hallam, 2010). This finding suggests that this capacity is based on some of the same sensibilities that comprise everyday EI and that the remaining musical capacities can be transferred to other activities if processes required share similarities (Hallam, 2010).

The present research will report on the differences in EI by age, gender, and relationship with music displayed by a group of adolescent students of obligatory secondary education (Enseñanza Secundaria Obligatoria, ESO). Given that this psychological variable is closely related to school outcomes, special attention will be paid to the synergies that previous research works have found in the positive effect of musical praxis and its repercussions in the academic field of young people.

### 1.1. Emotional intelligence and education

An intelligent person was traditionally considered to be one who obtained the best academic results. However, as Fernández-Berrocal and Extremera (2002) note, this idea started to be questioned some time ago as it did not guarantee success in the professional sphere or in everyday life. And, at that critical moment, the concept of EI as an alternative to the traditional vision of an intelligent individual emerged.

A lack of EI in students is associated with four specific problems in education: (a) a deficit in students' levels of well-being and psychological adjustment, (b) a reduction in the quantity and quality of interpersonal relationships, (c) a fall in academic performance, and (d) the appearance of disruptive behaviour and use of addictive substances. Therefore, students with better EI development display better psychological adjustment and emotional well-being, they have more interpersonal networks and of higher quality, and they display a lower tendency towards disruptive, aggressive, and violent behaviours. Equally, as they confront stressful situations with more ease, they perform better at school and consume addictive substances such as alcohol, tobacco etc. in smaller quantities (Extremera & Fernández-Berrocal, 2004).

In 2020, 90% of EI programmes implemented in educational centres had very positive effects on students: they improved their emotional and social skills, and they acquired the capacity to learn to confront academic difficulties in class and to regulate their emotions. These achievements were greater in primary education (Puertas-Molero et al., 2020), although a correlation between EI and academic performance was also observed in post-obligatory education students (Del Rosal et al., 2018).

Faced with this need to strengthen emotional development in individuals and society (Pastor et al., 2019), teachers must play an essential role. People's emotional

competences ought to be developed right from their initial training onwards (Iryhina et al., 2020), as the educational sphere is ideal for the benefits to spread to all of the citizens.

### 1.2. Emotional intelligence, age, and gender

EI varies by age (Salguero et al., 2010) and gender (Fernández-Berrocal et al., 1998; Pena et al., 2011, and Thayler et al., 2003, as cited in Extremera & Fernández-Berrocal, 2005). Studying this psychological variable in different groups gives an overview of its scope in multiple areas, including the study of development in adolescence. Thanks to these works, different psychological patterns can be established. For example, people with moderate-low scores in emotional attention and high clarity and repair scores achieve a better level of psychological adaptation (Extremera & Fernández-Berrocal, 2005). Similarly, lower levels of emotional clarity and repair in adolescents are often related to depressive behaviour (Extremera & Fernández-Berrocal, 2004). In this regard, the findings relating to gender are especially striking: when women with greater emotional attention and lower repair of their own emotions display greater depressive symptoms, these are greater than those of men with high levels of depression (Thayler et al., 2003, as cited in Extremera & Fernández-Berrocal, 2005). Similarly, the literature identifies a deficiency in EI depending on age in adolescence. In this sense, Salguero et al. (2010) identified the ages of 16 to 17 as the stage of adolescence in which levels of emotional attention increase most.

Ultimately, it is important to achieve a good level of emotional clarity and repair to achieve this equilibrium in the three factors of EI in adolescence. This aspect is especially relevant when considering the gender perspective, as women per se tend to score higher than men in attention to feelings (Fernández-Berrocal et al., 1998; Pena et al., 2011, and Thayler et al., 2003, as cited in Extremera & Fernández-Berrocal, 2005).

### 1.3. Emotional intelligence and music

Royal Decree 217/2022 of 29 March, regulating the Organisation and Minimum Content of Obligatory Secondary Education in Spain states that music, as well as being a means of expressing emotions, actively contributes to their development, improving individuals' sensitivity and emotional control. So, it is in this educational context that musical activity can play a unique role thanks to its natural implications for the emotional sphere.

Learning music has the capacity to improve psychological well-being, favouring adolescents' positive emotions and minimising their negative ones, as negative emotions (such as fear, irritation, anger, boredom, or anxiety) are not usually experienced when listening to music (Blasco & Calatrava, 2020). Music enhances the acquisition of emotional competences, which focus on the interaction between the person and the environment. Hence, they have an impact both on some immediate educational applications (Campayo & Cabedo, 2016) and on emotional regulation (Saarikallio, 2011), which is an essential component of EI.

Identifying emotions in musical performance is regarded as an aspect of EI (Resnicow et al., 2004). Also, whether in a group or individually, instrumental practice increases intrapersonal skills and favours control of emotions (Campayo-Muñoz & Cabedo-Mas, 2017). Even Bisquerra (2015) has attributed a purely emotional aim to music. And its effect is not one-way as there is a positive mutual correspondence between music and emotional skills, meaning that through their beneficial effects, the two areas mutually reinforce one another (Campayo & Cabedo, 2016; Bonastre & Nuevo, 2020). Consequently, music training has a positive influence on intrapersonal and interpersonal competences alike, and on improving academic performance in general (Barrientos et al., 2019).

In this sense, it is important to distinguish between two types of musical training: active and receptive. Active musical training, that is, when a person learns and makes music (Benítez et al., 2017), is a more complex phenomenon in cognitive terms and more significant from an educational perspective (Rauscher & Hinton, 2006). Although other musical experiences provoke and evoke an individual's emotions, music lessons also affect cognitive performance and capacity (Rauscher & Hinton, 2006); they favour conative skills, including self-concept and personality variables (Degé et al., 2014); and they act on EI and education through intra and interpersonal competences. All this comes together in an improvement in general academic performance (Barrientos et al., 2019). Ultimately, playing a musical instrument leads to a transfer of learning, that is to say, an improvement of skills in various extra-musical areas (Benítez et al., 2017).

The psychology of music has confirmed that playing music requires the emotional brain, which also affects other areas of the brain. This makes it work holistically, causing a series of specific neuronal connections de-

defined as “engrams” or fingerprints, which are real and characteristic of this activity, and that are not achieved through others (Lacárcel, 2003).

Nonetheless, all of this evidence in favour of musical training does not seem sufficient. Such is the need to make learning outcomes in education visible and quantify them that the imprecision of measurement of the aesthetic experiences that music and its methodology offer hampers its standing (Chao-Fernández et al., 2020).

Notwithstanding, researchers’ efforts to find quantifiable results in the field of music are bearing fruit. Many of them transcend the educational sphere and relate to the requirements of Spain’s Organic Act 3/2020, of 29 December, which amends Organic Education Act 2/2006, of 3 May (LOMLOE). However, for students to achieve these emotional competences well through music, musical training should have its own space in the curriculum, with the status of a central subject. This increased presence should, of course, be accompanied by a more consistent initial training of specialist music teachers.

## 2. Objective and hypothesis

The main purpose of this article is to measure adolescents’ EI according to the *age*, *gender*, and *musical studies* variables. The following specific objectives were set: to explore levels of EI in a group of adolescents by age and gender, to compare the EI scores obtained by young musicians and non-musicians and to explore the effect of musical praxis on the EI of adolescent musicians by gender. In line with all of this, we formulated the following hypotheses:

1. There are differences in EI by the age and gender of the adolescents.
2. Young people who pursue professional education in a conservatory will have different EI scores than those who have never received regulated musical training.
3. The relationship between musical praxis and EI in adolescents is not affected by gender.

The ultimate aim of the present study was to establish whether young musicians have different EI scores than non-musicians and whether *gender* as a variable affects music’s impact on adolescents.

## 3. Method

### 3.1. Population and sample

To guarantee the homogeneity of the sample, private educational centres classed as elitist were rejected from the start, as were centres classified as special educational support centres (Centros de Acción Educativa Singular [CAES]) for children with challenging home circumstances or very low-income households. The second selection criterion was that the centres be in places with socio-economic and cultural levels as similar as possible to those of the music conservatories. The following centres in the city of Valencia (Valencian Community, Spain) were finally selected:

- IES San Vicente Ferrer, located in L’Eixample.
- Colegio Salesiano San Antonio Abad, located in Morvedre, in the district of Zaidía, in the Sant Antoni neighbourhood.
- Colegio Mantellate, located in Llano de la Zaidía.

Of the three collaborating educational centres, one is publicly owned and the other two are state-funded independent schools.

The collaborating music conservatories are located in the city of Valencia and in Torrente, respectively. Both offer basic and professional studies in music, they are publicly owned, and they are managed by Valencia’s regional government (the Generalidad Valenciana). Specifically, the following conservatories were selected:

- The Velluters professional music conservatory from Valencia, located in the centre of the city, in the district called Ciutat Vella.
- The Torrent professional music conservatory (CPMT), located in the metropolitan area of Valencia.

The initial study sample comprised a total of 538 subjects, of which 129 were eliminated from the analysis as they did not fulfil the inclusion criteria. This left 409 participants. We performed the descriptive analyses of the sample on these 409 ESO students residing in Valencia, who were between 11 and 16 years of age ( $M = 13.86$ ;  $SD = 1.222$ ). Specifically, 205 were female and aged between 12 and 16 years ( $M = 13.96$ ;  $SD = 1.206$ ), while 204 were male and aged between 11 and 16 years ( $M = 13.76$ ;  $SD = 1.233$ ).



### 3.2. Variables and tools

Sociodemographic data. We used the ad hoc sociodemographic questionnaire to obtain quantitative and qualitative data to enable us to define the different categories and groups in the sample. This tool included 21 items that collected sociodemographic data, academic data, and musical habits. It was structured in two blocks of questions: one designed to gather sociodemographic data such as age, gender, and place of birth and residence; and another for academic data such as level of musical studies, time spent on these studies, age at which they started to study music and in what educational context, level of regulated studies, and future academic prospects.

Musical training. Two categories of subjects in the group were identified: *musicians* (those who were pursuing professional education studies in music conservatories) and *non-musicians* (those who were not pursuing these studies). These, in turn, were organised into four subgroups considering the type of music training they received, and how long they had been playing a musical instrument. Based on the definition of *musician* proposed by Zhang et al. (2020), the group of musicians comprised the young people who had had contact with music for at least six years. Afterwards, the following subgroups were delineated: *musicians with more than six years of training*, *musicians with less than six years of training*, *music at school only* (they have only studied music at school), *no music* (they have never studied music).

Emotional intelligence. In the analysis of EI, we used the Trait Meta-Mood Scale (TMMS-24), which measures intrapersonal intelligence in three dimensions: attention to one's own feelings, emotional clarity, and repair of one's own emotions, which would entail a valuation of EI by means of self-report (Extremera & Fernández-Berrocal, 2004).

Through their items, the different factors or dimensions of EI are explored:

- *Attention* (eight items): from 1 to 8.
- *Clarity* (eight items): from 9 to 16
- *Repair* (eight items): from 17 to 24

This test establishes different cut-scores in the assessment of EI for each gender (male–female).

### 3.3. Data collection procedure

After requesting and receiving the relevant permissions, the data collection was done in a single moment of time using the double-blind procedure. The subjects were identified with alphanumeric codes determined by the year group, class, and ID assigned to each subject. Consequently, the researchers did not have access to the participants' personal data and the centres could not access the results. The measurement of EI was done following the indications of the authors of the TMMS-24 questionnaire.

In one of the participating centres, the tool was administered online at the request of the centre; in the others, it was administered on paper. In light of this situation, all necessary analyses were performed to establish whether there were differences between formats that affected the results. As there were not, both were accepted for the research. The paper questionnaires were dispensed in groups, in morning classes and in the classrooms themselves. They were administered simultaneously to each class group in a time band of 35 to 40 minutes, allowing the collection of data in a single session for each of the class groups. The online format contained the same number of items, with the same scales and answer options and it was administered by means of Google Forms, with the students completing it individually at home, outside school hours.

### 3.4. Data analysis

Having made the necessary checks, we processed the data. We did the calculations using probabilistic sampling, meaning that all of the participants had the same random chance of forming part of the analyses. We used IBM SPSS 26.0 for all of the statistical analyses, taking  $p < 0.05$  as the significance level.

The TMMS-24 test measured perceived EI according to three different dimensions: *attention*, *clarity*, and *repair*. Due to their interdependence, we analysed outliers using the Mahalanobis procedure, resulting in the elimination of one participant (male, aged 12, non-musician) from the final sample. Furthermore, a total of thirteen participants with missing data were detected and were eliminated from the TMMS-24 analysis.

To describe the sample, we used descriptive statistics for continuous variables such as age, age when starting music, and number of hours of practice of the musical instrument (mean and standard deviation); as well as frequencies (number and percentage) for the interval, ordinal, or dichotomous variables (gender, country of birth, current and previous instrument, place where musical

instrument is practised, etc.). We used Student's *t* test to compare the means of male and female respondents, *musicians* and *non-musicians* groups, and the *musicians* subgroups (*musician* >6 years and *musician* <6 years) and *non-musicians* subgroups (*music at school only* and *no music*) by age and age at the start of their relationship with music. We also used the chi-squared test to evaluate the absence of differences by distribution of males and females in the different groups of *musicians* and *non-musicians*, as well as in the subgroups. Furthermore, we used single-variant ANOVA to investigate the differences between subgroups of *musicians* and *non-musicians* (between-subjects factor) in age and age at the start of music.

We analysed gender differences in EI (TMMS-24) using Student's *t* test for independent samples in the three dimensions: *attention*, *clarity*, and *repair*. Furthermore, we used the Pearson correlation to examine the relationship between these three dimensions and with age.

Additionally, we used a multivariate ANOVA with the *group* variable (categories: (i) *musician* and (ii) *non-musician*) and gender variable (categories: (i) *male* and (ii) *female*) as inter-subject variables to establish the differences in the three dimensions of emotional intelligence (*attention*, *clarity*, and *repair*) between the *musicians* and *non-musicians* groups, considering gender.

We used the Bonferroni test in the post hoc analyses. To analyse the subgroups of *musicians* (*musician* >6 years and *musician* <6 years) and *non-musicians* (*music at school only* and *no music*) and their relationship with the dimensions of EI (*attention*, *clarity*, and *repair*) considering gender, we performed a multivariate ANOVA with the *group* variable (categories: (i) *musician* >6 years, (ii) *musician* <6 years, (iii) *music at school only*, and (iv) *no music*) and gender variable (categories: (i) *male* and (ii) *female*) as inter-subject variables and the

dimensions of EI (*attention*, *clarity*, and *repair*) as intra-subject variables.

## 4. Results

The results of the preliminary analyses were as follows: the independent samples *t* test did not show significant differences by age between the *musicians* and groups ( $t_{407} = 0.620$ ,  $p = 0.536$ ). The female respondents from this sample started studying music aged between 3 and 15 ( $M = 8.71$ ,  $SD = 2.551$ ), while the male respondents started aged between 2 and 16 ( $M = 8.17$ ,  $SD = 2.477$ ). In other words, we found no differences by age or by age at start of music between male and female respondents (all  $p > 0.005$ ).

Regarding the subgroups of *musicians* (*musician* <6 years and *musician* >6 years) and of *non-musicians* (*music at school only* and *no music*), the ANOVA showed significant differences by age ( $F_{3, 405} = 74.881$ ,  $p < 0.001$ ). Musicians with more than six years of regulated training in music were older than musicians with less than six years of training and non-musicians who only receive training in school (all  $p < 0.001$ ). In contrast, the respondents who did not receive any music education were older than the musicians with more than six years of training ( $p = 0.001$ ).

Furthermore, the ANOVA also showed significant differences in the age of starting music education between musicians with more than six years of training, musicians with less than six years of training and those who had only received music training at school ( $F_{3, 335} = 76.120$ ,  $p < 0.001$ ).

We found no significant differences in the distribution of boys and girls between the groups of *musicians* and *non-musicians* ( $\chi^2_3 = 2.946$ ,  $p = 0.400$ ), indicating an even gender distribution in all of the groups, as Table 1 shows.

TABLE 1. Distribution of sample by music training received and gender.

Gender <i>n</i> (%)	Musician		Non-musician		Total
	>6 years	<6 years	Music at school only	No music	
Female	43 (53.1)	33 (50.8)	90 (46.2)	39 (57.4)	205 (50.1)
Male	38 (46.9)	32 (49.2)	105 (53.8)	29 (42.6)	204 (49.9)
Total ( <i>n</i> )	81	65	195	68	409

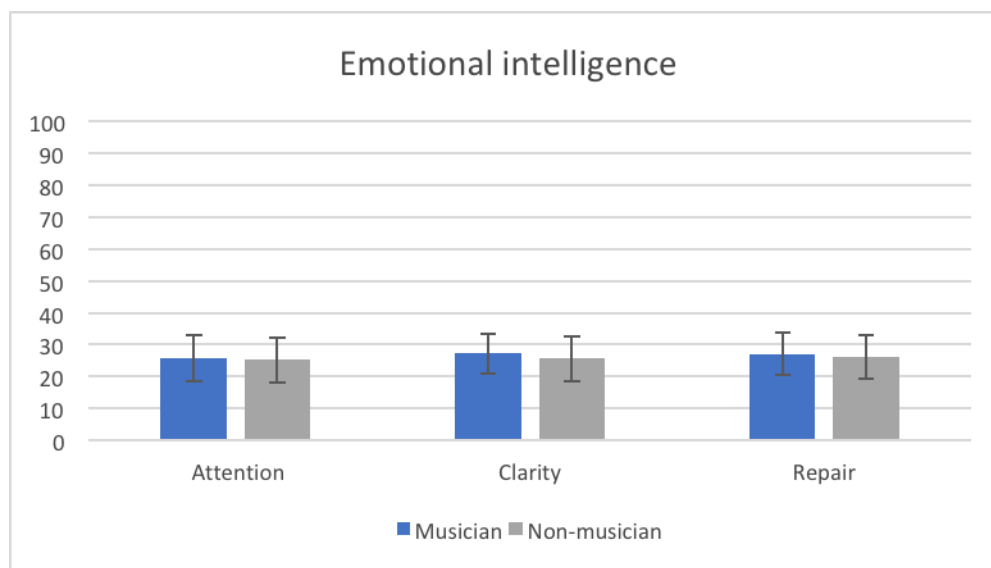
#### 4.1. Relationship between EI and the *musician*, *age*, and *gender* variables

The analyses performed showed a difference by gender the dimension of *attention* ( $t_{393} = 5.362, p < 0.001$ ), with girls scoring higher than boys. However, differences by gender were not apparent in the *clarity* and *repair* dimensions (both  $p > 0.149$ ). We also observed a positive correlation between age and the dimension of *attention* ( $r = 0.108, p = 0.031$ ), with higher *attention* scores being apparent at higher ages. On the contrary, we found no significant correlations between age and the dimensions of *clarity* or *repair* (all  $p > 0.239$ ). Ultimately, the dimensions of *attention*, *clarity*, and *repair* were found to be positively related to one another (all  $p < 0.001$ ).

The multivariate ANOVA with the *group* variable (categories: (i) *musician* and (ii) *non-musician*) and

*gender* variable (categories: (i) *male* and (ii) *female*) as inter-subject variables displayed a significant effect of the group variable (*musician-non-musician*) in the *clarity* dimension ( $F_{1,391} = 5.566, p = 0.019$ ), but this effect was not significant in the *attention* or *repair* dimensions (all  $p > 0.370$ ). The post hoc analyses displayed higher clarity scores in the musicians group than in non-musicians. Furthermore, a significant effect of the gender variable ( $F_{1,391} = 5.566, p = 0.019$ ) was observed in the *attention* dimension, but not in *clarity* or *repair* (all  $p > 0.293$ ). The post hoc analyses showed higher levels of *attention* in girls than in boys ( $p < 0.001$ ). The *group\*gender* interaction was not significant for any dimension ( $p > 0.184$  in all cases). Figure 1 shows the differences in EI scores between the *musicians* and *non-musicians* groups of adolescents.

FIGURE 1. Emotional intelligence between musicians and non-musicians.



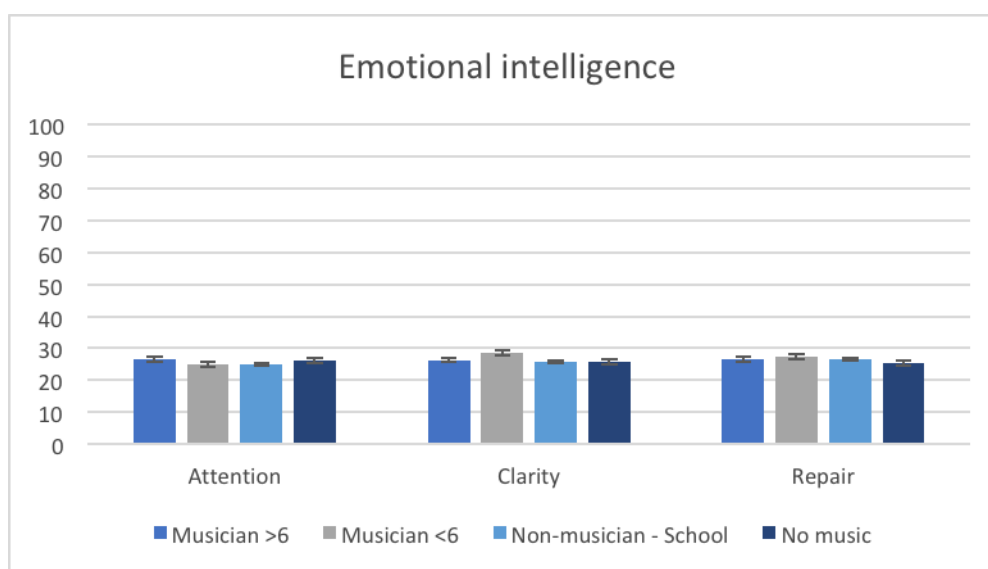
After a detailed analysis of the results considering the subgroups of *musicians* (*musician >6 years* and *musician <6 years*) and *non-musicians* (*music at school only* and *no music*), the multivariate ANOVA with its group variable (categories: (i) *musician >6 years*, (ii) *musician <6 years*, (iii) *music at school only*, and (iv) *no music*) and gender variable (categories: (i) *male* and (ii) *female*) continued to show the significant effect of the *group* variable in the *clarity* dimension ( $F_{3,387} = 3.064, p = 0.028$ ). However, this group effect was not significant in the *attention* or *repair* dimensions (all  $p > 0.315$ ).

The post hoc analyses showed that there were no differences between the group of *musicians >6 years* and the other groups (all  $p > 0.516$ ) in the *clarity* di-

mension. Nonetheless, the group of *musicians <6 years* displayed higher clarity scores than the *music at school only* group ( $p = 0.022$ ), but not in comparison with the *no music* group ( $p = 0.101$ ).

Furthermore, we observed a significant effect in the *gender* variable in the *attention* dimension ( $F_{1,387} = 22.914, p < 0.001$ ) but not in the *clarity* and *repair* dimensions (all  $p > 0.458$ ). The post hoc analyses showed higher levels of *attention* in girls than in boys ( $p < 0.001$ ). The *group\*gender* interaction was not significant for any dimension ( $p > 0.196$  in all cases). This shows that the relationship between music training and TMMS-24 is not modulated by gender. Figure 2 shows the differences in EI scores between the subcategories of *musicians* and *non-musicians*.

FIGURE 2. Emotional intelligence between subgroups of musicians and non-musicians.



## 5. Discussion

The hypotheses confirmed in this research state that there are differences in EI in adolescence depending on whether individuals are male or female and on their ages; that young people who are pursuing professional studies at a conservatory have different EI scores than those who have never received this teaching; and that the effect of musical praxis on adolescents is not affected by whether they are male or female.

Previous studies have considered differences in EI between young people by age and gender, as well as the need to implement programmes to develop this psychological variable in the educational sphere. However, there is a lack of research that analyses and compares EI between young musicians and non-musicians, or the effect of this artistic practice on students by gender. Thus, in this work, the three dimensions of intrapersonal EI have been examined with all of the sample, by age and gender, using TMMS-24. Furthermore, the impact of all of these variables on the various subcategories of *musicians* and *non-musicians* has been explored. All of this is discussed below.

### 5.1. Relationship between emotional intelligence and the age and gender variables

The present work finds a positive correlation between age and emotional attention in all of the sample, with emotional attention scores increasing with age. Furthermore, it detects significant differences by gender, with females having higher levels of attention than males. Agreeing with the studies analysed above, adolescents tend to pay more attention to their emotions as they get further into this developmental stage

(Salguero et al., 2010), especially females (Thayler et al., 2003, as cited in Extremera & Fernández-Berrocal, 2005).

Given that the imbalance between the dimensions that comprise EI can have very negative repercussions for people and, considering the risks inherent in achieving high levels in emotional *attention*, it is necessary to implement actions that especially reinforce *clarity* and emotional *repair* in young people. As previously noted, high levels of attention and low levels of clarity and emotional repair can result in emotional maladjustment and cause symptoms of anxiety, depression, and stress (Delhom et al., 2023; Extremera & Fernández-Berrocal, 2005); especially in the stage of adolescence, a period in which emotional attention is significantly affected by age and gender.

### 5.2. Relationship between EI and the music variable

The present study has found differences in the three dimensions of EI, achieving significance in emotional *clarity*, and displaying a trend towards greater emotional *repair* in the group of *musicians*.

It should be noted that emotional *clarity* is an important dimension in the process of emotional regulation, as people cannot manage or effectively repair their emotions without first being able to identify them. Consequently, emotional *clarity* is regarded as a key factor in the functional sequence that characterises the process of emotional regulation (Extremera & Fernández-Berrocal, 2005). So, musical praxis can positively affect the EI of the subjects and have a positive effect on their emotional regulation.



Although there is a gap in studies that compare EI between adolescent musicians and non-musicians (Campayo-Muñoz & Cabedo-Mas, 2017), some research works carried out with groups of musicians provide interesting findings that are in line with those found in this research. In this regard, Barrientos et al. (2019) showed that adolescents who play a musical instrument stand out in intrapersonal EI. This gives them a good capacity to reflect on themselves and good self-awareness of their own emotional life, favouring a greater capacity for self-realisation and a good level of autonomy and of assertiveness with others. In this sense, Chao et al. (2015) detected in adolescents an improvement in cognitive, behavioural, emotional, and social aspects that can be attributed to studying music.

In any case, the study of psycho-emotional aspects in the group of young musicians compared with their non-musician counterparts is a broad field that is yet to be explored.

## 6. Conclusions

We should firstly note that hypothesis one of this research is fulfilled, agreeing with previous studies. In the sample as a whole, girls displayed significantly better emotional attention than boys, and they all increased their scores in this dimension as they got further into adolescence. Therefore, there are differences by age and gender in the EI of male and female adolescents.

Secondly, we should note that hypothesis two is also fulfilled, as male and female adolescent musicians who are pursuing professional music studies at conservatories display significant differences in EI compared to non-musicians. Their scores are higher in the three dimensions that comprise EI, achieving significance in emotional *clarity*. This difference is crucial because, as previous research has shown, emotional clarity could prevent emotional maladjustment, avoiding its damaging consequences, and it could also have immediate educational application, improving general academic performance. The importance of this finding lies in the fact that, by better understanding their feelings and knowing how to identify them, adolescent musicians who pursue professional studies could have greater and better emotional balance, better psychological adjustment and a large reduction in depressive behaviours, as emotional clarity is considered to be an essential element in the process of emotional regulation.

Finally, we should note that hypothesis three is also fulfilled, as the significant effect of music on the perceived EI of young people is the same in males and females.

To summarise, the present study finds differences in the EI of male and female young people depending on their age and gender; that musicians display significantly higher levels of emotional clarity than non-musicians, and that the significant effect that pursuing professional music studies at a conservatory has on the EI of male and female musicians affects individuals equally, regardless of whether they are male or female. In this developmental stage in which young people in general see their emotional competences shaped both by age and by gender, this does not seem to affect musicians as much.

Finally, taking into account the possible academic and emotional impact of studying music in the educational sphere, we turn to earlier studies that confirm that emotional competences and music reciprocally reinforce one another enabling a process of feedback of the benefits in both spheres. Therefore, in view of the evidence that music has undoubted benefits in EI, it would be beneficial to increase the presence of music in the training of teachers and students, and so train people who are emotionally better prepared for society.

The limitations of this research include its methodology, as a transversal comparative study does not allow examination of changes over time or establish causal relations between the variables analysed. Similarly, it would be interesting to expand the study with young people who study at basic and higher levels in conservatories. Finally, focussing the gender variable on the male-female duality does not explore gender to the full extent that is necessary or advisable, as cultural studies currently do, where gender is more than a category and becomes one of the levels of intersectionality with which social differences are demarcated.

As future lines of research, it would be of value to establish whether subjects' academic qualifications correspond with their levels of EI, especially in the case of musicians. Given that music affects psychological variables that directly relate to academic and personal achievement, it would be necessary to carry out a longitudinal intervention in educational centres with students who are at risk of academic failure to make it possible to determine whether studying music has a causal effect on these and other psychological variables.

Finally, this study shows that young people who study music regularly and formally show significant differences in EI compared to young people who have not studied music. This challenges the devaluation of the individual's own EI, which depends on age and gender in adolescence.

## Notes:

<sup>1</sup> This research was done in the framework of the iMUSED (Investigating Music Education GIUV2020-483) research group of the Universidad de Valencia.

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