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The role of emotional intelligence and gender in the relationship between implicit theories of emotions and aggression: moderated mediation model in young individuals

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ABSTRACT

Aggression is a widespread problem among young individuals and has far-reaching consequences for society. Using a mediation model approach, this research seeks to delve into the impact of implicit theories of emotions and the ability emotional intelligence on aggressive behaviour. 608 Spanish students (9 and 18 aged) ($M_{age} = 14.07$; $SD = 2.64$; 46.4% boys) completed the Implicit Theories of Emotion Scale, The Botín Foundation's Emotional Intelligence Test for Adolescents, and The Buss-Perry Aggression Questionnaire. We found that individuals who possess incremental implicit theories of emotion tend to exhibit lower levels of aggression and higher levels of emotional intelligence. A noteworthy finding is that emotional intelligence mediates the relationship between implicit theories of emotions and aggressive behaviour. Additionally, the link between implicit theories of emotions and emotional intelligence and aggression is moderated by gender. These findings have significant implications for clinical practice, informing the development of targeted intervention programs to prevent aggression.

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Implicit theories of emotions; emotional intelligence; aggression; gender; youth

Introduction

Aggression in children and adolescents is a significant problem in contemporary society due to its adverse effects on both aggressors and victims. This problem leads to numerous fatalities and millions of young people suffering from various traumas requiring urgent medical attention (World Health Organization, 2020). Additionally, aggressive behaviours during adolescence serve as predictors of criminal involvement and the potential for violence in adulthood. These behaviours are closely linked to the primary mental health challenges commonly found among teenagers (Fung, 2019). Furthermore, the prevalence of aggressive behaviour among adolescents is extensive, and its occurrence within school environments is particularly concerning (Calmaestra et al., 2016).

Given the far-reaching implications of these findings, numerous studies have tried to identify the factors that mitigate aggressive behaviour. Specifically, research has highlighted the significant impact of emotions in reducing such behaviour. For instance, our implicit theories of emotions can directly influence aggression (Dickerson et al., 2018; Flynn, 2016). Additionally, studies have

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shown that variables such as emotional intelligence play a pivotal role in the manifestation of aggressive behaviour (Vega et al., 2022). Despite consistent demonstrations of a correlation between these three variables, there is currently a lack of research that analyzes them collectively. Given this gap, it is crucial to understand how implicit theories of emotions influence aggression through emotional intelligence during adolescence and its developmental stages. Adolescence is characterized by numerous critical periods, and previous studies indicate that when individuals have insufficient emotional intelligence and have an entity implicit theory of emotions, these critical periods are experienced more intensely, often resulting in increased aggression (Brackett et al., 2011; Dickerson et al., 2018; Flynn, 2016; Vega et al., 2022). Therefore, fostering emotional intelligence and promoting incremental implicit theories of emotions could mitigate these changes during this developmental stage, potentially having long-term repercussions in adulthood.

Implicit theories of emotions and aggression

Implicit theories refer to individuals' various conceptions and beliefs about different attributes, such as intelligence, emotion, social skills, relationships, management skills, social judgement, and stereotypes (Dweck, 2012). These beliefs influence behaviour and shape how individuals perceive reality (Dweck, 2012; Leith et al., 2014; Olson et al., 1996). Entity theorists consider these attributes relatively fixed and difficult to change, whereas incremental theorists tend to believe that, with sufficient effort, these attributes can be developed and improved over time (entity theories vs. incremental theories; Dweck & Leggett, 1988).

Much of the existing research on implicit theories has predominantly centred around beliefs about intelligence or personality. However, individuals also hold implicit theories about other attributes, including emotions. Some individuals perceive emotions as rigid and unchangeable, while others view emotions as malleable and susceptible to control and alteration (Tamir et al., 2007). Analyzing implicit theories of emotions is crucial since emotions significantly influence affect and human behaviour (Dweck et al., 1995). In fact, previous literature has shown that individuals who adhere to incremental theories, as opposed to entity theories, tend to use more adaptive regulation strategies such as cognitive reappraisal, have more social support, experience more positive emotions, have higher success rates, fewer depressive symptoms, and tend to have better overall well-being (Burnette et al., 2013; Cabello & Fernández-Berrocal, 2015; De Castella et al., 2013; Romero et al., 2014; Tamir et al., 2007). Despite the growing body of research analysing these theories, relatively few have examined how they are related to negative aspects such as aggression.

Aggression is defined as any action that is perpetrated with the intention of harming another individual who seeks to avoid such harm (Anderson & Bushman, 2002). The negative impact of aggression on both aggressors and victims has made it a significant societal concern. As a result, aggressive behaviour has garnered considerable attention and interest from researchers, particularly in children and adolescents (Crick et al., 2006; Olatunji & Idemudia, 2021). This is because this developmental stage is marked by numerous physical, psychological, and neurological transformations that have been associated with higher levels of aggressive behaviours (Özdemir et al., 2016). These behaviours are linked to psychosocial maladjustment, poor academic performance, absenteeism from school, delinquent acts, substance abuse, and low well-being (Ostrov & Godleski, 2009; Piquero et al., 2007). Identifying factors that can either increase or inhibit aggressive behaviour is essential, as this knowledge is crucial for informing the design of effective programs for violence prevention and aggression management.

Research has indicated a negative correlation between incremental implicit theories and aggression, with the majority of research focusing on implicit theories of personality or exploring the relationship between implicit beliefs of emotions and various aspects of emotional regulation and internalizing problems (e.g. Li et al., 2019; Lurie et al., 2022; Yeager et al., 2013). However, limited evidence has been found to support the notion that individuals who subscribe to entity implicit theories of emotions are more prone to displaying elevated levels of aggression. This is because

certain emotions, such as anger, which are strongly associated with aggressiveness, are perceived as fixed and unchangeable. Consequently, this perception can lead to the expression of aggressive behaviours (Dickerson et al., 2018; Flynn, 2016). Moreover, entity theories in other attributes, where individuals believe that factors such as personality, peer relations, or intelligence are beyond their control and cannot be changed, tend to predict increased tendencies towards externalizing behaviours among young individuals of various ages (Schleider et al., 2015). These findings could shed light on the potential underlying mechanisms through which an entity mindset may impact aggressive behaviour, thus supporting the notion of a connection between our implicit beliefs about emotions and aggression. Consequently, fostering flexible and healthy implicit theories of emotions could be a viable strategy for reducing the occurrence of aggression.

Regarding gender differences in implicit theories of emotions, the literature has produced mixed findings. While several studies have reported no significant gender differences in adolescents (Romero et al., 2014), others have suggested that girls tend to hold stronger entity beliefs than boys (Schleider & Weisz, 2016). This study also aims to provide further clarity on this issue by addressing these discrepancies. With respect to aggression, previous literature has demonstrated that adolescent boys tend to be more aggressive than girls (Vega et al., 2022). However, to our knowledge, the role of gender in the relationship between implicit theories of emotions and aggression has not been studied. Nevertheless, given the evidence suggesting gender differences in these variables, it is reasonable to hypothesize that the impact of implicit theories on aggression may vary between genders.

Implicit theories of emotions and emotional intelligence

Mayer and Salovey (1997) defined Emotional intelligence as '*the ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth*'. Joseph and Newman (2010) propose a division of emotional intelligence into the following three different models based on the type of instrument used and the conceptualization of the construct: *performance-based ability, self-report ability, and self-report mixed models*. The first two models understand emotional intelligence as a set of emotional skills. The performance-based ability model uses objective measures where participants must solve emotional problems, and some answers are more correct than others, while the self-report ability model uses self-report instruments. In turn, the self-report mixed model also uses self-reports, but understands emotional intelligence as a broader construct that includes personality variables, mental abilities, and motivation, along with interpersonal and intrapersonal skills (Mayer et al., 2008). Currently, all three models are used, however, there are several reasons to support the superiority of the performance-based ability model. This model has been shown to be more objective and less susceptible to social desirability bias, while having greater divergent validity and consistency in predicting general behaviour (Gutiérrez-Cobo et al., 2016; Mayer et al., 2000, 2016). While the performance-based ability model has received considerable support, research focusing on self-report models is more prevalent among adolescents. This preference is because self-reports are easier to comprehend and offer a cost-effective and efficient method of collecting large amounts of data (Kline, 1993). Additionally, there are relatively few performance instruments specifically designed for adolescents (Llamas-Díaz et al., 2023). Due to the limited literature utilizing performance-based tools and considering the justifications above, the present study employed the performance-based ability model to evaluate emotional intelligence.

Previous literature has highlighted the importance of emotional intelligence in children and adolescents. This is evidenced by the significant relationships found between this construct and pivotal aspects of daily life such as mental and physical well-being, social functioning, employment performance, interpersonal relationships, academic achievement, and aggression (Costa & Faria, 2023; Domínguez-García & Fernández-Berrocal, 2018; Gutiérrez-Cobo et al., 2023; Llamas-Díaz et al.,

2022; MacCann et al., 2020; Vega et al., 2022). Therefore, examining variables that contribute to increased emotional intelligence and its positive outcomes is crucial for overall well-being. Previous research has indicated that individuals who hold more flexible views of emotions, believing that emotions can be altered, tend to perceive greater control over their emotional experiences. This, in turn, leads to improved perception, understanding, and regulation of emotions (Cabello & Fernández-Berrocal, 2015; Gross & John, 2003; Tamir et al., 2007).

Specifically, studies have highlighted a strong connection between beliefs about the malleability of emotions and both emotion regulation and emotional experiences (Tamir et al., 2007). For example, individuals who believe they can change their emotions demonstrate increased use of various regulation strategies, such as cognitive reappraisal, which serves as a mediator in the relationship between their beliefs about the malleability of emotions and their overall well-being (De Castella et al., 2013; Skymba et al., 2022). As a result, examining and challenging incremental implicit theories of emotions can serve as a practical approach for enhancing emotional intelligence and promoting emotional health.

While numerous authors have focused on exploring gender differences in emotional intelligence, relatively few studies have addressed this issue in adolescents. The few studies available demonstrate that girls tend to show higher emotional intelligence abilities compared to boys (Fernández-Berrocal et al., 2018; Llamas-Díaz et al., 2023). Previous research suggests that these differences could stem from various biological, interpersonal, and socio-cultural factors (Brody, 1985). For instance, girls appear to be more proficient in interpreting facial expressions (McClure, 2000) and are skilled at concealing emotions, often using a bright smile to hide disappointment, in contrast to the neutral expressions typically adopted by boys (Cole, 1986). Differences have also been observed in other domains, including emotional communication (Zeman & Shipman, 1996) and the expression of emotions such as anger and sadness (Underwood et al., 1992).

Although the role of gender in the relationship between implicit theories of emotions and emotional intelligence remains unclear in the existing literature, the differences observed in both variables, coupled with previous studies highlighting the importance of gender in this relationship (e.g. Cabello & Fernández-Berrocal, 2015), prompt us to explore its potential moderating role in this study.

Emotional intelligence and aggression

Several studies in adolescents have identified a negative correlation between aggression and emotional intelligence. Adolescents with enhanced emotional abilities often show a decreased occurrence of negative emotions associated with the manifestation of aggressive behaviour, including (but not limited to) feelings of anger and hostility (García-Sancho et al., 2014). These findings consistently emerge regardless of the theoretical framework adopted to conceptualize emotional intelligence, the specific type of aggressive behaviour being examined, and the assessment instrument utilized (Vega et al., 2022).

Implicit theories of emotions, emotional intelligence, and aggression

Preliminary research indicates that beliefs in the malleability of emotions can impact levels of aggression (Schleider et al., 2015; Yeager et al., 2013). But what mechanism could explain this phenomenon? Individuals who hold the belief that emotions are malleable are more likely to be motivated to improve their emotional intelligence abilities. The belief that emotions are malleable correlates with better perception, understanding, and regulation of emotions (Cabello & Fernández-Berrocal, 2015; Gross & John, 2003; Tamir et al., 2007). Moreover, individuals with an incremental mindset are more inclined to view challenging emotional or social circumstances not merely as threats but also as opportunities for personal growth and emotional development (Cabello & Fernández-Berrocal, 2015). Additionally, entity beliefs about emotions influence

whether individuals attempt to control or regulate their emotions; typically, no effort is made to regulate emotions if one believes this is not possible (Gross & Thompson, 2007; Kneeland et al., 2016a; Tamir & Mauss, 2011). Indeed, experimental studies in adults have even suggested a causal relationship between emotional beliefs and regulation strategies (Kneeland et al., 2016a, 2016b). Furthermore, research has demonstrated that intervention programs targeting the enhancement of emotional abilities among adolescents result in discernible reductions in levels of aggressiveness (Garaigordobil & Peña-Sarrionandia, 2015).

Consequently, building upon this premise, our study postulates that holding incremental beliefs about emotions can impact emotional intelligence, thereby exerting a significant influence on individuals' propensity for aggression. A deeper insight into the relationship between these three variables could enhance our understanding of emotional and social development in young individuals and contribute to developing more effective prevention and treatment programs aimed at reducing aggression in this population. However, to the best of our knowledge, no studies have examined the relationship among all three variables collectively.

Aims and hypotheses

The importance of the variables examined in relation to psychological well-being, along with the limited body of research examining them collectively, formed the primary motivation for this study. Hence, the principal aim of this study was to examine the association between incremental implicit theories of emotions, emotional intelligence, and aggression. These associations were studied from late childhood, a period marked by significant changes that shape adolescence (Kupersmidt & Coie, 1990) through to early adulthood. Although the sample of this study (from 9 to 18 years old) is a broad period covering various critical periods of development, the objective of this research is to provide a comprehensive understanding of the mechanisms underlying these variables. Building on the rationale of prior research (Garaigordobil & Peña-Sarrionandia, 2015; Kneeland et al., 2016a, 2016b), we postulate that emotional intelligence may serve as a mediator between incremental implicit theories of emotion and aggression. Furthermore, given the gender differences found in the three variables under analysis, we aim to explore the potential moderating effect of this variable each of the associations. Based on the existing literature (e.g. Cabello & Fernández-Berrocal, 2015; Tamir et al., 2007; Vega et al., 2022; Yeager et al., 2013), we expect to observe (1) a negative relationship between incremental implicit theories of emotions and aggression, (2) a positive relationship between incremental implicit theories of emotions and emotional intelligence, (3) a negative relationship between emotional intelligence and aggression, (4) a mediating role of emotional intelligence in the relationship between incremental implicit theories of emotions and aggression, and (5) gender differences in the three variables examined in the study. Additionally, we will conduct an exploratory analysis to examine the potential moderating effect of gender on the relationship between these variables (see Figure 1 to review our proposed model).

Method

Participants

A total of 608 primary and high school students from six different schools in Andalucía (Spain) completed the questionnaires for this study. The ages of the participants ranged from 9 to 18, with a mean of 14.07 years (SD = 2.64). Among the participants, 34.5% belonged to late childhood (8–12 years), 59.4% (13–17 years) were adolescents, and 6.1% were in early adulthood (18 years). The distribution of the sample according to gender was 282 males (46.4%) and 326 females (53.6%). This investigation was approved by the Ethics Committee of the University of Málaga as part of the project 'Factores protectores del bienestar personal y escolar en la adolescencia (UMA18-FEDERJA

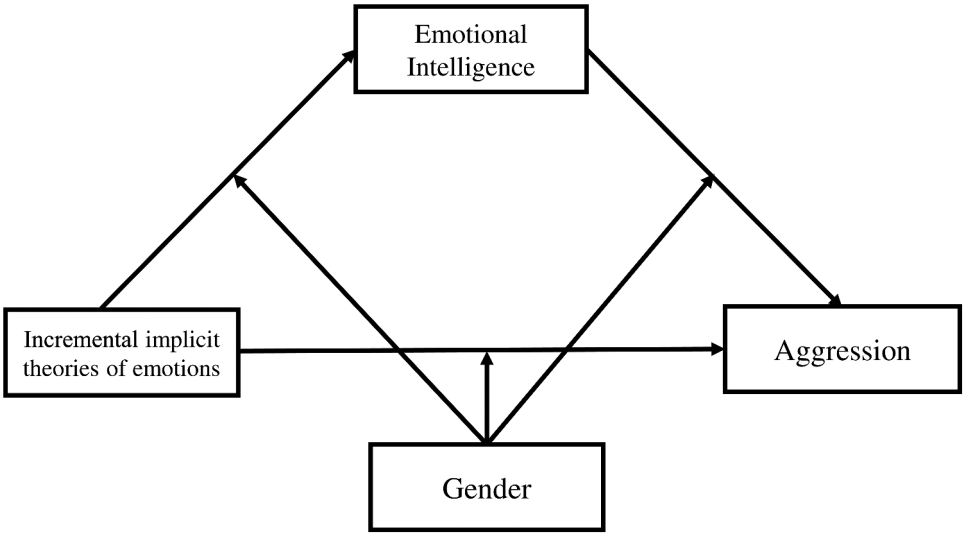

Figure 1. Representation of the proposed moderated mediation model.

-114)' (Approval Number: CEUMA: 38–2020-H). We obtained consent from all participating students and their parents and/or guardians before data collection.

Procedure

Several principals and teachers from various schools met with the researchers to clarify the purpose of this research and the evaluation methods to be employed. During these interviews, their consent was obtained, the required permissions were sought, and their cooperation in the study was agreed. Participants completed questionnaires to assess levels of aggression, implicit theories of emotions, and emotional intelligence through the online platform LimeSurvey (http://limesurvey.org). The questionnaires were administered in a single session at their schools, taking 50 minutes to complete. These sessions were supervised by previously trained teachers, who were available to answer any questions and provide assistance to participants if required.

Measures

Implicit theories of emotions

We used the Implicit Theories of Emotion Scale (Tamir et al., 2007), adapted from the scale created by Dweck (1999), to evaluate implicit theories of emotions. This instrument has four items with a 7-point Likert scale response format, two assessing incremental theories (e.g. 'Everyone can learn to control their emotions') and two assessing entity theories (e.g. 'No matter how hard they try, people can't really change the emotions that they have'). The entity items underwent reverse coding, and the responses were then averaged to generate a unified continuous scale. Higher values on this scale indicate stronger beliefs in incremental change, while lower values indicate stronger beliefs in entity-based factors. This scale has demonstrated adequate internal consistency with a score of $\alpha = .75$.

Ability emotional intelligence

The Botín Foundation's Emotional Intelligence Test for Adolescents (TIEFBA; Fernández-Berrocal et al., 2018) is an ability emotional intelligence measure. TIEFBA evaluates this construct through eight emotion-eliciting scenes. Participants complete four different activities for each scene to

evaluate the four branches of the ability model of emotional intelligence: perceiving, using, understanding, and managing emotions. This measure uses a 5-point Likert scale to evaluate the different activities. Examples of these activities include evaluating the main protagonist's facial expression to measure perceiving emotions or assessing the degree to which the protagonist's state of mind would help them perform three cognitive activities to measure using emotions. This instrument has demonstrated adequate internal consistency with a score of $\alpha = .94$ for the total score, while the score for the different branches ranged from $\alpha = .74$ to $\alpha = .86$. In this research, we used the total TIEFBA score.

Aggression

The Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992) measures aggression through 29 items with a 5-point Likert scale (ranging from 1, 'extremely uncharacteristic of me,' to 5, 'extremely characteristic of me'). This self-report scale evaluates four dimensions: hostility, anger, and verbal and physical aggression. We used the Spanish version of this instrument in our study (Andreu et al., 2002). This scale has demonstrated adequate internal consistency with a score of $\alpha = .88$ for the total score and the score for each subscale ranging from $\alpha = .68$ to $\alpha = .86$. In this research, we used the total BPAQ score.

Data analysis

All statistical analyses were conducted using the SPSS package (version 24.0; IBM, United States). First, descriptive statistics was carried out to evaluate the scores obtained for each measurement and gender differences were assessed using *t*-tests. Second, the association between implicit theories of emotions, emotional intelligence, and aggression was analysed using Pearson's correlation coefficients. The gender differences between the correlation coefficients among these variables were examined using Fisher's z-test (Cohen & Cohen, 1983). A moderated mediation model analysis was conducted according to the following steps. First, the PROCESS macro for SPSS (Model 4) was used to examine the mediating effect of emotional intelligence in the relationship between implicit theories of emotions and aggression (Hayes, 2013). Second, the PROCESS macro (Model 59) was used to examine the moderating effect of gender on the direct and indirect links between implicit theories of emotions and aggression. For Models 4 and 59, conditional indirect effects with bias-corrected and accelerated 95% confidence intervals (CIs) were obtained using a bootstrap method based on 5000 samples (Hayes, 2013).

Results

Preliminary analysis

Descriptive statistics and the student's *t*-test for independent samples for all study variables are displayed in Table 1. We found that girls have higher emotional intelligence than boys, while boys show higher levels of aggression and incremental implicit theories of emotions than girls. A correlation matrix (Pearson correlation coefficients) for the variables is shown in Table 2. Incremental implicit theories of emotions were positively correlated with emotional intelligence ($r = .10$, $p < .05$) and negatively correlated with aggression ($r = -.12$, $p < .01$). Finally, emotional

Table 1. Means, standard deviations (SD), and *t*-tests for gender differences in all the study variables.

	Total sample		Boys		Girls		Gender differences	
	Mean	SD	Mean	SD	Mean	SD	*t*	Cohen´s d
Incremental implicit theories of emotions	18.30	4.09	18.71	4.09	18.00	4.07	2.19*	0.18
Emotional Intelligence	102	13.90	99.30	14	104.73	13.40	−4.93**	0.40
Aggression	2.77	0.65	2.83	0.65	2.72	0.65	2.19*	0.18

*$p < .05$, **$p < .001$.

Table 2. Pearson's correlations between the study variables in the total sample and according to gender.

	Total sample			Boys			Girls		
	1	2	3	1	2	3	1	2	3
1-Incremental implicit theories of emotions	_			_			_		
2-Emotional Intelligence	.10*	_		.22***	_		.02	_	
3-Aggression	−.12**	−.15***	_	−.05	−.15*	_	−.20***	−.12*	_

*p < .05, **p < .01, ***p < .001.

intelligence was negatively correlated with aggression ($r = -.15$, $p < .001$). Pearson's correlation analyses were conducted separately for boys and girls (see Table 2), revealing that both boys ($r = -.15$, $p < .05$) and girls ($r = -.12$, $p < .05$) showed a negative correlation between aggression and emotional intelligence. Fisher's z-test yielded a result of z = .37 and $p = .70$, indicating that the correlation for boys did not significantly differ from that of girls. Moreover, a negative correlation between aggression and incremental implicit theories of emotions was found for girls ($r = -.20$, $p < .001$), but not boys ($r = -.05$, $p = .49$). Fisher's z-test yielded a result of z = 1.86 and $p < .01$, indicating that the correlation for girls was significantly stronger than that for boys. Furthermore, a positive correlation between incremental implicit theories of emotions and emotional intelligence was found for boys ($r = .22$, $p < .001$), but not for girls ($r = .02$, $p = .71$). Fisher's z-test yielded a result of z = 2.49 and $p < .001$, indicating that the correlation was significantly stronger for boys than girls.

The mediating role of emotional intelligence

Our Hypothesis 4 predicted that emotional intelligence plays a mediating role in the relationship between incremental implicit theories of emotions and aggression. Model 4 of the PROCESS macro (Hayes, 2013) was applied to test this hypothesis. The results (see Figure 2) indicate that incremental implicit theories of emotions were positively associated with emotional intelligence ($p < .05$; β = .32; se = .13; CI [.0520, .5926]), which was, in turn, negatively related to aggression ($p < .001$; β= −.01; se = .00; CI [−.0101, −.0027]). The mediation analyses revealed a significant negative indirect effect of incremental implicit theories of emotions on aggression (indirect effect coefficient = −.002, se = .00; 95% CI [−.0047, −.0003]; explained variance of the model $R^2 = 3.23\%$). Moreover, we found a negative and significant direct effect of incremental theories of emotions on aggression ($p < .001$; direct effect coefficient = −.02; se = .00; CI [−.0291, −.0040]). Therefore, emotional intelligence partially mediated the association between incremental implicit theories of emotions and aggression.

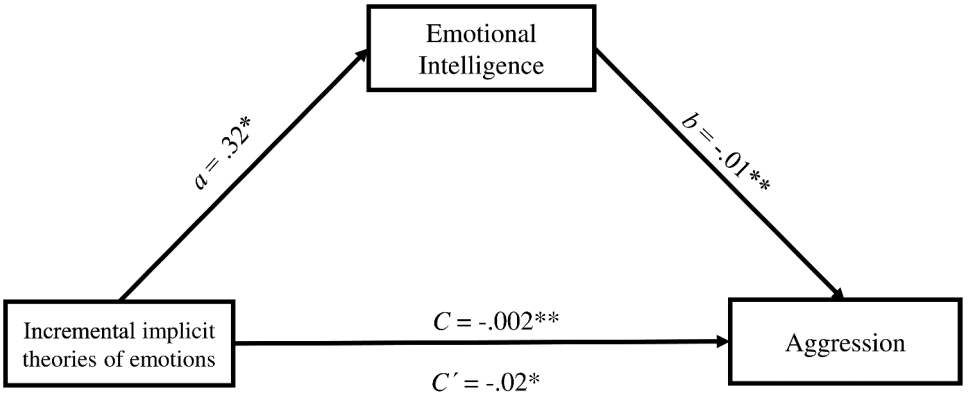

Figure 2. Path coefficients for mediation analysis on aggressive behaviour. $p<0.05$, **p<0.01

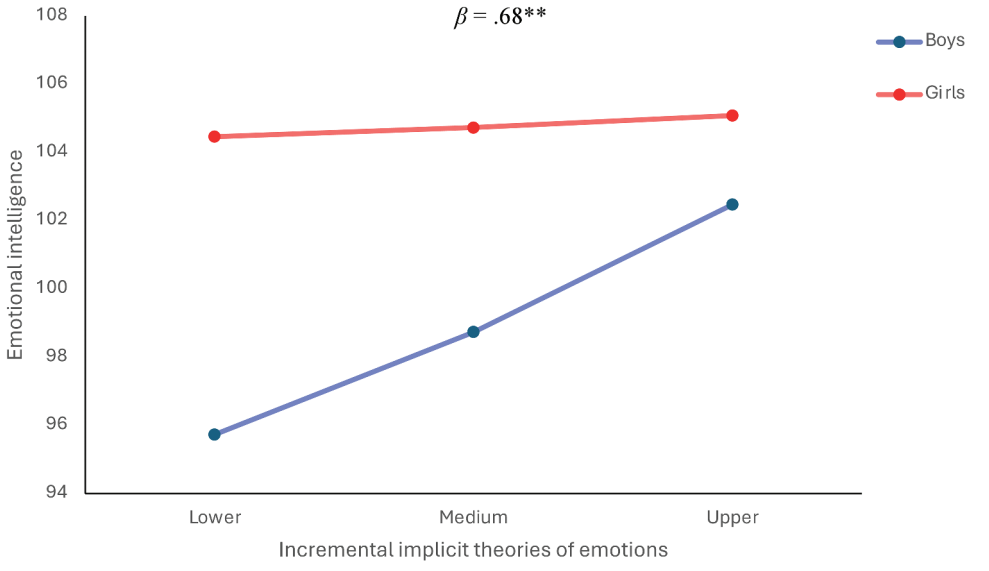

Figure 3. Relationship between emotional intelligence and incremental implicit theories of emotions according to gender. Note. *p < .01, **p < .001.

Testing for moderated mediation

To confirm that gender moderates the relationship between incremental implicit theories of emotions and aggression and emotional intelligence, PROCESS macro model 59 (Hayes, 2013) was applied. The results show that gender moderates the relationship between incremental implicit theories of emotions and emotional intelligence ($p < .01$; $\beta = -0.68$). Specifically, the relationship between incremental implicit theories of emotions and emotional intelligence is only observed in boys ($p < .01$; *effect* = 0.74; se = .19; CI [.3605, 1.1361]) (Figure 3). The relationship between emotional intelligence and aggression was not moderated by gender (p =.77; $\beta = 0.00$). The direct effect between incremental implicit theories of emotions and aggression that is moderated by gender ($p < .001$; $\beta = -0.03$). Specifically, the analysis revealed that the relationship between incremental

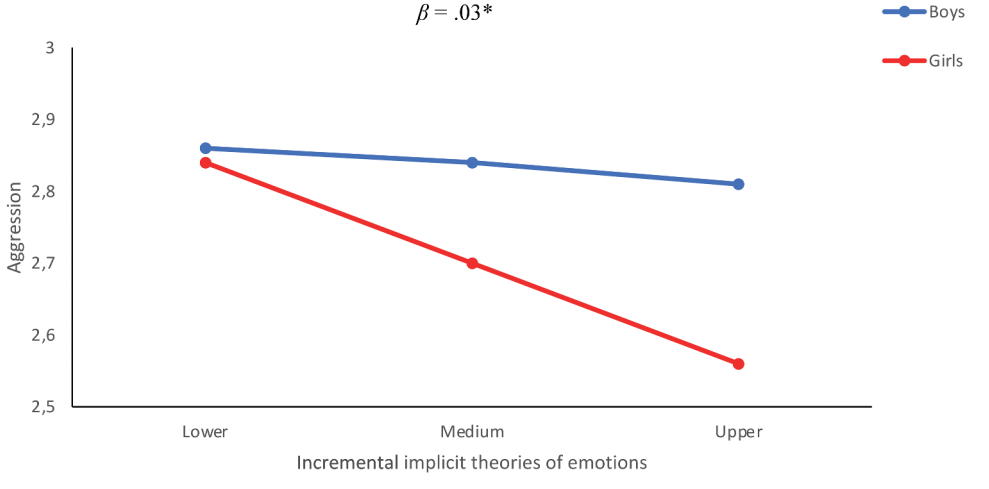

Figure 4. Relationship between aggression and incremental implicit theories of emotions according to gender. Note. *p < .01, **p < .001.

implicit theories of emotions and aggression was only observed in girls ($p < .001$; *effect* = −0.03; se = .00; CI [−.0484, −.0142]) (Figure 4). Finally, the indirect effect of incremental implicit theories of emotions on aggression is moderated by gender. Specifically, the analysis revealed that this indirect relationship was only observed in boys ($\beta = -0.005$; $p < .05$; [CI −.0111, −.0010]).

Discussion

The high prevalence and severe consequences linked to aggression in childhood, particularly in adolescence, are a considerable cause for concern. Despite this, there is still a limited understanding of the underlying mechanisms that contribute to the emergence of this behaviour in young individuals. In light of this gap, the present study aimed to investigate the protective factors associated with aggression among youngsters, focusing particularly on the roles of incremental implicit theories of emotions and emotional intelligence, as indicated by previous studies. To the best of our knowledge, this study represents the first attempt to concurrently investigate the relationship between these three variables in the 9 to 18-year age range. The findings provide evidence supporting the notion that emotional intelligence mediates the relationship between theories of emotions and aggression in children and adolescents.

Our findings supported our first hypothesis, indicating that individuals who perceive emotions as fixed and beyond their control may be more prone to engaging in aggressive behaviours (Cabello & Fernández-Berrocal, 2015; Gutiérrez-Cobo et al., 2023). Moreover, these results replicate the findings of previous research that demonstrated a link between entity theories in various attributes, where young individuals perceive factors such as personality, peer relations, or intelligence as beyond their control and, therefore, present a higher likelihood of exhibiting externalizing behaviours such as aggression (Schleider et al., 2015). Although relatively few studies have examined this relationship, our findings are consistent with previous research (e.g. Dickerson et al., 2018; Flynn, 2016). These findings suggest that people who believe that emotions are fixed and beyond their control may experience intense negative emotions such as anger and frustration more frequently, which, in turn, can increase the likelihood of engaging in aggressive behaviours (Cabello & Fernández-Berrocal, 2015; Gutiérrez-Cobo et al., 2023).

Our findings also support our second hypothesis; we observed that individuals who held incremental theories towards emotions, believing that emotions could be developed and modified, tended to have higher emotional intelligence. These findings are consistent with those reported in previous studies demonstrating the positive effect of incremental implicit theories of emotion-related attributes on individuals´ emotional intelligence, both in adults and young people (Cabello & Fernández-Berrocal, 2015; Costa & Faria, 2022, 2023). When individuals perceive emotions as largely uncontrollable, they are less likely to invest effort in regulating those emotions they feel powerless to control. This aligns with prior research indicating that individuals exhibit stronger self-regulation when they are motivated and confident in their ability to engage in this process (Job et al., 2010; Tamir & Mauss, 2011).

Our results also support our third suggested hypothesis, which proposed that there is a negative correlation between emotional intelligence and aggression. This relationship has been consistently demonstrated in previous studies, as evidenced by a recent meta-analysis (Vega et al., 2022) that included 17 studies with samples of young individuals. The results of these studies suggest that adolescents with higher levels of emotional intelligence tend to exhibit lower levels of aggression, a pattern of results that appears to be consistent across different theoretical models of emotional intelligence, the types of aggressive behaviour measured, and the assessment instruments employed.

In line with our fourth hypothesis, our findings revealed that emotional intelligence serves as a mediator in the relationship between incremental implicit theories of emotions and aggression. Specifically, individuals who hold more malleable views of emotions, considering them as changeable and adjustable, may be better equipped to regulate their emotions and respond to challenging

situations more adaptively and less aggressively. While some studies have established a negative link between incremental implicit theories of emotions and aggression (Dickerson et al., 2018), rather less is known about the specific mechanisms underlying this relationship in children and adolescents. Furthermore, previous studies have already provided evidence of the mediating role of emotional intelligence in the link between various factors and aggression-related variables in young individuals (Oluyinka, 2009; Zhang et al., 2022), but not with implicit theories of emotion. Therefore, one of the strengths of our study lies in examining a broad age range, including children and adolescents, to investigate a general mechanism involving the mediating role of emotional intelligence in the association between incremental implicit theories and aggression.

Finally, concerning our fifth hypothesis regarding gender differences, one of the most interesting findings is the moderating effect of gender in the relationship between incremental implicit theories and emotional intelligence. There are several potential explanations for this result. In particular, boys showed stronger adherence to the incremental view of emotions than girls, which is consistent with findings from certain adolescent studies (Ford, 2016). It is plausible that boys could overestimate their adherence to incremental implicit theories compared to girls, a trend observed in self-report measures of emotional intelligence (Salguero et al., 2015; Yeager & Dweck, 2020). Additionally, our findings revealed the reverse pattern for ability EI when assessed using a performance instrument, showing that girls have higher levels of ability emotional intelligence than boys, consistent with prior adolescent research (Fernández-Berrocal et al., 2018; Llamas-Díaz et al., 2023). Therefore, the observation that the relationship between incremental implicit theories and EI exists only for boys suggests there could be a ceiling effect when evaluating EI in girls. Specifically, the overall EI scores for girls are high and therefore do not differ according to other variables such as, for example, the self-perception component and theories of emotion malleability where girls tend to lag behind due to biological, interpersonal, and sociocultural factors (Brody, 1985; Underwood et al., 1992).

It is possible that girls recognize the importance of emotions and are highly attuned to their presence. However, at this age, they may have less confidence in their ability to manage emotions due to their greater emotional complexity (Salguero et al., 2015). This could cease to be the case in later stages of development, where women, with maturity and experience, may perceive themselves as more capable. Consequently, incremental implicit theories become more relevant as they grow older.

Gender was also found to moderate the relationship between incremental implicit theories of emotions and aggression; in this case, the direct relationship was only observed in girls, and the indirect relationship was only observed in boys. These analyses – which have not previously been conducted – suggest that the malleability of emotions is manifest differently in boys and girls. The direct effect suggests that girls may be more likely to recognize and express emotions verbally, while boys tend to express emotions nonverbally or through actions that lead to aggressive situations (Archer, 2004; Barrett et al., 2000; Card et al., 2008). Therefore, while incremental theories regarding emotions could lead to a decrease in aggression in girls, this is not the case for boys since, although they believe that emotions can be modified, they perceive aggression to be an acceptable way of responding to conflict situations (Ostrov & Keating, 2004).

Concerning the indirect connection between incremental implicit theories of emotions and aggression underscores the importance of boys believing in their ability to regulate emotions and actively cultivating their emotional competence to recognize, comprehend, and manage them effectively. These skills would empower them to respond more adaptively in conflict scenarios, fostering more significant social adjustment.

Clinical implications

These findings carry significant implications for interventions targeting young individuals. Our results strongly suggest that cultivating incremental implicit theories of emotions to enhance the utilization of emotional intelligence could be a viable strategy to reduce the incidence of aggressive

behaviours indirectly and directly among young individuals. Changing beliefs regarding emotions could serve as an initial step in adopting effective emotion regulation strategies, such as cognitive reappraisal. Recent studies have highlighted the impact of instilling entity beliefs about emotions in adults, revealing significant implications for emotion regulation (Kneeland et al., 2016a, 2016b; Rovenpor & Isbell, 2018). Given that children and adolescents typically hold more optimistic views regarding the controllability of emotions compared to adults (Ford, 2016), it becomes important to address and manage these beliefs early on. Focusing on these developmental stages is essential, as it is easier to prevent an increase in entity beliefs about emotions than to mitigate them once they have already become established. In turn, previous research has demonstrated that programs aimed at enhancing emotional intelligence have led to a decrease in aggression (Castillo-Gualda et al., 2018). Therefore, it would be advisable for such programs to also incorporate incremental implicit theories of emotions, recognizing that fostering the beliefs about the malleability of emotions can contribute to achieving long-term positive outcomes (Aronson et al., 2002; Blackwell et al., 2007). Furthermore, prior studies have suggested that contextual factors play a role in shaping the impact of implicit theories on adolescents. Specifically, within the classroom environment, it is crucial for teachers to embrace incremental theories and actively promote and create an atmosphere that fosters the development of students' implicit theories (Yeager et al., 2022).

Limitations

Despite the valuable insights provided by this study into the underlying mechanisms of aggressive behaviour in children and adolescents, several limitations must be considered. First, the use of self-report measures to evaluate variables such as aggression may be prone to response biases and may not accurately reflect objective reality. Therefore, future research should use more objective measures to replicate these findings. For instance, utilizing recent technologies such as wireless microphones and concealed cameras to monitor children during recess periods at school playgrounds could provide valuable insights (Tapper & Boulton, 2002). Additionally, obtaining data from parents and teachers would allow the triangulation of data and provide more accurate and reliable information on this topic. Second, while significant changes related to aggression have been observed within the age range studied in this research (Arango et al., 2022; Da Silva et al., 2020; Espelage et al., 2018), and considering that interventions in children and young people could be key to preventing future maladaptive behaviours, future studies should analyse potential changes in the relationships among the variables studied across different stages of development. Third, our study included a sample aged between 9 and 18 years. Examining a wide range of ages makes it possible to uncover patterns and trends in the relationships between the study variables that would otherwise not be apparent if the sample were restricted to a narrower age range. This approach aids in obtaining a more comprehensive understanding of how these variables are interrelated throughout development. However, future studies should analyse how these variables evolve over time and in relation to the age of the participants. Fourth, due to the study's cross-sectional nature and the use of correlation analyses, it was not possible to establish causal relationships between the variables of interest. Future studies should employ longitudinal and experimental designs to causally analyse the role of the target variables in aggressive behaviour. Moreover, further longitudinal studies can specifically test multigroup differences between age and gender groups to confirm the moderation effects explored in this study. Finally, future studies should investigate the effectiveness of emotional intelligence training and belief modification regarding emotion controllability in reducing aggressive behaviour in young people, with the aim of improving existing interventions.

Conclusion

In conclusion, our findings suggest that incremental implicit theories of emotions are negatively associated with aggression in youngsters, directly and indirectly, through the

mediating effect of emotional intelligence. Moreover, we observed that the relationship between incremental implicit theories of emotions and emotional intelligence, as well as incremental implicit theories of emotions and aggression, are moderated by gender. These results hold potential significance for clinical applications, providing insights to guide the development of targeted intervention programs aimed at preventing aggression. Such programs could incorporate strategies to foster the development of incremental implicit theories of emotions and emotional intelligence while considering the gender-specific differences identified for these variables. Additionally, cultivating incremental theories concerning the various domains relevant to students' success and well-being among educators could play a pivotal role in facilitating the adoption and growth of positive beliefs among adolescents.

Ethics approval and consent to participate

High school students participated in the study with written informed consent from their parents/legal guardians. Participants were informed of the confidentiality and anonymity of their responses, and all methods were performed in accordance with the Helsinki Declaration. This study was approved by the Research Ethics Committee of the University of Málaga (approval number: 10–2019-H). Written informed consent was required from parents/legal guardians to participate in the study.

Availability of data and materials

Study data are available upon request from correspondence author Rosario Cabello (rcabello@uma.es).

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R.G-L., A.C., L.F., P.F-B., and R.C. designed the research study. R.G-L and A.C. collected the data. R.G-L., P.F-B., and R.C. performed the data analysis and its interpretation. R.G-L., A.C., wrote the first draft with input from R.

C. The final draft was co-writing by R.C., L.F., and P.F-B. All authors reviewed and approved the final manuscript.

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