# Angry rumination as a mediator of the relationship between ability emotional intelligence and various types of aggression

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**Abstract**

Ability Emotional Intelligence (AEI) has been negatively associated with aggressive behavior. There is, however, no evidence about the associations between AEI and indirect aggression or angry rumination, although several studies have reported that people with low AEI tend to use depressive rumination as an emotional regulation strategy. The purposes of this study were to provide preliminary evidence on the relationships between AEI and angry rumination and between AEI and indirect aggression, and to examine the role of angry rumination as a mediator of the relationship between AEI and different types of aggression (physical, verbal and indirect aggression). We used a cross-sectional design; 243 undergraduate students completed questionnaires assessing the variables of interest. The results provided evidence for negative associations between AEI and both angry rumination and indirect aggression. Analysis also indicated that angry rumination was a significant mediator of the relationship between AEI and all three types of aggression. These findings are discussed in the light of aggression models and their practical implications for work on prevention or treatment of aggressive behavior are considered.

*Keywords*: emotional intelligence, aggression, angry rumination, indirect aggression

## Highlights

- We investigate the link between Ability Emotional Intelligence (AEI) and aggression
- AEI was negatively related to physical, verbal and indirect aggression
- Angry rumination was negatively related to AEI
- Angry rumination mediated the relationship between AEI and aggression

## 1. Introduction

Emotional Intelligence (EI) is defined as the set of abilities involved in perception, usage, understanding, management and regulation of emotions (Mayer & Salovey, 1997). EI can be conceptualized as a trait or as a mental ability. Trait EI (TEI) or trait emotional self-efficacy is a set of emotional self-perceptions located at the lower levels of the personality hierarchy (Petrides, Pita, & Kokkinaki, 2007) and is assessed with self-report measures (Petrides, 2009) whereas ability emotional intelligence (AEI) is defined as a set of abilities related to processing emotional information (Mayer & Salovey, 1997) and is measured in terms of maximum performance (Mayer, Salovey, Caruso, & Sitarenios, 2003).

People with lower EI tend to be characterized by conflict and aggressive behavior (García-Sancho, Salguero, & Fernández-Berrocal, 2014). The most of research on this field has focused on TEI. TEI and AEI have been conceptualized like two different constructs and have shown different associations with related variables (Petrides & Furnham, 2003). Therefore this study extends previous research by focusing on the association between AEI and aggression and exploring the role of angry rumination as a mediator of the relationships between these variables.

### 1.1. Emotional Intelligence and Aggression

Aggression has been defined as any form of behavior intended to harm or injure another individual (Anderson & Bushman, 2002) and can be classified as overt or indirect. Overt aggression is behavior which is intended to have a direct negative effect on the victim's well-being; overt aggression can be physical or verbal (Coie & Dodge, 1998). Physical aggression encompasses behaviors such as hitting or pushing, whilst verbal aggression encompasses verbal attacks in the form of name calling, taunting or threats. Indirect aggression is behavior which causes harm indirectly, by damaging

social relationships and it encompasses behaviors such as gossiping, excluding the victim from social groups or spreading rumors (Björkqvist, 2001; Card, Stucky, Sawalani, & Little, 2008). In recent years there has been an increased interest in indirect aggression as it is the most common form of aggressive behavior in adulthood (Anguiano-Carrasco & Vigil-Colet, 2011).

Various theories of aggressive behavior have been put forward. These have been integrated into the General Aggression Model (GAM; Anderson & Bushman, 2002). The GAM provides a parsimonious account of why people act aggressively in terms of three levels: personal and situational factors, internal states and outcomes of appraisal and decision-making processes. In this model personal factors (e.g. personality traits, gender, attitudes) interact with situational factors (e.g. insults, presence of guns, alcohol) to create an internal state which influences behavior. Internal state, which is a composite of cognitions (hostile thoughts, aggressive scripts), affect (anger, general negative affect) and arousal (physiological and psychological arousal) influences appraisals and decision-making processes which may or may not result in an aggressive response.

A number of studies have highlighted the role of emotional variables on aggressive behavior (Denson, 2013; Denson, Pedersen, Friese, Hahm, & Roberts, 2011; Dollar, Doob, & Sears, 1939). Lemerise and Arsenio (2000) proposed that emotion processes may have a relevant role during information processing in a social situation. For instance, deficits in recognition of facial emotions may result in a tendency to attribute anger to others and react aggressively (see García-Sancho, Salguero, & Fernández-Berrocal, 2015a). Similarly, individuals who are unable to manage strong emotions may be overwhelmed by them during appraisal and decision-making processes, and therefore generate a smaller range of responses, most of which are

related to their affective state (e.g. aggressive responses when they feel angry) (Lemerise & Arsenio, 2000). This perspective suggests that EI may have a role in reducing and managing aggressive behavior.

García-Sancho, Salguero and Fernández-Berrocal (2014) systematically reviewed research on the relationship between EI and aggression and concluded that there was strong evidence that EI and aggressive behavior are negatively associated (García-Sancho et al., 2014); the association was consistent across populations, ages and indicators. Few studies, however, have analyzed the association between AEI and aggression (Plugia, Stough, Carter, & Joseph, 2005). An investigation of the relationship between AEI and aggression which was intended to address this gap in the literature (García-Sancho, Salguero & Fernández-Berrocal, 2015b) revealed negative associations between AEI and physical and verbal aggression in both adult and adolescent samples. Also, AEI showed incremental validity on physical aggression after controlling traits personality in adults and AEI predicted physical aggression nine months later in adolescents (García-Sancho et al., 2015b). In contrast, verbal aggression was only weakly associated with AEI in both adults and adolescents, suggesting that the extent to which AEI influenced aggression might depend on the type of aggression. No other forms of aggression were explored in this study, leaving open the question of how indirect aggression, one of the most common aggressive behaviors in adulthood, is related to AEI (Anguiano-Carrasco & Vigil-Colet, 2011). This study explored the associations between AEI and all three types of aggression (physical, verbal and indirect).

### 1.2.Angry Rumination as Mediator

Angry rumination is potential contributor to aggression. Angry rumination is the term used for repetitive, negative cognitions about an anger-inducing event, such as

anger-inducing memories, angry thoughts and feelings, and plans for revenge (Denson, Pedersen, & Miller, 2006; Sukhodolsky, Golub, & Cromwell, 2001). A substantial body of empirical evidence suggests that angry rumination following a provocation increases aggression towards the provocateur (Bushman, 2002), and even towards other targets (Bushman, Bonacci, Pedersen, Vasquez, & Miller, 2005).

According to the GAM, rumination after an anger-inducing provocation maintains or increases the activation of all three aspects of internal state leading to aggression: angry affect, aggressive cognitions and physiological arousal (Pedersen et al., 2011). Internal state influences appraisal and decision-making processes by increasing the likelihood that they will result in aggressive behavior (Anderson & Bushman, 2002). Denson's (2013) multiple system model of angry rumination posits that when one experiences angry feelings, aggressive thoughts and high arousal it takes more effort to self-regulate one's internal state and this effort consume cognitive resources. Given that executive functioning is a limited yet renewable resource, it is possible that angry rumination temporarily depletes executive functioning resources (Slotter & Finkel, 2011) thus impairing appraisal and decision-making processes and increasing the risk of impulsive behavior such as retaliatory aggression (Denson et al., 2011). Additionally, other associated type of rumination, hostile rumination, defined as tendency to have repetitive thoughts related to desire for retaliation and vengeance (Caprara, 1968), mediated the relationship between traits of personality associated to negative affect (emotional stability) and violent behavior (Caprara et al., 2013).

Little is known about the relationship between EI and angry rumination. To the best of our knowledge, there has been only one study investigating the association between TEI and angry rumination, and it reported a negative association (Sukhodolsky et al., 2001). EI has been associated with emotional regulation (see Peña-Sarrionandia,

Mikolajczak, & Gross, 2015, for a review). Several studies have shown that people with lower AEI tend to use depressive rumination, as an emotional regulation strategy (Curci, Lanciano, Soleti, Zammuner, & Salovey, 2013; Lanciano, Curci, Kafetsios, Elia, & Zammuner, 2012). Some authors have suggested that people with low EI may be overwhelmed by their emotions when they experience an event with high negative emotional impact; their difficulties perceiving, understanding and regulating sadness and related negative emotions may mean that they experience these emotions as threatening and use rumination as an avoidant coping strategy (Salguero, Extremera, & Fernández-Berrocal, 2013; Smith & Alloy, 2009). It seems plausible that EI should also be associated with other forms of rumination, such as angry rumination, but to date no study has investigated this. Given that angry rumination is an explanatory factor in models of aggression, and that AEI has been associated with other forms of rumination and aggressive behavior, angry rumination may mediate the relationship between AEI and aggression.

### 1.3.This Research

In summary, there is evidence of an association between AEI and aggression; however, the magnitude of this association depends on the type of aggression involved (physical or verbal) and there is no evidence on the relationship between AEI and other forms of aggression such as indirect aggression. There is evidence that people who engage in angry ruminative thinking are more likely to act aggressively, but although AEI has been linked with ruminative thinking there has been no research investigating its relationship with angry rumination. Finally, given what is known about the relationships among AEI, aggression and angry rumination it seems plausible that angry rumination mediates the association between AEI and aggression. The objectives of this study were therefore 1) to analyze the association between AEI and different types of

aggression, namely physical, verbal and indirect aggression; 2) to examine the relationship between AEI and angry rumination; 3) to determine whether angry rumination mediates the relationship between AEI and aggression.

## 2. Method

### 2.1.Participants and Procedure

The participants were 243 undergraduate students (52 men and 191 women) at public university in South of Spain aged between 19 and 54 years old ($M$ = 21.78, S.D. = 4.38). Participation was in exchange for extra course credit and was entirely voluntary and anonymous. The participants completed the AEI measure individually in a group format during a normal lesson day and the rest of the scales were completed individually as part of an electronic survey.

### 2.2.Measures

**Physical and verbal aggression** (Aggression Questionnaire, AQ; Buss & Perry, 1992). The AQ is a self-report questionnaire containing of two subscales assessing physical aggression (nine items) and verbal aggression (five items). All items are rated on a five-point Likert scale (1= extremely uncharacteristic to 5=extremely characteristic). The original scale has adequate internal consistency for both subscales (Buss & Perry, 1992); we used a Spanish version which has also shown good internal consistency and reliability (Rodríguez, Peña, & Graña, 2002).

**Indirect Aggression Scale** (IAS; Forrest, Eatough, & Shevlin, 2005). The IAS is a self-report scale for adults. It evaluates indirect aggression using 25 items which are rated using a five-point Likert scale (1 = never do this to 5 = do this regularly). There are two versions (aggressor and target) which provide an indication of an individual's tendency to practice or suffer indirect aggression. We used the aggressor version. All

items of the original aggressor version of the scale demonstrated internal consistency (Forrest et al., 2005). The Spanish aggressor version showed good psychometric properties, high reliabilities and a fairly clear one-dimensional structure (Anguiano-Carrasco & Vigil-Colet, 2011).

**Angry rumination** (Displaced Aggression Questionnaire, DAQ; Denson et al., 2006). Angry rumination was measured with the angry rumination subscale of The Displaced Aggression Questionnaire. It is 10-item self-report measure with responses given on a seven-point Likert scale (1 = extremely unlike me to 7 = extremely like me). It assesses tendency to think about anger-inducing events and their causes and the experience of anger. The original version has high levels of internal consistency and test-retest reliability (Denson et al., 2006). Its factorial structure is equivalent to the original English version and has good psychometric properties (García-Sancho, Salguero, Vasquez, & Fernández-Berrocal, 2015).

**Emotional intelligence** was assessed using the Mayer–Salovey–Caruso Emotional Intelligence Test Version 2.0 (MSCEIT; Mayer et al., 2003). The MSCEIT assesses AEI through the performance on eight tasks and emotional problems. The test comprises 114 items and evaluates the four branch or aspects of EI specified in Mayer and Salovey's (1997) theoretical model: perception of emotions, emotional facilitation, understanding of emotion and management of emotion. Previous work has supported the validity of construct of EI factor and has demonstrated that the EI construct is broader that any one of its subcomponents (MacCann, Joseph, Newman, Roberts, 2013). Therefore in this study we used the global EI score, which is a global score on the sum of the four aspect of EI. The MSCEIT has shown satisfactory psychometric properties and has convergent and discriminant validity (Mayer et al., 2003). The

Spanish version has shown similar psychometric properties (Extremera, Fernandez-Berrocal, & Salovey, 2006).

## 3. Results

### 3.1.Descriptive Statistics and Correlations

Descriptive statistics, reliability and zero-order correlation coefficients for the study variables are shown in Table 1. Overall, total AEI was negatively correlated with angry rumination ($r$ = -0.20) and with all three types of aggression (physical aggression $r$ = -0.23; verbal aggression $r$ = -0.15; indirect aggression $r$ = -0.20). Angry rumination was positively correlated with physical aggression ($r$ = 0.35), verbal aggression ($r$ = 0.30) and indirect aggression ($r$ = 0.27). Finally there were positive correlations between all pairs of types of aggression ($r$ ranged from 0.39 to 0.40). Because previous research have identified gender differences in aggressive behaviour we assessed gender differences in the strength of the correlations between AEI, angry rumination and all three types of aggression using Fisher r-to-z transformation. However, no significant gender differences were shown between AEI and angry rumination ($z$ = -.79, $p$ =.42) , AEI and physical ($z$ = .38 , $p$ =.69) verbal ($z$ = -1.78, $p$ =.07) and indirect aggression ($z$ = -1.02 , $p$ =.30) and between the correlations coefficients between angry rumination and physical ($z$ = -.07 , $p$ =.94), verbal ($z$ = -.47, $p$ =.63) and indirect aggression ($z$ = .001, $p$ = 1.00).

### 3.2.Mediation Analyses

We test the mediation hypothesis using structural equation modelling (SEM) with latent variables in EQS 6.1 (Bentler, 1995), using the maximum likelihood estimation procedure (ML), to control for measurement error. Scores of each of the four branches of the MSCEIT were used as indicators of the EI latent factor. We averaged items

subset into three parcels for the latent factors of angry rumination, physical aggression and indirect aggression, and into two parcels for the latent factor of verbal aggression. Since univariate and multivariate kurtosis statistics were found to indicate non-normality, the Satorra-Bentler scaled ML correction was used to adjust the model chi-square (Hu, Bentler, & Kano, 1992). The following measures of model fit were used (Schweizer, 2010): the root mean square error of approximation (RMSEA), the Bentler comparative fit index (CFI), and the standardized root mean square residual (SRMR). CFI values above .90 indicate good fit. RMSEA values below .08 are considered a reasonable fit, whereas values below .05 indicate good fit. SRMR values are expected to be below .10.

We tested the proposed model in which EI is related to different types of aggression via the mediation effect of angry rumination. A fully-saturated model was tested, including all possible paths of the mediation model. The model showed the following fit indices: S-B $\chi 2 = 109.56$, $df = 80$, $p = .016$; normed $\chi 2$ ($\chi 2/df$) = 1.4; RMSEA = 0.04 (90% CI = 0.02– 0.06); CFI = 0.97; SRMR = 0.06. Globally, theses indices indicate a good fit to the data. As presented in Figure 1, angry rumination was positively related with the all types of aggression and EI was negatively related with angry rumination. A significant direct effect of EI on physical and indirect aggression was found, whereas the direct effect of EI on verbal aggression was non-significant. In the mediation model, EI was significantly indirectly related with the all types of aggression toward angry rumination (-.08 for verbal aggression, -0.9 for physical aggression, and -.05 for indirect aggression; all coefficients were significant at $p < .05$). The absent of direct effect of EI on verbal aggression indicates that angry rumination fully mediated this relationship.

## 4. Discussion

This research examined the relationship between AEI, angry rumination and aggression. First, we analyzed the associations between AEI and three different types of aggression: physical, verbal and indirect aggression. Second, we analyzed the relationship between AEI and the tendency to ruminate on angry feelings. Third, we investigated angry rumination as a mediator of the relationship between AEI and the three different types of aggression.

We found that people with higher AEI reported using all the types of aggressive behavior we studied less frequently. This result is consistent with previous research (García-Sancho et al., 2014) and suggests that people who manage their emotions effectively are less likely to harm or injure others.

Our results provide evidence for a negative relationship between AEI and indirect aggression; people with low AEI showed a tendency to use social relationships to harm others through gossiping, spreading rumors or social exclusion. Similar results have been found in studies with TEI; children with low self-efficacy for emotional abilities received more nominations from their classmates for being a bully (Mavroveli, Petrides, Sangareau, & Furnham, 2009) and were more likely to be involved in indirect bullying as aggressors than people with high TEI (Kokkinos & Kipritsi, 2012). In adulthood aggression between women often takes an indirect form (Anguiano-Carrasco & Vigil-Colet, 2011), and indirect aggression is frequent in everyday conflicts and may affect the quality of social interactions. Although preliminary, our results suggest that EI should be considered as a factor in explanatory models of indirect aggression.

The second aim of this research was to provide the first empirical data on the relationship between AEI and angry rumination. We found that individuals with lower AEI were more likely to ruminate about anger-inducing events. This corroborates previous results using self-report measures of EI (Sukhodolsky et al., 2001) and is

consistent with studies showing an association between AEI and depressive rumination (Curci et al., 2013; Lanciano et al., 2012). This pattern of results provides support for the idea that people with low EI have an emotional regulation style characterized by a perseverative focus on thoughts and feelings associated with negative emotion-eliciting situations (Peña-Sarrionandia et al., 2015). It is possible, as some authors have proposed in the case of depressive rumination (Salguero et al., 2013; Smith & Alloy, 2009), that when faced with an event with high emotional impact, people who have difficulty perceiving, using, understanding and regulations are overwhelmed by negative emotions and use rumination as a regulation strategy in an attempt to avoid this.

Finally, we investigated the mediation of the relationship between AEI and aggression by angry rumination. As hypothesized, angry rumination mediated this relationship in the case of all the types of aggression studied. Our findings indicate that people with low AEI engage in aggressive behavior more frequently partly due to their tendency to use angry rumination to regulate their emotions. We have offered an account of low AEI people could use angry rumination to avoid negative affect following an anger-inducing provocation above. However, angry rumination does not regulate or attenuate negative emotional states; in fact the opposite, it sustains or enhances anger, aggressive cognitions and physiological arousal and thus increases the likelihood of aggressive behavior (Bushman, 2002; Pedersen et al., 2011).

Several limitations of this study should be noted. First, all three types of aggression were assessed using self-report indicators, so data on tendency to act aggressively is based entirely on respondents' perceptions and may over or underestimate aggression. Second, the cross-sectional design means that we cannot establish causal relationships. Third, only undergraduate students participated in this study and the results may not generalize to the general population. Finally, the majority

of the sample was female; previous research indicates that men are more physical aggressive than women (Card et al., 2008) and it is possible that the relationship between EI and aggression varies according to gender.

Despite these limitations the study provides preliminary evidence of associations among AEI, angry rumination and aggression and suggests future lines of research. Previous studies have also found that ruminating about anger increases aggression in an experimental context (Pedersen et al., 2011). Future research should be replicate our results in a behavioral experiment which measures EI as this would provide more reliable evidence to support our findings. It would also be useful to replicate these results in a longitudinal design in order to clarify the causal relationships between AEI, angry rumination and aggression.

In summary, this research has several theoretical and practical implications. From a theoretical perspective, it provides preliminary evidence about the relationship between AEI and indirect aggression. Our results also extend knowledge in this area as they have uncovered a potential psychological mechanism – angry rumination - through which low EI might lead to aggression. Our findings about the associations between AEI, angry rumination and aggressive behavior have some practical implications for development of programs to reduce or prevent aggression. Given the associations between aggression and AEI and angry rumination, intervention programs could include EI training or techniques for reducing angry rumination. An emotional learning program for children and adolescents was found to reduce aggressive behavior (Castillo, Salguero, Fernández-Berrocal, & Balluerka, 2013); it would interesting to investigate whether this was because they learned to restrain a tendency to ruminate.

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## Tables and Figures

Table 1. Means, standard deviations, reliabilities and intercorrelations among measures.

Figure 1. Mediation model of relationships between emotional intelligence and types of aggression through angry rumination.

Table 1. Means, standard deviations, reliabilities and intercorrelations among measures.

| | 1 | 2 | 3 | 4 | M (SD) | α |
|---|---|---|---|---|---|---|
| EI | | | | | 100 (14.28) | .85 |
| Angry Rumination | -.20** | | | | 36.49 (12.06) | .91 |
| Physical Aggression | -.23** | .35** | | | 16.44(5.35) | .78 |
| Verbal Aggression | -.15* | .30** | .40** | | 14.24(3.28) | .70 |
| Indirect Aggression | -.20** | .27** | .39** | .40** | 39.99(10.03) | .88 |

Note: **$p$ <.01, * $p$< .05

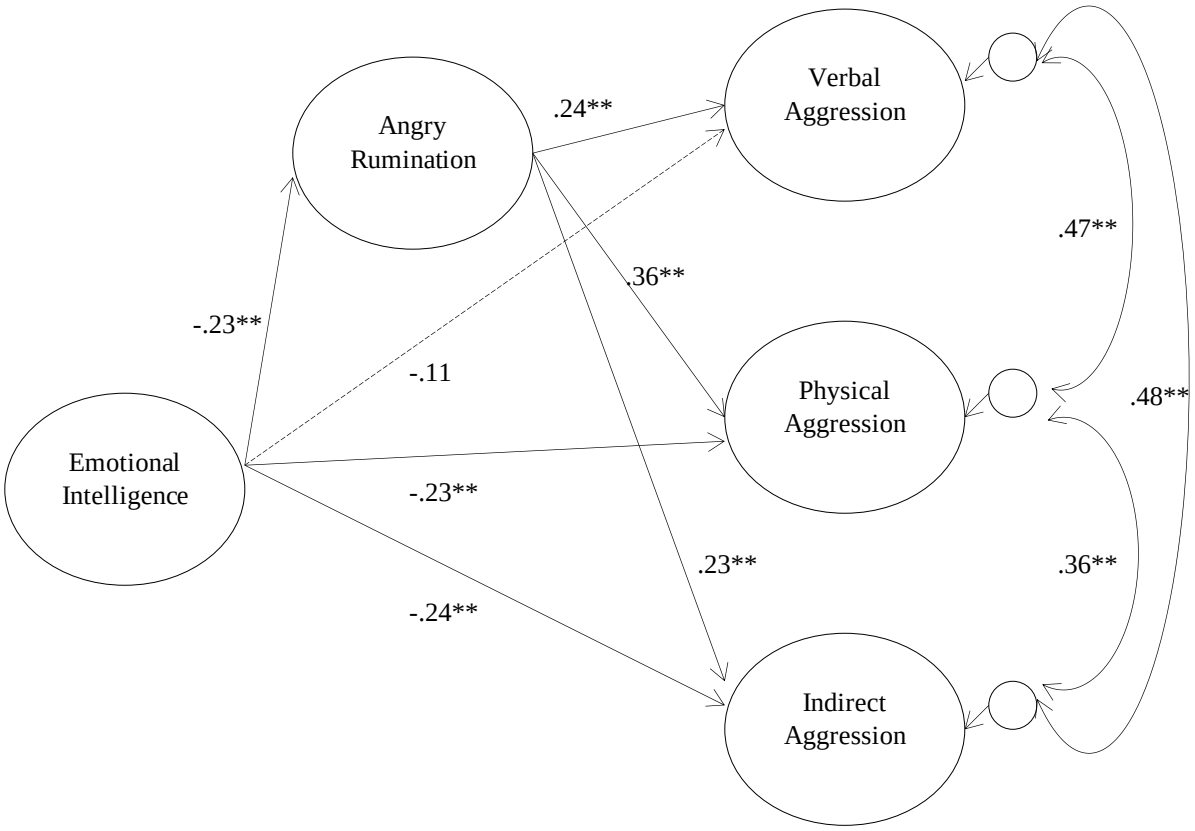


Figure 1. Mediation model of relationships between emotional intelligence and types of aggression through angry rumination.
Note: Standardized beta coefficients are shown. Dashed paths represent non-significant relationships.
**p < .01