

The relationship between aggression and ability emotional intelligence: The role of negative affect.

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## Abstract

This study aimed to contribute to the understanding of the mechanisms underlying the relationship between aggressive behaviour and individual levels of ability emotional intelligence (EI). Three hundred and ninety-five participants took part in this study. Participants were assessed on ability EI, negative affect (NA), and aggression by the Mayer-Salovey-Caruso Emotional Intelligence Test, the Positive and Negative Affect Schedule, and the Buss-Perry Aggression questionnaires, respectively. The results revealed a negative relationship between aggression and ability EI, but this relationship depended on multiple factors: the type of EI branches and aggression dimensions, the influence of NA, and gender. Emotional management ability showed a direct relationship with aggression, while emotional perception ability presented an indirect relationship with aggression through the effect of NA. These EI abilities were related to different aggression dimensions, highlighting the direct relationship with physical aggression. Moreover, gender differences showed that women possess greater EI abilities, higher levels of NA, less aggressive behaviour, and a lower relationship between NA and aggression compared with men. This research offers a better understanding of the psychological processes explaining aggression. The inclusion of our findings in the design of prevention and treatment programs could be of great help in the control and reduction of aggressive behaviour.

## 1. Introduction

Aggression is an important concern in psychiatry, public health, and for current society in general (Averill, 2012; Houston et al., 2004). This research aims to contribute to a better understanding and prevention of the aggressive behaviour through the study of how emotional intelligence is related to different types of aggressive behaviour and how these relationships are a function of the level of negative affect.

Aggression has been defined as any behaviour that is displayed with the intention to hurt another individual who does not wish to be harmed (Anderson and Bushman, 2002). This is currently an important concern for society because of the adverse consequences generated for both the victims and aggressors. For instance, there is a strong association between having suffered maltreatment and presenting social maladaptation or psychiatric disorders (Cullerton-Sen et al., 2008). Victims of aggression are more likely to suffer from depression, anxiety, stress, and sleeping difficulties (Crick and Bigbee, 1998; O'Moore and Kirkham, 2001). Moreover, people characterized by aggressive behaviour show a higher probability of substance abuse, involvement in delinquent activities, personality disorders, low academic performance, school absenteeism, and personal relationship problems, among others (Coccaro et al., 2014; Moffitt, 2006; Ostrov and Godleski, 2009; Piquero et al., 2007).

It is important to understand the psychological factors and processes underlying aggression in order to develop suitable prevention programs and effective treatments. One of the most prominent models attempting to explain aggressive behaviour is the General Aggression Model (GAM) developed by Anderson and Bushman (2002). This model proposes that aggression occurs as a result of the interaction of multiple social, cognitive, and psychological factors through three different stages: (1) inputs: interaction of personal factors (e.g., personality traits, beliefs, gender) and characteristics of a particular situation (e.g., aggressive cues, provocation); (2) routes: present internal states composed of cognition (e.g., hostile thoughts), arousal (e.g., high arousal) and affect (e.g., negative mood) through which input variables have an impact on the next stage; and (3) outcomes: individuals evaluate the situation and make decisions as a function of the results from the inputs and internal state.

This model stands out from other models by presenting an integrative framework of the aggression theories (DeWall et al., 2011). This stresses the need to take into account a considerable number of factors for the understanding, prevention, and reduction of

aggressive behaviour. In this regard, the influence of emotion on aggression is a well-known phenomenon and it can exert an influence at different stages of the GAM model (Anderson and Bushman, 2002; Denson, 2013; Lemerise and Arsenio, 2000). For instance, Lemerise and Arsenio (2000) showed that in the first phase of the GAM model, a deficit in interpersonal emotion perception can cause an individual to misattribute a particular emotion in others during his/her social interactions (e.g. anger) and this leads him/her to react aggressively. A further example, related to the last phase of the GAM model, would be the fact that people with low emotional regulation abilities, in the face of negative situations that generate high emotional activation, have greater difficulty in controlling the emission of aggressive behaviour towards others (Robertson et al., 2012). Thus, the suitable processing of emotional information in social situations and the prior emotional activation level are key to manage and avoid aggressive behaviours. Two important emotional concepts associated with aggression in these types of situations are emotional intelligence (EI) and negative affect (NA). Next, we will discuss each of them in detail.

The EI construct has been widely linked with the management and control of aggressive behaviours (García-Sancho et al., 2014). EI is defined by Mayer and Salovey (1997, pp.3-31) 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*”. Garcia-Sancho et al., (2014), through a systematic review, found strong evidence to suggest that EI and aggressive behavior are negatively related. Eighteen of the nineteen identified studies revealed that people with high EI showed less aggressive behaviours than those with low EI, this relationship being consistent across age, gender, and culture.

EI has mainly been discussed from three theoretical approaches, according to its conceptualization and the type of measuring instruments employed: performance-based ability, self-report ability, and self-report mixed models (Joseph and Newman, 2010). The performance-based ability model considers EI as a form of mental ability based on emotional aptitudes which can be assessed in an objective manner through performance tests where people have to solve emotional problems with correct and incorrect responses (Mayer et al., 2008). The self-report ability model understands EI in a similar way, however it employs self-report instruments for its assessment, which is a more subjective

measure. The self-report mixed model also employs subjective self-report instruments, but it defines EI as a broader concept that includes mental abilities, personality factors, motivations, and inter/intrapersonal skills. The performance-based ability model has received greater empirical support compared with the other models and its theoretical foundations have been developed more extensively (Mayer et al., 2008; Mayer et al., 2016). It has been shown that the measuring instruments associated with this model provide better divergent validity, and are more consistent in predicting multiple factors such as certain daily behaviours, performance in emotionally laden cognitive tasks, or personality disorder (Brackett and Mayer, 2003; Gutierrez-Cobo et al., 2016; Gutierrez-Cobo et al., 2017; Mayer et al., 2000; Mayer et al., 2016; Megías et al., 2017; Webb et al., 2013). On the basis of all this evidence, the present study focuses on the performance-based ability model. Therefore, from now on we will use the term ability emotional intelligence (ability EI) throughout this text to refer to emotional intelligence.

Within the ability models, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer et al., 2002) is the most accepted instrument to assess EI. However, despite its popularity and the fact that it is the model with the strongest empirical support, few studies have used this instrument to relate EI and aggression (Coccaro et al., 2016; García-Sancho et al., 2014). The MSCEIT is divided into four branches according to the Mayer and Salovey (1997) definition: perceiving, facilitating, understanding, and managing. Perceiving emotions refers to the ability to perceive emotions in oneself and others as well as in other type of stimuli. Facilitating emotions is the ability to generate, use and feel emotions to facilitate thought or employ them in other cognitive processes. Understanding emotions is the ability to understand emotional information and meaning, and how emotions combine and progress through relationship transitions. Finally, managing emotions is the ability to modulate emotion in oneself and others to promote personal understanding and growth. Interestingly, it has been demonstrated that the relationship between ability EI and aggression depends on the ability EI branches (Coccaro et al., 2015; García-Sancho et al., 2017). For example, Coccaro et al. (2015) found that the strategic area of the MSCEIT (understanding and management branches) was negatively related to aspects of aggression, but not to the experiential area (perceiving and facilitation branches).

Previous literature has also shown that the EI-aggression relationship depends on the type of aggression to be treated. Instruments such as the Buss and Perry Aggression

Questionnaire (BPAQ; Buss and Perry, 1992) divide this construct into four different dimensions: physical, verbal, hostility, and anger. In this regard, the studies of García-Sancho et al., (2016, 2017) have observed a stronger negative relationship between EI level and physical aggression compared with other dimensions.

As previously mentioned, the NA level is another emotional concept that has been commonly associated with aggression (Lazarus, 2000). NA is understood as the extent to which a person reports feeling upset or unpleasantly aroused, in other words, the disposition to experience aversive emotional states (Watson and Tellegen, 1985). High NA levels predispose an individual to a set of cognitive and emotional biases that make aggressive behaviour more likely to appear (Burt and Donnellan, 2008). In addition, there is also general consensus on the fact that EI is inversely related to NA (Burt et al., 2009; Shi and Wang, 2007). In particular, people with a higher level of EI (and its branches) perceive negative emotions more objectively and are better able to regulate NA (Arsenio and Lemerise, 2001; Babcock et al., 2008; Bourke et al., 2010; García-Sancho et al., 2015). Thus, NA appears to be a key concept for both EI and aggression. Although evidence exists about the influence of NA on both concepts, no studies have yet examined the effect of NA on the relationship between them.

In addition, previous studies in the literature have revealed gender differences in EI, aggression, and NA (Cabello et al. 2016; Fernández-Berrocal et al., 2012; Fujita et al., 1991). Women score higher than men in the main the factors that make up EI and NA (Extremera et al., 2006; López-Gómez et al., 2015; Palmer et al., 2005). On the other hand, men usually show higher levels of aggression (Peláez-Fernández et al., 2014; García-Sancho et al., 2016).

The main objective of the present research was to study how ability EI and aggression are related, along with the mediator effect of NA on this relationship. In order to carry out a detailed study of this issue, we investigate the relationship of each one of the MSCEIT branches (EI abilities) with different dimensions of aggression. Moreover, given the gender differences in EI, aggression, and NA showed by the previous literature, we explored whether the studied relationships are equal across genders. We hypothesize that (1) there is a negative direct relationship between aggression and ability EI, that is, the higher the ability EI levels, the lower the levels of aggression; (2) this relationship depends on NA; (3) significant relationships will depend on the MSCEIT branches and

aggression dimensions studied; and (4) men will show higher levels of aggression, whilst women will show higher levels of ability EI and NA.

## 2. Method

### 2.1. Participants and procedure

Three hundred and ninety-five participants from the University of Málaga (Spain) voluntarily took part in this study. The participant's age ranged from 19 to 30 years with an average of 21.3. Two hundred and ninety-five (75%) were women and one hundred (25%) were men. Each participant had to complete the following three questionnaires: MSCEIT, PANAS, and BPAQ (see Material section for more information). Participants were informed that confidentiality and anonymity of the collected data would be protected. All participants signed a written informed consent form and were treated in accordance with the Helsinki declaration (World Medical Association, 2008).

### 2.2. Materials

The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer et al., 2002) is a performance-based ability measure of EI. This scale is composed of 141 items divided into four branches according to Mayer and Salovey's theory (Mayer and Salovey, 1997): perceiving, facilitating, understanding, and managing emotions. To carry out the present study, the Spanish version of MSCEIT was used (Extremera et al., 2006), which shows adequate psychometric properties similar to the English version (Cronbach's  $\alpha = .95$ ; Sanchez-Garcia et al., 2016).

The Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) questionnaire was used for the assessment of negative affect (NA). This questionnaire is a 20-item self-report measure where participants have to rate on a 5-point scale (1 "not at all" to 5 "strongly") the extent to which they feel a particular emotion. For the current study the degree of affect was assessed at trait-level (in general). In this questionnaire, ten items are employed to assess positive emotions (active, alert, attention, determined, enthusiastic, excited, inspired, interested, proud, and strong) and another ten items are used to measure negative emotions (afraid, ashamed, distressed, guilty, hostile, irritable, jittery, nervous, scared, and upset). According to the main objective of the study, only negative emotions (i.e. negative affect) were included in the analysis. We employed the Spanish version of the questionnaire (Sandin et al. 1999) which has an adequate

Cronbach's alpha for both men (PA:  $\alpha = 0.89$ ; NA:  $\alpha = 0.91$ ) and women (PA:  $\alpha = 0.87$ ; NA:  $\alpha = 0.89$ ).

The Buss–Perry Aggression Questionnaire (BPAQ; Buss and Perry, 1992) was used for measuring aggressive behaviour. The BPAQ consists of 29 items in a five-point Likert format (1 = extremely uncharacteristic of me, 5 = extremely characteristic of me), grouped into four dimensions assessing physical aggression (9 items), verbal aggression (5 items), anger (7 items), and hostility (8 items). We employed the Spanish version of the BPAQ questionnaire (Andreu-Rodríguez et al., 2002) which has shown good reliability for the total score ( $\alpha = 0.88$ ) and for each subscale (physical:  $\alpha = 0.86$ ; verbal:  $\alpha = 0.68$ ; anger:  $\alpha = 0.77$ ; hostility:  $\alpha = 0.72$ ).

### 2.3. Statistical analyses

First, zero-order Pearson's correlations were calculated to describe the relationships between MSCEIT total score, MSCEIT branches, PANAS subscales, BPAQ total score and BPAQ dimensions. Given the presumed impact of gender on the studied variables we also conducted t-test comparisons between men and women for each variable. Second, a path analysis with maximum likelihood estimation was used to evaluate whether ability EI branches are directly related to total aggression score and indirectly related via PANAS NA. Third, we performed a new, more complex path analysis to evaluate which branches of the ability EI are directly related to the four aggression dimensions of BPAQ (physical aggression, verbal aggression, anger and hostility) and indirectly related via PANAS NA.

In both path analyses, MSCEIT branches (perceiving, facilitating, understanding, and managing emotions) were modelled as exogenous variables, and correlated within the model because of the strong associations between them (see Table 1). PANAS NA was included as intervening endogenous variable and aggression scores (total for the first path analysis, and physical aggression, verbal aggression, anger, and hostility for the second) as dependent endogenous variables. Given the strong association between BPAQ dimensions (see Table 1), correlations between error terms of the BPAQ dimensions were added to the model (Arbuckle, 2012; Gunzler and Morris 2015). We tested the theoretically driven model previously described to assess the direct and indirect relationships between the variables of interest. A priori hypothesized paths that did not reach significance levels were progressively excluded from the model to identify the most parsimonious model. Finally, in order to study whether the same final path model can be

applied across genders, we conducted an additional multigroup analysis, differentiating between men and women on the first and second path analyses.

Pearson's correlations and path analyses were conducted using SPSS v.20 and AMOS 21.0 software (SPSS Inc., Chicago, IL). The model fit of path analysis was assessed by chi-square analysis ( $\chi^2$ ), comparative fit index (CFI), goodness of fit index (GFI), and the root mean square error of approximation (RMSEA) (see Arbuckle, 2011; Byrne, 2010). Indirect effects for the path analysis were tested using bootstrapping with 5000 iterations and 95% confidence intervals (CIs).

### 3. Results

All correlation coefficients and *p*-values for Pearson's correlations between all dimensions of the MSCEIT, BPAQ, and PANAS NA are presented in Table 1. Among these, according to the aims proposed in this study, we highlight the following significant relationships: a) MSCEIT total, and MSCEIT facilitating and managing branches with BPQA total, physical, verbal, and hostility, b) MSCEIT perception with BPQA total and hostility, c) MSCEIT total and perception with PANAS NA, and d) PANAS NA with BPAQ total and all its dimensions.

- Insert Table 1 –

T-tests comparing the scores of men and women for each of the variables included in the analyses are shown in Table 2. Significantly higher scores were observed for women on the MSCEIT total, MSCEIT facilitating and managing branches, and PANAS NA compared with men (all  $p < .01$ , medium effect sizes ranging from .30 to .42). Further, significantly lower scores were found for women on the BPAQ total, physical, and verbal. (all  $p < .01$ , medium effect sizes ranging from .27 to .64).

- Insert Table 2 –

With respect to the analysis of the first path model (with BPAQ as total score), we began exploring the original full model containing all proposed paths. Table 3 shows the standardized  $\beta$  coefficients and significance tests for all the direct and indirect effects of this model. The paths found to be non-significant were progressively excluded from the original model in order to provide a more adequate and parsimonious model. The resulting revised model consisted of the following significant direct relationships (see Figure 1 and Table 4): MSCEIT perceiving branch with PANAS NA, MSCEIT managing branch with BPAQ total, and PANAS NA with BPAQ total. In addition, MSCEIT perceiving was indirectly associated with BPAQ total through PANAS NA. The fit of this revised model was adequate,  $\chi^2(6) = 6.34$ ,  $p = .38$ , GFI = .99, CFI = .99, and RMSEA = .012. Figure 1 presents the final revised model with the standardized parameter estimates. Standardized  $\beta$  coefficients and significance tests for the direct and indirect effects are shown in Table 4.

Results for the multigroup analysis (men vs. women) on this revised model revealed that the constrained model (structural weights) had a good fit,  $\chi^2(15) = 20.05$ ,  $p = .17$ , GFI = .98, CFI = .98, RMSEA = .03. Therefore, our model fits adequately to the data and it is applicable to both men and women. However, significant differences in fit were found between the constrained and unconstrained model:  $\Delta\chi^2(3) = 10.38$ ,  $p = .016$ . This better fit was due to the existence of significant differences between genders in the pathway coefficients linking PANAS NA and BPAQ ( $p < .05$ ; men:  $\beta = .35$ ; women:  $\beta = .42$ ). Both men and women showed a significant direct relationship between PANAS NA and BPAQ, but women showed a stronger relationship.

- Insert Table 3 -

- Insert Table 4 -

- Insert Figure 1 -

In regard to the second path analysis (including all the BPAQ dimensions), Table 5 presents the standardized  $\beta$  coefficients and significance tests for all the direct and

indirect effects of the original full model. As in the first path analysis, non-significant paths were progressively removed from the original model. In addition, the path MSCEIT managing with BPAQ verbal was maintained in the model following AMOS's modification indices. The resulting revised model and the statistical parameters for the direct and indirect effects are presented in Figure 2 and Table 6. The model consisted of the following significant direct relationships: the perceiving branch of the MSCEIT showed a significant direct relationship with PANAS NA. Moreover, MSCEIT managing was directly associated with BPAQ physical, verbal and hostility. PANAS NA revealed direct associations with the dimensions physical, verbal, hostility, and anger of the BPAQ. With respect to indirect effects, through PANAS NA, MSCEIT perceiving was indirectly related to the four dimensions of the BPAQ. The revised model presented a good fit to the data,  $\chi^2(16) = 10.65, p = .83, GFI = .99, CFI = 1.00,$  and  $RMSEA < .001$ .

Multigroup analysis results on the revised path model revealed that the constrained model (structural weights) had a good fit,  $\chi^2(40) = 34.33, p = .72, GFI = .99, CFI = 1.00, RMSEA < .001$ . The model fitted adequately to the data for both men and women. The constrained model showed non-significant differences compared with the unconstrained model  $\Delta\chi^2(8) = 11.61, p = .16$ . However, significant differences were found between genders in some pathways (all  $p < .05$ ): PANAS NA and the branches of the BPAQ physical (men:  $\beta = .30$ ; women:  $\beta = .17$ ), verbal (men:  $\beta = .37$ ; women:  $\beta = .18$ ), and anger (men:  $\beta = .49$ ; women:  $\beta = .26$ ). Men showed a stronger relationship between PANAS NA and the BPAQ branches.

- Insert Table 5 –

- Insert Table 6 –

- Insert Figure 2 –

#### 4. Discussion

There is an extensive literature showing the negative relationship between EI and aggression (see García-Sancho et al., 2014). However, certain mechanisms underlying this relationship remain unknown. A deeper understanding of these psychological processes would help to design and implement better prevention and treatment programs. Both EI and aggression are multidimensional constructs that cover different aspects. Relationships between these dimensions have been sparsely studied, but complex interplays are expected. Moreover, whilst emotional variables such as NA have been separately associated with both EI and aggression, its influence on the EI-aggression relationship has not previously been studied. Thus, the present research aimed to explore the mechanisms underlying the relationship between each of the EI branches (from the MSCEIT questionnaire) with different aggression dimensions (BPAQ dimensions) as a function of NA.

The results of our research revealed a first final path model where the perception and managing branches of the MSCEIT were related to aggression, measured as a total score. The emotional managing branch showed a direct relationship, while the perception branch showed an indirect relationship through NA. In both cases, the higher the ability EI, the lower the aggression levels. In addition, the EI perception branch was negatively related to NA, and NA was positively related to aggression. A second path analysis dividing aggression into the BPAQ dimensions (physical, verbal, hostility, and anger) revealed that MSCEIT managing was directly related to physical, verbal and hostility aggression. Thus, MSCEIT managing was the emotional branch with the strongest direct association with aggression. Further, MSCEIT perception was indirectly related to the four aggression dimensions through the effect of NA. The direction of these relationships was always negative, that is, greater ability EI was associated with lower levels of aggression.

Although both path models (with total aggression and with aggression dimensions) had a good fit for both women and men, the moderation model revealed gender differences in the association between NA and aggression. Men showed a stronger positive relationship between NA and the total, physical, verbal, and anger aggression scores than women. Regarding gender differences in individual variables, as expected, men showed higher levels of aggression in terms of total score, along with the physical and verbal dimensions in comparison with women. Finally, women showed higher levels of total EI, facilitating EI, managing EI, and NA compared with men.

Our results are compatible with the findings of previous research and with Hypothesis 1 initially proposed in the introduction. The literature has shown that higher levels of EI are related to lower levels of NA (Burt et al., 2009; Shi and Wang, 2007) and aggression (Coccaro, 2016; García-Sancho et al., 2014; García-Sancho et al., 2016; García-Sancho et al., 2017). Specifically, consistent with those studies, in our sample the highest direct correlation between ability EI and aggression was observed with the physical dimension. Moreover, NA was positively related to aggression (Burt and Donnellan, 2008; Lazarus, 2000; Robertson et al., 2012).

Particularly important to the aim of the current study, NA was included as a mediator of the relationship between the ability EI branches and the total aggression score. Higher levels of managing emotions were associated with lower aggression, independently of NA. Therefore, an adequate ability to manage emotions plays a central role in determining personal and social success by helping individuals to carry out adaptive responses in aggressive contexts (Côté, 2014; Cabello and Fernández-Berrocal, 2015; García-Sancho et al., 2017; Gutiérrez-Cobo et al., 2016, 2017; Peña-Sarrionandia et al., 2015). In addition to this direct effect, and in accord with Hypothesis 2, the perceiving branch of the MSCEIT and aggression were indirectly related through the effect of NA. Following the GAM model, this result could be taken to reflect the fact that the inadequate ability to perceive other emotions (Stage 1 of the GAM) may generate high levels of negative affect (Stage 2) and, consequently, aggressive behaviours (Stage 3) (Anderson and Bushman, 2002; Lemerisa and Arsenio, 2000). For instance, labelling other's neutral or positive emotions as negative (or vice versa), may increase NA in that situation leading a higher probability of an aggressive behaviour (Arsenio and Lemerise, 2001; Bourke et al., 2010, García-Sancho et al., 2015). Hypothesis 3 also was supported, given that the EI-aggression relationship was dependent on the MSCEIT branches and BPAQ dimensions, as previously discussed.

Finally, in accord with Hypothesis 4 and previous findings in the literature, gender differences were obtained in ability EI, aggression, and NA (Anderson and Bushman, 2002; Cabello et al. 2016; Fujita et al., 1991). But in addition, our results represent a step forward in the explanation of gender differences in aggression levels, since we found a moderator effect of gender on the relationship between NA and aggression, with men showing a stronger relationship between these variables than women.

Taken together, these findings could form the basis of novel interventions that could be implemented to reduce aggressive behaviour. Previous literature has evidenced the effectiveness of certain interventions based on cognitive control, mindfulness, and self-control training (Denson et al., 2011). The present study opens up the possibility of future lines of investigation concerned with the effectiveness of training different EI abilities in reducing NA and various types of aggressive behaviour. This appears to be a promising line of future research given the previous evidence about the role of EI training on the reduction of aggression in adolescents (Castillo et al., 2013).

As limitations of the research, it is important note that, given the correlational nature of this study, our results do not necessarily imply causality and the observed relationships could also be explained by the effect of other confounding variables. Thus, further research should aim at experimental and longitudinal designs in order to make causal and directional inferences. In addition, the sample population of this study was restricted to young adults ranging in age from 19 to 30 years, and overrepresented by women (75% women vs 25% men). Although the number of men in the study was not excessively small (100 men), we must take into account the possible influence of the gender distribution on our results given the differences found between men and women in the correlation and path analyses. Finally, the BPAQ and PANAS questionnaire are self-reported instruments, and, consequently, exposed to possible response and introspective biases. It would be interesting that future research work with behavioural and physiological measures to avoid these issues.

## 5. Conclusion

The present study explored the mechanisms underlying the negative relationship between ability EI and aggression. We observed that this relationship was a function of multiple factors such as the performance level in each of the ability EI branches, the aggression dimension, the influence of NA, and gender. Emotional management ability showed a direct relationship with aggression, while emotional perception ability was related to aggression indirectly through the effect of NA. These relationships depended on the type of aggression to be treated. Moreover, gender differences revealed that women possess greater ability EI, higher levels of NA, less aggressive behaviour, and a weaker relationship between NA and aggression compared with men. These findings may be an excellent tool for the development and implementation of better prevention and treatment

programs for reducing aggressive behaviour, which could potentially benefit both clinical practice and society in general.

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Table 1. Pearson's correlations among variables included in this study.

|                     | MSCEIT<br>Perceiving | MSCEIT<br>Facilitating | MSCEIT<br>Underst. | MSCEIT<br>Managing | BPAQ<br>Total | BPAQ<br>Physical | BPAQ<br>Verbal | BPAQ<br>Hostility | BPAQ<br>Anger | PANAS<br>NA   |
|---------------------|----------------------|------------------------|--------------------|--------------------|---------------|------------------|----------------|-------------------|---------------|---------------|
| MSCEIT Total        | <u>.77**</u>         | <u>.76**</u>           | <u>.62**</u>       | <u>.64**</u>       | <u>-.14**</u> | <u>-.14**</u>    | <u>-.10*</u>   | <u>-.14**</u>     | -.06          | <u>-.13*</u>  |
| MSCEIT Perceiving   |                      | <u>.49**</u>           | <u>.22**</u>       | <u>.24**</u>       | <u>-.11*</u>  | -.09             | -.06           | <u>-.10*</u>      | -.06          | <u>-.14**</u> |
| MSCEIT Facilitating |                      |                        | <u>.33**</u>       | <u>.39**</u>       | <u>-.15**</u> | <u>-.15**</u>    | <u>-.11*</u>   | <u>-.12*</u>      | -.07          | -.09          |
| MSCEIT Understand.  |                      |                        |                    | <u>.33**</u>       | .00           | .02              | -.00           | -.01              | .00           | -.04          |
| MSCEIT Managing     |                      |                        |                    |                    | <u>-.16**</u> | <u>-.18**</u>    | <u>-.11*</u>   | <u>-.17**</u>     | -.02          | -.07          |
| BPAQ Total          |                      |                        |                    |                    |               | <u>.71**</u>     | <u>.76**</u>   | <u>.71**</u>      | <u>.81**</u>  | <u>.38**</u>  |
| BPAQ Physical       |                      |                        |                    |                    |               |                  | <u>.42**</u>   | <u>.33**</u>      | <u>.43**</u>  | <u>.15**</u>  |
| BPAQ Verbal         |                      |                        |                    |                    |               |                  |                | <u>.31**</u>      | <u>.53**</u>  | <u>.20**</u>  |
| BPAQ Hostility      |                      |                        |                    |                    |               |                  |                |                   | <u>.46**</u>  | <u>.46**</u>  |
| BPAQ Anger          |                      |                        |                    |                    |               |                  |                |                   |               | <u>.32**</u>  |

Note: Significant correlations are indicated by underlined values (\*  $p < 0.05$ ; \*\*  $p < 0.01$ ).

Table 2. Results of the gender t-test analyses for variables included in the study.

|                      | Women  |       | Men    |       | <i>T</i> | <i>p</i>        | Cohen's <i>d</i> |
|----------------------|--------|-------|--------|-------|----------|-----------------|------------------|
|                      | Mean   | SE    | Mean   | SE    |          |                 |                  |
| MSCEIT Total         | 109.05 | 9.06  | 105.72 | 10.86 | 3.01     | <u>.003</u>     | .30              |
| MSCEIT Perceiving    | 107.88 | 12.04 | 106.26 | 11.29 | 1.18     | .239            | .12              |
| MSCEIT Facilitating  | 102.09 | 9.83  | 98.44  | 10.89 | 3.12     | <u>.002</u>     | .31              |
| MSCEIT Understanding | 108.75 | 9.21  | 107.98 | 10.80 | 0.69     | .490            | .07              |
| MSCEIT Managing      | 110.38 | 10.17 | 104.79 | 14.63 | 4.21     | <u>&lt;.001</u> | .42              |
| BPAQ Total           | 2.43   | 0.48  | 2.58   | 0.52  | -2.72    | <u>.007</u>     | .27              |
| BPAQ Physical        | 1.76   | 0.53  | 2.19   | 0.73  | -6.38    | <u>&lt;.001</u> | .64              |
| BPAQ Verbal          | 2.76   | 0.68  | 2.99   | 0.67  | -2.99    | <u>.003</u>     | .30              |
| BPAQ Hostility       | 2.50   | 0.68  | 2.58   | 0.64  | -0.99    | .319            | .09              |
| BPAQ Anger           | 2.69   | 0.67  | 2.56   | 0.70  | 1.58     | .116            | .15              |
| PANAS NA             | 2.18   | 0.76  | 1.92   | 0.63  | 3.12     | <u>.002</u>     | .31              |

Note: Mean, standard error, *T*, *p* value and Cohen's *d* for each variable are included in the table. Significant correlations are indicated by underlined values.

Table 3. Standardized  $\beta$  coefficients and  $p$  values (in parentheses) for the significant direct and indirect effects of the first path analysis (with BPAQ total score) for the original full model.

| <i>Direct Effects</i> | BPAQ total   | PANAS<br>NA  | <i>Indirect Effects with<br/>PANAS NA as mediator</i> | BPAQ total   |
|-----------------------|--------------|--------------|---|--------------|
| MSCEIT perceiving     | .000 (.985)  | -.117 (.025) | MSCEIT perceiving                                     | -.042 (.018) |
| MSCEIT facilitating   | -.096 (.168) | -.032 (.635) | MSCEIT facilitating                                   | -.011 (.617) |
| MSCEIT underst.       | .091 (.113)  | .010 (.788)  | MSCEIT underst.                                       | .004 (.768)  |
| MSCEIT managing       | -.129 (.004) | -.033 (.550) | MSCEIT managing                                       | -.012 (.517) |
| PANAS NA              | .364 (.007)  |              |   |              |

Table 4. Standardized  $\beta$  coefficients and  $p$  values (in parentheses) for the significant direct and indirect effects of the first path analysis (with BPAQ total score) for the revised model.

| <i>Direct Effects</i> | BPAQ total   | PANAS<br>NA  | <i>Indirect Effects<br/>through PANAS NA</i> | BPAQ total   |
|-----------------------|--------------|--------------|--|--------------|
| MSCEIT perceiving     | —            | -.138 (.011) | MSCEIT perceiving                            | -.051 (.007) |
| MSCEIT facilitating   | —            | —            | MSCEIT facilitating                          | —            |
| MSCEIT underst.       | —            | —            | MSCEIT underst.                              | —            |
| MSCEIT managing       | .370 (.005)  | —            | MSCEIT managing                              | —            |
| PANAS NA              | -.137 (.009) |              |  |              |

Table 5. Standardized  $\beta$  coefficients and  $p$  values (in parentheses) for the significant direct and indirect effects of the second path analysis (with BPAQ dimensions) for the original full model.

| <i>Direct Effects</i>                  | BPAQ<br>physical | BPAQ<br>verbal | BPAQ<br>hostility | BPAQ<br>anger | PANAS<br>NA  |
|--|------------------|----------------|-------------------|---------------|--------------|
| MSCEIT perceiving                      | -.012 (.876)     | .010 (.962)    | -.003 (.966)      | .004 (.914)   | -.117 (.025) |
| MSCEIT facilitating                    | -.108 (.121)     | -.084 (.289)   | -.039 (.403)      | -.061 (.359)  | -.032(.635)  |
| MSCEIT underst.                        | -.123 (.027)     | .061 (.435)    | .067 (.100)       | .027 (.533)   | .010 (.788)  |
| MSCEIT managing                        | -.169 (.010)     | -.091 (.159)   | -.150 (.009)      | .014 (.819)   | -.033 (.550) |
| PANAS NA                               | .130 (.023)      | .189 (.009)    | .445 (.009)       | .316 (.010)   |              |
| <i>Indirect Effects<br/>through NA</i> | BPAQ<br>physical | BPAQ<br>verbal | BPAQ<br>hostility | BPAQ<br>anger |              |
| MSCEIT perceiving                      | -.015 (.020)     | -.022 (.020)   | -.052 (.019)      | -.037 (.018)  |              |
| MSCEIT facilitating                    | -.004 (.532)     | -.006 (.599)   | -.014 (.617)      | -.010 (.617)  |              |
| MSCEIT underst.                        | .001 (.749)      | .002 (.730)    | .005 (.787)       | .003 (.768)   |              |
| MSCEIT managing                        | -.004 (.454)     | -.006 (.469)   | -.014 (.533)      | -.010 (.485)  |              |

Table 6. Standardized  $\beta$  coefficients and  $p$  values (in parentheses) for the significant direct and indirect effects of the second path analysis (with BPAQ dimensions) for the revised model.

| <i>Direct Effects</i>                  | BPAQ<br>physical | BPAQ<br>verbal | BPAQ<br>hostility | BPAQ<br>anger | PANAS<br>NA  |
|--|------------------|----------------|-------------------|---------------|--------------|
| MSCEIT perceiving                      | —                | —              | —                 | —             | -.138 (.011) |
| MSCEIT facilitating                    |                  | —              | —                 | —             | —            |
| MSCEIT underst.                        | —                | —              | —                 | —             | —            |
| MSCEIT managing                        | -.173 (.020)     | -.101 (.012)   | -.144 (.005)      | —             | —            |
| PANAS NA                               | .138 (.016)      | .193 (.009)    | .448 (.009)       | .319 (.012)   | —            |
| <i>Indirect Effects<br/>through NA</i> | BPAQ<br>physical | BPAQ<br>verbal | BPAQ<br>hostility | BPAQ<br>anger |              |
| MSCEIT perceiving                      | -.019 (.007)     | -.027 (.009)   | -.062 (.008)      | -.044 (.006)  |              |

Figure captions.

Figure 1. Final revised model of the first path analysis (with BPAQ total score) with standardized path coefficients and explained variance for variables included in the model.

Figure 2. Final revised model of the second path analysis (with BPAQ dimensions) with standardized path coefficients and explained variance for variables included in the model.

Figure 1.

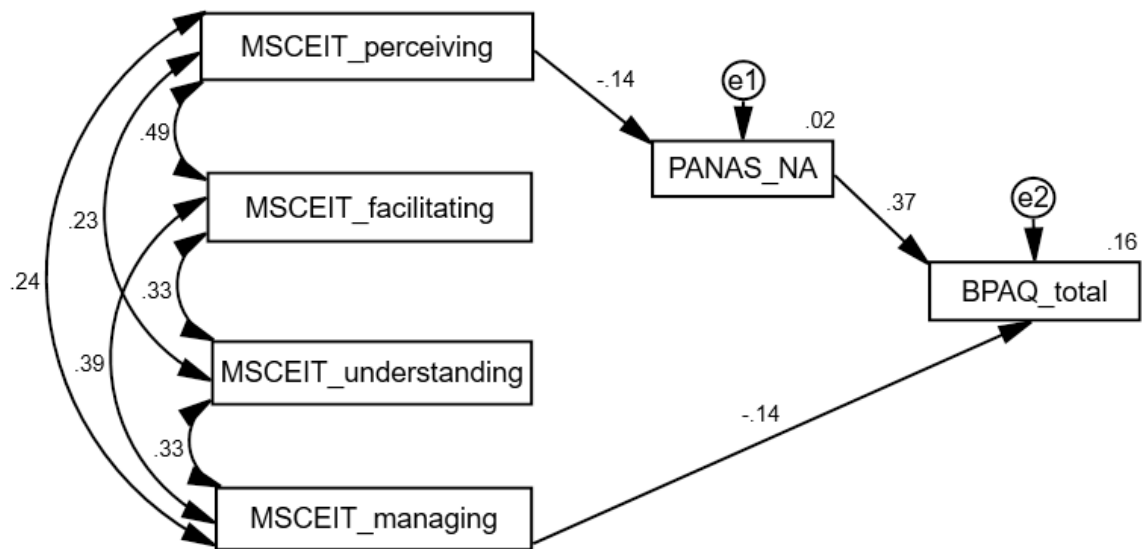


Figure 2.

