



# Reactive and proactive aggression subgroups in early adolescents and the interplay among callous-unemotional traits, moral disengagement, empathy and functions of aggression

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## Abstract

This study assessed different profiles of proactive and reactive aggression and examines the interplay among moral disengagement (MD), empathy, callous-unemotional (CU) traits and two functions of aggression, proactive and reactive, in a non-clinical sample of 301 Greek early adolescents. Three aggression profiles emerged (i.e., low, combined, reactive) with the combined aggression group scoring higher on CU traits and MD than the high reactive and low aggression groups. Callous-unemotional traits and MD were positively associated with proactive and reactive aggression, while cognitive empathy was negatively associated with proactive aggression and MD. MD and cognitive empathy moderated the association between CU traits and proactive aggression, while affective empathy moderated the CU traits and reactive aggression link. The results highlight that MD and empathy are key factors in the association between aggression and CU traits in early adolescents. Practical implications are also discussed.

**Keywords** Proactive/reactive aggression · Empathy · Moral disengagement · Callous-unemotional traits

Social cognitive models have been widely used to explain how interactions between individual parameters (i.e., personality traits) and interpretations of social events or other cognitive factors may be conducive to aggressive behavior. Social Cognitive Theory (Bandura 1986) posits that moral disengagement (MD) is a cognitive process referring to the selective activation and inhibition of internal controls that enable distinct forms of antisocial conduct. Almost two decades of research has demonstrated that humans who typically endorse MD mechanisms often engage in distinct types of aggression, beginning from early adolescence (Gini et al. 2014; Kokkinos et al. 2016a).

Limited data exists on the associations between MD and the different functions of aggression, namely proactive and reactive aggression. Proactive aggression is characterized as intentional, goal directed and occurring in the absence of provocation (Helseth et al. 2016) used for gaining social

dominance based on the social learning theory (Barratt et al. 1999). On the other hand, according to the frustration aggression model, reactive aggression is a response to perceived threat or provocation combined with anger (Helseth et al. 2016), feelings of remorse and thought confusion (Barratt et al. 1999). Indeed, evidence claims that the functions of aggression have unique correlates associated with developmental pathways. For instance, reactive aggression is linked to different maladjustment symptoms (e.g., internalizing problems, difficulties in emotion regulation) (Card and Little 2006), while proactive is associated with CU traits and positive attitudes towards aggressive actions (Marsee and Frick 2007).

A key issue in research exploring reactive and proactive aggression is related to the high inter-correlations between the two aggression functions (Merk et al. 2005; Polman et al. 2007). Various methods to control for the co-occurrence of each aggression function have been used in prior research, such as the creation of person-centered groups comparing individuals with specific profiles of proactive and reactive aggression. Although, such a person-centered approach appears to be rarely implemented in early adolescents, the limited research evidence demonstrates that aggressive children constitute a heterogeneous group (Thomson and Centifanti 2018). Indeed, prior research has identified a group

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of youth manifesting reactive aggression, whereas most youth showing high levels of proactive aggression also score high on reactive aggression (Centifanti et al. 2015; Marsee et al. 2014). Thus, the value of the distinction between the two functions was debated and it was claimed that proactive aggression constitutes an indicator of more severe aggressive behavior. The identification of groups of children on their use of reactive and proactive aggression is crucial for understanding individuals and informing intervention and treatment programs. Specifically, early identification of aggressive groups of children as well as the understanding their psychological profiles is an important endeavor for advancing and individualizing early intervention.

Early adolescents who show combined forms of aggression may be differentiated by individual factors. The examination of group differences on personality characteristics, such as CU traits may untangle the mechanisms by which children become reactive and proactive aggressors. For instance, results of several studies show that the presence of elevated psychopathic tendencies denotes a particular subgroup of adolescents who show heightened risk for both reactive and proactive forms of aggression (Thomson and Centifanti 2018). Regarding MD, no study has compared this construct between groups of youth with distinguishing profiles of aggression. Both types of aggression are also positively associated with MD (Gini et al. 2014), but to date it is not clear whether we should expect a stronger link for one compared to the other type. Perpetrators of proactive aggression seem to have adequate knowledge of the moral norms, but their instrumental goals nullify their moral awareness (Gini 2006; Gini et al. 2011; Hawley 2003; Sutton et al. 1999). They do not appear to encounter social cognitive deficits, but their readiness to engage in proactive aggression to satisfy their desires, despite the potential costs to targets of aggression, implies that their hostility might mirror problematic ethical reasoning (Arsenio et al. 2009). In other words, adolescents who engage in aggression for instrumental gain tend to morally disengage if they expect emotional or material gains emerging from the aversive behavior (e.g., Arsenio et al. 2009; and Keller 2009). On the contrary, reactive aggression is associated with frustration and anger compared to moral reflection, characterized by impulsivity and self-regulatory processing deficits (Fontaine and Dodge 2006). The capacity of regulating one's behavior based on ethical standards demands skills that are frequently beyond reactive perpetrators—due to their degree of affective and behavioral disorganization.

Previous research has documented the positive links between MD and adolescents' aggressive conduct, however less is known about the interactions of MD with other individual risk factors for the prediction of youth's aggression (Gini et al. 2014). A meta-analysis by Gini et al. (2014) suggests that future studies should move from 'main effect' investigations, focused on the links between MD and aggression, to

'interaction effect' studies, exploring more complicated patterns of associations. Indeed, recent research has indicated the moderating role of MD in the relation between callous-unemotional (CU) traits and aggression (Gini et al. 2015), between low empathy and antisocial conduct in adolescents (Hyde et al. 2010), as well as between cynicism and unethical decision making in a sample of young adults (Detert et al. 2008). Studies of such individual traits implicated in the aggression research emphasize the role of CU traits. The latter have been included in the most recent revision of the Diagnostic and Statistical Manual of Mental Disorders – 5th Edition (DSM-5; American Psychiatric Association 2013) as specifier for the diagnosis of conduct disorder referring to lack of remorse, guilt, empathy, and deficient affect (Frick and Moffitt 2010). A handful of studies advocate that the association between CU traits and aggressive behavior may differ depending on the functions of aggression (i.e., reactive and proactive) indicating that high CU traits adolescents tend to show reactive and, even slightly more, proactive aggression (Fanti et al. 2009; Frick et al. 2003; Marsee et al., 2014; Orue et al. 2016). Regarding the aggressive groups comparisons in terms of CU traits, some empirical evidence suggests no differences in CU traits between individuals exhibiting a combination of reactive and proactive aggressive acts and those who show only reactive (Muñoz et al. 2008).

Many studies have shown that CU traits are associated with a deficit in the affective experience of empathic concern to the distress in others (Kimonis et al. 2006; Dadds et al. 2009), which researchers have argued may relate to an inability to stop aggression when it is clear that the victim is in distress (Lovett and Sheffield 2007). However, the lack of empirical evidence on the type of empathy deficits that underlie youth's potential engagement in aggression, renders any intervention on empathy among aggressive individuals unwarranted. Empathy is considered a multidimensional construct which includes cognitive and affective components (Batanova and Loukas 2014), with affective empathy referring to one's ability to experience the emotions of others, while cognitive to the ability to identify and understand the emotional states of others (Reniers et al. 2011). Thus, this study addresses this limitation by exploring how interactions of CU traits with both components of empathy contribute to the proactive and reactive aggressive behavior.

Research findings about the comparisons of the cognitive and affective facets of empathy between meaningful aggression groups are scarce and slightly inconsistent. Indeed, some studies have found that children with low affective empathy manifest both reactive and instrumental aggression (Mayberry and Espelage 2007; Rieffe and Terwogt 2006; Wolke et al. 2000), whereas other studies have found that children with high cognitive empathy display only (or mainly) proactive aggression (e.g., Lovett and Sheffield 2007). Further, a negative association between the cognitive component of empathy

and the proactive function of aggression has been also documented (e.g., Gini et al. 2007).

Another important topic regarding the above variables (i.e., CU traits, MD, components of empathy, and functions of aggression) is the role of gender. Girls tend to exhibit less aggressive conduct compared to males (Stadler et al. 2013). As far as the distinction between proactive and reactive aggression is concerned, recent research has shown significant gender differences with males scoring higher on both functions of aggression (Dadds et al. 2009; Salmivalli and Nieminen 2002). Moreover, male adolescents tend to score higher than females on CU traits (e.g., Ciucci and Baroncelli 2014; Fanti et al. 2009; Kimonis et al., 2014). Gender differences have also been consistently reported for MD. In general, it seems that males score higher on MD than females (e.g., Gini et al. 2015; Kokkinos et al. 2016a). Regarding empathy, prior research is consistent showing that males are in generally less empathic than females in both cognitive and affective empathy (e.g., Chan and Wong 2019; Lui et al. 2016; van Hazebroek et al. 2016). However, other research evidence among early adolescents has revealed no significant gender difference in terms of empathy (Kokkinos and Kipritsi 2012) or showed higher scores for males (Chan and Wong 2017).

### **Moral Disengagement Moderates the Relationship between Callous – Unemotional Traits and Aggression**

It has been argued that high CU individuals are characterized by lack of empathy, lack of remorse about immoral actions, shallow affect and deficits in moral consciousness (Glenn et al. 2009). Due to such characteristics, youth tend to justify their harmful and immoral actions (Risser and Eckert 2016), being therefore more likely to engage in aggressive behavior. From a developmental perspective, some researchers (e.g., Hyde et al. 2010) argued that aggressive youth during the school age may internalize attributions related to MD mechanisms which may develop into later high callousness or low empathy. Such attitudes tend to be steady over childhood and strongly linked to aversive conduct in youth who activate MD processes. Gini et al. (2011) suggest that aggressors can perceive the factors affecting right and wrong judgments but fail to recognize the importance of moral norms and the effects of aggression on others' well-being. Overall, coupled with CU traits, MD processes may enhance youths' propensity to aggression due to the limited salience of individuals' distress signals and lack of guilt.

However, little is known about the potential moderating role of MD in the association between CU traits and the two aggressive functions, as, to the best of our knowledge, only one study confirmed that morally disengaged justifications

moderate the link between psychopathic traits and peer proactive and reactive aggression (Gini et al., 2015). Early adolescents with CU traits tend to manifest both functions of aggression, but exhibit higher levels of proactive aggression (Fanti et al., 2009) by minimizing the significance of negative consequences of their actions (Rosan & Costea-Barlutiu, 2013), a behavior resembling one of the mechanisms of morally disengaged behavior. It is suggested that they may have established moral standards, but they may face difficulties in judging their immoral acts as wrong (e.g., Caravita et al. 2012; Gini 2006; Gini et al. 2011).

Justifications that reframe antisocial conduct or the aggressor's role may serve to distance the individual from the act, letting high CU traits individuals more easily endorse aggressive behavior (e.g., Barchia and Bussey 2011; Caravita et al. 2012; Gini et al. 2015; Pozzoli et al. 2012). On the other side, justifications that reframe the victim's role by blaming or dehumanizing it may be associated with the lack of emotional attachments with others of youth high in CU traits. Without such attachments, justifications that decrease the humanity or feelings of others may be readily accessible (Stevens et al. 2012). According to Gini et al. (2015), MD may function as a defense or coping mechanism by high CU individuals to continue exhibiting antisocial behavior without afflicting their positive self-image. Following this framework, the first moderation model explores whether MD moderates the relationship between CU traits and proactive and reactive aggression.

### **Empathy Moderates the Relationship between Callous-Unemotional Traits and Aggression**

Callous-unemotional traits were strongly associated with deficits in both cognitive and affective empathy in adjudicated youths (Pardini et al. 2003) and residential adolescents (Lui et al. 2016) and they were negatively associated with cognitive empathy in a sample of detained male adolescents (Kahn et al. 2016). The limited research evidence with typically developing youth reports a negative association between psychopathic traits and affective empathy among adolescents (e.g., Muñoz et al. 2011; Pardini et al. 2003). Regarding cognitive empathy, results are inconsistent as some studies have found no association between the two factors (e.g., Dadds et al. 2009), while others have found a negative one (e.g., Muñoz et al. 2011; Pasalich et al. 2014) as CU traits were associated with adolescents' deficits in recognizing others' emotions.

Interestingly, deficits in sharing or inferring others' emotional states are considered important factors, which deteriorate high CU adolescents' conduct problems (De Ridder et al. 2016). Regarding the two functions of aggressive behavior among early adolescents with psychopathic traits, those with

CU traits are involved in serious offending behavior and exhibit more proactive aggression (Frick and Moffitt 2010). Hence, when early adolescents with CU traits possess high levels of empathy they share and recognize the feelings of others; show concern to the distress of others and therefore do not manifest aggression. Based on this body of evidence and the limited research on the relationship between CU traits, empathy and aggression functions, the second model will test the moderating effect of cognitive and affective empathy in the link between CU traits and proactive and reactive aggression.

## The Present Study

In consideration of the above evidence and the limited relevant research literature, this study sought to explain aggressive behavior (proactive and reactive) through the investigation of the interactions between personality (i.e., CU traits), and socio-cognitive variables, that is MD and empathy.

Specifically, the aims of this study are four-fold. First, in accordance with the existing literature this study examines the associations between CU traits, MD and the two functions of aggression. It is hypothesized that proactive and reactive aggression will be positively associated with CU traits with a stronger association for the first one as well as with MD. With respect to the link between CU traits and cognitive empathy no hypothesis can be formulated due to inconsistent research findings. Second, the distinct profiles of reactive and proactive aggressive behaviors will be examined in terms of the risk factors under study. Specifically, it is predicted that the reactive aggressive group will score lower on MD and empathy compared to other groups, while the combined group will report more CU traits. Third, the moderating role of MD and empathy, in the link between CU traits and the two functions of aggression will be examined. It is expected that high levels of MD will strengthen the association between CU traits and both proactive and reactive aggression. High cognitive empathy will minimize the positive relationship between CU traits and reactive aggression, while as for the moderating role of cognitive empathy on the link between CU traits and proactive aggression it is hypothesized that cognitive empathy will strengthen this association. Considering affective empathy as a moderator, it is hypothesized that higher levels will minimize the positive relationship between CU traits and both proactive and reactive aggression. Finally, gender differences will be explored. Specifically, with reference to proactive and reactive aggression, it is expected that males will report higher engagement in both proactive and reactive aggression. Moreover, males are anticipated to score lower on both cognitive and affective empathy, higher on CU traits and on MD compared to females.

Additionally, the focus of this study relies on early adolescence because during this developmental period aggressive responses become stable, moral judgments are being supported by cognitive development (Gini et al. 2011), and moral rules have been internalized (Gini et al. 2014). Besides, the association between MD and aggression strengthens (Gini et al. 2014), mainly because during early adolescence peers become an important source of reference for cognition and behavior (Caravita et al. 2014), and the measurement of psychopathic traits is more reliable (van Baardewijk et al. 2008).

## Method

### Participants

A convenience sample of 301 Greek 5th (age = 11 years old) ( $n = 155$ ) and 6th graders (age = 12 years old) ( $n = 145$ ) ( $M = 11.3$ ;  $SD = .90$ ); 138 (45.8%) boys and 160 (53.2%) girls (3 cases had missing gender data), from 5 public primary schools from northern Greece participated in the study.

### Procedure

The study was conducted upon permission by the Institute of Education Policy, a scientific and consulting body under the authority of the Greek Ministry of Education and Religious Affairs. Following the terms of the research permit, students participated on a voluntary and anonymous basis after parental/guardian consent was obtained. Of the total number of 310 parents contacted, only 9 denied participation. Teachers and students were informed about the purposes of the study by the second author who group administered the questionnaires during a classroom session (approx. 20 min. completion time) and provided any necessary explanations. Students were told that participation was voluntary. Surveys were administered in the same order in all classrooms. Students were encouraged to answer honestly and were also assured that their responses would be kept confidential.

### Materials

All the administered scales have been validated in previous research with Greek-speaking samples (Antoniadou et al. 2016; Kokkinos et al. 2016a, b). The factor structure of the measures appears to be fairly robust for self-report. In order to explore whether the structure of each of these measures for the present scales was similar to those previously emerged, a series of Confirmatory Factor Analyses (CFAs) were performed using a robust maximum likelihood estimation method with the Satorra-Bentler scaled chi-square test for non-normal data (Mplus version 6.1; Muthén and Muthén 2010). The model fit was evaluated using a number of fit indexes, such as, the

Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR) (Jackson et al. 2009). The  $\chi^2/df$  was also considered. Factor loadings were assessed for statistical significance at the  $p < .01$  level.

### Aggression

The 23-item Reactive-Proactive Aggression Questionnaire (RPQ; Raine et al. 2006, for the Greek translation see Fanti et al. 2009) assessing proactive (e.g., Hurt others to win a game) (11 items) and reactive (e.g., Reacted angrily when provoked by others) (12 items) aggression was used in the present study. The items were rated on a 3-point Likert scale with 0 = *never*, 1 = *sometimes*, 2 = *often* and are summed to form the subscales of proactive and reactive aggression as well as an overall score on total aggression. The scale has good psychometric properties. Cronbach alpha was .86 for proactive, .84 for reactive and .90 for total aggression, while the CFA suggested that the two-dimensional structure has been confirmed  $\chi^2/df = 3001.251/253$ , CFI = .93, TLI = .93, SRMR = .074, RMSEA = .052(.044–.060).

### CU Traits

The 6-item callous-unemotional (CU) subscale of the Youth Psychopathic Traits Inventory–Short Child Version (YPI-SCV; van Baardewijk et al. 2010) was used (e.g., Feelings are less important to me than they are for others). Items are rated on a 4-point scale (1 = *not true at all* to 4 = *applies very much*). The satisfactory psychometric properties of the scale have been confirmed by previous studies (e.g., Antoniadou et al. 2016; Gini et al. 2015; Kokkinos et al. 2016b). Cronbach's alpha was acceptable ( $\alpha = .67$ ), while the CFA for the one-factor model for the CU subscale fit the data well,  $\chi^2/df = 12.405/7$ , CFI = .97, TLI = .94, SRMR = .037, RMSEA = .051(.000–.096).

### Moral Disengagement

The 14-item elementary school version of the Moral Disengagement scale (Caprara et al. 1995; for the Greek translation see Kokkinos et al. 2016a, b) was used (e.g., To hit obnoxious classmates is just giving them “a lesson”). The scale has shown good reliability, and is by far the most commonly used measure of MD across countries such as Italy and the USA (Gini et al. 2014). Participants rated the degree of their approval of moral disengagement on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). The questionnaire demonstrates good scale score reliability for the MD (Cronbach's alpha = .76). Although the items describe different mechanisms, previous studies using this scale with children (e.g., Gini 2006; Kokkinos et al. 2016a, b) have pointed

out a uni-dimensional structure. A CFA testing the structure of the scale fits the data acceptably and confirmed its uni-dimensionality,  $\chi^2/df = 108.134/72$ , CFI = .93, TLI = .91, SRMR = .050, RMSEA = .041(.024–.056).

### Empathy

The 20-item Basic Empathy Scale (BES; Jolliffe and Farrington 2006a, for the Greek translation see Antoniadou and Kokkinos 2015), assessing both cognitive (9 items; e.g., It is hard for me to understand when my friends are sad) and affective empathy (11 items; e.g., I usually feel calm when other people are scared) was used. Items were scored on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). Prior studies have shown quite satisfactory psychometric properties of the scale (Jolliffe and Farrington 2006b). Internal consistencies Cronbach's alpha of the subscales for the present sample were .71 for cognitive and .64 for affective empathy, while a CFA suggested that this two-factor model fits the data well,  $\chi^2/df = 197.972/145$ , CFI = .92, TLI = .90, SRMR = .057, RMSEA = .035(.021–.046).

### Student Characteristics

Participants provided information about gender, and grade level.

### Analysis Plan

Descriptive statistics were calculated for all measures. A series of independent t-tests examined potential gender differences in aggression (proactive and reactive), CU traits, empathy, and MD. Paired samples t-tests explored within-group gender differences for proactive and reactive aggression. Pearson correlation coefficients evaluated the relationships among the variables.

To examine distinct profiles of reactive and proactive aggression a Latent Profile Analysis (LPA) was conducted to classify participants based on their reactive and proactive aggression subscale scores. There is evidence that LPA has more power for detecting the optimal number of profiles than algorithmic clustering techniques, such as K-means or hierarchical clustering (Magidson and Vermunt 2002). Models containing from 1 to 9 profiles were evaluated using the following information criteria: Bayesian Information Criterion (BIC) and the bootstrapped likelihood ratio test (BLRT, McLachlan and Peel 2000). The smallest BIC value generated amongst competing models often indicates the best fitting model. The BLRT assesses difference in goodness-of-fit between model  $k$  and model  $k-1$ , where  $k$  refers to the number of tested profiles, and a significant  $p$  value indicates that model  $k-1$  should be rejected in favour of model  $k$ . LPA was performed using Latent GOLD 5.1 (Vermunt and Magidson 2005). Next, we investigated the relation between participants' reactive and

proactive aggression profile and their gender, grade, CU traits, MD and empathy. Because the aggression profile is a categorical variable, we used multinomial logistic regression analysis with the aggression profile as the dependent variable and gender, grade, CU traits, MD, and empathy (cognitive and affective) as predictors. The analysis was conducted using IBM SPSS Statistics version 23.

Moderation analyses tested whether MD and empathy (i.e., affective and cognitive) moderated the associations between CU traits and aggression functions. Two preliminary multiple regression analyses were conducted predicting proactive and reactive aggression, respectively from CU traits, the three moderators (MD, affective and cognitive empathy), the interactions between each moderator and CU traits and gender as a covariate. For any interactions that were not significant, the associated interaction term with the largest  $p$  value was dropped and the analysis was repeated until only significant interactions remained in the model. This procedure revealed two significant moderators for proactive aggression (MD and cognitive empathy) and one significant moderator for reactive aggression (affective empathy). Significant interactions were probed and plotted using the PROCESS macro for SPSS v3.4.1 (Hayes 2017) with 5000 bootstrap samples and 95% confidence intervals. The bias-corrected bootstrap confidence intervals indicate significance when the confidence interval does not contain zero ( $p < .05$ ). Analyses were conducted for residualized reactive and proactive aggression scores (e.g., Raine et al. 2006) controlling for residualized proactive and reactive aggression respectively. Specifically, reactive aggression was regressed on proactive scores and Pearson standardized residuals were saved to index purely proactive aggression, while the standardized residuals of proactive on reactive aggression were saved to index purely reactive aggression.

## Results

### Preliminary Analyses

Descriptive statistics, reliability and zero-order correlations appear in Table 1. CU traits were positively moderately correlated with proactive and reactive aggression ( $z = .267$ ,  $p = .39$ ) and positively but lowly with MD ( $r = .13$ ). The two functions of aggression were moderately positively correlated with each other ( $r = .56$ ) and with MD ( $z = 1.55$ ,  $p = .06$ ). Furthermore, cognitive empathy had a negative low correlation with both proactive aggression and MD, while the two dimensions of empathy were positively but lowly intercorrelated. Finally, boys reported higher levels of proactive ( $t(295) = 5.94$ ,  $p < .01$ ) and reactive aggression ( $t(295) = 4.49$ ,  $p < .01$ ) and MD ( $t(295) = 2.95$ ,  $p < .01$ ) and lower levels of affective empathy ( $t(296) = -4.53$ ,  $p < .01$ ), while no other gender differences were found.

**Table 1** Means, standard deviations, and correlations among measures ( $N = 301$ )

Scale	Range	M	SD	1	2	3	4	5
CU	0–4	.77	.62					
PA	0–2	.21	.30	.30**				
RA	0–2	.69	.40	.28**	.56**			
MD	1–5	2.45	.63	.13*	.42**	.31**		
CE	1–5	3.88	.66	.03	-.14*	.08	-.16**	
AE	1–5	3.02	.78	.06	-.08	-.04	.04	.13*

CU callous – unemotional traits, PA proactive aggression, RA reactive aggression, MD moral disengagement, CE cognitive empathy, AE affective empathy

\* $p < .05$ ; \*\* $p < .01$

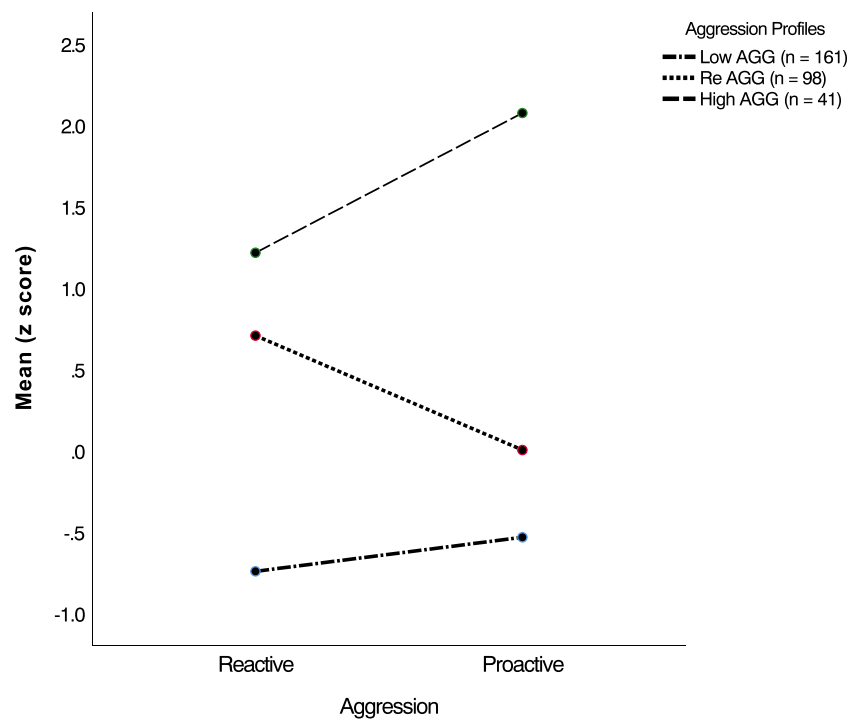
### Reactive and Proactive Aggression Profiles

Latent profile models with a range of one through nine latent classes were estimated, showing that the model with three classes had the lowest BIC value. Moreover, a conditional bootstrap (“Bootstrap -2LL Diff”) procedure showed that the three-profile solution provided a significant improvement over the two-profile solution ( $-2LL \text{ Diff} = 618.69$ ;  $p < .001$ ). Figure 1 presents the three latent profiles identified by LPA. The most numerous profile, Profile 1 ( $n = 161$ , 54%), was labeled “low aggression”. Members of this profile had low levels of both proactive and reactive aggression. Profile 2 ( $n = 98$ , 33%; “high reactive aggression”) was characterized by relatively high reactive and moderate proactive aggression. Profile 3 ( $n = 41$ , 13%; “combined”) was composed of participants high on both reactive and proactive aggression. In addition, members of the combined profile had significantly higher reactive aggression than members of the high reactive aggression profile ( $t(157) = 7.33$ ,  $p < .001$ ,  $d = 1.19$ ) and members of the low aggression profile had significantly lower proactive aggression than members of the high reactive aggression profile ( $t(157) = 10.768$ ,  $p < .001$ ,  $d = 1.31$ ).

### Aggression Profile Differences

Multinomial logistic regression analysis showed significant effects of gender ( $\chi^2(2) = 19.33$ ,  $p < .001$ ), CU traits ( $\chi^2(2) = 23.89$ ,  $p < 0.001$ ) and MD ( $\chi^2(2) = 34.59$ ,  $p < .001$ ), whereas the effects of grade, cognitive empathy and affective empathy were not significant. Table 2 presents the descriptive statistics of the independent variables for the three derived profiles. Boys were more likely than girls to belong to the combined aggression profile than the low aggression profile ( $b = 1.821$ , Wald  $\chi^2(1) = 14.741$ ,  $p < .001$ ) and the high reactive aggression profile ( $b = .965$ , Wald  $\chi^2(1) = 4.306$ ,  $p = .038$ ). Moreover, boys were more likely than girls to belong to the high reactive aggression profile than the low

**Fig. 1** Profiles of proactive and reactive relational aggression



aggression profile ( $b = .856$ , Wald  $\chi^2(1) = 8.611$ ,  $p = .003$ ). Results also revealed that participants with higher CU traits and MD were more likely to belong to the combined aggression profile than the low aggression profile ( $b = 1.454$ , Wald  $\chi^2(1) = 18.866$ ,  $p < .001$  for CU traits and  $b = 2.026$ , Wald  $\chi^2(1) = 27.127$ ,  $p < .001$  for MD, respectively) and the high reactive aggression profile ( $b = .666$ , Wald  $\chi^2(1) = 4.397$ ,  $p = .036$  and  $b = 1.314$ , Wald  $\chi^2(1) = 12.567$ ,  $p < .001$ , respectively). In addition, participants with higher CU traits and MD were more likely to belong to the high reactive aggression profile than the low aggression profile ( $b = .788$ , Wald  $\chi^2(1) = 11.104$ ,  $p = .001$  and  $b = .712$ , Wald  $\chi^2(1) = 8.296$ ,  $p = .004$ , respectively).

**Moderation Analyses**

The results of moderation analysis (PROCESS Model 2) showed that both MD and cognitive empathy function as moderators of the effect of CU traits on proactive aggression. This

model explained 23% of the variance in proactive aggression. A significant main effect of gender was found ( $b = -.29$ ,  $p = .01$ ), suggesting that males reported significantly higher engagement in proactive aggression than females. The moderation of the effect of CU traits by MD ( $b = .40$ , SE = .14, 95% CI [.13–.73]) uniquely accounts for 3% of the variance ( $F(1, 287) = 8.46$ ,  $p < .001$ ), whereas the moderation by cognitive empathy ( $b = -.33$ , SE = .12, 95% CI [-.57, -.07]) uniquely accounts for 2% of the variance ( $F(1, 287) = 8.46$ ,  $p < .001$ ).

Tests of simple slopes (Fig. 2) revealed that among students with high MD, i.e. one standard deviation (SD) above the mean, there was a significant positive relationship between CU traits and proactive aggression, while among students with low MD (one SD below then mean) the relationship between CU traits and proactive aggression was insignificant. Furthermore, among students with low cognitive empathy (one SD below the mean) the positive relationship between CU traits and proactive aggression was stronger than for students with high cognitive empathy (one SD above the mean).

**Table 2** Gender, grade, callous-unemotional traits, moral disengagement, and empathy scores of the three aggression profiles

Aggression profile	n	CU		MD		CE		AE		Gender % of boys	Grade % of 5th graders
		M	SD	M	SD	M	SD	M	SD		
High AGG	41	1.16	.63	3.01	.60	3.73	.66	3.00	.74	76	53
Re AGG	98	.87	.61	2.49	.59	3.98	.59	3.00	.77	54	46
Low AGG	161	.62	.57	2.28	.58	3.87	.69	3.03	.80	35	56

CU callous – unemotional traits, MD moral disengagement, CE cognitive empathy, AE = affective empathy, High AGG reactive-proactive aggression profile, Re AGG reactive aggression profile, low AGG low aggression profile

The results of moderation analysis (PROCESS Model 1) showed that affective empathy functions as moderator of the effect of CU traits on reactive aggression. This model explained 10% of the variance in reactive aggression. The moderation of the effect of CU traits by affective empathy ( $b = .24$ ,  $SE = .12$ , 95% CI [.03–.40]) uniquely accounts for 1% of the variance ( $F(1, 287) = 4.20$ ,  $p < .05$ ). Figure 3 shows the simple slope analysis suggesting that among students with high and moderate affective empathy, CU traits had a significant positive effect on reactive aggression, while among students with low affective empathy the effect of CU traits on reactive aggression was insignificant.

Consequently, affective empathy was not found to moderate the link between CU traits and proactive aggression, while for reactive aggression MD and cognitive empathy were not found to moderate the association with CU traits.

## Discussion

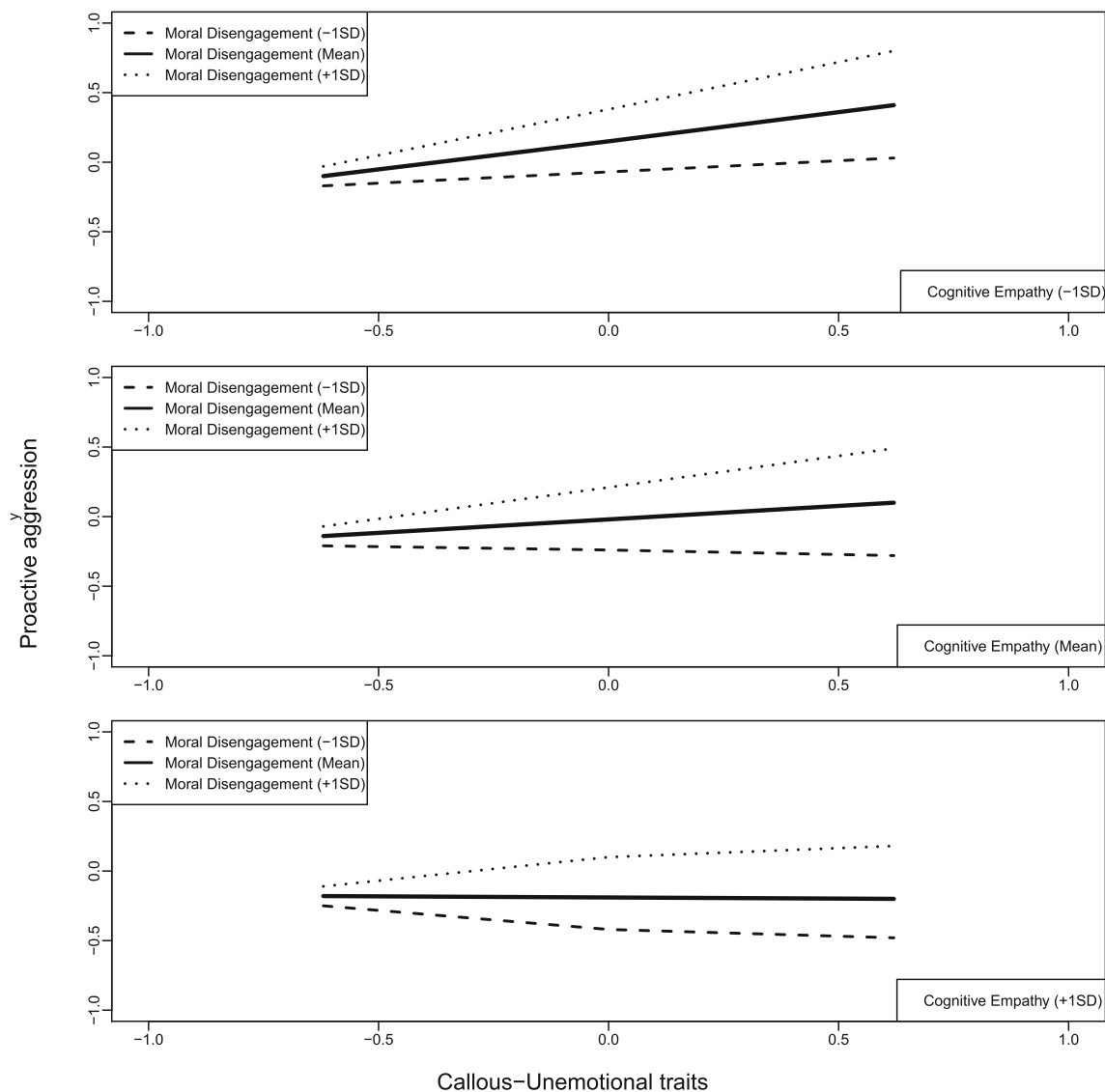
This study extends existing research on the associations among MD, empathy, and functions of aggressive behavior by investigating the moderating role of MD and empathy on the relationships between CU traits, proactive and reactive aggression in a community sample of Greek early adolescents. In terms of the obtained correlations, positive associations have been found between CU traits and both proactive and reactive aggression pointing out that individuals characterized by lack of empathy, remorse and morality tend to engage in aggression both for their own personal gain and as a response to perceived provocations (Fanti et al. 2009; Glenn and Raine 2009; Salmivalli et al. 2005). However, although the positive association between CU traits and proactive aggression is well-documented in the literature, the positive association between these traits and the reactive function of aggression has been only scarcely supported based on prior research (Ragbeer 2015; Souroulla et al. 2019; White et al. 2015). This association could be attributed to the socio-emotional context of the emotion-eliciting stimuli (Northam and Dadds 2020). Other-oriented stimuli including witnessing another person in distress hold negative associations with emotional responsiveness for those with high compared to low CU traits, while emotion-eliciting stimuli related to ‘self’ (e.g., participation in a frustration-inducing task) are more likely to be associated with both high and low CU traits. One explanation for these results is that self-orientated stimuli may have more personal salience than other types, which might increase the chances of greater emotional responsiveness. Maybe a potential threat to ‘self’ is sufficiently salient to trigger an emotional response of similar magnitude to those with low CU traits (e.g. Lau and Marsee 2013). Additionally, positive links emerged between MD and both functions of aggression, supporting previous relevant evidence (e.g., Gini et al. 2014, 2015).

Regarding the positive links between CU traits and MD, early adolescents with CU traits show deficits in moral attributions of their acts (Risser and Eckert 2016) and as such they are more prone to antisocial behavior (e.g., Frick et al. 1999; Glenn et al. 2009; Kokkinos et al. 2016b). A non-significant association emerged between CU traits and cognitive empathy in common with previous findings (Dadds et al. 2009). Nevertheless, as it was hypothesized, CU traits were negatively associated with affective empathy indicating that CU early adolescents lack in the experience of feeling others’ distress (e.g., Dadds et al. 2009; Kimonis et al. 2006).

With respect to gender differences, results indicated that boys reported higher levels of proactive and reactive aggression than girls, a finding that is in line with similar research (Fanti et al. 2009). Males’ greater scores on proactive aggression could be attributed to their desire to dominate over weaker peers using aggressive behavior which makes them feel stronger (Peets and Kikas 2006). Further, past research has typically indicated that males show higher levels of impulsivity (Meier et al. 2008) and emotional dysregulation (Stickle et al. 2012) which could explain males’ higher score on reactive aggression. Furthermore, boys showed higher levels of MD corroborating previous findings (e.g., Ciucci and Baroncelli 2014; Fanti et al. 2009), and lower levels of affective empathy than girls, confirming social stereotypes, whereby girls are more empathic than boys (Warden and Mackinnon 2003) and tend to exhibit more socially accepted behavior.

The present study also examined which profiles of aggressive behavior emerged in the current sample in terms of the functions of aggression (reactive or proactive). Research has consistently shown that the substantial correlation between reactive and proactive aggression appears to be due to the fact that most children who show high levels of proactive aggression also show high rates of reactive aggression (Marsee and Frick 2007; Marsee et al. 2011; Marsee et al. 2014). The observed pattern is consistent with prior research showing three aggression groups (low aggression, high reactive, combined). Thus, theories explaining the different functions of aggression consider the fact that proactive aggression is often rated in the absence of reactive aggression (Marsee and Frick 2007; Marsee et al. 2014). These results are in line with previous findings showing no support for profiles containing only proactive aggression (Dinić and Raine 2019) and document that proactive aggression does not occur independently of reactive aggression as well as that it is not as common in the general population as reactive aggression (Brugman et al. 2017). Results also revealed that males were more likely to belong to the combined aggression profile than females. Given that such gender specific patterns have scarcely been explored in prior research (Crapanzano et al. 2010), such evidence should be replicated before conclusive statements can be reached. Still, combined with the higher scores of males on both proactive and reactive aggression, such evidence could





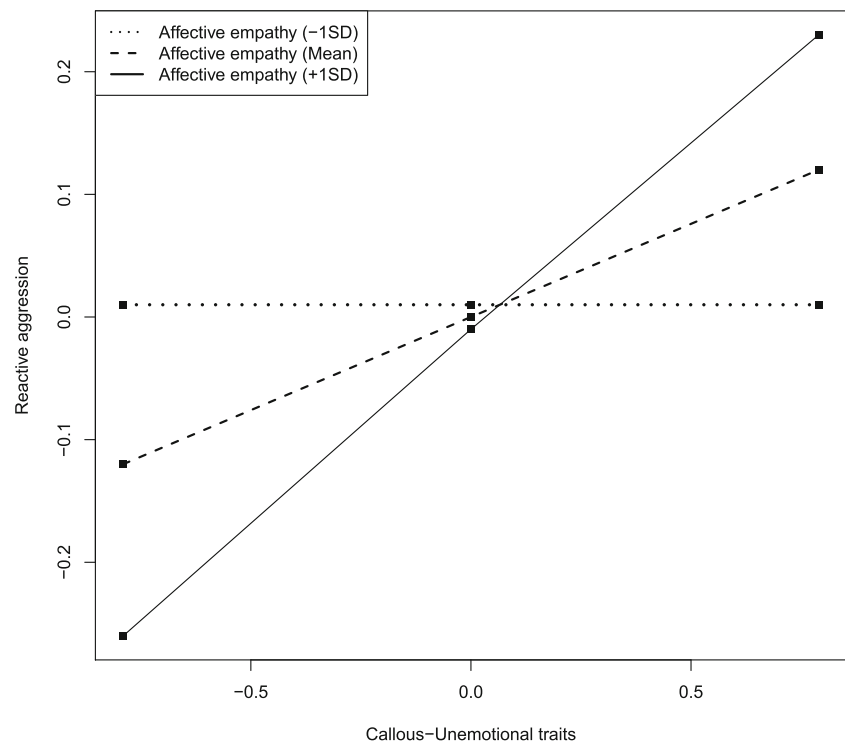
**Fig. 2** CU traits as a function of moral disengagement. The interaction predicts proactive aggression. Slope analysis indicates that as CU-traits increase, proactive aggression increases in the case of high moral disengagement or low cognitive empathy

suggest that males show more severe aggressive patterns compared to females. Findings also indicated that the combined group differed from the reactive and non-aggressive group in terms of MD. Specifically, both proactive and reactive aggressors tend to morally disengage either if they foresee emotional or material gains resulting from the transgression (e.g., Arsenio et al. 2009; Gasser and Keller 2009) or if they aggress as a response to perceived threat or provocation combined with anger and frustration (Fontaine and Dodge 2006). Further, the combined group reported higher CU traits compared to the other two groups. This finding is more consistent with the contention that those high on both types of aggressive behaviors show higher levels of risk factors of aggression. These findings indicate that for early adolescents who report less remorse and empathy for the victims are more likely to

engage in antisocial behavior and delinquency (Kerns et al. 2015).

In an effort to better understand the interactions between CU traits and aggression, integrated models were tested in which MD and empathy (both affective and cognitive) served as moderators. Regarding the moderating role of MD, findings indicated that high MD enhances the strength of the association between CU traits and aggressive behavior. Specifically, only the link between such characteristics and proactive aggression was significant at increased levels of MD, demonstrating that MD mechanisms facilitate callous and unemotional youth’s instrumental usage of aggressive conduct toward others. These findings are in line with previous evidence (e.g., Caravita et al. 2012; Gini et al. 2015) putting emphasis on the function of MD processes in empowering individuals with psychopathic traits to use instrumental forms of

**Fig. 3** CU traits as a function of affective empathy. The interaction predicts reactive aggression. The slope indicates that as CU-traits increase, reactive aggression increases in the case of moderate and high affective empathy



aggression. Interestingly, it has been suggested that internal attributions regarding deactivation of moral norms and justifications of immoral actions through MD are being stable during preadolescence (Hyde et al. 2010). When these attributes are combined with the presence of CU traits, early adolescents are more prone to aggressive behavior. Moreover, according to Stevens et al. (2012), morally disengaged behavior may be expressed due to deficient emotional attachments with the target of aggression. However, MD did not emerge as a moderator between CU traits and reactive aggression, possibly because MD is more associated with proactive rather than reactive aggression as it serves as a defense mechanism driving the individual to continue using proactive aggression for the achievement of personal goals and for the maintenance of a positive self-image (Gini et al. 2015).

Additionally, the analyses indicated that cognitive empathy was found to moderate the link between CU traits and proactive aggression. Interestingly, when cognitive empathy increases, individuals with high levels of CU traits exhibit less proactive aggression, that is they tend not to exhibit aggressive reactions, probably because they are able to take the role of the other appreciating her/his perspective and feelings (Davis 1994), even if they have the tendency for callousness, uncaringness and unemotionality. Indeed, some studies endorsed the finding of the negative association between cognitive empathy and aggressive behavior (i.e., bullying) (Gini et al. 2007; Mayberry and Espelage 2007; Rieffe et al. 2016), suggesting that high cognitive empathy may serve as a strong, protective factor for preventing manifestation of

proactive, goal-directed aggressive behavior for those early adolescents with CU traits.

The hypothesis about the moderating role of cognitive empathy in the association between CU traits and reactive aggression was not confirmed (e.g., Rieffe et al. 2016). It may be that, affective empathy plays a more important role than cognitive empathy in inhibiting reactive aggression, which is related to difficulties in emotion regulation (Seah and Ang 2008) and anger (Hubbard et al. 2010). An unexpected paradoxical finding showed that affective empathy emerged as an important moderator in the association between CU traits and reactive aggression. Specifically, early adolescents with psychopathic personality characteristics are more likely to exhibit aggression if they share the emotional state of others. A potential explanation of this finding may be that if an individual feels the negative emotions of the others s/he may be more prone to exhibit reactive aggression, that is acting with impulsivity, anger, and provocation. It is therefore possible that high CU pre-adolescents may exhibit increased emotional responsiveness (Lau and Marsee 2013). Likewise, increased empathy is associated with high levels of arousal when receiving taunts from an 'opponent' (Kimonis et al. 2008) and therefore highly empathetic individuals are more likely to engage in reactive compared to proactive aggression. In line with this, Lovett and Sheffield (2007) argued that affective empathy is more likely to inhibit proactive than reactive aggression, as it is more likely associated with emotional and hot-blooded expressions. Munoz et al. (2011) found that callousness is robustly associated with aggressive behavior over and above

scores in both cognitive and affective empathy. Finally, results did not reveal any significant moderating role of affective empathy in the link between CU traits and proactive aggression.

Findings from this study have key theoretical and clinical implications. For example, interventions should focus on promoting the development of social skills, prosocial behavior and empathic understanding for early adolescent samples (Marsee et al. 2005). Notably, cognitive-behavioral procedures for minimizing emotional reactivity, such as developing better emotion regulation skills and controlling of anger responses may be especially important in dealing with reactive aggression (Larson and Lochman 2003), whereas strategies that enhance alternative goal setting and accomplishment (Frick 2006), may help to prevent the emergence of frequent proactive aggression.

Furthermore, strategies regarding early adolescents high on CU traits who exhibit both proactive and reactive aggression should focus on different aims. In accordance with research (e.g., Thomaes et al. 2009), those who show proactive aggression should be trained in enhancing empathy and to be motivated to self-interest and reward-oriented response (Frick 2001). On the other hand, adolescents with reactive aggressive responses should be trained in impulsivity reduction, self-control and problem-solving strategies (Conduct Problems Prevention Research Group 2002).

Moreover, future programs should emphasize on moral development and more specific on moral emotions (Malti et al. 2010) and increase of empathic understanding as they may serve as protective factors that diminish the possibility adolescents with CU traits to exhibit proactive aggression. In particular, education on awareness of moral transgressions and disengaged moral judgments so that they self-regulate (Gini et al. 2011) during social communication should be provided, as well as teaching socio-emotional strategies that aim at enhancing empathy in early adolescents. Nevertheless, our results suggest that children who are predominantly high in reactive aggression may benefit less from approaches targeting on moral development than from other interventions (e.g., those focused on self-regulation processes and empathic concern about others). The combination of deficient social cognitive and developmental outcomes and processes reported by youth with CU traits provides evidence that social cognitive interventions to promote social skills and empathic responding might be successful for reducing these problems. In addition, based upon the current findings, treatment studies should consider both cognitive skills and mood regulation skills to directly address the deficits associated with CU traits. In short, accounting for the heterogeneity among early adolescents with CU traits could facilitate the implementation of treatments tailored to the individualized needs of these youths.

The study has several limitations. First of all, the cross-sectional research design does not allow inferring causality

between the variables. Thus, longitudinal research would be able to detect causes and to trace developmental changes. Moreover, all measures were self-report measures that although they reflect self-perceptions of individuals, they are susceptible to biases. The use of self-reports without other sources of information also increases the risk of shared-method or shared-reporter variance. Furthermore, the findings cannot be generalized to a wider population due to small sample size. Nevertheless, the present study makes a contribution to research investigating the link between personality traits and aggressive behavior pointing out the crucial role of emotional-cognitive variables in this association.

Further, these analyses were limited to the middle-school years, which restricts our findings to a specific age population. Future studies should expand this analysis to both younger children and late adolescents and young adults to establish whether this pattern of associations is replicated at different age levels. Finally, even though the direction of the hypothesized paths is theoretically sound, only a longitudinal study can clarify the direction of associations. Replication of these findings in studies with a longitudinal design is warranted.

In conclusion, the present study enhances our knowledge of the role of two important individual variables (i.e., MD and empathy) in explaining the functions of aggressive behavior among non-referred early adolescents. It shows that both proneness to the use of MD, as well as low empathy may facilitate different types of aggressive behavior, depending on one's CU traits.

## Compliance with Ethical Standards

The study was approved by the Institute of Education Policy, a scientific and consulting body under the authority of the Greek Ministry of Education, Research and Religious Affairs. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee, and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Conflict of Interest** Author A, Author B, Author C and Author D declare that they have no conflict of interest.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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