

The Moderating Effect of Gender on the Relation Between Callous-Unemotional Traits and Conduct Problems in Adolescents

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Abstract

In this study the association between Callous-Unemotional (CU) traits and conduct problems in adolescents was examined. Besides, it was assessed whether gender has a moderating effect on the relationship between CU traits and conduct problems. The latter was investigated to gain a better understanding of how conduct problems and psychopathic traits are manifested in both males and females. The Inventory of Callous-Unemotional Traits (ICU; Frick, 2003) and the Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001) were filled out by 454 participants. These participants ranged between the age of 16 and 25 years ($M_{age} = 21.4$, $SD = 2.5$), of which 74.7% were females and 25.3% were male. The conduct problems were measured using the SDQ and CU traits were assessed with the ICU. A moderation analysis and an independent samples t-test were performed to analyze the data. The outcomes revealed that adolescents with elevated CU traits will experience more (severe) conduct problems. Moreover, it was found that there were no gender differences with regards to conduct problems, and that gender does not moderate the association between conduct problems and CU traits. Nevertheless, various limitations should be considered when interpreting these findings. Further research is required to gain a better understanding of- and prove the moderating role of gender on the relationship between conduct problems and CU traits. Yet, the results obtained in this study will serve as a guideline for future research studies.

Keywords: psychopathic traits, conduct problems, gender, ICU, SDQ

The Moderating Effect of Gender on the Relation Between Callous-Unemotional Traits and Conduct Problems in Adolescents

Research on the topic of psychopathy in adolescents and its association with the increase in conduct problems has advanced over the past decade (Pisano et al., 2017; Salekin, 2017). Significant conduct problems involving antisocial and aggressive behaviors that violate key societal rules or the rights of others are a serious concern for mental health and public law (Frick et al., 2014). Such conduct problems play a crucial role in the development of criminal behavior and are associated with several other emotional, social, and educational difficulties (Frick et al., 2005; Kimonis & Frick, 2011). Numerous research findings suggest that there is great variability in the types of conduct problems, the level of impairment related to the deviant behavior, future impairment risks, and the response to treatment among adolescents who display serious conduct problems (Frick, 2012; Moffit et al., 2008). Furthermore, there appears to be a large variation in the social, affective, cognitive, and biological attributes of adolescents with severe conduct problems, indicating various different causal pathways leading to behavioral difficulties (Frick & Viding, 2009). The presence of psychopathic features can be considered as one of such etiological pathways to problem behavior (Pardini & Frick, 2013).

Over the past years, a new approach has been developed that puts more emphasis on adolescents' affective and interpersonal qualities, as opposed to merely the conduct problems. This approach aims to provide insight into the construct of psychopathy which is assumed to play a substantial part in conduct problems (Frick et al., 2014). Psychopathy can be defined as a pathological pattern of personality marked by a lack of guilt and empathy, arrogance, and superficial charm, commonly resulting in persistent criminal behavior (Cleckly, 2017). Psychopathy can be divided into three conceptually destructive separated, but inter-correlated domains (Pisano et al., 2017). According to decades-long clinical research studies on

incarcerated adolescents, it is strongly suggested that the so-called active domain, consisting of callous-unemotional (CU) traits, is emphasized in the trajectory of conduct problems (Frick et al., 2003; López-Romero et al., 2012; Skeem et al., 2011). CU traits are typically characterized by low empathy and remorse, interpersonal callousness, short-lived emotional states, and a lack of concern for performance (Frick et al., 2014). Salihovic and Stattin (2016) indicated that CU traits in adolescence are strong predictors of conduct problems both concurrently and longitudinally. Correspondingly, Christian et al. (1990) determined that the presence of elevated CU traits in adolescents may designate a specifically hostile and severe pattern of conduct problems and may enhance the prediction of later maladaptive outcomes. Besides, it is also shown that adolescents with high levels of psychopathic traits, particularly CU traits, often have a childhood history marked by such destructive behavioral patterns (Leistico et al., 2008; Hare et al., 1992; Miller & Eisenberg, 1988).

In contrast to antisocial adolescents without CU traits, antisocial adolescents with elevated CU traits show a more severe, destructive, and continuous pattern of antisocial activities. Also, they typically respond less strongly to alarming and emotionally upsetting stimuli, and are at bigger risk to develop psychopathy during adulthood (Frick & White, 2008). Blair et al. (2005) suggested that antisocial individuals with CU traits, present different emotional and cognitive deficits as opposed to antisocial individuals without psychopathic features. Hence, it is implied that different causal factors underlie these antisocial tendencies. Various longitudinal studies have repeatedly indicated that low fearful arousal, found in adolescents with CU traits, appears to be a unique causal factor underlying severe conduct problems such as violence (Loeber & Pardini, 2008). Namely, Fowles and Kochanska (2000) argued that children and adolescents with a relatively fearless temperament show impairments in the development of empathy and guilt, partly due to the reduced emotional arousal they experience in response to punishment cues for misbehavior

and cues of distress in others (Frick & Viding, 2009). Together, these discoveries suggest that low temperamental fear fostered by CU traits may lead to the early development of severe conduct problems because it causes insufficient punishment-oriented socialization skills (Pardini, 2006). Consistent with this theoretical model, Marsh and Blair (2008) argued that adolescents high on CU traits show impairments when processing cues of fearful distress in others. This is likely due to a reduced ability to attend to emotionally prominent facial features. An impaired recognition of fearful facial expressions could interfere with the early understanding of moral socialization, which might perhaps lead to conduct problems (Pardini & Frick, 2013).

It is important to consider the role of gender (differences) when examining the relationship between CU traits and conduct problems in adolescents. In line with the discoveries of Fanti and Henrich (2010), boys are more likely than girls to engage in conduct problems and to be characterized by psychopathic traits. Therefore, it is suggested that girls are less likely to be categorized in groups that exhibit elevated CU traits, conduct problems, or both. Also, there is growing empirical support for the difference in phenotypical manifestations across gender, yet research on psychopathic traits and the association with conduct problems in girls is scarce relative to boys (Fanti, 2013). For instance, psychopathic traits in girls are presumably linked to indirect aggression instead of direct aggression. Furthermore, a strong association between psychopathic traits and direct aggression is found in boys instead of girls (Marsee et al., 2005). Additionally, comorbid internalizing problems are more likely to emerge in girls with conduct problems than boys with conduct problems. Moreover, with girls CU traits are positively related to such internalizing problems (Essau et al., 2006; Fanti, 2013). Overall, these outcomes indicate that boys and girls possibly display various types of aggressive behaviors that characterize conduct problems, with CU traits having a different effect on the type of antisocial behaviors both genders exhibit.

Fanti et al. (2013) discovered gender differences in the level of CU traits and co-occurring conduct problems, based on an extensive nationally representative sample of adolescent males and females. Compared to girls, a larger percentage of boys showed both primary CU traits and secondary CU traits. Primary variants of CU traits are possibly reinforced by deficient arousal cues, whereas secondary variants are considered to develop as a coping strategy in reaction to a traumatic event (Craig et al., 2021). It is likely that the lower percentage of females reporting elevated CU traits is attributable to the differences in socialization experiences across gender. Given that girls' socialization experiences are more likely to increase empathic sensitivity, the risk of engaging in antisocial behaviors decreases (Zahn-Waxler, 2000). Moreover, a lower percentage of boys than girls were categorized in the anxious low CU group (Fanti et al., 2013), which is consistent with evidence that adolescent girls are more prone than boys to experience anxiety (Lewinsohn et al., 1998). Boys tend to prefer more novel and risky activities and are more likely to participate in proactive aggressiveness compared to girls (Crapanzano et al., 2010; Fanti et al., 2009).

There are critical limitations in the existing literature on the relationship between CU traits and conduct problems. Namely, there is a lack of evidence proving that gender indeed has a moderating role in this association, and what this role entails. Since other studies have not explicitly focused on clarifying this matter, this study aims to examine the relationship between CU traits and conduct problems in a community sample of adolescents. Furthermore, this study will examine whether gender moderates the relationship between CU traits and conduct problems. To investigate this, two different questionnaires were used.

The research findings discussed earlier provided strong support for the following hypotheses. Hypothesis 1 (H1) is that adolescents high on CU traits will experience more (severe) conduct problems. Hypothesis 2 (H2) is that boys will report higher conduct

problems than girls. Lastly, hypothesis 3 (H3) is that the influence of gender on the relationship between psychopathic traits and conduct problems will be stronger for men than for women. Specifically, boys high on CU traits will report more (severe) conduct problems (IV) than girls high on CU traits.

As claimed by a wide variety of research studies, psychopathy is an important concept for understanding an ordinate proportion of crimes committed (Kiel, and Hoffman, 2011) because it explains the prominent antisocial behaviors in adolescents leading to these transgressions (Barry et al., 2000). The manipulative interpersonal style of psychopathic individuals typically has a destructive impact on life (Anderson & Kiehl, 2014). To be exact, they tend to experience relational and work-related problems, show higher crime rates than non-psychopathic individuals, and tend to be at risk for substance abuse more often (Colins et al, 2017). Especially the increase in crime rates, due to the interplay of CU traits and conduct problems, have a negative impact on society. Studies in this field, including this research study, might contribute to broadening our knowledge on this aspect and could help identify adolescents who are in urgent need of an intervention because of their critical patterns of disruptive behavior and psychopathic traits.

Methods

Participants and Procedure

The final sample consisted of 454 Dutch adolescents in total ($n = 454$) from the general population. The participants were required to be between the ages of 16 and 25 years old ($M_{\text{age}} = 21.4$, $SD = 2.5$), which was the only inclusion criteria for this study. Additional demographic data collected in this study included information about the participants' gender (74.7% were female, 25.3% were male) and education level which was estimated based on the following seven Dutch education levels: VMBO (2.4%), HAVO (4.6%), VWO (4.8%), MBO (14.1%), HBO (34.8%), WO (37.9%), and other (1.3%).

This research study was approved and conducted in compliance with the guidelines stated by the Ethics Review Board of the Tilburg School of Social and Behavioral Sciences. This study was conducted in the Netherlands and participants were recruited through convenience sampling. The relevant questionnaires were distributed among the social network of Tilburg University master students via various platforms. The online questionnaire took approximately 15-20 minutes to complete, and participation was voluntary and anonymous. Prior to participation, respondents provided their written consent. The informed consent stated that the data would be processed and stored anonymously, provided a brief explanation of the research project, and disclosed the age requirements. Moreover, all individuals were clearly informed of their right to withdraw from the study at any time. In case of questions, comments, or any feelings of discomfort caused by the subjects discussed, participants were presented with the opportunity to leave a message or contact various mental health services for support at the end of the study.

Measures

Callous-unemotional Traits Measure

To measure participants' CU traits levels, The Inventory of Callous Unemotional Traits (ICU; Frick, 2004) was used. The ICU is a 24-item self-report measure created to assess CU traits in youth. All items are rated on a 4-point Likert scale (ranging from 0 = not at all true to 3 = definitely true). By means of confirmatory factor analysis, the ICU could be translated into three independent factors (Callous, Unemotional, Uncaring) that together create the general ICU factor. High scores on these three dimensions indicate an increased presence of CU traits (Pechorro et al., 2016).

Internal consistencies of the ICU questionnaire, determined by Cronbach's alpha, were found to be largely acceptable for the three subscales and the ICU total score, with $\alpha = 0.64$ for Unemotional, $\alpha = 0.70$ for Callousness, $\alpha = 0.73$ for Uncaring, and $\alpha = 0.77$ for the ICU total (Essau et al., 2006). Moreover, the internal consistency coefficients in the current study varied from acceptable to good, with $\alpha = 0.81$ for the Unemotional dimension, $\alpha = 0.66$ for the Callousness dimension, $\alpha = 0.70$ for the Uncaring dimension, and $\alpha = 0.79$ for ICU total.

Conduct Problems Measure

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001), suitable for adolescents between 11-17 years old, was used to assess the level of conduct problems one exhibits. The SDQ is available in several versions to accommodate the needs of numerous professionals such as researchers, clinicians, and educationalists. The SDQ version used in this study consists of two parts: a 25-item questionnaire that asks about psychological attributes and an impact supplement. These 25 items are divided into 5 subscales that include 5 items each: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behaviors. These items were answered using a 3-point Likert scale, ranging from 0 = False to 2 = True. In the impact supplement, participants were asked whether they experience any difficulties, and if so, additional information was acquired about the chronicity, overall distress, social impairment, and burden to others (Goodman, 1999). These impact items were scored on a 4-point Likert scale, (e.g. 0 = not at all to 3 = a great deal). For this study, only the scores of the items belonging to the conduct problems subscale were included in the analyses.

The internal consistencies of the SDQ (S11-17) vary from poor to acceptable (Giannakopoulos et al., 2013), with a weak internal consistency for both the peer problems

subscale ($\alpha = 0.50$) and the conduct problems subscale ($\alpha = 0.56$), a questionable consistency for the hyperactivity/inattention subscale ($\alpha = 0.63$), and an acceptable internal consistency for the emotional symptoms ($\alpha = 0.73$), the prosocial behavior ($\alpha = 0.72$) and total difficulties score ($\alpha = 0.77$). The impact supplement of this SDQ was discovered to be significantly correlated with the hyperactivity/inattention and emotional symptoms subscales, and the total difficulties score ($p < 0.001$) (Van Widenfelt et al., 2003). In the current study, the internal consistency was found to be poor for the conduct problems subscale with a Cronbach's alpha of $\alpha = 0.45$, and acceptable for the SDQ total with $\alpha = 0.71$.

Statistical Analysis

IBM SPSS Statistics version 25 was used to analyze the data. First, a priori G*power analysis was performed to predict the desired sample size. The estimated required sample size for this study was 77 or more, with a minimum threshold value of power of 0.80, a medium effect size of 0.15, and a significance level of $\alpha = 0.05$. Secondly, the missing values of the variables included in the study were examined with descriptive analyses. Participants with over 10% of missing values on a questionnaire were excluded from the analyses (Dong & Peng, 2013). Accordingly, 401 participants of the original 855 participants were extracted from the dataset because they had missing data caused by incomplete survey responses. Further, a descriptive statistics table was included to provide an overview of the mean, standard deviation, and sample size for the variables used.

The research question was analyzed using a moderation analysis (multiple linear regression analysis). The dependent variable (DV) used in this study was the conduct problems measure. Specifically, the total score of the items on the conduct problems subscale of the SDQ, which is a scale variable (SDQ; Goodman, 2001). The independent variable (IV)

was the CU trait measure which is the ICU total score (ICU; Frick, 2004). Additionally, gender was used as the moderator variable. Moreover, the IV was measured on a continuous scale, and gender on a categorical scale.

In order to execute the moderation analysis and to draw inferences regarding the model estimates, several assumptions had to be met. The first two assumptions, which were both met, require the DV and IV to be measured on a continuous scale and the moderator variable to be dichotomous (this is only the case in the model). The third assumption that had to be met, was the independence of residuals. The Durbin-Watson statistic was used to test whether there was no autocorrelation in the residuals. The Durbin-Watson statistic is assumed to have a value ranging between 0 and 4, indicating that the residuals are independent of each other. The fourth assumption is that there was a linear relationship between the DV and the IV for each group of the dichotomous moderator variable. To check for linearity, a scatterplot was created and visually inspected to confirm whether the relationship displayed was linear. The fifth assumption requires the data to show homoscedasticity, which is when the error variances are constant for all combinations of the IV and the moderator variable. To assess the homoscedasticity of the data, the studentized residuals were plotted against the unstandardized predicted values for both groups of the moderator variable. If the model is well-fitted, there should be no clear pattern in the distribution. The sixth assumption suggests that the data does not show multicollinearity. To determine whether the data meets this assumption, the Tolerance- and VIF values (Collinearity Statistics) were assessed. For this assumption to be met, the Tolerance values should not be less than 0.10 and VIF values should not exceed 10. In addition, the seventh assumption implies that there should be no influential cases biasing the model such as significant outliers, highly influential points, or high leverage points. Outliers were examined using “studentized deleted residuals”, influential points were checked using “Cook’s distance”, and leverage points were detected

using “Leverage distance values”. Lastly, assumption eight entails that the residuals (errors) are approximately normally distributed. This last assumption was formally tested using the “Shapiro-Wilk test for normality” and a “Normal Probability Plot of the Residuals”. In the results section, it will be discussed whether the assumptions for a moderation analysis were met.

The following three hypotheses, H1, H2, H3, were examined with a hierarchical multiple regression analysis. H1 included a linear regression analysis with the conduct problems measure (SDQ) as the DV and the CU traits measure (ICU) as the IV. This was entered in the first block of the hierarchical regression model. H2 included the same linear regression analysis, but with Gender as an additional predictor in block 2. In addition, an independent samples t-test was performed to examine H2 more closely. This way, the means of the conduct problem measure for both gender groups (male and female) could be compared, to see whether there is a gender difference regarding conduct problems. Here, SDQ (DV) was used as the test variable and the variable Gender (IV) was used as the grouping variable. Finally, for H3, the same regression analysis used for H2 was repeated, but an interaction term was included in the third block of the model. The interaction term is the product of the standardized variable ‘gender’ and the standardized variable ‘ICU’ (Gender x ICU).

Results

First of all, the descriptive statistics of all variables used in the study are presented in Table 1. This table shows that males score on average higher ($M = 2.2$) than females ($M = 2.0$) on the SDQ conduct problems subscale. Furthermore, it was shown that participants scored highest on the ‘Unemotional’ and ‘Uncaring’ subscales of the ICU. In this case, men scored on average ($M = 9.1$ and $M = 7.5$) higher on both subscales compared to women.

Table 1. *Descriptive statistics*

	Total			Male	Female	Shapiro-Wilk		
	<i>N</i> = 454			<i>n</i> = 115	<i>n</i> = 339	Statistic	<i>df</i>	<i>p</i>
	<i>M</i> (<i>SD</i>)	Min.	Max.	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)			
SDQ	2.0 (1.2)	0	7	2.2 (1.3)	2.0 (1.1)	0.892	454	< 0.001
Lose Temper*	0.4 (0.6)	0	2	0.35 (0.58)	0.35 (0.56)			
Well-behaved**	1.2 (0.6)	0	2	1.12 (0.62)	1.21 (0.64)			
Fighting***	0.2 (0.5)	0	2	0.37 (0.58)	0.13 (0.39)			
Lying	0.1 (0.3)	0	2	0.17 (0.42)	0.08 (0.30)			
Stealing	0.1 (0.4)	0	2	0.18 (0.39)	0.14 (0.40)			
ICU	19.4 (7.3)	3	45	22.8 (8.0)	18.2 (6.7)	0.982	454	< 0.001
Callousness	4.4 (3.2)	0	21	6.2 (3.7)	3.7 (2.7)			
Unemotional	7.7 (3.5)	0	20	9.1 (3.7)	7.2 (3.3)			
Uncaring	7.3 (3.4)	0	15	7.5 (3.6)	7.2 (3.4)			
Interaction	0.01 (1)	-6.16	4.33	-0.02 (1.8)	-0.003 (0.6)	0.942	454	< 0.001

Note. *N* = sample size; *n* = number of participants; *M* = mean; *SD* = standard deviation;
 ICU = Inventory of Callous Unemotional Traits; SDQ = Strengths and Difficulties
 Questionnaire.

* “I get very angry”

** “I usually do as I am told”

*** “I fight a lot

Next, the correlations of the variables were calculated and presented in Table 2. The data met all the assumptions of the Pearson correlation test. The Pearson correlation test provides information about the strength- and direction of the association between the three ICU subscales of CU traits (CU traits measure) and the five items belonging to the SDQ conduct problem subscale (Conduct problems measure).

Table 2. *Correlations between Callous-Unemotional Subscales and Conduct Problem Subscale*

	Callousness	Unemotional	Uncaring
Conduct Problems (SDQ)	.37 **	0.013	.17 **

Note. SDQ = Strengths and Difficulties Questionnaire.

* $p < 0.05$; ** $p < 0.01$.

The outcome indicates that the overall correlation between the variables ICU (CU traits measure) and SDQ (Conduct problems measure) is $r = 0.25$, $p < 0.01$. To be more precise, ‘Callousness’ and ‘Uncaring’ are significantly positively correlated with the conduct problem subscale ($r = 0.037$, $p < 0.01$; $r = 0.17$, $p < 0.01$). Moreover, it is notable to mention that the subscale ‘Unemotional’ seems to be weakly correlated with the conduct problems subscale ($r = 0.013$). Since these correlation values range between $r = 0.01$ and $r = 0.37$, the relationship between conduct problems and CU traits can generally be considered as weak.

To test the hypotheses that adolescents high on CU traits will experience more (severe) conduct problems, that males will report higher conduct problems than females, and that gender moderates the relationship between conduct problems and CU traits, a moderation analysis was conducted. The statistical assumptions for a moderation analysis, which are equal to the ones for an independent samples t-test, were tested and were all met. However, the assumption that the values of the residuals are normally distributed should be interpreted with caution. Namely, the Shapiro-Wilk test for normality generated a significant result meaning that the residuals are not normally distributed (see Table 1). After visual examination of the Q-Q plots and histograms of the different variables, it was decided to use a parametric test. The information obtained from these plots did not seem to be in line with the results from the Shapiro-Wilk test, because the plots showed an approximately normal

distribution of the residuals. Besides, since the sample size is relatively large ($N = 454$), it is automatically assumed that the sampling distribution of the mean is normal regardless how values are distributed in the population. As a consequence, many test results are unaffected by even severe violation of normality. Moreover, it was tested whether there were influential cases (outliers, influential points, leverage points) biasing the model. Through examining the boxplots, Cook's Distances and Leverage values for each variable, it was indicated that there might be several outliers. The potential outliers were excluded from the dataset, and the regression was executed once again. Since the output remained exactly the same, it is concluded that there are no influential cases biasing the model.

To test whether adolescents high on CU traits will experience more (severe) conduct problems (H1), two variables were included in the first block of the hierarchical regression model: SDQ (DV) and ICU (IV). Parameter estimates of the analysis for H1 can be found in Table 3. The results showed that the first model accounted for a significant amount of variance in adolescents' conduct problems, $R^2 = .063$, $F(1, 452) = 30.44$, $p < 0.001$. Specifically, it was indicated that ICU explained 6.3% of the variance and that there was a significant main effect of ICU, $B = 0.041$, $t(452) = 5.52$, $p < 0.001$. Hence, it was found that adolescents high on CU traits indeed experience more (severe) conduct problems. Based on these results, this hypothesis was accepted.

The second hypothesis, which entails that boys will report higher conduct problems than girls, the same analysis as for H1 was performed, however, the moderator variable 'Gender' was added to the regression model. Parameter estimates of the analysis for H2 can be found in Table 3. The outcome of this analysis indicated that model 2 is significant, $F(2, 451) = 15.45$, $p < 0.001$. Nevertheless, the second model did not account for significantly

more variance in adolescents' conduct problems than the first model, $\Delta R^2 = 0.001$, $\Delta F(1, 451) = 0.491$, $p = 0.484$. Explicitly, it was indicated that both ICU and Gender explained 6.4% of the variance and that there was a significant main effect of CU traits, $B = 0.039$, $t(452) = 5.10$, $p < 0.001$, but a non-significant main effect of Gender, $B = -0.09$, $t(452) = -0.70$, $p = 0.484$. This means that there is no gender difference regarding conduct problems.

Moreover, the second hypothesis was also tested by means of an independent samples t-test. The outcome of the analysis presented that males have a higher mean ($M = 2.18$, $SD = 1.3$) for the conduct problems measure (SDQ) compared to girls ($M = 1.91$, $SD = 1.1$), and that this mean difference is significant, $t(452) = 2.14$, $p < 0.05$. Accordingly, these results support the hypothesis that males report higher conduct problems than females, however, without considering the effect of CU traits on conduct problems. Since not all variables are considered at ones, this outcome seems to provide a less precise picture of the relationship between gender and conduct problems. Thus, based on the results of the first analysis, the hypothesis that males report significantly higher conduct problems than females was rejected.

Lastly, the interaction term between Gender and ICU was added to the hierarchical regression model to test if boys high on CU traits will report more (severe) problems than girls high on CU traits (H3). The parameter estimates of the analysis for H3 are presented in Table 3. The third model was also found to be significant $F(3, 450) = 10.28$, $p < 0.001$. Further, the results showed that the interaction term did not account for a significant proportion of the variance in adolescents' conduct problems, $\Delta R^2 = 0.00$, $\Delta F(1, 450) = 0.017$, $p = 0.897$. After adding the interaction term to the model it was indicated that the percentage of variance explained remained exactly the same (6.4%), meaning that the interaction term (Gender x ICU) explained none of the variance (0.0%). All in all, it was shown that the interaction term was non-significant, $B = -0.007$, $t(452) = -0.13$, $p = 0.897$. Therefore, H3 was

rejected, and it could thus be concluded that gender does not moderate the relationship between CU traits and conduct problems.

Table 3. *Parameter Estimates of the Main Effects of ICU and Gender, and the Interaction Effect between Gender and ICU*

Variables	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)					
ICU	0.04	0.01	0.25	5.52	< 0.001
Gender	-0.09	0.13	-0.03	-0.70	0.483
Interaction (Gender x ICU)	-0.01	0.05	-0.01	-0.13	0.897

Note. Dependent variable: SDQ = Strengths and Difficulties Questionnaire; ICU = Inventory of Callous Unemotional Traits.

Discussion

Research on the topic of psychopathic traits and conduct problems have predominantly focused on the various types of conduct problems adolescents engage in, and the different effects CU traits have in the trajectory of conduct problems and the prediction of future maladaptive outcomes. However, little research has taken the role of gender into account and focused on the possible moderating effect gender has on the relationship between psychopathic traits and conduct problems (Falcón et al., 2021). Therefore, the aim of this study was to gain insight in the association between CU traits and conduct problems, and to examine this relationship. A correlation analysis was first performed to investigate the association between CU traits and conduct problems. Besides, a moderation analysis was performed to evaluate the role of gender in this relationship.

Moreover, four hypotheses were tested in this research study. The first hypothesis assumed that adolescents high on CU traits would experience more (severe) conduct problems (H1). Additionally, it was hypothesized that males would report higher conduct problems than females (H2). Lastly, the third hypothesis assumed that there would be a moderation effect of

gender, and thus, boys high on CU traits would report more (severe) conduct problems than girls high on CU traits.

The results from the correlation analysis presented that the ICU subscales ‘Callousness’ and ‘Uncaring’ were significantly positively correlated with the SDQ conduct problem subscale. Furthermore, it was found that the subscale ‘Unemotional’ was poorly associated with the conduct problems subscales. In addition, all correlations were in general relatively weak ($r = 0.251$), but it could still be assumed that the variables ICU (CU traits measure) and SDQ (Conduct problems measure) are correlated and that a high score on CU traits is possibly associated with a high score on conduct problems. The results of the linear regression analysis showed that there is indeed a significant positive linear relationship between CU traits (ICU) and conduct problems (SDQ). This result supports the hypothesis that adolescents high on CU traits indeed experience more (severe) conduct problems (H1). Taking into account the previously discussed correlations, it was assumed that mainly higher values on ‘unemotionality’ and ‘carelessness’ lead to more (severe) conduct problems (see Table 2). This outcome largely corresponds with the findings obtained in the research study of Frick et al. (2003). This study concluded that CU traits concurrently and prospectively predict a number of antisocial outcomes such as conduct problems. Also, increased levels of CU traits are thought to underlie a particularly hostile form of conduct problems that is persistent across development (Frick & White, 2008; Frick & Viding, 2009). According to Frick and Viding (2009), this is due to the fearless temperament fostered by high levels of CU traits, which causes reduced experience of emotional arousal in response to punishment cues. In the study conducted by Kimonis et al. (2013), it was found that high reports on a lack of caring about others’ feelings and the absence of emotional expressions, was strongly associated with high scores on (property) delinquency and proactive/reactive overt aggression.

Based on the results from the second regression analysis, as part of the hierarchical regression analysis, it was revealed that there is a non-significant main effect of Gender. This means that the variable Gender does not explain a statistically significant amount of variance in SDQ (conduct problems measure) besides CU traits, which automatically implies that there are no gender differences with regards to conduct problems. Thus, in this case boys do not report more conduct problems than girls and a weak association between gender and conduct problems is indicated, which is the reason for rejecting H2. This conclusion is not in accordance with the result from a study done by Fenti and Henrich (2010), in which was stated that boys are more likely to engage in conduct problems than girls. Besides, Crapanzano et al. (2010) stated that males tend to prefer more risky activities and are more likely to participate in proactive aggressiveness compared to females. Also, Khan and Avan (2020) argued that there are gender differences for conduct problems, as boys reported more externalizing problems and to be at significantly higher risks for behavioral problems than girls. This contrast in the findings on the level of conduct problems in boys and girls between this study and others, might be due to the strong association between CU traits and conduct problems. In this study the variable Gender was added as a predictor of conduct problems in a hierarchical regression analysis next to CU traits. The outcome of this model showed us that ICU (CU trait measure) explained a higher percentage of the variance in SDQ (conduct problems measure) compared to Gender. Additionally, the distinct results across studies, with regards to gender difference in exhibiting conduct problems, might be explained by the variations in samples used. In this study, the sample comprised people from the general population, whereas most other studies use clinical samples involving incarcerated individuals. Accordingly, several studies showed that the majority of the incarcerated populations tend to be men who exhibit conduct problems (Hofvander et al., 2017). This

might partially explain the outcomes of many research studies, showing that males report higher levels of conduct problems as opposed to females.

Finally, the Interaction term (Gender x ICU) was added to the moderation analysis and it was verified that boys high on CU traits do not report more (severe) conduct problems than girls high on CU traits. In other words, the Interaction effect was not significant which means that gender does not have a moderating effect on the relationship between CU traits and conduct problems. Hence, the third hypothesis was rejected. This suggests that there is no difference between the extent- and intensity of conduct problems in boys and girls who score high on CU traits. This outcome is not in line with findings of previous research, even though there is only a limited amount of studies that touch up on the role of gender in the manifestation of CU traits and conduct problems, and the association between these two. For instance, Marsee et al. (2005) indicated that gender probably operated as a moderator variable, with boys high on psychopathic traits demonstrating direct aggression and girls high on psychopathic traits demonstrating rather indirect aggression. Yet, it could be argued that this finding says more about the role of gender in the relationship between the level of CU traits and the type of conduct problems both genders exhibit, instead of the degree of conduct problems they present. Moreover, it is difficult to state a specific reason for the discrepancy between the outcome of this study compared to other studies with regards to the moderating role of gender. This is mainly because there are no other research studies that specifically discuss gender as a moderating factor in the association between CU traits and conduct problems.

Furthermore, it is important to touch up on some limitations this research study presents. First of all, the data used in this study was collected via self-report instruments. This

could lead to less accurate measures since participants sometimes have the tendency to give socially desirable responses. Therefore, future research should focus on using more reliable measurement instruments to measure the levels of conduct problems as well as CU traits in individuals. Another limitation of this study is with respects to the sample. Namely, the sample included substantially more women than men (74.7% vs 25.3%). This overrepresentation of women could have an effect on the outcomes that were acquired. Hence, future research studies should take this matter into consideration, and preferably use a larger sample size with a more equal distributions of gender. This might provide a more accurate subdivision of the sample based on conduct problems and gender. Consequently, the moderating effect of gender on the relationship between conduct problems and CU traits can studied more precisely. As mentioned previously, the sample in this study was based on the general population. For following research, it is important to explore the options of including a clinically based sample. This will ultimately allow for a better interpretation of the results. Lastly, the internal consistency for the conduct problems subscale was found to be poor ($\alpha = 0.45$). This suggests that the set of five items are not as closely related, meaning that it is likely not a consistent measure of the conduct problems concept. For this reason, the outcomes of this study should be interpreted with caution.

To conclude, this study is the first one to examine the moderating role of gender in the association between conduct problems and callous unemotional traits, in a relatively large sample of 454 participants. Moreover, this research raises awareness about the effects of- and the relationship between conduct problems and CU traits during adolescence, as well as the assumed gender differences. In general, the preliminary findings of this study are a valuable asset to the field of research, mainly because of the scarcity of research studies on this topic. Although gender was not necessarily found to play a moderating role in the relationship between conduct problems and CU traits, the results do confirm the hypothesis that

adolescents who score high on CU traits experience more (severe) conduct problems. Also, this study concluded that there are no gender differences regarding conduct problems. The accuracy of this finding will have to be further investigated in future research. The outcomes of this study can be used as a guideline for future research. When the limitations of this research study are carefully dealt with in future research, the chances of understanding the role of gender in the association between conduct problems and CU traits will likely increase.

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