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ORIGINAL ARTICLE

Emotion Dysregulation, ODD and Conduct Problems in a Sample of Five and Six-Year-Old Children

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Abstract
Previous studies examining the relationship between emotion dysregulation and externalizing behavior problems have, so far, focused on using general screening questionnaires capturing a wide range of externalizing behaviors and emotion dysregulation has mostly been assessed through direct observation using negative mood induction and behavioral tasks. The purpose of this study was to explore this relationship using a multi-informant rated clinical questionnaires. Parents and teachers of 609 5–6-year-old children (46% girls, 54% boys) completed the ERC, DBRS, and SDQ. ODD symptoms/conduct problems and lability/negativity were more severe among boys but girls had better emotion regulation. The results also showed a significant main effect for emotion dysregulation and ODD symptoms/conduct problems and that gender had no moderating effect on the relationship. These findings show a strong association between emotion dysregulation and concurrent ODD symptoms/conduct problems and suggest that emotional difficulties should be considered when exploring causes of behavior difficulties in daily life.

Keywords Emotion regulation · ODD symptoms · Conduct problems · Children · Gender differences

Introduction

Behavior disorders, such as Oppositional Defiant Disorder (ODD), are common in early childhood and cause considerable impairment in the first years of elementary school. They are also highly comorbid with other disorders, resulting in often complicated clinical presentation and pervasive impairment for afflicted children [1–3]. Recent literature has implicated deficits in emotion regulation in the manifestation of externalizing behavior problems in general, but the association between emotion regulation and ODD symptoms has received much less attention. The purpose of this study was to examine the relationship between emotion dysregulation, ODD symptoms and conduct problems in 5 and 6-year-old children.

Emotion Dysregulation and ODD Symptoms

Emotion dysregulation is commonly described as a lack of age-appropriate regulation skills [4–10] and may be viewed as a dual construct: the first aspect being ineffective emotion regulation, or under-regulation, when children demonstrate deficiencies in the ability to manage their emotions, which change rapidly and are expressed intensively [5, 11, 12]; and the second aspect being sensitive to emotion eliciting events, or lability, where children swiftly respond to emotion inducing events, often negatively, and have difficulty in recovering from their reactions [10, 13, 14]. Research shows that children acquire skills to regulate their emotions between ages 2–5, making the preschool years a particularly interesting study period [15–19]. ODD is a persistent pattern of anger, irritability, defiance, argumentative behavior and/or vindictiveness often resulting in problematic interactions with others. In the recent literature and in the DSM-5 the disorder has been conceptualized as a multi-dimensional construct with these symptoms being subcategorized, placing irritability and mood related symptoms in a separate

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category from defiant behavior and vindictiveness. Although the diagnostic criteria did not change, this subcategorization has drawn increased attention to the emotion related aspect of the disorder [20–23]. ODD is one of the leading cause for referrals to youth mental health services with the prevalence estimated at 5–13% among school-aged children [3, 24–26]. Additionally, children diagnosed with ODD are at more risk for co-occurring problems and comorbidity as well as continued adjustment difficulties later in life [25, 27, 28]. The first years in elementary school are a period of vulnerability when the onset of ODD is prominent and many comorbid problems seem to form [3, 20, 27, 29, 30]. This highlights the importance of identifying factors, such as emotion dysregulation, that could possibly influence the onset and symptom severity of ODD in children. Emotion dysregulation has been linked to various psychopathology in children and adolescents, such as depression, anxiety and eating disorders [9, 31–33] but studies on the connection between emotion dysregulation and ODD symptoms specifically, are lacking. It therefore remains unclear what role emotion dysregulation plays in the manifestation and development of ODD symptoms, but research has inferred that emotion dysregulation could be a possible risk factor, core feature or even a dimension of ODD [20, 34, 35].

Studies examining the relationship between emotion dysregulation and externalizing behavior problems have, so far, focused on using general screening questionnaires capturing a wide range of externalizing behaviors and emotion dysregulation has mostly been assessed through direct observation using negative mood induction and behavioral tasks. Hill et al. found an association between emotion dysregulation, observed during frustration tasks, and externalizing behavior problems, measured by the Child Behavior Checklist (CBCL). According to parent-report, the children who showed more dysregulation during frustration tasks had more severe externalizing behavior problems and emotion dysregulation was found to be a stronger predictor for these symptoms among girls [36]. Gerstein et al. reported a positive correlation between distress venting during a frustration task and externalizing behavior problems (on the CBCL), and concluded that children who displayed dysregulation also showed more severe externalizing behaviors. The sample included both typically developing children and children with developmental delays but gender differences were not examined and only parent report was used [19]. Both Gerstein et al. and Hill et al. were solely based on parent reports of externalizing behavior problems and in both studies emotion dysregulation was derived from performance on frustration tasks in a laboratory setting, which may limit the generalizability of the results. Only two studies have used clinical questionnaires to assess emotion dysregulation or ODD symptoms. Martel et al., used the Disruptive Behavior Rating Scale (DBRS) to assess ODD symptoms but used only a few items on the CBCL to evaluate emotion dysregulation. They found that high levels of negative affect, such as fear, sadness and anger, measured by the CBCL, appeared to be associated with more severe ODD symptoms. Gender differences were not examined and only parent-report was used [34]. Blandon et al., used the Emotion Regulation Checklist (ERC) for evaluating emotion dysregulation and the CBCL to estimate externalizing behavior problems. They reported a negative correlation between emotion regulation and externalizing behavior problems and concluded that better emotion regulation was associated with less externalizing behaviors. They used both parent- and teacher-report but did not examine gender differences [37].

Gender

Gender differences in relation to this topic have received little attention. ODD is known to be more common among boys [3, 25] but little is known about gender differences regarding emotion regulation in children. Hill et al. found that emotion dysregulation was a stronger predictor for externalizing behavior problems among girls but other studies in this area have not reported any gender comparisons. Among adolescents and adults the results vary, ranging from no gender differences to better emotion regulation among women compared to men [38, 39]. As ODD is more commonly found in boys [3, 25], it is important to document not only gender differences for emotion regulation and lability/negativity separately but also the potential effect gender has on the relationship between overall emotion dysregulation, ODD symptoms and conduct problems.

Current Study

In summary, research has shown association between emotion dysregulation and externalizing behavior problems in children [40–43]. However, previous studies examining this relationship have, so far, been based on parent report on general screening questionnaires capturing a wide range of externalizing behaviors rather than symptoms of specific behavior disorders, such as ODD [34, 37]. Emotion dysregulation has also mostly been assessed using direct observation of behavior during specific laboratory tasks limiting the generalizability of results [19, 36]. Consequently, studies examining the relationship between emotion dysregulation and ODD symptoms among young children are lacking, as are studies on gender differences. The novelty of the current study lies in the use of multi-informant evaluation of emotion dysregulation and a clinical DSM diagnostic criteria based measure of ODD symptoms, providing a comprehensive view from both parents and teachers about the child´s behavior in everyday situations. Additionally, gender comparisons have been limited in previous studies and analyses

of potential moderating effects of gender on the relationship between emotion dysregulation and behavior disorders have not been conducted. In light of the results from Martel et al. and Blandon et al. we expect a strong relation between emotion dysregulation and ODD symptoms/conduct problems, especially regarding lability/negativity. We also expect to see more prominent emotion dysregulation, ODD symptoms and conduct problems among boys.

Method

Participants

Participants were parents and teachers of 609 children from the ages of five to six ($M = 5.6$; SD = 0.31). The sample consisted of 280 girls (46%) and 329 boys (54%). In total, 550 parents (94% mothers) and 409 teachers answered for the children. Participants were recruited through preschools in the capital region of Iceland where 63% of the population resides. The Icelandic preschool system is comprised of public and private schools for children aged one to five. Attendance is not mandatory but 93% of 5-year old children in the capital region attend preschool [44]. Children already clinically diagnosed with Intellectual Disabilities, Language Disorder, autism spectrum disorders, behavior disorders, or ADHD were excluded from the study. As the Icelandic population is very homogeneous, with 92% of the population of Norse–Celtic descent, [44] questions about race and ethnicity were not included in the study. The participants´ socioeconomic status is representative for the region they were recruited from; with 68% holding a BSc or MSc degree, 67% working full time and 83% married. Participants, both parents and teachers, were not paid for their participation but entered a lottery to win a monetary reward.

Measures

Emotion Regulation Checklist (ERC)

Emotion dysregulation was assessed using the ERC, a widely used hetero-evaluation for emotion dysregulation allowing for both parent- and teacher report [45]. The ERC comprises of 23 items describing children's emotion-related behavior divided into two subscales: (1) emotion regulation subscale (ER) containing eight items assessing emotion regulation and (2) lability/negativity subscale (L/N) containing 15 items measuring emotional lability/negativity. Each item is rated on a four-point Likert scale ranging from never (1) to always (4). Higher score on the emotion regulation means better emotion regulation and higher score on the lability/negativity means more lability/negativity. The lowest score possible for emotion regulation subscale is 8 and highest is 32. Lowest possible for lability/negativity is 15 and highest is 60. Reliability coefficients are high for the overall scale ($\alpha = 0.89$) and for the two subscales (emotion regulation $\alpha = 0.83$ and lability/negativity $\alpha = 0.96$) [45, 46]. The questionnaire has been translated to several languages including Icelandic. A preliminary assessment of the psychometric properties of the Icelandic translation of the ERC indicated acceptable reliability and internal consistency (emotion regulation $\alpha = 0.70$ and lability/negativity $\alpha = 0.89$). This sample yielded similar results (emotion regulation $\alpha = 0.70$ and lability/negativity $\alpha = 0.86$).

Disruptive Behavior Rating Scale (DBRS)

The DBRS contains 26 items assessing inattention, hyperactivity–impulsivity, and oppositional defiant behavior among school-aged children [47]. ODD symptoms were measured using the ODD section of the DBRS which includes eight items describing symptoms of ODD on a four-point Likert scale ranging from never or rarely (0) to very often (3). The DBRS is based on the DSM-IV diagnostic criteria for both ADHD and ODD. The questionnaire is answered by parents and teachers and they indicate how often a child displayed symptoms in the past 6 months [47]. A preliminary assessment of the psychometric properties of the Icelandic translation of the DBRS indicated acceptable reliability and internal consistency ($\alpha = 0.93$). Similar results were found in this sample ($\alpha = 0.90$).

Strength and Difficulties Questionnaire (SDQ)

Conduct problems were assessed using the SDQ. The questionnaire is a brief but reliable instrument consisting of 25 items measuring psychological attributes among children on a three-point Likert scale ranging from not true (0) to certainly true (2) [48]. The SDQ consists of five subscales measuring conduct problems, emotional symptoms, hyperactivity/inattention, peer relationship problems, and prosocial behavior. The questionnaire is available in many languages and has three versions, self-report, parent report and teacher report. In the current study, the parent and teacher-rated scores for the SDQ conduct problems subscale were used (i.e. items no. 5, 7, 12, 18 and 22). The SDQ has been translated and standardized in Icelandic and its psychometric properties have been found to be acceptable ($\alpha = 0.71$) [49]. Similar results were found in this sample ($\alpha = 0.68$).

Procedure

After obtaining Institutional Review Board (IRB) approval (VSNb2016030001/03.01), the participants were recruited from preschools in all municipalities of the capital region. Parents of all children attending their last year at preschool

were invited to participate in the study. This study is a part of a larger ongoing longitudinal study aimed at identifying possible emotion-related predictors for the development of ODD and comorbid problems. Data collection was conducted in the capitol area of Reykjavik and all the preschools in the area were invited to participate which are 126 schools in total, whereof 77 (61.1%) agreed to participate. A detailed letter was sent to parents of children attending the participating preschools. Parents gave their informed consent by registering electronically for the study and then received, via email, a link to the online questionnaires, the informed consent included permission to contact the child's teacher. Teachers also received an email with a detailed letter and a link to the questionnaires. All measures in the study were administered electronically using *QuestionPro.*

Data Analyses

Descriptive analyses included frequency, means and standard deviations (SD) in addition to power calculations. According to power calculations the minimum sample size needed for the current analyses was 385 participants (using 95% confidence level, 0.5 SD, and a confidence interval of ± 5%). Item correlation was also calculated as associations between the scores on the DBRS questionnaire and the lability/negativity subscale on the ERC could possibly be inflated due to similarity in wording of the questions. A value of $r = 0.5$ and higher is estimated to be moderate to high correlation [50] and was used as guideline for which items were removed before further analyses was conducted. Additionally, regression analysis was conducted to examine the moderation effect of gender on the relationship between emotion dysregulation, ODD symptoms and conduct problems (*SDQ*). Lastly, a factorial multivariate analysis of variance (MANOVA) was performed to compare outcomes on all measurements among children rated above the cut-off on the ERC subscales, to detect possible group differences for ODD symptoms and conduct problems (*SDQ*) and assess the relationship between emotion dysregulation and ODD symptoms/conduct problems further. Follow-up analysis of variance (ANOVA) were also conducted to identify group differences. The cut-off scores for the ERC subscales are seldom used compared to mean scores [51–54]. However, during the development and validation of the questionnaire, Shields and Cicchetti adopted the use of a cut-off score of 1.0 SD from the mean for both subscales. The cut-off score is established by converting raw scores to Z-scores and identifying participants 1.0 SD from the mean [45]. The same was done in this study but using a more conservative cut-off score of 1.5 SD from the mean both to avoid overestimation of emotion dysregulation in the sample and to correspond with the cut-off score of other questionnaires used. Lastly, missing values were excluded pairwise in the analyses since missing values were under 7% for all variables.

Results

Descriptive Statistics

An overview of the mean scores on all measurements for the overall sample and by gender can be seen in Table 1. The mean for emotion regulation was higher than lability/negativity for the overall sample and the mean was statistically higher for girls on emotion regulation, both according to parents $t(538) = 3.625$, $p < 0.001$ and teachers, $t(396) = 5.143$, $p < 0.001$. The mean was higher for boys on lability/negativity, also both according to parents, $t(535) = -3.637$, $p < 0.001$ and teachers, $t(382) = -5.567$, $p < 0.001$. There was a significant difference between parent- and teacher report on lability/negativity, $t(343) = 6.965$, $p < 0.001$, but not on emotion regulation, $t(343) = 1.875$, $p = 0.062$. Gender differences were also apparent for ODD symptoms, measured by the DBRS, as boys had a statistically significant higher mean than girls, according to both parents, $t(529) = -2.048$, $p = 0.041$ and teachers, $t(395) = -6.129$, $p < 0.001$. There was also a significant difference between parent- and teacher report on ODD symptoms,

Table 1 Mean scores for all measurements

	Parents $n = 550$ (303 boys/247 girls) M (SD)	Teachers $n = 409$ (210 boys/199 girls) M (SD)
Emotion regulation		
Total sample	27.38 (3.03)	27.34 (3.73)
Boys	26.96 (3.11)	26.45 (3.91)
Girls	27.90 (2.85)**	28.30 (3.18)**
Lability/negativity		
Total sample	25.71 (6.15)	22.17 (6.91)
Boys	26.57 (6.23)**	24.02 (7.69)**
Girls	24.64 (5.88)	20.23 (5.38)
ODD symptoms		
Total sample	4.07 (3.83)	2.43 (4.02)
Boys	4.37 (4.04)*	3.49 (4.85)**
Girls	3.69 (3.52)	1.31 (2.48)
Conduct problems		
Total sample	1.27 (1.42)	1.06 (1.65)
Boys	1.39 (1.51)*	1.52 (1.90)**
Girls	1.13 (1.29)	0.548 (1.11)

Emotion regulation and lability/negativity Emotion Regulation Checklist, *ODD symptoms* Disruptive Behavior Rating Scale, *Conduct problems* Strengths and Difficulties Questionnaire

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

$t(334) = 5.174$, $p < 0.001$. Similar results were found regarding conduct problems measured by the SDQ. There was significant gender differences as the mean was higher for the boys both according to parents, $t(515) = -2.042$, $p = 0.042$ and teachers, $t(392) = -6.129$, $p < 0.001$ but there was not a statistically significant difference in parent report compared to teacher report, $t(320) = 0.0650$, $p = 0.516$.

Item correlation was completed before further analysis was conducted due to potential overlap in questions on the ERC and the DBRS. The results showed an overlap between four questions on the lability/negativity subscale of the ERC and five questions on the DBRS. On the ERC these items were; item 2 ("*exhibits wide mood swings*"), item 6 ("*easily frustrated*"), item 8 ("*tantrums easily*") and item 14 ("*responds angrily to limit-setting*) and on the DBRS; item 1 ("*loses temper*"), item 2 ("*argues with adults*"), item 3 ("*actively defies or refuses to comply with adults' request or rules*"), item 6 ("*is touchy or easily annoyed*") and item 7. ("*is angry or resentful*"). The highest correlation was found between item 8 on the ERC and item 1 on the DBRS, $r = 0.724$. Correlation between other items ranged from $r = 0.511$ to $r = 0.595$. The correlation for all items on the Conduct Problems Subscale of the SDQ and the Lability/Negativity subscale of the ERC was below $r < 0.5$. When these four items were removed from the ERC the correlation between parent rated lability/negativity and ODD symptoms decreased from $r = 0.748$ to $r = 0.631$ and $r = 0.816$ to $r = 0.731$ for teacher report. Correlations between lability/negativity and conduct problems decreased from $r = 0.721$ to $r = 0.636$ for parent report, and $r = 0.757$ to $r = 0.701$ for teacher report. Similar results were found when examining change in correlation for genders separately, the correlation for girls decreased from $r = 0.725$ to $r = 0.600$ for parent report and from $r = 0.769$ to $r = 0.668$ for teacher report. For boys the correlation decreased from $r = 0.760$ to $r = 0.645$ for parent report and from $r = 0.797$ to $r = 0.713$ for teacher report. All correlation coefficients remained statistical significant ($p < 0.01$).

Moderation Analysis

To examine the moderating effect of gender on the relationships between emotion regulation, lability/negativity and both ODD symptoms and conduct problems, a regression analysis was calculated, and the results can be seen in Table 2. When looking at the effect of gender on the relationship between overall emotion dysregulation and ODD symptoms the model as a whole was statistically significant for both parent-report, $F(2,528) = 195.650$, $p < 0.001$ and teacher-report, $F(2,392) = 226.286$, $p < 0.001$. Emotion regulation and lability/negativity were both a unique contributor to the variance in ODD symptoms. When gender was added to the second model, which was also overall significant for parent-report $F(3,527) = 130.712$, $p < 0.001$ and teacher-report $F(3,391) = 151.063$, $p < 0.001$, the predictive capacity of the model only increased by .1% which was not statistically significant. Similar results were observed for conduct

Table 2 Moderation effect of gender on the relationship between emotion dysregulation, ODD and conduct problems

	R^2	R^2 change	Emotion regulation		Lability/negativity		Gender	
			ß	*t*	*ß*	*t*	*ß*	*t*
ODD symptoms								
Parents								
Model 1	0.426	0.426	−0.202	−5.380**	0.532	14.210**		
Model 2	0.427	0.001	−0.203	−5.415**	0.536	14.222**	−0.032	−0.952
Teachers								
Model 1	0.536	0.536	−0.157	−3.736**	0.631	15.058**		
Model 2	0.537	0.001	−0.152	−3.608**	0.623	14.526**	0.907	0.365
Conduct problems								
Parents								
Model 1	0.444	0.444	−0.227	−6.056**	−0.527	14.060**		
Model 2	0.445	0.000	−0.228	−6.058**	−0.528	14.009**	−0.010	−0.300
Teachers								
Model 1	0.521	0.521	−0.209	−4.854**	0.581	13.507**		
Model 2	0.527	0.006	−0.200	−4.641**	0.563	12.884**	0.080	2.154*

Model 1: (Constant), emotion regulation and lability/negativity. Model 2: (Constant), emotion regulation, lability/negativity and gender

Emotion regulation and lability/negativity Emotion Regulation Checklist, *ODD symptoms* Disruptive Behavior Rating Scale, *Conduct problems* Strengths and Difficulties Questionnaire

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

problems (*SDQ*), the model was statistically significant for parent-report, $F(2,513) = 205.213$, $p < 0.001$ and teacher-report, $F(2,385) = 209.460$, $p < 0.001$, where both emotion regulation and lability/negativity were unique contributors to the variance of conduct problems (*SDQ*). When gender was added to the model, which was also significant for both parent-report, $F(3,512) = 136.596$, $p < 0.001$, and teacher-report, $F(3,384) = 142.506$, $p < 0.001$ the predictive capacity did not increase at all for parent-report but increased by 0.6% for teacher-report which was statistically significant (see Table 2).

Multivariate Interaction

Lastly, outcomes on the DBRS and Conduct Problems Subscale on the SDQ were compared between those rated above the cut-off on the ERC subscales and can be seen in Table 3. A factorial MANOVA revealed a significant multivariate main effect for poor emotion regulation on the linear composite for ODD symptoms and conduct problems (*SDQ*), according both to the parents, Wilks´ $\lambda = 0.966$, $F(2,505) = 8.80$, $p < 0.01$ and the teachers, Wilks´ $\lambda = 0.911$, $F(2,376) = 18.27$, $p < 0.01$. There was also a significant effect for high lability/negativity for ODD symptoms and conduct problems (*SDQ*), both according to the parents, Wilks´ $\lambda = 0.853$, $F(2,505) = 43.60$, $p < 0.001$, and teachers, Wilks´ $\lambda = 0.649$, $F(2,376) = 101.89$, $p < 0.01$. Given the significance of the overall MANOVA tests, indicating a difference between groups for the composite of symptoms, follow-up ANOVAs were examined separately for all measurements and the results can also be viewed in Table 3. Children rated above cut-off for lability/negativity scored significantly higher on the DBRS and Conduct Problems Subscale of the SDQ, than children reported below the cut-off score, both according to the parents and the teachers.

Discussion

Research has shown association between emotion dysregulation and externalizing behavior problems in children [40–43]. However, previous studies examining this relationship have, so far, been based on parent report on general screening questionnaires capturing a wide range of externalizing behaviors rather than symptoms of specific behavior disorders, such as ODD [34, 37]. Emotion dysregulation has also mostly been assessed using direct observation of behavior during specific laboratory tasks limiting the generalizability of results [19, 36]. The purpose of this study was to examine emotion dysregulation in relation to ODD symptoms and conduct problems among preschool-aged boys and girls. The novelty of the current study lies in the use of multi-informant evaluation of emotion dysregulation and a DSM diagnostic criteria based measure of ODD symptoms. We believe that these measurements provide a more comprehensive view of potential difficulties with emotion regulation than can be obtained when evaluating the performance of the children on specific frustration tasks in a laboratory setting, as the questionnaires evaluate the children during interactions with others in diverse everyday situations.

There were several important findings in this study. Means were high for both emotion regulation and lability/negativity which means that the children were able to manage their emotions and express them appropriately, however, in contrast they were also sensitive to emotion eliciting events and had difficulty recuperating from them afterwards (see Table 1). Parents reported significantly more problems compared to teachers for ODD symptoms and lability/negativity but parent- and teacher report was similar for emotion regulation and conduct problems. These results could suggest that problematic behavior may be more prominent in the home compared to the school setting or that parents and teachers interpret problematic behavior differently.

Table 3 Differences in mean scores among children rated below and above the cut-off scores on the ERC subscales

	Parents		Teachers	
	Below cut-off	Above cut-off	Below cut-off	Above cut-off
	M (SD)	*M* (SD)	*M* (SD)	*M* (SD)
Emotion regulation	$n = 437$	$n = 27$	$n = 306$	$n = 23$
ODD symptoms	3.83 (3.73)	8.54 (3.46)*	2.03 (3.64)	7.37 (5.12)*
Conduct problems	1.14 (1.33)	2.93 (1.44)**	0.846 (1.33)	3.50 (2.47)**
Lability/negativity	$n = 426$	$n = 38$	$n = 295$	$n = 34$
ODD symptoms	3.46 (3.10)	11.48 (4.00)**	1.48 (2.39)	10.73 (5.50)**
Conduct problems	1.04 (1.18)	3.52 (1.58)**	.683 (1.08)	4.22 (1.98)**

Emotion regulation and lability/negativity Emotion Regulation Checklist, *ODD symptoms* Disruptive Behavior Rating Scale, *Conduct symptoms* Strengths and Difficulties Questionnaire

*$p < 0.05$ **$p < 0.01$

Correlation analyses showed a relatively strong relationship between emotion dysregulation, ODD symptoms and conduct problems which supports our hypothesis and is congruent with previous studies that have found an association between emotion dysregulation and externalizing behavior problems [34, 37] The argument could be made that these findings were merely an artifact of items being similar on the ERC and DBRS questionnaires. However, this does not seem to be the case as item correlation on these measures was low, except on four items on the lability/negativity subscale and five items on the DBRS. Much lower correlation was found between items on the ERC and the Conduct Problems Subscale on the SDQ. Correlation analyses were repeated after removing the four items on the lability/negativity subscale of the ERC that had the highest correlation with questions on the DBRS. Even with the four items removed there was only a minor reduction in correlation, for the overall sample and separately for each gender, and statistical significance did not change.

Gender comparisons revealed significant differences for both parents and teachers. Both reported more severe lability/negativity among the boys and poorer emotion regulation indicating that boys had overall more severe emotion dysregulation compared to girls (see Table 1). Since gender comparisons in emotion dysregulation in this age group are lacking, it is challenging to compare these findings to previous studies [19, 34, 37] but supports our hypothesis that these symptoms would be more prominent among boys. Only one study examining gender differences found that emotion dysregulation was a stronger predictor for externalizing behavior problems among girls compared to boys [36]. In the examination of possible moderating effect of gender on the relationship between emotion dysregulation, ODD symptoms and conduct problems the results showed that gender did not have an effect on either relationship, according to parents or teachers. Gender had only a significant moderating effect on the relationship between emotion dysregulation and conduct problems for teacher report but even if the increase was statistically significant it was not meaningful as it only explained .6% of the variance. The effect of gender on the relationship between emotion dysregulation, ODD symptoms and conduct problems has, to our knowledge, not been explored in this way before. The same analysis showed that emotion regulation and lability/negativity had a strong effect on both ODD symptoms and conduct problems as around 50% of the variance was explained by emotion dysregulation (see Table 2). This means that emotion dysregulation, was a strong predictor of ODD symptoms and conduct problems but gender had no effect on the relationship. In other words, how children manage their emotions, how sensitive they are to emotion eliciting events and whether they have difficulty recovering seems to influence the severity of ODD symptoms and conduct problems, regardless of the child's gender. These results may indicate that the problematic behavior children with ODD display could be the result of difficulties with emotion dysregulation rather than being a voluntary disruptive behavior and that this affects both genders equally. It could also suggest that ODD, which is often conceptualized as having an anti-social undertone, is strongly related to the ability to cope with emotion eliciting events. This notion is in congruence with the idea that ODD is a multi-dimensional construct and is perhaps not only a disorder of defiance and deliberate disregard of others, but also a disorder of mood regulation [20, 22, 35].

Lastly, results showed differences between children who were rated above the cut-off score for poor emotion regulation or high lability/negativity and for ODD symptoms and conduct problems (*SDQ*). Children displaying emotion dysregulation were reported to show more severe ODD symptoms and conduct problems than children not displaying such difficulties (see Table 3). Children rated above the cut-off for high lability/negativity seemed to have more severe ODD symptoms and conduct problems, both according to parents and teachers. Previous studies have not examined cut-off scores on the ERC in relation to outcomes on other clinical measurements [19, 34, 36, 37]. The fact that children who measured above the cut-off score on emotion dysregulation were more likely to display other difficulties could potentially have clinical implications. Using a clinical screening questionnaire is an inexpensive, quick and efficient way to identify children with emotion dysregulation and might help with finding children potentially at risk for additional difficulties.

The current study had some limitations. First, the data is cross-sectional and therefore do not describe any possible developmental processes at work. Second, there were unequal numbers of participants regarding parent- and teacher report as fewer teachers participated. Lastly, when comparing children above the cut-off score, results should be interpreted with caution as there were unequal numbers of children in each group. Despite the aforementioned limitations, the study had several strengths. The sample was large and well above the minimum number of participants required according to power analysis and was a community sample. Additionally, the study included both parent- and teacher report on emotion dysregulation, ODD symptoms and conduct problems providing a comprehensive overview of the child´s behavior in everyday situations, both at home and at school.

Summary

The current results show a strong relationship between emotion dysregulation, ODD symptoms and conduct problems in 5–6-year-old children, especially regarding lability/negativity which supports our hypothesis. Gender differences

were found as emotion dysregulation, ODD symptoms and conduct problems were more severe among boys, also supporting our hypothesis. However, gender had no moderating effect on the relationship between emotion dysregulation, ODD symptoms or conduct problems. How children manage their emotions and if they are sensitive to emotion eliciting event and have difficulty recovering seems to influence the severity of ODD symptoms and conduct problems, regardless of the child's gender. These results add to a limited but growing literature on young children with regard to associations between emotion dysregulation, ODD symptoms and conduct problems [19, 34, 36, 37]. These findings also provide valuable information about the clinical presentation of emotion dysregulation, ODD symptoms and conduct problems and suggest that emotional difficulties among young children should be considered when exploring causes of behavioral difficulties in daily life. Future studies should focus on longitudinal assessment of the role of emotion dysregulation in the development and manifestation of ODD symptoms among children.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval 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. IRB approval: VSNb2016030001/03.01.

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