



## Examining parent-report of Children's emotion regulation in paediatric OCD: Associations with symptom severity, externalising behaviour and family accommodation

Matthew L. McKenzie<sup>a,\*</sup>, Caroline L. Donovan<sup>b</sup>, Melanie J. Zimmer-Gembeck<sup>a</sup>, Allison M. Waters<sup>b</sup>, Sharna L. Mathieu<sup>a</sup>, Lara J. Farrell<sup>a</sup>

<sup>a</sup> School of Applied Psychology, Griffith University, Gold Coast Campus, Australia

<sup>b</sup> School of Applied Psychology, Griffith University, Mount Gravatt Campus, Australia

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### ABSTRACT

Paediatric Obsessive-Compulsive Disorder (OCD) is associated with significant family accommodation (FA), which frequently results in heightened parental distress, increased OCD severity and impairment. Examining factors which might drive FA is an important focus for the field. This study aimed to examine parents' report of children's emotion regulation (ER) and associations with OCD severity, externalising symptoms, and FA. Participants were 76 youth (7 to 17 years) with a primary diagnosis of OCD and one of their parents. Following child diagnostic and OCD symptom interviews, parents completed study questionnaires. Results indicated that parent-report of children's emotional Lability/Negativity was significantly and positively correlated with child externalising symptoms and FA, whereas children's adaptive ER was significantly and negatively correlated with externalising symptoms only. Furthermore, children's emotional Lability/Negativity predicted externalising symptoms, even when accounting for OCD severity. Lability/Negativity did not predict FA after controlling for OCD severity and externalising symptoms, however it was a significant moderator of the relationship between OCD severity and FA. These findings extend the growing body of literature on ER and OCD in youth and highlight the importance for clinicians to specifically address such deficits in ER as a part of OCD treatment.

Childhood obsessive-compulsive disorder (OCD) is associated with severe impairments across several domains of a child's functioning, including social and academic functioning (Piacentini, Bergman, Keller, & McCracken, 2003; Storch et al., 2010a). However, the adverse effects of OCD extend far beyond impairment to the child, with heightened family accommodation (FA) to symptoms and emotional distress frequently reported by other family members (Stewart et al., 2017). FA refers to behaviours carried out by family members to assist the patient in completing rituals and/or modifications to normal family routines to reduce the patient's distress. The process of FA however, often results in major disruptions to family life, including heightened distress among parents, as well as dysfunctional parent-child dynamics (Ramos-Cerqueira, Rodrigues Torres, Torresan, Maranhao Negreiros, & Nakano Vitorino, 2008). Furthermore, FA has consistently been associated with poorer treatment outcomes for children and youth (Storch et al., 2008). Therefore, studies that examine factors associated with this process are necessary.

### 1. Child variables and family accommodation

Despite the clinical significance of FA, knowledge regarding its predictors is limited. Understanding what drives parental accommodation may inform new approaches to supporting families in managing their child's OCD related distress and symptoms. Most studies examining predictors of FA in paediatric OCD have highlighted significant associations with child OCD symptom severity (Pinto, Van Noppen, & Calvocoressi, 2013; Storch et al., 2007). However, a recent meta-analysis involving 41 studies on FA highlighted that despite the medium effect size for OCD severity and FA ( $r = 0.42$ ), the specific causal direction of the effect has not been established and is likely bi-directional (Wu et al., 2016). While there is a well-established association between child OCD severity and FA, it is possible that the magnitude of this relationship may be influenced by other factors that have not yet been explored in the literature. The extent to which children and adolescents with OCD are able to regulate their emotional distress may be one such factor.

\* Corresponding author. School of Applied Psychology, Griffith University, Parklands Dr. G40, Southport, QLD, 4222, Australia.  
E-mail address: [matthew.mckenzie@alumni.griffithuni.edu.au](mailto:matthew.mckenzie@alumni.griffithuni.edu.au) (M.L. McKenzie).

Additionally, several studies have highlighted patterns of externalising behaviour in OCD being associated with heightened FA, suggesting that externalising behaviour may serve a coercive function in eliciting FA (Caporino et al., 2012; Flessner et al., 2011; Lebowitz, Omer, & Leckman, 2011; Lebowitz, Vitulano, & Omer, 2011; Storch et al., 2007). Storch, Lewin, Geffken, Morgan, and Murphy (2010b) examined associations between FA and disruptive behaviour disorders (DBD) co-occurring with OCD in 192 children and adolescents, including youth with OCD only, those with OCD and DBD comorbidity, and those with OCD and other comorbid diagnoses. They found that in families where children had OCD and comorbid DBD there was increased likelihood of FA relative to the other two groups. Similarly, in a qualitative study examining coercive and disruptive behaviours (CDB), Lebowitz, Vitulano, and Omer (2011) interviewed the parents of 10 children and adolescents with OCD and comorbid CDB and found that there was indeed a pattern of coercive behaviour in which OCD-related rules were imposed aggressively on parents and siblings. Likewise, in a separate study by Lebowitz, Vitulano, et al. (2011), 83% of parents whose children had both OCD and comorbid DBD reported that their child imposed rules or behaviors on others and tended to react with rage or violence to the individual's non-adherence to these OCD-rules, this was compared to 23% of the parents of youth with DBD alone.

More recently, Lebowitz, Storch, MacLeod, and Leckman (2015) examined FA as a potential mediator of the relationship between CDB and OCD severity among 61 treatment-seeking youth diagnosed with OCD. Their findings highlighted that the indirect pathway through FA explained over 97% of the association between CDB and OCD severity. Additionally, a recent treatment outcome study found that changes in CDB following family-based cognitive-behavioural therapy (CBT) for OCD mediated the relationship between changes in FA and OCD impairment (Schuberth, Selles, & Stewart, 2018). Taken together, these studies highlight that FA is a complex phenomenon in OCD which is likely influenced by several factors, with strong empirical support for associations with OCD severity and externalising behaviour in youth. Storch et al. (2012) suggested that these episodes of CDB may represent the child's inability to regulate their internal distress. Therefore, examining emotion regulation (ER) as a potential predictor of externalising behaviours in youth with OCD, as well as its association with OCD severity and FA, may deepen our understanding of FA and inform interventions that target this phenomenon in treatment. In general, despite the well-intentioned nature of FA, this process serves to compromise the child's potential for improvement in self-regulation, emotional management and overall symptom coping (Lebowitz, Scharfstein, & Jones, 2014).

## 2. Emotion regulation in paediatric OCD

Emotion Regulation (ER) is broadly understood to be an interactive process that occurs between the individual and their environment, whereby individuals determine which emotions they experience, when they experience them, and how they express them based on their interpretations of the environment (Gross, 1998). The goal of ER is to alter the magnitude and/or duration of emotional responses (Gross, 2013; Gross, Sheppes, & Urry, 2011), and efforts at modulating and modifying emotional experiences typically involve the use of one or more strategies that may determine the observable response (Campos, Mumme, Kermoian, & Campos, 1994; Thompson & Calkins, 1996). In paediatric OCD, there have been few studies examining children's capacity to regulate emotions. Bender, Pons, Harris, Esbjorn, and Reinholdt-Dunne (2015) explored understanding of emotions and emotion dysregulation in a sample of 16 clinically anxious children (aged 8 to 12 years) and found that children with OCD symptoms had greater difficulty understanding emotions and were more emotionally dysregulated than children without these symptoms. Berman, Shaw, Curley, and Wilhelm (2018) evaluated parents' report of their child's adaptive and maladaptive ER using the Emotion Regulation Checklist

(with the Emotion Regulation subscale representing adaptive ER and the Lability/Negativity subscale representing maladaptive ER). The authors examined the relationship between ER, OC symptoms and obsessive beliefs in a sample of clinically anxious children ( $n = 27$  aged 8–18 years), a proportion of whom met criteria for OCD. It was found that obsessive beliefs and OC symptom dimensions were negatively associated with children's adaptive ER, and positively associated with children's emotional Lability/Negativity. While these findings highlight interesting associations between children's ER and child OC symptoms, they do not shed light on the extent to which ER may be associated with externalising behaviours or FA.

A recent study examining group differences among 137 youth with OCD who were classified as higher or lower on emotional control, highlighted that those lower on emotional control had significantly greater FA and externalising symptoms (McKenzie, Donovan, Mathieu, Hyland, & Farrell, 2019). Given empirical evidence reviewed earlier regarding the frequency of disruptive/dysregulated behaviour among some youth with OCD, and the fact that ritualising behaviours (i.e., compulsions) are proposed to serve as regulatory processes for managing dysfunctional beliefs and associated distress, an underlying deficit in ER may play a role in the child's symptoms and may likewise drive parental accommodation. However, further research is needed to clarify these proposed associations.

## 3. The present study

The current study aimed to explore ER among a sample of youth who had a primary diagnosis of OCD using a well-validated parent-report measure of child ER (Emotion Regulation Checklist; Shields & Cicchetti, 1997) which includes an adaptive ER subscale (Emotion Regulation subscale) and a maladaptive ER subscale (Lability/Negativity subscale). Specifically, this study aimed to: (a) examine the degree to which parents' report of children's (adaptive) ER and their Lability/Negativity was associated with child OCD severity, externalising symptoms, and FA; (b) examine whether parents' report of children's Lability/Negativity was a significant unique predictor of child externalising behaviour, when accounting for OCD severity; (c) examine whether parents' report of children's Lability/Negativity was a significant unique predictor of FA, when accounting for child OCD severity and externalising symptoms, and finally (d) to explore whether parents' report of children's Lability/Negativity moderated the relationship between OCD severity and FA. In line with these aims, it was hypothesised that:

**H1.** Children's emotional Lability/Negativity would be significantly and positively correlated with child OCD severity, externalising symptoms, and FA, whereas children's (adaptive) ER would be significantly and negatively associated with these variables.

**H2.** Children's emotional Lability/Negativity would be a significant and unique predictor of greater externalising symptoms, when accounting for child OCD severity.

**H3.** Children's emotional Lability/Negativity would be a significant and unique predictor of greater FA, when accounting for child OCD severity and externalising symptoms.

**H4.** Children's emotional Lability/Negativity would moderate the relationship between OCD severity and FA whereby greater Lability/Negativity would be associated with a stronger association between OCD severity and FA.

## 4. Method

### 4.1. Participants

Participants in this study were 76 youth (and their parents) aged 7

**Table 1**  
Comorbidity characteristics of study participants.

	Secondary Diagnoses		Tertiary Diagnoses	
	n	%	n	%
Generalised Anxiety Disorder	23	31.9	1	1.4
ADHD	9	12.5	4	5.6
Separation Anxiety Disorder	8	11.1	5	6.9
Specific Phobia	6	8.3	8	11.1
Social Phobia	3	4.2	3	4.2
Major Depressive Disorder	2	2.8	1	1.4
Oppositional Defiant Disorder	2	2.8	4	5.6
Dysthymia	1	1.4	7	9.7
Panic Disorder	1	1.4	1	1.4
Total	55	76.4	34	47.3

Note: ADHD = attention-deficit/hyperactivity disorder.

to 17 years ( $M = 12.48$ ,  $SD = 2.49$ ) with a primary diagnosis of OCD, which was on average within the severe range (Children's Yale–Brown Obsessive–Compulsive Scale, CY-BOCS; Scahill et al., 1997:  $M = 27.43$ ,  $SD = 3.54$ ). Most participants had comorbid conditions, with 28.6% having a diagnosis of OCD only, 24.7% being diagnosed with OCD and one other secondary diagnosis, and 46.7% being diagnosed with OCD and two or more comorbid diagnoses. Table 1 illustrates the frequencies and percentages of secondary and tertiary comorbid diagnoses. All participants went on to receive individual treatment through a university research treatment program.

This study formed part of a larger treatment study, with inclusion criteria that the child had a primary diagnosis of OCD, one parent willing to participate, and if taking medication, the child needed to be on a stable dose of medication for at least 12 weeks prior to study entry. Children were excluded if they had psychosis, intellectual disability, autism spectrum disorder (levels 2 or 3), active suicidal ideation, or concurrent participation in psychotherapy. In the larger clinical trial 119 children and adolescents that were screened for eligibility were excluded from the trial because they did not meet criteria ( $n = 71$ ), they declined participation ( $n = 46$ ) or for other reasons ( $n = 2$ ). Families excluded from the study were provided with referral options for appropriate treatment and care services.

#### 4.2. Measures

**Anxiety Disorders Interview Schedule for DSM-IV, Parent Version (ADIS-IV-P; Silverman & Albano, 1996).** The ADIS-IV-P is a semi-structured clinical interview for parents of children aged 7 to 17 years and is specifically designed to assess for DSM diagnoses of childhood anxiety, mood, and behavioural disorders. Parents were administered the interview over the telephone to determine whether the child or adolescent met criteria for an OCD diagnosis, and to confirm secondary and tertiary comorbid diagnoses, including other anxiety disorders, mood disorders (Major Depressive Disorder and Dysthymia), externalising disorders (ADHD and Oppositional Defiant Disorder), and to screen for pervasive developmental disorders (PDD). Participants received a Clinician Severity Rating (CSR) ranging from 0–8 for each diagnosis they obtained, with a score of 4 indicating a clinically significant diagnosis. The ADIS-IV-P has demonstrated good interrater and test-retest reliability in past studies (Silverman & Albano, 1996), and has been shown to be as reliable when administered over the phone as face to face (Rapee et al., 1997). Inter-rater reliability was conducted across 20% of the digital audiotaped diagnostic interviews by an independent rater, with results indicating excellent reliability (primary diagnosis = 1.0; secondary diagnosis = 0.84; tertiary diagnosis = 0.83).

**Children's Yale–Brown Obsessive–Compulsive Scale (CY-BOCS; Scahill et al., 1997).** The CY-BOCS is a clinician-rated, semi-structured inventory of OCD symptoms and severity over the prior week and is

considered the gold standard of OCD assessment in youth aged 4–18 years (Storch et al., 2004). It uses a five-point Likert scale and captures frequency, interference, distress, resistance and control for obsessions and compulsions, which combine to create a total score of OCD severity. The CY-BOCS has demonstrated high internal consistency, with total score alphas ranging from .87 to .90 (Scahill et al., 1997; Storch et al., 2004). In this study, it was administered to the child or adolescent with a parent present.

**Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997).** The ERC is a parent-report measure of children's ER ability. The ERC uses a four-point Likert scale (1 - *Never*; 2 - *Sometimes*; 3 - *Often*; 4 - *Almost Always*) to assess the frequency with which the child demonstrates several ER processes according to the parent. The Lability/Negativity subscale assesses inflexibility, lability, and dysregulated negative affect (e.g., “Exhibits wide mood swings”). The Emotion Regulation subscale measures appropriate emotional expression, empathy, and emotional self-awareness (e.g., “Can modulate excitement in emotionally arousing situations”). Both subscales have demonstrated strong reliability in previous studies (Lability/Negativity = 0.96, Regulation = 0.83; Shields & Cicchetti, 1997). Validity has been established through positive correlations with observers' ratings of children's regulatory abilities and the proportion of expressed positive and negative affect (Shields & Cicchetti, 1997). In the current study, Cronbach's  $\alpha$  of .72 and .85 were found for the Emotion Regulation and Lability/Negativity subscales respectively.

**Child Behaviour Checklist for Ages 6–18 (CBCL/6–18; Achenbach & Rescorla, 2001).** The CBCL is a parent-report measure of children's behavioural problems and social competencies, during the past six months. Items are rated using a three-point Likert scale (0 - *Not True*, 1 - *Somewhat or Sometimes True*, or 2 - *Very True or Often True*). Only the Externalising symptoms scale was used in this study. The Externalising domain measures behavioural problems and contains two subscales: Rule Breaking Behaviour and Aggressive Behaviour. Validity and reliability are excellent for the Externalising scale (.97) (see Achenbach & Rescorla, 2001). In the current study, Cronbach's  $\alpha = 0.83$  for the Externalising symptoms scale.

**Family Accommodation Scale, Self-Report (FAS-SR; Pinto et al., 2013).** The FAS-PR is a 19-item parent self-report measure of family accommodation of a child's OCD-related behaviours over the previous month. Items are anchored with respect to either frequency or magnitude using a five-point Likert scale ranging from 0 (*Never*) to 4 (*Daily*). Scores are summed to produce an overall accommodation score, where higher scores indicate greater parental accommodation. Internal consistency for the FAS has been found to be high, with demonstrated Cronbach's  $\alpha = 0.90$  (Pinto et al., 2013). In the current study, Cronbach's  $\alpha$  was .92.

#### 4.3. Procedure

Ethical approval for recruitment and procedures involved in this study were obtained from the institution's human research ethics committee. Participants were recruited either through advertising or referrals by healthcare providers. Participants and their parents were required to provide written assent and informed consent. Following an expression of interest in the program, parents were contacted for a brief telephone screen to determine potential eligibility for the program. If deemed likely eligible, the diagnostic telephone interview (ADIS-IV-P) was conducted to confirm the child's suitability. Following administration of the ADIS-IV-P, the child and parent attended the university clinic to complete the CY-BOCS. All diagnostic assessments were administered by fully licensed psychologists or psychologists (with provisional registration), and clinical supervision was provided by a senior clinical psychologist with extensive experience in the assessment and treatment of OCD (LJF). All diagnostic assessments were audio recorded and diagnoses and severity ratings were subject to group clinical consensus by clinicians experienced in the assessment and treatment of

OCD. Parents were provided with a link to the online assessment batteries and completed their assessments at home. Following assessment, all children were offered intensive Cognitive-Behavioural Therapy with Exposure and Response Prevention (CBT-ERP) as part of a larger research trial.

**5. Results**

All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 24 and the PROCESS Macro version 3.0 (Hayes, 2018). Missing data in the sample ranged from 5.26% (FAS-SR and CBCL,  $n = 4$ ) to 6.58% (ERC,  $n = 5$ ). Person-mean imputation was applied to individual scale items for respective measures when fewer than 10% of the items on a scale had incomplete data. This was done to reduce the missing data for subscale and total scores where relevant (Shrive, Stuart, Quan, & Ghali, 2006; Siddiqui, 2015). G\*Power (Faul, Erdfelder, Buchner, & Lang, 2009) was used to conduct post hoc power analyses which indicated that the power to detect obtained effects at the .05 level was .85 for the regression models.

**H1. Parent-report of Child ER ability and Associations with OCD Severity, Externalising Symptoms and Family Accommodation**

Pearson's correlations were performed to evaluate the relationship between children's emotional Lability/Negativity, their adaptive ER, OCD severity, externalising symptoms, and FA (see Table 2). Children's Negativity/Lability was significantly and positively correlated with child externalising symptoms ( $r = 0.67, p < .01$ ) and FA ( $r = 0.27, p < .05$ ), but not child OCD severity ( $r = 0.07, p > .05$ ). However, children's (adaptive) ER was significantly and negatively correlated with child externalising symptoms only ( $r = -.25, p < .05$ ), thus providing partial support for Hypothesis 1.

**H2. Children's Negativity/Lability as a Predictor of Externalising Symptoms**

A hierarchical multiple regression (HMR) was conducted, to assess the extent to which Children's Negativity/Lability predicted child externalising symptoms. OCD severity was entered at Step 1 and accounted for 2.6% of the variance in explaining externalising symptoms ( $F(1, 74) = 1.99, p = .16$ ). At Step 2, Negativity/Lability explained an additional 43.6% of variance ( $F_{chg}(1, 73) = 0.59.20, p < .001$ ), OCD severity remained non-significant ( $p = .19$ ), accounting for only 2.3% of the unique variance. In total both predictors accounted for a significant 46.2% of the variance in externalising symptoms ( $F(2, 73) = 31.38, p < .001$ ), thus Hypothesis 2 was supported (see Table 3).

**H3. Children's Negativity/Lability as a Predictor of Family Accommodation**

Another HMR was conducted, to assess the extent to which Children's Negativity/Lability predicted FA. OCD severity and externalising symptoms were entered at Step 1 and accounted for 31.4% of the variance in explaining FA ( $F(2, 73) = 16.72, p < .001$ ). At Step 2, Negativity/Lability explained an additional 0.4% of variance ( $F_{chg}(1, 72) = 0.436, p = .51$ ), externalising symptoms was no longer

**Table 2**  
Means, standard deviations, and bivariate correlations among measures.

	M	SD					
Lability/Negativity	29.67	7.10	1	-.55**	.07	.67**	.27*
Emotion Regulation	22.92	3.51		1	-.12	-.25*	-.11
OCD Severity	27.62	3.77			1	.16	.49**
Child Externalising Symptoms	52.81	10.77				1	.35**
Family Accommodation	26.36	18.30					1

\* $p \leq 0.05$ , \*\* $p \leq 0.01$ .

**Table 3**  
Hierarchical multiple regression analysis testing the hypothesised predictors of externalising symptoms ( $N = 75$ ).

Variable	B	SE B	$\beta$	p
Step 1, $R^2 = .03, F(1, 74) = 1.99, p = .16$				
OCD Severity	.460	.326	.162	.16
Step 2, $\Delta R^2 = .44, F_{chg}(1, 73) = 59.20, p < .001$				
OCD Severity	.321	.244	.113	.19
Lability/Negativity	1.01	.131	.662	< .001**

Note: Final  $R^2 = 0.46, F(2, 73) = 31.38, p < .001$ .

\* $p \leq 0.05$ , \*\* $p \leq 0.01$ .

**Table 4**  
Hierarchical multiple regression analysis testing the hypothesised predictors of family accommodation ( $N = 75$ ).

Variable	B	SE B	$\beta$	p
Step 1, $R^2 = .31, F(2, 73) = 16.72, p < .001$				
OCD Severity	2.10	.468	.440	< .001**
Externalising Symptoms	.475	.165	.283	.01**
Step 2, $\Delta R^2 = .01, F_{chg}(1, 67) = .725, p = .397$				
OCD Severity	2.11	.471	.443	< .001**
Externalising Symptoms	.377	.223	.224	.10
Lability/Negativity	.222	.336	.087	.51

Note: Final  $R^2 = 0.32, F(3, 72) = 11.20, p < .001$ .

\* $p \leq 0.05$ , \*\* $p \leq 0.01$ .

significant ( $p = .13$ ), accounting for only 3.8% of the unique variance and OCD severity remained a significant unique predictor, accounting for 21.9% of unique variance. In total all three predictors accounted for a significant 31.8% of the variance in FA ( $F(3, 72) = 11.20, p < .001$ ), thus Hypothesis 3 was not supported (see Table 4).

**H4. Children's Negativity/Lability as a moderator in the relationship between OCD Severity and Family Accommodation**

PROCESS Macro version 3.0 (Hayes, 2018) was used to test the hypothesis that children's Negativity/Lability would moderate the relationship between OCD severity and FA. The overall, model incorporating all three variables was significant  $F(3, 72) = 11.81, p < .001, R^2 = 0.33$ , indicating that 33% of the variance in FA was explained by OCD severity, children's Negativity/Lability and the interaction between both predictors. Additionally, the interaction term (OCD severity and children's Negativity/Lability) was significantly associated with FA,  $B = .19, t = 2.04, p = .045$  and accounted for 3.9% of the variance in FA, indicating that children's Negativity/Lability moderated the relationship between OCD severity and FA. Therefore, the study's fourth hypothesis was supported.

**6. Discussion**

This study aimed to explore parents' report of children's ER in childhood OCD, and its associations with OCD symptom severity, child externalising symptoms, and FA. As predicted in the first hypothesis, children's emotional Lability/Negativity was significantly and positively correlated with child externalising symptoms and FA, whereas children's (adaptive) ER was negatively correlated with externalising symptoms only. There was also support for the second hypothesis whereby children's emotional Lability/Negativity significantly predicted child externalising symptoms, after controlling for OCD severity. However, children's emotional Lability/Negativity was not found to be a significant unique predictor of FA, after controlling for OCD severity and externalising symptoms, therefore the study's third hypothesis was not supported. Finally, as predicted in the fourth hypothesis, children's emotional Lability/Negativity moderated the relationship between OCD severity and FA. These results will now be discussed in turn.

The finding that children's emotional Lability/Negativity was a

significant predictor of externalising symptoms is consistent with the argument posited by other researchers that the coercive and disruptive behaviour often observed among some youth with OCD may represent the child's inability to regulate their internal distress (Storch et al., 2012) and greater deficits in ER may be associated with increased presentation of these behaviours (McKenzie et al., 2019). These findings are also interesting when considered for their potential association with several previous studies (e.g., Garcia et al., 2010; Ginsburg, Kingery, Drake, & Grados, 2008; Schubert et al., 2018; Torp et al., 2015) which have highlighted externalising symptoms as a significant predictor of poorer treatment response. Interestingly, Schubert et al. (2018) strongly asserted that attention to externalising behaviours is important in the treatment of paediatric OCD, based on their findings that reductions in FA lead to improvements in child and family functioning only when these disruptive behaviours are also reduced. It may therefore be considered that youth with greater externalising behaviours may be good candidates for a higher dose of evidence-based treatment or perhaps may benefit from an augmented treatment that also focuses on emotion dysregulation in order to reduce externalising symptoms and improve OCD treatment outcomes.

Furthermore, when considering the difficulty parents experience with children who have externalising symptoms in combination with OCD, clinicians might provide greater validation of the parental experience and challenges facing parents of these severe and clinically complex youth. A family-based OCD treatment approach may assist parents' understanding of their child's behaviour and OCD symptoms, management of child behavioural and emotional problems, as well as provide management of parental distress, in addition to treatment of OCD symptoms.

The findings of the current study corroborated those in previous studies which highlight OCD severity and child externalising behaviour as robust predictors of FA (e.g., Stewart et al., 2008; Storch et al., 2008; Storch et al., 2010b), and thus when accounting for these predictors, children's Negativity/Lability was not found to be a significant predictor of FA. However, children's Negativity/Lability significantly moderated the cross-sectional relationship between OCD severity and FA, suggesting that the degree to which children are able to regulate their emotional distress may influence the association between the severity of their OCD and the degree to which parents participate in their child's rituals or make modifications to daily routines in order to reduce their child's distress. Such findings further highlight the importance of addressing ER deficits with acuity in the context of existing evidence-based treatments for OCD. CBT for paediatric OCD certainly addresses the regulation of emotions, which may be one reason why CBT-ERP is effective in treating this disorder. However, perhaps there is room to deepen or extend existing approaches by specifically targeting ER skill-building in youth who may be identified as having a greater deficit at baseline, greater OCD severity or particularly high levels of FA. The emergence of Emotion Regulation Therapy (ERT; see Mennin & Fresco, 2014) has combined principles from traditional and contemporary CBT (including skills training and exposure) along with practical findings from affective science that target specific skills in treatment, focusing on identified disruptions in the individual's cognitive, emotional and motivational systems. This approach to intervention has maintained that it is *not* separate from CBT but rather is considered a mechanism-targeted form of CBT aimed at improving efficacy (Mennin & Fresco, 2014). Thus, CBT techniques of ERP can be used in conjunction with an ERT framework. This approach to date has mostly targeted individuals with Generalised Anxiety Disorder, especially cases where there is co-occurring major depressive disorder and RCTs have demonstrated efficacy for this approach (Mennin, Fresco, O'Toole, & Heimberg, 2018). Similar augmentations of evidence-based treatment have been noted for other anxiety-based psychopathologies such as PTSD (e.g., Cloitre et al., 2010; Cloitre, Koenen, Cohen, & Han, 2002) as well as specific phobia (Kamphuis & Telch, 2000) with favourable results.

Alternatively, Suveg et al. (2018) argued that the skills children

learn during traditional CBT to target their anxiety may generalise to more global abilities to regulate other emotions as well, and therefore may not be highly differentiated from the effects of an *emotion-focused* version of the treatment. Nevertheless, Suveg et al. (2018) assert that given the central role of ER in healthy development, therapeutic interventions that emphasise the development of such competencies may have benefits that extend beyond diagnostic and severity outcomes and instead have more visible impact on other areas of the child's functioning (e.g., family and social functioning).

### 6.1. Strengths, limitations and direction for future research

The current study has built on the growing body of research linking ER to OCD symptoms and may help to expand upon current cognitive-behavioural explanations of OCD. Its strengths include the use of a relatively large and well-defined clinical sample compared to previous literature on ER and OCD, utilising a broad age range of participants (7 to 17 years old), and the use of gold standard diagnostic measures of OCD. However, the findings of this study should be considered within the context of some limitations. The study measures parents' self-report of family accommodation practices which is subject to fair criticism that the accuracy of self-reporting is questionable at times, since it requires a fair degree of insight, which varies across individuals (Robinson & Clore, 2002). The addition of clinician-rated measures provides a useful adjunct to self-report measures. Additionally, parent-report measures of child ER provide information about the child's regulatory capacity over a period of time from the perspective of a caregiver, who has had the advantage of observing trends in the child's response to a plethora of situations. However, the drawback is that such observations do not provide information about the internal process of the child that might drive behavioural responses (e.g., the child's use of specific strategies within or across situations), instead this focus on observable behaviour may best be characterised as the output of the ER process. Therefore, future research may consider obtaining both parent and child evaluations of ER and additionally may employ more objective measures of ER such as psychophysiological measures.

Additionally, the rate of comorbidity within the sample was relatively high (which is representative of the presentation of the disorder across most clinical contexts). However, as it concerns efforts to make determinations about deficits in ER specific to OCD it should be considered that these deficits may be associated, to some degree, with these comorbidities (i.e., not just OCD) or it may be that the collective contributions of OCD and other comorbid diagnoses may have exacerbated the individual's difficulties with ER. The use of regression analyses, as was used in this study, is limited in its capacity to account for some of the transdiagnostic symptom overlap across disorders. Thus, Aldao (2013) proposed that structural equation modelling (see Arbuckle, 2007; Mueller & Hancock, 2008) may be useful in modelling covariance structures among symptoms of comorbid disorders that have such symptom overlaps with OCD. However, these statistical procedures typically require a much larger sample size than was used in this study and the difficulty ascertaining clinical samples large enough to undertake this kind of statistical analysis has been a challenge of the field of clinical research to date.

### 6.2. Clinical implications

The current study has outlined several key considerations for clinical practice emanating from its findings, as well as directions for future research in the area. Children's difficulties with regulating their emotions may, in part, account for higher levels of externalising symptoms which is not only distressing for family members but is also associated with poorer response to treatment. Furthermore, such difficulties with ER may influence the association between the severity of the child's OCD and the degree of FA which takes place. Therefore, it may be important for clinicians to address such deficits in ER as a part of OCD

treatment.

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## References

- Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA school-age forms and profiles*. Burlington, VT: University of Vermont Research Center for Children (Youth and Families).
- Aldao, A. (2013). The future of emotion regulation research: Capturing context. *Perspectives on Psychological Science*, 8, 155–172. <https://doi.org/10.1177/1745691612459518><https://search.crossref.org/?q=The+future+of+emotion+regulation+research%3A+Capturing+context>.
- Arbuckle, J. L. (2007). *Amos 16.0 [computer software]*. Chicago, IL: Smallwaters.
- Bender, P. K., Pons, F., Harris, P. L., Esbjörn, B. H., & Reinholdt-Dunne, M. L. (2015). Emotion understanding in clinically anxious children: A preliminary investigation. *Frontiers in Psychology*, 6, 1916. <https://doi.org/10.3389/fpsyg.2015.01916>.
- Berman, N. C., Shaw, A. M., Curley, E. E., & Wilhelm, S. (2018). Emotion regulation and obsessive-compulsive phenomena in youth. *Journal of Obsessive-Compulsive and Related Disorders*, 19, 44–49. <https://doi.org/10.1016/j.jocrd.2018.07.005>.
- Campos, J. J., Mumme, D. L., Kermoian, R., & Campos, R. G. (1994). A functionalist perspective on the nature of emotion. *Monographs of the Society for Research in Child Development*, 59, 284–303. <https://doi.org/10.2307/1166150>.
- Caporino, N. E., Morgan, J., Beckstead, J., Phares, V., Murphy, T. K., & Storch, E. A. (2012). A structural equation analysis of family accommodation in pediatric obsessive-compulsive disorder. *Journal of Abnormal Child Psychology*, 40(1), 133–143.
- Cloitre, M., Koenen, K. C., Cohen, L. R., & Han, H. (2002). Skills training in affective and interpersonal regulation followed by exposure: A phase-based treatment for PTSD related to childhood abuse. *Journal of Consulting and Clinical Psychology*, 70, 1067. <https://doi.org/10.1037/0022-006X.70.5.1067>.
- Cloitre, M., Stovall-McClough, K. C., Nooner, K., Zorbas, P., Cherry, S., Jackson, C. L., & Petkova, E. (2010). Treatment for PTSD related to childhood abuse: A randomized controlled trial. *American Journal of Psychiatry*, 167, 915–924. <https://doi.org/10.1176/appi.ajp.2010.09081247>.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G\* Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41, 1149–1160. <https://doi.org/10.3758/BRM.41.4.1149>.
- Flessner, C. A., Freeman, J. B., Sapyta, J., Garcia, A., Franklin, M. E., March, J. S., et al. (2011). Predictors of parental accommodation in pediatric obsessive-compulsive disorder: Findings from the pediatric obsessive-compulsive disorder treatment study (POTS) trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, 50, 716–725. <https://doi.org/10.1016/j.jaac.2011.03.019>.
- García, A. M., Sapyta, J. J., Moore, P. S., Freeman, J. B., Franklin, M. E., March, J. S., et al. (2010). Predictors and moderators of treatment outcome in the pediatric obsessive compulsive treatment study (POTS I). *Journal of the American Academy of Child & Adolescent Psychiatry*, 49, 1024–1033. <https://doi.org/10.1016/j.jaac.2010.06.013>.
- Ginsburg, G. S., Kingery, J. N., Drake, K. L., & Grados, M. A. (2008). Predictors of treatment response in pediatric obsessive-compulsive disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 47, 868–878. <https://doi.org/10.1097/CHI.0b013e3181799ebd>.
- Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*, 74(1), 224–237.
- Gross, J. J. (2013). Emotion regulation: Taking stock and moving forward. *Emotion*, 13, 359. <https://doi.org/10.1037/a0032135>.
- Gross, J. J., Sheppes, G., & Urry, H. L. (2011). Emotion generation and emotion regulation: A distinction we should make (carefully). *Cognition & Emotion*, 25, 765–781. <https://doi.org/10.1080/02699931.2011.555753>.
- Hayes, A. F. (2018). *The PROCESS macro for SPSS and SAS*. Computer software. Retrieved from <http://www.processmacro.org>.
- Kamphuis, J. H., & Telch, M. J. (2000). Effects of distraction and guided threat reappraisal on fear reduction during exposure-based treatments for specific fears. *Behaviour Research and Therapy*, 38, 1163–1181. [https://doi.org/10.1016/S0005-7967\(99\)00147-3](https://doi.org/10.1016/S0005-7967(99)00147-3).
- Lebowitz, E. R., Omer, H., & Leckman, J. F. (2011). Coercive and disruptive behaviors in pediatric obsessive-compulsive disorder. *Depression and Anxiety*, 28, 899–905. <https://doi.org/10.1002/da.20858>.
- Lebowitz, E. R., Scharfstein, L. A., & Jones, J. (2014). Comparing family accommodation in pediatric obsessive-compulsive disorder, anxiety disorders, and nonanxious children. *Depression and Anxiety*, 31, 1018–1025. <https://doi.org/10.1002/da.22251>.
- Lebowitz, E. R., Storch, E. A., MacLeod, J., & Leckman, J. F. (2015). Clinical and family correlates of coercive-disruptive behavior in children and adolescents with obsessive-compulsive disorder. *Journal of Child and Family Studies*, 24, 2589–2597. <https://doi.org/10.1007/s10826-014-0061-y>.
- Lebowitz, E. R., Vitulano, L. A., & Omer, H. (2011). Coercive and disruptive behaviors in pediatric obsessive compulsive disorder: A qualitative analysis. *Psychiatry: Interpersonal and Biological Processes*, 74, 362–371. <https://doi.org/10.1521/psyc.2011.74.4.362>.
- McKenzie, M. L., Donovan, C. L., Mathieu, S. L., Hyland, W. J., & Farrell, L. J. (2019). Variability in emotion regulation in paediatric obsessive-compulsive disorder: Associations with symptom presentation and response to treatment. *Journal of Obsessive-Compulsive and Related Disorders*, 24, 100502. <https://doi.org/10.1016/j.jocrd.2019.100502>.
- Mennin, D. S., & Fresco, D. M. (2014). Emotion regulation therapy. In J. J. Gross (Ed.). *Handbook of emotion regulation* (pp. 469–490). (2nd ed.). New York: Guilford Press.
- Mennin, D. S., Fresco, D. M., O’Toole, M. S., & Heimberg, R. G. (2018). A randomized controlled trial of emotion regulation therapy for generalized anxiety disorder with and without co-occurring depression. *Journal of Consulting and Clinical Psychology*, 86, 268. <https://doi.org/10.1037/ccp0000289>.
- Mueller, R. O., & Hancock, G. R. (2008). Best practices in structural equation modeling. *Best practices in quantitative methods*, 488508. <https://doi.org/10.4135/9781412995627.d38>.
- Piacentini, J., Bergman, R. L., Keller, M., & McCracken, J. (2003). Functional impairment in children and adolescents with obsessive-compulsive disorder. *Journal of Child and Adolescent Psychopharmacology*, 13, 61–69. <https://doi.org/10.1089/104454603322126359>.
- Pinto, A., Van Noppen, B., & Calvocoressi, L. (2013). Development and preliminary psychometric evaluation of a self-rated version of the family accommodation scale for obsessive-compulsive disorder. *Journal of obsessive-compulsive and related disorders*, 2, 457–465. <https://doi.org/10.1016/j.jocrd.2012.06.001>.
- Ramos-Cerqueira, A. T., Rodrigues Torres, A., Torresan, R. C., Maranhao Negreiros, A. P., & Nakano Vitorino, C. (2008). Emotional burden in caregivers of patients with obsessive-compulsive disorder. *Depression and Anxiety*, 25, 1020–1027. <https://doi.org/10.1002/da.20431>.
- Rapee, R. (1997). Potential role of childrearing anxiety and depression. *Clinical Psychology Review*, 17, 47–67.
- Robinson, M. D., & Clore, G. L. (2002). Belief and feeling: Evidence for an accessibility model of emotional self-report. *Psychological Bulletin*, 128, 934. <https://doi.org/10.1037/0033-2909.128.6.934>.
- Scahill, L., Riddle, M. A., McSwiggan-Hardin, M., Ort, S. I., King, R. A., Goodman, W. K., et al. (1997). Children’s Yale-Brown obsessive compulsive scale: Reliability and validity. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36, 844–852.
- Schubert, D. A., Selles, R. R., & Stewart, S. E. (2018). Coercive and disruptive behaviors mediate group cognitive-behavioral therapy response in pediatric obsessive-compulsive disorder. *Comprehensive Psychiatry*, 86, 74–81. <https://doi.org/10.1016/j.comppsy.2018.07.012>.
- Shields, A., & Cicchetti, D. (1997). Emotion regulation among school age children: The development and validation of a new criterion q-sort scale. *Developmental Psychology*, 33(6), 906–916.
- Shrive, F. M., Stuart, H., Quan, H., & Ghali, W. A. (2006). Dealing with missing data in a multi-question depression scale: A comparison of imputation methods. *BMC Medical Research Methodology*, 6, 57. <https://doi.org/10.1186/1471-2288-6-57>.
- Siddiqui, O. I. (2015). Methods for computing missing item response in psychometric scale construction. *American Journal of Biostatistics*, 5, 1. <https://doi.org/10.3844/amjbsp.2015.1.6>.
- Silverman, W. K., & Albano, A. M. (1996). *The anxiety disorders interview Schedule for DSM-IV-child and parent versions*. London: Oxford University Press.
- Stewart, S. E., Beresin, C., Haddad, S., Egan Stack, D., Fama, J., & Jenike, M. (2008). Predictors of family accommodation in obsessive-compulsive disorder. *Annals of Clinical Psychiatry*, 20, 65–70. <https://doi.org/10.3109/10401230802017043>.
- Stewart, S. E., Hu, Y. P., Leung, A., Chan, E., Hezel, D. M., Lin, S. Y., et al. (2017). A multisite study of family functioning impairment in pediatric obsessive-compulsive disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 56, 241–249. <https://doi.org/10.1016/j.jaac.2016.12.012>.
- Storch, E. A., Geffken, G. R., Merlo, L. J., Jacob, M. L., Murphy, T. K., Goodman, W. K., et al. (2007). Family accommodation in paediatric obsessive-compulsive disorder. *Journal of Clinical Child and Adolescent Psychology*, 36, 207–216. <https://doi.org/10.1080/15374410701277929>.
- Storch, E. A., Jones, A. M., Lack, C. W., Ale, C. M., Sulkowski, M. L., Lewin, A. B., & Murphy, T. K. (2012). Rage attacks in pediatric obsessive-compulsive disorder: Phenomenology and clinical correlates. *Journal of the American Academy of Child & Adolescent Psychiatry*, 51, 582–592. <https://doi.org/10.1016/j.jaac.2012.02.016>.
- Storch, E. A., Larson, M. J., Muroff, J., Caporino, N., Geller, D., Reid, J. M., et al. (2010). Predictors of functional impairment in pediatric obsessive-compulsive disorder. *Journal of Anxiety Disorders*, 24, 275–283. <https://doi.org/10.1016/j.janxdis.2009.12.004>.
- Storch, E. A., Lewin, A. B., Geffken, G. R., Morgan, J. R., & Murphy, T. K. (2010). The role of comorbid disruptive behavior in the clinical expression of pediatric obsessive-compulsive disorder. *Behaviour Research and Therapy*, 48, 1204–1210. <https://doi.org/10.1016/j.brat.2010.09.004>.
- Storch, E. A., Merlo, L. J., Larson, M. J., Marien, W. E., Geffken, G. R., Jacob, M., et al. (2008). Clinical features associated with treatment-resistant paediatric obsessive-compulsive disorder. *Comprehensive Psychiatry*, 49, 35–42. <https://doi.org/10.1016/j.comppsy.2007.06.009>.
- Storch, E. A., Murphy, T. K., Geffken, G. R., Soto, O., Sajid, M., Allen, P., et al. (2004).

- Psychometric evaluation of the children's Yale-Brown obsessive-compulsive scale. *Psychiatry Research*, 129, 91–98. <https://doi.org/10.1016/j.psychres.2004.06.009>.
- Suveg, C., Jones, A., Davis, M., Jacob, M. L., Morelen, D., Thomassin, K., et al. (2018). Emotion-focused cognitive-behavioral therapy for youth with anxiety disorders: A randomized trial. *Journal of Abnormal Child Psychology*, 46, 569–580. <https://doi.org/10.1007/s10802-017-0319-0>.
- Thompson, R. A., & Calkins, S. D. (1996). The double-edged sword: Emotional regulation for children at risk. *Development and Psychopathology*, 8(1), 163–182.
- Torp, N. C., Dahl, K., Skarphedinsson, G., Compton, S., Thomsen, P. H., Weidle, B., & Ivarsson, T. (2015). Predictors associated with improved cognitive-behavioral therapy outcome in pediatric obsessive-compulsive disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 54, 200–207. <https://doi.org/10.1016/j.jaac.2014.12.007>.
- Wu, M. S., McGuire, J. F., Martino, C., Phares, V., Selles, R. R., & Storch, E. A. (2016). A meta-analysis of family accommodation and OCD symptom severity. *Clinical Psychology Review*, 45, 34–44. <https://doi.org/10.1016/j.cpr.2016.03.003>.