Adverse Childhood Experiences and Obsessive-Compulsive Personality Traits: Mediating Effects of Attachment and Metacognition

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Abstract

Adverse childhood experiences are regularly implicated as a risk factor in the development of Obsessive-Compulsive Personality Traits (OCPT). Nevertheless, the majority of individuals exposed to adverse childhood experiences do not go on to develop adult OCPT. This study aimed to investigate whether attachment or metacognition best mediate the association between adverse childhood experiences and OCPT. Undergraduate psychology students ($N = 194$) participated in a 30-minute anonymous online survey, and completed a retrospective adverse childhood experiences measure, along with measures of current attachment, metacognition, OCPT, and depression. Bootstrapped mediation revealed that attachment-anxiety positively mediated between adverse childhood experiences and OCPT. Mediation was not found for either attachment-avoidance or metacognition. These findings provide preliminary evidence that attachment-anxiety may be important for understanding the effects of adverse childhood experiences on OCPT development. Additionally, the findings suggest that future research should investigate the predictive role of specific types of adverse childhood experiences. The potential clinical utility for both assessment and treatment effects based on the co-occurrence of adverse childhood experiences and heightened attachment-anxiety on OCPT are discussed.

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Introduction

Adverse childhood experiences (ACEs), such as childhood abuse, neglect, and traumatic household environments, are associated with numerous poor physical and mental health, and social and behavioural outcomes in a dose-dependent relationship (Petruccelli et al., 2019). One such outcome is OCPT, which encompasses Obsessive-Compulsive Personality Disorder (OCPD)-related characteristics including preoccupation with details, devotion to productivity, overconscientious, perfectionism, and interpersonal and affective difficulty (APA, 2022). While OCPD represents the clinical diagnosis of these traits, OCPT are present in sub-clinical populations and are associated with reduced quality of life and moderate psychosocial, interpersonal, and occupational impairment (Soeteman et al., 2008). Despite this, research regarding OCPT etiology is generally both limited and indeterminate (Diedrich & Voderholzer, 2015).

There is, however, substantial evidence for the link between ACEs and adult obsessive-compulsive personality pathology. Several clinical and self-report sub-clinical studies demonstrate that ACEs are positively associated with both OCPT and OCPD (Afifi et al., 2011; Hengartner et al., 2013; Lobbestael et al., 2010). Nevertheless, there is a general consensus that disordered personality traits are a culmination of recurrent interactions between individual vulnerabilities and environmental influences (Diedrich & Voderholzer, 2015; Graybar & Boutilier, 2002). On this view, a sole causal factor, such as ACEs, is insufficient to fully account for the development of OCPT (Cicchetti, 2006, 2016; Cicchetti et al., 1988; Diedrich & Voderholzer, 2015). However, the factors that mediate this established relationship between ACEs and OCPT remain poorly elucidated. Consequently, this led the present study to examine

what mediating variables may help explain the development of OCPT following ACE-exposure. Possible candidates include attachment (Zakiei et al., 2017) and metacognition (Rees & Anderson, 2013) since both are associated with ACEs and OCPT independently.

Attachment is an individual's characteristic manner of relating to and receiving intimacy from attachment figures (Levy et al., 2011). Central to attachment is the quality of caregiving provided by a primary caregiver, with this forming the psychological foundation from which a child develops internal working models of self and others (Levy et al., 2011). ACEs, of which poor quality caregiving is typically characteristic, disrupt the formation of secure internal working models of self and others. Instead, internal working models of the self as worthless and of others being both rejecting and unreliable may develop (Yumbul et al., 2010). Such internal working models underly insecure attachment, which, broadly speaking, typically develops along the continua of attachment-anxiety and attachment-avoidance (Lin et al., 2020). Unsurprisingly, there is considerable evidence that ACEs contribute to insecure attachment: child physical, sexual, and emotional abuse, and neglect are all positively associated with adult insecure attachment within student and community samples (Erozkan, 2016; Lin et al., 2020; Yumbul et al., 2010).

Internal working models associated with insecure attachment are also associated with obsessive-compulsive personality pathology. Patients with OCPD report significantly greater fearful attachment than non-OCPD controls (Wiltgen et al., 2015). Additionally, self-reported attachment insecurity positively associates with OCPT amongst undergraduates (Zakiei et al., 2017). Internal working models of the self and others underlying OCPT relate to the belief of needing absolute internal and external control, which may perpetuate attachment insecurity (Lyddon & Sherry, 2001). Thus, stable, inflexible perfectionistic behaviours may result and develop into adult OCPT. Given that evidence indicates that ACEs precede insecure

attachment, and that insecure attachment positively associates with OCPT, insecure attachment might plausibly mediate between ACEs and OCPT.

An alternative potential mechanism underlying the relationship between ACEs and OCPT is metacognition. Defined as one's beliefs about thinking, as well as strategies used to control, monitor, and appraise thinking, metacognition develops throughout childhood and adolescence (Rees & Anderson, 2013). Myers and Wells (2015) propose that ACE-exposed individuals tend to develop dysfunctional metacognitive beliefs about the need to use worry and threat monitoring to avoid emotional distress. This subsequently triggers a cognitive-attentional syndrome entailing rumination, attentional focusing on threat, and maladaptive coping strategies. This cognitive-attentional syndrome then maintains a metacognitive inflexibility that inhibits implementing alternate thought styles. Ultimately, this emotion regulation dysfunction descends into psychopathological states. Several research findings demonstrate a positive relationship between ACEs and dysfunctional metacognition. For example, Scarpa et al. (2009) found child sexual abuse severity positively correlates with maladaptive metacognitive control strategies. Similarly, child emotional abuse positively correlates with metacognitive rumination (Raes & Hermans, 2008) and metacognitive beliefs (Myers & Wells, 2015).

Empirical evidence also exists for a link between metacognition and obsessive-compulsive pathology (Rees & Anderson, 2013). Several cross-sectional self-report studies demonstrate that metacognition is positively associated with obsessive-compulsive symptoms in both student and clinical samples (Myers et al., 2009; Solem et al., 2010). One recent study suggests the link between family abuse and obsessive-compulsive symptoms is fully mediated by post-traumatic and obsessive cognitions (Despotes et al., 2021). However, Despotes et al. (2021) did not examine metacognition specifically, but rather cognition primarily and elements of metacognition. Nevertheless, from a neurocognitive perspective, undergraduates with

pronounced OCPT displayed executive dysfunction in attentional shifting—a phenomenon referred to as obsessional slowness (García-Villamisar & Dattilo, 2015). Such slowness is proposed to result from preservation and rumination (i.e., elements of cognitive attentional syndrome; García-Villamisar & Dattilo, 2015; Veale, 1993). Given that evidence demonstrates that ACEs contribute to dysfunctional metacognition, and that dysfunctional metacognition contributes to obsessive-compulsive pathology, metacognition may also possibly mediate between ACEs and OCPT.

To our knowledge, no study has yet integrated both attachment and metacognition to examine whether these variables can contribute to accounting for why ACEs sometimes lead to OCPT and not at other times. Some empirical evidence exists for a relationship between attachment and metacognition (Myers & Wells, 2015; Yavuz et al., 2019), although the specific sequence remains unclear. Myers and Wells (2015), on the one hand, posit that metacognition serves as a mediator between child emotional abuse and attachment, whereas Yavuz et al. (2019) suggest a mediated pathway from attachment to somatization through metacognition, implying a potential temporal precedence of attachment over metacognition. Nevertheless, it is still unclear whether either metacognition or attachment even mediate the ACEs-OCPT link in the first place. This raises concerns about the suitability of examining attachment and metacognition within a single model, as parallel mediation presumes mediators are not causally associated, while serial mediation assumes a temporal precedence among mediators (Hayes, 2018).

Empirical support for a postulated mediation simply indicates the data is consistent with that model *as well as* other possible models, while failure to find mediation is a disconfirmation of the postulated chain (Hayes, 2018; Salthouse, 2011). Thus, examining multiple postulated mediation models using the same data allows for the disconfirmation and elimination of possible alternative models, thereby increasing confidence in a target model/s (Hayes, 2018;

Salthouse, 2011). Hence, the aim of this paper was to investigate whether attachment or metacognition mediate the relationship between ACEs and OCPT in separate alternative analyses. All hypotheses are examined controlling for depression. As depression is found to distort reports of OCPT due to obsessive-compulsive personality psychopathology closely approximating the distress of mood disorders (Case et al., 2007), controlling for depression is considered best practice when assessing ACEs and OCPT. Thus, we hypothesised that (1) attachment-anxiety will significantly positively mediate the association between ACEs and OCPT; (2) attachment-avoidance will significantly positively mediate the association between ACEs and OCPT, and; (3) metacognition will significantly positively mediate the association between ACEs and OCPT.

Methods

Participants and Procedure

Two hundred undergraduate first-year psychology students completing research for course credit were recruited via an undergraduate online participant pool system. Six participants were excluded for failing more than one attention check, leaving a total of 194 participants. The sample was aged 18 to 54 ($M = 21.6$, $SD = 7.2$), and females constituted 82.99% ($n = 161$) of the sample. Ethnicity was reported as 110 as White/Caucasian (56.70%), 31 as Asian (15.98%), 15 as South Asian (7.73%), 13 as Middle Eastern (6.70%), two as Hispanic or Latino (1.03%), one as Aboriginal or Torres Strait Islander (0.52%), and 22 as other (11.34%). Inclusion criteria was 18-years of age or older and fluent English. This study was granted ethical approval by Macquarie University's Human Research Ethics Committee (reference number 520221114836842).

All participants, who were blind to the study's hypotheses, completed a 30-minute anonymous online Qualtrics survey as part of a larger project. All participants completed a

series of demographic questions regarding gender, age, and ethnicity, followed by a battery of self-report questionnaires including the Child Abuse and Trauma Scale, Experiences in Close Relationships – Revised, Metacognition Questionnaire – 30, Schedule for Nonadaptive and Adaptive Personality – 2 OCPD scale, the Five Factor Obsessive-Compulsive Inventory – Short Form, and the International Personality Item Pool Depression Scale. All participants provided consent to participate and were presented a post-participation debrief statement.

Measures

Child Abuse and Trauma Scale (CATS)

The CATS (Sanders & Becker-Lausen, 1995) retrospectively assesses the frequency of adverse childhood and adolescent experiences perpetrated by principal caretakers. The CATS has 38 self-report items, with a total score and three sub-scales: neglect/negative home atmosphere (14-items), sexual abuse (6-tiems) and punishment (6-items). Items are rated on a 5-point Likert scale ranging from 0 (*never*) to 4 (*always*), with higher total and sub-scale average scores (0-4) indicating greater ACE severity. The CATS has displayed strong temporal stability, good convergent validity, and strong internal consistency ($\alpha = 0.90$; Sanders & Becker-Lausen, 1995). The CATS was found to have excellent reliability ($\alpha = .96$).

Experiences in Close Relationships – Revised Questionnaire (ECR-R)

The ECR-R (Fraley et al., 2000) assesses underlying adult attachment patterns in intimate relationships. The ECR-R has 36 self-report items that form two dimensions: an 18-item attachment-anxiety scale and an 18-item attachment-avoidance scale. Items are rated on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), with higher average total scores (1-7) for both scales indicating greater attachment-anxiety and avoidance. The ECR-R has good temporal stability, good convergent validity, and excellent internal consistency with Cronbach's alphas exceeding .90 for both scales (Sibley et al., 2005). The ECR-R was found to have excellent reliability ($\alpha = 0.95$ for both scales).

The Metacognitions Questionnaire – 30 (MCQ-30)

The MCQ-30 (Wells & Cartwright-Hatton, 2004) measures individual differences in metacognitions. The MCQ-30 has 30 self-report items rated on a 4-point Likert scale ranging from 1 (*do not agree*) to 4 (*agree very much*), with higher total sum scores (30-120) indicating greater dysfunctional metacognition. The MCQ-30 has displayed good convergent validity, acceptable-to-good temporal stability, and excellent internal reliability ($\alpha = 0.93$; Wells & Cartwright-Hatton, 2004). The MCQ-30 was found to have excellent reliability ($\alpha = 0.92$).

International Personality Item Pool Depression Scale (IPIP-DEP)

The IPIP-DEP (Goldberg et al., 2006; freely accessed online via https://ipip.ori.org/) assesses the tendency to experience negative affect and was used to control for depression. The IPIP-DEP has 10 self-report items rated on a 5-point Likert scale from 1 (*very inaccurate*) to 5 (*very accurate*), with higher total sum scores (10-50) reflecting greater negative affect. The IPIP-DEP has demonstrated good convergent validity (Donnellan et al., 2006) and internal consistency ($\alpha = .88$; Goldberg et al., 2006). The IPIP-DEP was found to have similarly good reliability ($\alpha = 0.88$).

Outcome Measures

Two measures were selected for testing OCPT to assess differing conceptualisations of these traits. The literature is currently still debating whether measuring personality pathology is best approached via either a maladaptive trait or a DSM criteria-based approach (Widiger & Hines, 2022). As such, the FFOCI-SF is derived from maladaptive variants of the Five Factor Model of personality (Costa & McCrae, 1992), while the SNAP-2 measures the OCPD DSM-5 criteria (American Psychiatric Association, 2013). Utilising both measures will consequently help assess a broader spectrum of OCPT, while also providing grounds for determining convergent validity.

Schedule for Nonadaptive and Adaptive Personality – 2 (SNAP-2). The SNAP-2 (Clark, 2014) is designed to measure both healthy and pathological personality traits. This study used only the OCPD scale (SNAP-2 OCPD) which dimensionally assesses the DSM-5 (APA, 2013) OCPD criteria. The SNAP-2 OCPD has 25 self-report items rated on a dichotomous '*True*' or '*False*' scale, with higher total sum scores (0-25) indicating greater OCPD symptomology. The SNAP-2 OCPD has demonstrated good convergent validity (Clark, 2014), adequate temporal stability, and acceptable internal consistency ($\alpha = .79$; Samuel et al., 2012). The SNAP-2 was found to have acceptable reliability ($\alpha = 0.70$).

Five Factor Obsessive-Compulsive Inventory – Short Form (FFOCI-SF). The FFOCI-SF (Griffin et al., 2018) measures maladaptive traits associated with OCPD based on the Five-Factor Model of personality. The FFOCI-SF has 48 self-report items rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher total sum scores (48-240) indicative of greater OCPD trait presence. The FFOCI-SF has exhibited acceptable-to-good internal consistency ($\alpha = .71$ to $.85$) and good convergent validity, including with the SNAP-2 ($r = .47$; Samuel et al., 2012). The FFOCI-SF was found to have excellent reliability ($\alpha = 0.91$).

Statistical Analysis

Data analysis was conducted using Stata/MP 17.0. Initially, Spearman's rank-order correlation was used to explore bivariate relationships. For the primary analysis, on the recommendation of Hayes (2009), bootstrapped mediation with 5000 iterations was used. Bootstrapping has greater power and tests for significance by calculating confidence intervals as opposed to inferentially testing the indirect effect (Hayes, 2009). Attachment-anxiety, attachment-avoidance, and metacognition were independently assessed as a mediator between ACEs (predictor variable) and OCPT (outcome variable). For each mediator, two models were assessed; one where OCPT was measured by the SNAP-2 and once as measured by the FFOCI-

SF. Depression was controlled for in all models. For the statistically significant mediation models, standardized seemingly unrelated regressions between the model paths were used to obtain path values.

Results

Descriptive Statistics

Examination of distance and influence revealed no outliers in the present sample. Firstly, Table 1 presents the descriptive statistics for this study's variables. The CATS scores had adequate variability and central tendency comparable to what is previously found within small undergraduate samples (Sanders & Becker-Lausen, 1995).

Table 1.

Descriptive Statistics for Study Variables.

Variable	*M*	*SD*	Min	Max	Skew	Kurtosis	Shapiro-wilk
Child Abuse and Trauma Scale	1.1	0.7	0.05	3.10	0.78	2.88	*p* < .001
ECR-R Attachment-Anxiety	3.8	1.4	1.00	6.67	–0.01	2.13	*p* = .007
ECR-R Attachment-Avoidance	3.0	1.2	1.00	6.22	0.10	2.21	*p* = .003
Metacognitions Questionnaire – 30	67.0	15.9	33	113	0.27	2.79	*p* = .317
FFOCI-SF	143.6	22.6	81	214	–0.02	3.41	*p* = .434
SNAP-2	13.8	4.2	3	23	–0.07	2.31	*p* = .152
International Personality Item Pool Depression Scale	28.5	8.7	10	49	0.18	2.37	*p* = .067

Note. N = 194. ECR-R = Experiences in Close Relationships – Revised; FFOCI-SF = Five Factor Obsessive-Compulsive Inventory – Short Form; SNAP-2 = Schedule for Nonadaptive and Adaptive Personality – 2.

Correlational Analysis

To analyse the bivariate relationships, Spearman's rank-order correlations were conducted. As displayed in Table 2, all the correlations were as expected except attachment-avoidance scores were not significantly correlated with FFOCI-SF OCPT scores. Convergent validity of the

OCPT scales was displayed through a significant strong positive correlation between FFOCI-SF and SNAP-2 scores.

Table 2.

Correlations Between Study Variables.

Variable	1.	2.	3.	4.	5.	6.
.1. Child Abuse and Trauma Scale						
2. ECR-R Attachment-Anxiety	.42***					
3. ECR-R Attachment-Avoidance	.28***	.45***				
4. Metacognitions Questionnaire – 30	.36***	.53***	.24***			
5. FFOCI-SF	.21**	.23**	.07	.36***		
6. SNAP-2	.32***	.38***	.16*	.45***	.61***	
7. IPIP-DEP	.45***	.65***	.42***	.64***	.26***	.31***

Note. $N = 194$. ECR-R = Experiences in Close Relationships –Revised; FFOCI-SF = Five Factor Obsessive-Compulsive Inventory – Short Form; SNAP-2 = Schedule for Nonadaptive and Adaptive Personality – 2; IPIP-DEP = International Personality Item Pool Depression Scale.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Mediation Analyses

Regarding hypothesis 1, the mediation results demonstrated that the standardised indirect effect of ACEs on FFOCI-SF OCPT via attachment-anxiety was non-significant ($ab = .02$, $p = .272$, BC 95% CI [–.008, .086]). Comparatively, as seen in Figure 1, the results demonstrated that the standardised indirect effect of ACEs on SNAP-2 OCPT via attachment-anxiety was significant and positive ($ab = .05$, $p = .041$, BC 95% CI [.012, .023]). Moreover, the bootstrapped standardised seemingly unrelated regression (5000 resamples) results demonstrated the standardised direct effect of ACEs on SNAP-2 OCPT was significant and positive ($c' = .14$, $p = .042$, BC 95% CI [.008, .282]). Thus, attachment-anxiety appears to mediate between ACEs and OCPT when measured by the SNAP-2 but not the FFOCI-SF[1].

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[1] Statistical significance of all the direct and indirect paths remains the same when additionally controlling for age, gender, and ethnicity.
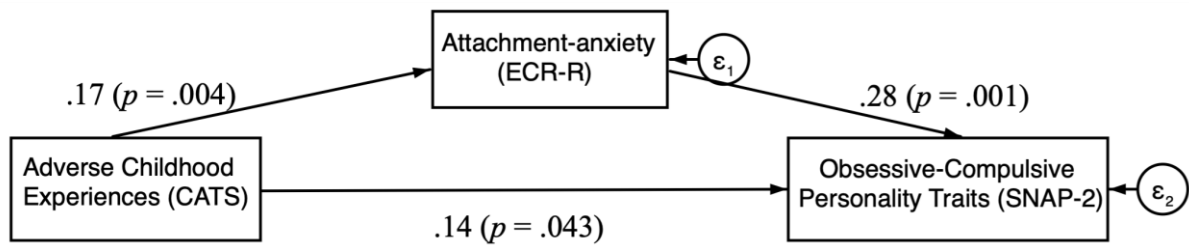
Figure 1. Mediation Model with Attachment-anxiety as the Mediator and SNAP-2 as the Outcome. *Note.* CATS = Child Abuse and Trauma Scale; ECR-R = Experiences in Close Relationships -Revised; SNAP-2 = Schedule for Nonadaptive and Adaptive Personality – 2; ε_1, ε_2 = unobserved errors.

Regarding hypothesis 2, the mediation results demonstrated that the standardised indirect effects of ACEs on FFOCI-SF OCPT ($ab = -.002$, $p = .800$, BC 95% CI [–.031, .012]) and SNAP-2 OCPT ($ab = .002$, $p = .797$, BC 95% CI [–.011, .031]) via attachment-avoidance were both non-significant. Thus, unexpectedly, attachment-avoidance does not appear to mediate between ACEs and OCPT[2].

Regarding hypothesis 3, the mediation results demonstrated that the standardised indirect effects of ACEs on FFOCI-SF OCPT ($ab = .04$, $p = .212$, BC 95% CI [–.008, .120]) and SNAP-2 OCPT ($ab = .04$, $p = .184$, BC 95% CI [–.018, .094]) via metacognition were both non-significant. Thus, unexpectedly, metacognition does not appear to mediate between ACEs and OCPT[3]. Upon encountering this unexpected finding, a post-hoc hypothesis derived from the existing literature referenced earlier (Scarpa et al., 2009) was posed (Hollenbeck & Wright, 2017)—could this mediation relationship be contingent upon a specific ACE subtype, notably

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[2] Statistical significance of all the direct and indirect paths remains the same when additionally controlling for age, gender, and ethnicity.

[3] Statistical significance of all the direct and indirect paths remains the same when additionally controlling for age, gender, and ethnicity.

sexual abuse (Scarpa et al., 2009), as opposed to ACEs as a general class? Thus, we performed a post-hoc exploratory bootstrapped mediation analyses with child sexual abuse as the predictor. The results showed that the standardised indirect effects of child sexual abuse on FFOCI-SF OCPT (ab = .003, p = .927, BC 95% CI [–.052, .068]) and SNAP-2 OCPT (ab = .003, p = .925, BC 95% CI [–.056, .063]) via metacognition were both non-significant.

Discussion

This study, to our knowledge, is the first to investigate whether attachment and metacognition best account for the relationship between ACEs and OCPT. Our first hypothesis, that attachment-anxiety would be a significant positive mediator between ACEs and OCPT controlling for depression, was partially supported. Bootstrapped mediation analyses demonstrated that attachment-anxiety appeared to positively mediate when OCPT were measured by the SNAP-2 but not the FFOCI-SF. While causal conclusions cannot be drawn due to our study's cross-sectional design, this finding is consistent with recent research which finds that ACEs are positively associated with adult insecure attachment (Erozkan, 2016; Lin et al., 2020); and adult insecure attachment is associated with greater OCPT (Wiltgen et al., 2015; Zakiei et al., 2017). Moreover, this preliminary evidence extends the literature and suggests that attachment-anxiety may help account for why ACEs, at times, lead to OCPT and not at others.

In the context of attachment theory, this finding suggests that exposure to the adverse caregiving typical in ACE environments likely induces attachment-anxiety (Lin et al., 2020). Attachment-anxiety is associated with an internal working model of the self as needing absolute control and anguishing over abandonment and rejection. As such, attachment-anxiety may increase OCPT-related characteristics and interpersonal difficulties via internal working models aimed at obtaining this control (Lin et al., 2020). Ultimately, these behaviours may be

a coping mechanism in childhood, but precipitate maladaptive OCPT in adulthood (Lyddon & Sherry, 2001).

However, the finding that attachment-anxiety did not appear to mediate when OCPT were measured with the FFOCI-SF is possibly due to differences in the way the FFOCI-SF and the SNAP-2 conceptualise OCPT. The FFOCI-SF measures the maladaptive traits of disordered personality (i.e., OCPD), whereas the SNAP-2 measures the spectrum of healthy and disordered personality traits associated with OCPD. Given the ongoing refinement of dimensional models of personality disorder traits (e.g., Krueger & Hobbs, 2020), this finding may offer tentative preliminary support that the SNAP-2 better captures pathological personality variation within non-clinical samples due to assessing both degree of pathological trait and aspects of functional impairment (Sleep et al., 2021).

The mediation results, however, did not support our second hypothesis that attachment-avoidance would be a significant positive mediator between ACEs and OCPT. We believe this non-significant finding makes a valuable contribution, nonetheless, given that the current results replicated associations previously demonstrated in the literature, *viz.* attachment-avoidance positively associating with both ACEs and OCPT (Erozkan, 2016; Zakiei et al., 2017). Accordingly, we can say with relative confidence, that mediation does not occur between ACEs and OCPT via attachment-avoidance. This lack of mediation is potentially explicable in terms of attachment deactivation. Attachment-avoidance tends to engage deactivating behaviours (e.g., emotional suppression) and avoidant coping strategies (Levy et al., 2011), whereas OCPT reflect excessive control and anxious-type behaviours, more characteristic of attachment-hyperactivation (i.e., attachment-anxiety).

The current findings also did not support our third hypothesis that metacognition would be a significant positive mediator between ACEs and OCPT. Again, we believe that this non-significant finding makes a valuable contribution given that the current results replicated

associations previously demonstrated in the literature, *viz.* dysfunctional metacognition positively associating with both ACEs and obsessive-compulsive symptoms (Myers & Wells, 2015; Solem et al., 2010). There are several considerations when addressing this finding. Previous research suggests that metacognition is positively associated with child sexual (Scarpa et al., 2009) and emotional abuse specifically (Myers & Wells, 2015). While our exploratory analysis with child sexual abuse as a predictor did not find a mediating effect, this may be a methodological artefact as previous research typically assesses single abuse types (e.g., a modified version of the Child Abuse Survey consisting of only the child sexual abuse items; Scarpa et al., 2009). Myers and Wells (2015) also suggest that metacognition mediates between child emotional abuse and attachment-anxiety. Given that our findings now indicate that attachment-anxiety does mediate between ACEs and OCPT, we extrapolate a hypothesised serial mediation model whereby metacognition is involved in the association between child emotional abuse specifically and OCPT, with attachment-anxiety.

There are both future research and clinical implications based on our findings. As previously mentioned, our inability to find a mediating role of metacognition invites further enquiry. Specifically, as the relationship between metacognition and ACEs is specific to child sexual and emotional abuse, future research should replicate this study with a greater range of measures to explore whether metacognition mediates between sexual and emotional abuse, and OCPT. Additionally, future research could employ a larger sample size and path analysis to investigate whether both metacognition and attachment-anxiety have an indirect serial role between child emotional abuse and OCPT.

In terms of contributions, our findings provide preliminary evidence for why ACEs at times lead to OCPT and not at other times which has potential clinical implications. Our results suggest assessing for presence of attachment-anxiety in patients with OCPT and a history of ACEs may aid clinician understanding of symptoms as a potential distress regulator. Current

treatment evidence for obsessive-compulsive personality pathology suggests cognitive therapy and cognitive-behavioural therapy have a moderate effect (Diedrich & Voderholzer, 2015). Thus, integrating an attachment-informed psychotherapy approach into these treatments aimed at improving attachment security may be beneficial.

However, this study's results should be considered in light of important limitations. Firstly, this study employed a cross-sectional design to examine mediation which limits directionality and causal conclusions (Maxwell & Cole, 2007). However, given the nature of ACEs, demonstrating causality is ethically and methodologically challenging. Thus, consistent with past methodological practices, this study used cross-sectional quasi-longitudinal mediation to investigate whether there were patterns consistent with mediation. To move further toward elucidating direction and causality, future research should utilise a quasi-experimental or prospective design. Our use of a retrospective self-report measure of ACEs may also have led to under-reporting, over-reporting, or refusal to report (Hengartner et al., 2013). However, retrospective self-reporting of ACEs and victimization is generally reliable and accurate, has little recall bias, and is both appropriate and ethical (Hardt & Rutter, 2004). Finally, our use of an undergraduate, non-clinical sample means results may not generalise to clinical populations. However, both the SNAP-2 (Clark, 2014) and FFOCI-SF (Hall-Jones et al., 2021) have been found to generalise to clinical groups. Moreover, the use of psychology undergraduates as participants means they may have been aware of the objectives of the study. Although the participants were blinded to the study hypotheses, future research utilising undergraduate samples would benefit from recruiting from diverse disciplines.

Conclusion

This study was the first to examine whether attachment or metacognition mediate the relationship between ACEs and OCPT. The results provide preliminary evidence that

attachment-anxiety may help account for why ACEs sometimes lead to OCPT and not at other times. In line with an attachment theory perspective, this suggests exposure to childhood adversity likely increases attachment-anxiety which, in turn, motivates a need for control that is likely met by performance of OCPT-like characteristics. Ultimately, these behaviours, initially employed for coping, may develop into maladaptive adult OCPT. The results further indicate that mediation is neither occurring for attachment-avoidance nor metacognition, although both are implicated in OCPT. Although future longitudinal research is needed for addressing questions of causality, considering the effects of the co-occurrence of ACEs and heightened attachment-anxiety on OCPT may have clinical utility for both assessment and treatment.

References

Afifi, T. O., Mather, A., Boman, J., Fleisher, W., Enns, M. W., MacMillan, H., & Sareen, J. (2011). Childhood adversity and personality disorders: Results from a nationally representative population-based study. *Journal of psychiatric research*, *45*(6), 814–822. https://doi.org/10.1016/j.jpsychires.2010.11.008

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.). https://doi.org/10.1176/appi.books.9780890425787

Cicchetti, D. (2006). Development and psychopathology. In *Developmental Psychopathology: Theory and Method* (2 ed., Vol. 1, pp. 1-23). John Wiley & Sons, Inc.

Cicchetti, D. (2016). A multilevel developmental psychopathology systems perspective on depression. In T. Frodl (Ed.), *Systems Neuroscience in Depression* (pp. 3-28). Academic Press. https://doi.org/https://doi.org/10.1016/B978-0-12-802456-0.00001-7

Cicchetti, D., Toth, S., & Bush, M. (1988). Developmental psychopathology and incompetence in childhood: Suggestions for intervention. *Advances in Clinical Child Psychology*, 1-71. https://doi.org/https://doi.org/10.1007/978-1-4613-9829-5_1

Clark, L. A. (2014). *Schedule for Nonadaptive and Adaptive Personality – Second Edition (SNAP-2)*. University of Notre Dame.

Despotes, A. M., Darnell, B. C., Lee, S. R., & Valentiner, D. P. (2021). Past adversity and obsessive-compulsive symptoms: The mediating roles of posttraumatic cognitions and posttraumatic stress symptoms. *Journal of Obsessive-Compulsive and Related Disorders*, 28, 100613. https://doi.org/10.1016/j.jocrd.2020.100613

Diedrich, A., & Voderholzer, U. (2015). Obsessive–Compulsive Personality Disorder: A current review. *Current Psychiatry Reports*, *17*(2), 1–10. https://doi.org/10.1007/s11920-014-0547-8

Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The mini-IPIP scales: Tiny-yet-effective measures of the Big Five factors of personality. *Psychological Assessment, 18*(2), 192–203. https://doi.org/10.1037/1040-3590.18.2.192

Erozkan, A. (2016). The link between types of attachment and childhood trauma. *Universal Journal of Educational Research, 4*(5), 1071–1079. https://doi.org/10.13189/ujer.2016.040517

Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology, 78*(2), 350–365. https://doi.org/10.1037/0022-3514.78.2.350

García-Villamisar, D., & Dattilo, J. (2015). Executive functioning in people with obsessive-compulsive personality traits: Evidence of modest impairment. *Journal of Personality Disorders*, *29*(3), 418-430. https://doi.org/10.1521/pedi_2013_27_101

Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. G. (2006). The International Personality Item Pool and the future of public-domain

personality measures. *Journal of Research in Personality, 40*(1), 84–96. https://doi.org/10.1016/j.jrp.2005.08.007

Graybar, S. R., & Boutilier, L. R. (2002). Nontraumatic pathways to Borderline Personality Disorder. *Psychotherapy*, *39*(2), 152-162. https://doi.org/10.1037/0033-3204.39.2.152

Griffin, S. A., Suzuki, T., Lynam, D. R., Crego, C., Widiger, T. A., Miller, J. D., & Samuel, D. B. (2018). Development and examination of the Five-Factor Obsessive-Compulsive Inventory–Short Form. *Assessment, 25*(1), 56–68. https://doi.org/10.1177/1073191116643818

Grøtte, T., Solem, S., Vogel, P. A., Güzey, I. C., Hansen, B., & Myers, S. G. (2015). Metacognition, responsibility, and perfectionism in Obsessive–Compulsive Disorder. *Cognitive Therapy and Research, 39*(1), 41–50. https://doi.org/10.1007/s10608-014-9635-7

Hall-Jones, M., Liggett, J., & Sellbom, M. (2021). Validation of the Five-Factor Obsessive–Compulsive Inventory in a mental health sample. *Assessment, 28*(4), 1147–1158. https://doi.org/10.1177/1073191120976860

Hanel, P. H. P., & Vione, K. C. (2016). Do student samples provide an accurate estimate of the general public? *PloS One, 11*(12), e0168354. https://doi.org/10.1371/journal.pone.0168354

Hardt, J., & Rutter, M. (2004). Validity of adult retrospective reports of adverse childhood experiences: Review of the evidence. *Journal of Child Psychology and Psychiatry, 45*(2), 260–273. https://doi.org/10.1111/j.1469-7610.2004.00218.x

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*(4), 408–420. https://doi.org/10.1080/03637750903310360

Hengartner, M. P., Ajdacic-Gross, V., Rodgers, S., Müller, M., & Rössler, W. (2013). Childhood adversity in association with personality disorder dimensions: New findings in an

old debate. *European Psychiatry*, 28(8), 476–482. https://doi.org/10.1016/j.eurpsy.2013.04.004

Hollenbeck, J. R., & Wright, P. M. (2017). Harking, Sharking, and Tharking: Making the Case for Post Hoc Analysis of Scientific Data. *Journal of Management*, *43*(1), 5–18. https://doi.org/10.1177/0149206316679487

Krueger, & Hobbs, K. A. (2020). An overview of the DSM-5 Alternative Model of Personality Disorders. *Psychopathology, 53*(3-4), 126–132. https://doi.org/10.1159/000508538

Levy, K. N., Ellison, W. D., Scott, L. N., & Bernecker, S. L. (2011). Attachment style. *Journal of Clinical Psychology, 67*(2), 193–203. https://doi.org/10.1002/jclp.20756

Lin, H. C., Yang, Y., Elliott, L., & Green, E. (2020). Individual differences in attachment anxiety shape the association between adverse childhood experiences and adult somatic symptoms. *Child Abuse & Neglect, 101*, 104325. https://doi.org/10.1016/j.chiabu.2019.104325

Lobbestael, J., Arntz, A., & Bernstein, D. P. (2010). Disentangling the relationship between different types of childhood maltreatment and personality disorders. *Journal of Personality Disorders, 24*(3), 285–295. https://doi.org/10.1521/pedi.2010.24.3.285

Lyddon, W. J., & Sherry, A. (2001). Developmental personality styles: An attachment theory conceptualization of personality disorders. *Journal of Counseling and Development, 79*(4), 405–414. https://doi.org/10.1002/j.1556-6676.2001.tb01987.x

Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation. *Psychological Methods, 12*(1), 23–44. https://doi.org/10.1037/1082-989X.12.1.23

Myers, S. G., Fisher, P. L., & Wells, A. (2009). An empirical test of the metacognitive model of obsessive-compulsive symptoms: Fusion beliefs, beliefs about rituals, and stop signals. *Journal of Anxiety Disorders, 23*(4), 436–442. https://doi.org/10.1016/j.janxdis.2008.08.007

Myers, S. G., & Wells, A. (2015). Early trauma, negative affect, and anxious attachment: The role of metacognition. *Anxiety, Stress, and Coping, 28*(6), 634–649. https://doi.org/10.1080/10615806.2015.1009832

Petruccelli, K., Davis, J., & Berman, T. (2019). Adverse childhood experiences and associated health outcomes: A systematic review and meta-analysis. *Child Abuse & Neglect*, *97*, 104127. https://doi.org/10.1016/j.chiabu.2019.104127

Raes, F., & Hermans, D. (2008). On the mediating role of subtypes of rumination in the relationship between childhood emotional abuse and depressed mood: Brooding versus reflection. *Depression and Anxiety, 25*(12), 1067–1070. https://doi.org/10.1002/da.20447

Rees, C. S., & Anderson, R. A. (2013). A review of metacognition in psychological models of Obsessive–Compulsive Disorder. *Clinical Psychologist, 17*(1), 1–8. https://doi.org/10.1111/cp.12001

Salthouse, T. A. (2011). Neuroanatomical substrates of age-related cognitive decline. *Psychological Bulletin*, *137*(5), 753-784. https://doi.org/10.1037/a0023262

Samuel, D. B., Riddell, A. D. B., Lynam, D. R., Miller, J. D., & Widiger, T. A. (2012). A five-factor measure of obsessive-compulsive personality traits. *Journal of Personality Assessment, 94*(5), 456–465. https://doi.org/10.1080/00223891.2012.677885

Sanders, B., & Becker-Lausen, E. (1995). The measurement of psychological maltreatment: Early data on the Child Abuse and Trauma Scale. *Child Abuse & Neglect, 19*(3), 315–323. https://doi.org/10.1016/S0145-2134(94)00131-6

Scarpa, A., Wilson, L. C., Wells, A. O., Patriquin, M. A., & Tanaka, A. (2009). Thought control strategies as mediators of trauma symptoms in young women with histories of child sexual abuse. *Behaviour Research and Therapy, 47*(9), 809–813. https://doi.org/10.1016/j.brat.2009.06.002

Sibley, C. G., Fischer, R., & Liu, J. H. (2005). Reliability and validity of the Revised Experiences in Close Relationships (ECR-R) self-report measure of adult romantic attachment. *Personality & Social Psychology Bulletin*, *31*(11), 1524–1536. https://doi.org/10.1177/0146167205276865

Sleep, Lynam, D. R., & Miller, J. D. (2021). Personality impairment in the DSM-5 and ICD-11: Current standing and limitations. *Current Opinion in Psychiatry, 34*(1), 39–43. https://doi.org/10.1097/YCO.0000000000000657

Soeteman, D., Verheul, R., & Bussehbaeh, J. J. (2008). The burden of disease in personality disorders: Diagnosis-specific quality of life. *Journal of Personality Disorders*, *22*(3), 259–268. https://doi.org/10.1521/pedi.2008.22.3.259

Solem, S., Håland, Å. T., Vogel, P. A., Hansen, B., & Wells, A. (2010). Change in metacognitions predicts outcome in Obsessive–Compulsive Disorder patients undergoing treatment with exposure and response prevention. *Behaviour Research and Therapy, 47*(4), 301–307. https://doi.org/10.1016/j.brat.2009.01.003

Veale, D. (1993). Classification and treatment of obsessional slowness. *British Journal of Psychiatry*, *162*(2), 198-203. https://doi.org/10.1192/bjp.162.2.198

Wells, A., & Cartwright-Hatton, S. (2004). A short form of the Metacognitions Questionnaire: Properties of the MCQ-30. *Behaviour Research and Therapy, 42*(4), 385–396. https://doi.org/10.1016/S0005-7967(03)00147-5

Widiger, T. A., & Hines, A. (2022). The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition alternative model of personality disorder. *Personality Disorders: Theory, Research, and Treatment, 13*(4), 347–355. https://doi.org/10.1037/per0000524

Wiltgen, A., Adler, H., Smith, R., Rufino, K., Frazier, C., Shepard, C., Booker, K., Simmons, D., Richardson, L., Allen, J. G., & Fowler, J. C. (2015). Attachment insecurity and Obsessive–

Compulsive Personality Disorder among inpatients with serious mental illness. *Journal of Affective Disorders, 174*, 411–415. https://doi.org/10.1016/j.jad.2014.12.011

Yumbul, C., Cavusoglu, S., & Geyimci, B. (2010). The effect of childhood trauma on adult attachment styles, infidelity tendency, romantic jealousy and self-esteem. *Procedia - Social and Behavioral Sciences, 5*, 1741–1745. https://doi.org/10.1016/j.sbspro.2010.07.357

Zakiei, A., Alikhani, M., Farnia, V., Khkian, Z., Shakeri, J., & Golshani, S. (2017). Attachment style and resiliency in patients with Obsessive-Compulsive Personality Disorder. *Korean Journal of Family Medicine, 38*(1), 34–39. https://doi.org/10.4082/kjfm.2017.38.1.34