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Pathways to Trait-Aggression – The Role of Childhood Emotional Maltreatment, Hostile Attribution Bias and Emotion Regulation: A Systematic Review and Empirical Study.

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Thesis Abstract

Background: The long-term detrimental impact of childhood emotional maltreatment is being increasingly recognised in the empirical literature. Adulthood trait-aggression is one proposed outcome of childhood emotional maltreatment. However, the pathways by which emotional maltreatment leads to trait-aggression are not well understood.

Method: A systematic review was conducted to appraise the current empirical evidence base regarding the relationship between childhood emotional maltreatment and adulthood trait-aggression. Eighteen studies were reviewed and their quality analysed based on a number of pre-defined criteria.

An empirical study was conducted using a cross-sectional, survey based design to evaluate hostile attribution bias and emotion regulation difficulties as mediators between childhood emotional maltreatment and adulthood trait-aggression. Participants were men (N = 42) recruited from NHS Forensic Mental Health Services.

Results: Results from the systematic review provided support for a positive and significant association between childhood emotional abuse and adulthood trait-aggression. There was evidence to indicate that childhood emotional neglect was also positively associated with adulthood trait-aggression, however, only a small number of studies have examined this relationship.

The empirical study found significant indirect effects of childhood emotional abuse on self-reported aggression through emotion regulation difficulties. Emotion regulation difficulties did not have a significant effect on the relationship between childhood emotional neglect and aggression. Hostile attribution bias was not found to significantly mediate the relationship between either emotional abuse and aggression or emotional neglect and aggression.

Conclusion: Those who experience emotional maltreatment during childhood may be at increased likelihood of engaging in aggressive behaviour in adulthood. Emotion regulation difficulties may play a key role in the relationship between childhood emotional abuse and aggression and this should be taken into consideration when assessing and treating adults who have difficulties with aggression. The routes by which emotional neglect and emotional abuse lead to aggression may differ. Further research is required to better understand the processes which lead from emotional maltreatment to aggression, particularly with regards to emotional neglect.

Childhood emotional maltreatment and adulthood trait-aggression: A systematic review[1]

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1 This review has been written in accordance with author guidelines for Aggression and Violent Behavior, A Review Journal. See Appendix A for author guidelines.

Abstract

There is empirical and theoretical support for the hypothesis that experiencing emotional maltreatment in childhood increases the likelihood of developing trait-aggression. The current review aimed to systematically identify and critically evaluate studies which had examined the relationship between childhood emotional maltreatment and adulthood trait-aggression. Searches of 4 electronic databases identified 18 studies which met criteria for inclusion in this review. Quality criteria relevant to the review aims were developed and studies were rated in accordance with these. Overall, results provided support for the hypothesis that childhood emotional abuse was positively associated with adulthood trait-aggression. Few studies specifically measured the relationship between childhood emotional neglect and trait-aggression but the majority of those that did also found it to be positively associated with trait-aggression. Relative strengths of the evidence base were its analyses of data, interpretation of results and the psychometric properties of measures used to assess childhood emotional maltreatment. Limitations of the evidence base were its use of sampling strategies and the sample representativeness. Recommendations for future research include: to further evaluate the relationship between childhood emotional neglect and aggression, to study these relationships in more representative samples and to extend the research to the investigation of the causal pathways by which childhood emotional maltreatment leads to trait-aggression.

Keywords: Childhood emotional maltreatment; Childhood emotional abuse; Childhood emotional neglect; Aggression

Highlights:

- Theory and research suggest that emotional maltreatment in childhood may be related to trait-aggression in adulthood.

- A systematic review was conducted to identify evidence regarding the nature and strength of the relationship between childhood emotional maltreatment and trait-aggression.

- The empirical literature largely supports a positive relationship between experiencing childhood emotional maltreatment and later aggression.

- Further research is required to better understand the reasons for this relationships and the processes by which childhood emotional maltreatment leads to aggression.

1. Introduction

In comparison with other categories of maltreatment, longitudinal outcomes of emotional abuse and neglect are relatively under researched and therefore their long term consequences are not yet well understood (Behl, Conyngham & May, 2003; Yates & Wekerle, 2009). Childhood emotional maltreatment involves verbalisations or non-contact actions which result in feelings of humiliation, low self-worth and other adverse emotional outcomes. This may take the form of emotionally abusive actions, such as verbal rejection, degradation, encouragement to engage in maladaptive behaviours and intimidation; or emotionally neglectful actions, such as failure to provide emotional nurturance or support or being emotionally detached, ambivalent or distant (Morelen & Shaffer, 2012).

It has been proposed that, in addition to being a type of maltreatment in its own right, emotional maltreatment is likely to underlie most incidences of abuse and neglect and, therefore, may be the most prevalent type of maltreatment (Claussen & Crittenden, 1991). A series of meta-analyses conducted by Stoltenborgh and colleagues regarding the worldwide prevalence of childhood emotional, physical and sexual maltreatment provide some support for this hypothesis (Stoltenborgh, Bakermans-Kranenburg, Alink, & van IJzendoorn, 2012; Stoltenborgh, Bakermans-Kranenburg, van Ijzendoorn, & Alink, 2013; Stoltenborgh, van IJzendoorn, Euser, & Bakermans-Kranenburg, 2011). These found that there was a 36.3% (N = 76,586) prevalence of emotional abuse, an 18.4% (N = 59,655) prevalence of emotional neglect, a 22.6% (N = 194,655) prevalence of physical abuse, a 16.3% (N = 59,406) prevalence of physical neglect and an 11.8% (N = 9,911,748) prevalence of sexual abuse. Studies have indicated that not only can co-occurring emotional maltreatment exacerbate the negative consequences of other types of maltreatment but even when occurring alone its effects can be as harmful, if not more so than other types of maltreatment (Hart, Brassard, Binggeli & Davidson, 2002). For these reasons, in recent decades increased acknowledgment has been given to the potential severe and detrimental impact that childhood emotional maltreatment can have and there has been increased focus on investigating its effects on psychological adjustment and long-term outcomes (Shaffer, Yates, & Egeland, 2009; Yates & Wekerle, 2009).

Childhood maltreatment has been found to be positively associated with increased levels of aggressive or violent behaviour in adulthood (for reviews of the literature see: Kaplan, Pelcovitz & Labruna, 1999; Lee & Hoaken, 2007; Lewis, 1992; Malinosky-Rummel & Hansen, 1993). There is a particularly large body of evidence indicating that children who are physically abused are at increased risk of displaying aggression as adults (Malinosky-Rummel & Hansen, 1993). Similarly, sexual abuse has been found to be associated with later sexual aggression (Glasser et al., 2001; White & Smith, 2004). There is also limited evidence to indicate that children who are physically neglected show higher levels of aggression than those who are not (Kotch et al., 2008; Lewis, 1992). Although not as widely researched as the relationship between other forms of maltreatment and aggression, there is some empirical evidence to support the hypothesis that emotional maltreatment in childhood may also be related to increased aggression in adulthood and a relationship between these variables has been found in a range of community, prison and clinical psychiatric samples (Allen, 2011; Carli et al., 2012; Garno, Gunawardane, & Goldberg, 2008; Roy, 2009). These studies provide some initial evidence that emotional maltreatment in childhood may be related to elevated levels of aggression in adulthood, however positive and significant associations between the two variables have not been consistently found (Degue, DiLillo, & Scalora, 2010; Sarchiapone et al., 2009).

While aggressive behaviour itself can be considered a temporary state, the term trait-aggression refers to the personality-level tendency for an individual to behave in an aggressive manner (Buss & Perry, 1992). The concept of aggression as a trait is supported by research which has found it to be relatively stable across time and situation (Huesmann, Dubow & Boxer, 2009; Olweus, 1979; Shoda, Mischel & Wright, 1993; Tremblay & Belchevski, 2004). Much of the existing research regarding aggression is weakened by a tendency to use the term aggression interchangeably with other related but fundamentally different constructs, in particular those of violence, hostility and anger (Eckhardt, Norlander & Deffenbacher, 2004; Rippon, 2000). The presence of aggressive behaviour is essential to the definition of trait-aggression. Aggressive behaviour may take a range

of forms, including contact physical behaviours, which have the potential to result in physical harm or damage to others, the self or objects or non-contact behaviours such as verbalisations – such as verbal abuse, intimidation or threats and non-verbal behaviours - such as, intimidating body language (Rippon, 2000). Whilst violence is considered a type of aggression, it refers to only one aspect of this, specifically describing contact physical aggression, directed at others, which causes or has the potential to cause considerable physical harm (Anderson & Bushman, 2002). Hostility may describe a range of thoughts, beliefs and attitudes related to the negative evaluation of other people or experiences - for example, suspicion, resentment, indignation, perceived threat – or which are supportive of aggressive behaviour (Eckhardt, Norlander & Deffenbacher, 2004). As such, hostility differs from aggression and violence in that it refers to individual's internal cognitive experiences rather than their observable behaviours. Similarly, anger describes individuals' internal experiences, in this case the spectrum of negative affective state (along with associated physiological phenomena) related to feelings of annoyance, aggravation or rage (Eckhardt, Norlander & Deffenbacher, 2004). Such definitional ambiguity has, in part, contributed to the unclear and inconsistent conceptualisation and operationalisation of trait-aggression between studies; with some researchers defining trait-aggression with reference to only behavioural elements and others using more complex, multi-dimensional definitions. Although the behavioural element of aggression is vital for its definition, research has indicated that hostility and anger may also be key dimensions of trait-aggression and, as such, focussing solely on the behavioural component of aggression may oversimplify the construct (Buss & Perry, 1992; Felsten & Hill, 1999; Rippon, 2000). It has been proposed that an individual's tendencies toward experiencing hostility and anger, which have been proposed to remain relatively stable over time, may be what maintains and drives their tendency to behave aggressively (Bettencourt, Talley, Benjamin & Valentine, 2006; Parrot & Zeichner, 2003; Rowell Huesmann & Eron, 1989). Thus, trait-aggression may be regarded as a multi-dimensional construct consisting of a complex interplay between the cognitive, affective and behavioural elements of hostility, anger and aggressive behaviour and the individual's propensity to experience these (Buss & Perry, 1992).

Lewis (1992) proposed that childhood maltreatment may lead to aggressive behaviour through the mediating influence of shame. Receiving persistent negative messages about the self from care-givers, through either their behaviour or verbalisations, may result in the development of feelings of shame in the child. How the individual manages this sense of shame can influence the psychological or behavioural outcome. For example, if the negative message is internalised the individual may become anxious, depressed or suffer low self-esteem (Ferguson & Stegge, 1995). Conversely, the individual might attempt to reduce the distress and discomfort caused by feelings of shame by externalising the emotion, resulting in anger, hostility and aggression (Tangney & Dearing, 2002; Tangney, Wagner, Fletcher, & Gramzow, 1992). This theory may be relevant to emotional maltreatment, as emotionally abusive or neglectful behaviours such as belittling, humiliation, and rejection may be particularly pertinent to the development of a negative beliefs about the self and associated feelings of shame (Crawford & Wright, 2007).

Social learning theories have also been used to explain the relationship between emotional maltreatment and aggression. For example, through modelling of ineffective or abusive interpersonal skills - such as verbal aggression - the child may too learn to use these maladaptive social and relational skills (Vissing Straus, Gelles, & Harrop, 1991). Modelling of maladaptive social behaviours has also been proposed to strengthen the development of the externalisation of shame through modelling this as a means of managing unpleasant emotions (Gold, Sullivan & Lewis, 2011). These learned patterns of interactions may persist into adulthood, particularly in interpersonally or emotionally challenging situations (Allen, 2011).

At present, there is little empirical evidence to support these theories specifically with regards to the relationship between emotional maltreatment and aggression. Additionally, some have theorised that childhood emotional maltreatment might reduce the likelihood of aggressive behaviour. A poor sense of self-worth has been found to be associated with emotional maltreatment (Briere & Runtz, 1990) and it may be that this leads to a diminished sense of confidence in one's own autonomy

and a sense of helplessness. It has been posited that perceived low self-worth may result in difficulties being assertive or defending one's self within interpersonal relationships, thus, leading to passivity rather than aggression (Iwaniec, 2000).

As detailed, the impact of childhood emotional maltreatment is likely to be enduring and deleterious. A proposed outcome of this specific type of maltreatment is the development of trait-aggression. There is some theoretical and empirical literature available which supports the hypothesis that trait-aggression is related to childhood emotional maltreatment. However, there are also theories and empirical literature which do not support this hypothesis. Taking this information into consideration, the current review is warranted to summarise and critically evaluate the current research base regarding the relationship between childhood emotional maltreatment and trait-aggression. Additionally, through review of these papers the study aims to identify any other variables or processes which may contribute to this relationship.

2. *Method*

2.1 Operationalisation of key constructs

2.1.1 Childhood emotional abuse, neglect and maltreatment

There is dispute in the childhood emotional maltreatment literature regarding whether its operationalsiation should focus on parental behaviours, their adverse outcomes (either immediate and long-term) for the child involved or a combination of both (Glaser, 2002). Whilst it would be difficult to reliably determine a direct cause and effect relationship between childhood emotional maltreatment and its long-term adverse outcomes, a number of childhood maltreatment measures do include some measurement of individual's perception of the immediate emotional or psychological impact of the perpetrators' behaviour. Taking this into consideration, studies were considered eligible for inclusion in the current review whether they measured the emotionally maltreating behaviour – for example, using self-report items such as, "Your mother (father) ridiculed your feelings" (Nicholas & Beiber, 1997) or 'insulted you' (Briere & Runtz, 1990) – and/or measured the perceived

immediate impact of the behaviour – for example, 'made you feel like a bad person' (Briere & Runtz, 1988) or 'I felt loved' (Bernstein & Fink, 1998).

Accordingly, childhood emotional abuse was operationalised as the adult retrospective report of non-contact actions (either verbal or non-verbal) from a parent, caregiver or other significant older person, which were considered to result in or have the potential to result in negative psychological, emotional or developmental consequence – such as, feelings of humiliation, degradation, lack of self-worth or fear (Glaser, 2002). Emotional neglect was operationalised as the adult retrospective report of whether a parents, caregivers or significant older person were perceived to have provided emotionally or psychologically supportive interactions or relationships. Emotional maltreatment was considered the combined experience of these two constructs. Due to the multitude of forms emotionally maltreating behaviour may take and the potential variation between measures used in studies, an exhaustive set of criteria of specific abusive or neglectful behaviours was not predetermined. Papers were included whether they operationalised emotional maltreatment on a continuum or using cut-off scores. Childhood was considered to encompass any age up until a maximum of eighteen years old. Studies were also eligible regardless of whether they asked about behaviour from specified older people (e.g. asked about behaviour of primary maternal, primary paternal figures or other significant adults) or did not specify a perpetrator. However, as variation in operational definitions with regards to cut-off age and perpetrator of maltreatment may limit the comparability between studies reviewed, differences in these areas were outlined at the data extraction stage (see Table 1).

2.1.2 Trait-aggression

Taking into account the relatively small body of existing empirical literature in this area along with the cross-study disparity between operational definitions of trait-aggression, the current review chose to employ a relatively inclusive operational definition of trait-aggression, with the intention of minimising the chance of omitting potentially relevant literature. Therefore, minimum criteria for the definition of trait-aggression was that measures assessed the tendency for individuals to engage in

aggressive behaviour - either physical, verbal or both. However, studies which included more complex multi-dimensional operational definitions (i.e. including hostility and anger in addition to aggressive behaviours) were also included. To avoid the measure of state rather than trait aggression, studies were only included if the measures used required participants to report their aggression across their lifespan, across adulthood or with no specified time period. Thus, measures which stipulated any other specific recall period - for example, 'in the last week' or 'in the last month' - were excluded. Due to the extensive range of behaviours which may be considered aggressive, an exhaustive list of specific behaviours were not stipulated. As with emotional maltreatment, due to the impact that operational variation may have had on comparability of studies, key details of these definitions were outlined during the data extraction stage (see Table 1).

2.2 Search Strategy

An initial search of The Cochrane Database of Abstract Reviews of Effects (DARE) was performed in December 2013 to identify whether another similar systematic review had been conducted. The following search string was used: ('child$ emotional abuse' OR 'child$ emotional neglect' OR 'child$ emotional maltreatment' OR 'child$ emotional trauma' OR 'child$ psychological abuse' OR 'child$ psychological maltreatment') AND ('aggress$' OR 'hostil$' OR 'violen$' OR 'anger'). Despite being theoretically different terms, the terms hostil$, violen$ and anger were included in the search due to the previously discussed tendency for researchers to use these terms interchangeably with aggression, to avoid overlooking relevant papers. No similar reviews were identified. The same terms were then used to search the following databases up to and including December 2013: PsycINFO, Medline, EMBASE and CINAHL.

2.3 Inclusion Criteria

Studies were included if they were quantitative, observational studies, printed in English. Only research published in peer reviewed journals was considered eligible

for the review - therefore, dissertation research, book chapters, non-peer reviewed journal articles, poster abstracts and conference presentations were excluded.

Included studies were required to provide a measure of childhood emotional abuse, neglect or a combination of the two and a measure of trait-aggression, which were operationalised in line with the definitions outlined in section 2.1. Where the operationalisation of CEM and trait-aggression was not clearly outlined within the individual journal articles, this was established by reviewing the measures used or obtaining further information about these. It was also necessary for included studies to report a statistical measure of the relationship between the two variables of interest. Given the relatively limited evidence base in this specific area, it was decided to include studies which both examined the relationship of between childhood emotional maltreatment and adulthood trait-aggression as a primary or a secondary aim. As the review aimed at examining the potential influence of childhood emotional maltreatment on adulthood trait-aggression, studies which used samples entirely comprised of children (in this case considered to be people under the age of 16 years) were excluded. Studies with prospective designs were considered eligible for inclusion providing that they assessed trait-aggression when participants were over the age of 16 years old. Studies were excluded if they assessed the effects of an intervention (psychological, medical or otherwise).

Studies which measured state aggression or aggression only within specific relationships (such as toward an intimate partner or child) were excluded, as it is unclear from available evidence whether these types of relationship specific aggression are representative of overall levels of trait-aggression. Additionally, studies were excluded if they solely measured violence (i.e. contact physical aggression directed towards other people, which resulted in or had the potential to result in substantial physical harm).

2.4 Search Results and Process

Using the above search process, 853 articles were retrieved from PsycINFO, 536 from Medline, 370 from EMBASE and 377 from CINAHL. Once duplicate papers had been removed, a total of 1120 articles remained. The study selection process is detailed in Figure 1

Articles were first screened against the inclusion criteria by title. Studies were excluded at this stage if their title clearly indicated that: they were not quantitative observational studies (for example, including terms such as 'systematic review', 'meta-analysis', 'randomised control trial', 'case-study' or 'qualitative'). Titles were retained if they referred to childhood maltreatment of any nature, or used other potentially relevant terms – such as, 'childhood experiences', 'childhood adverse experiences' or 'parental verbal abuse'. Exceptions to this were made where it was clearly evident from the title that the focus of the paper was on some aspect of childhood maltreatment other than its long-term effects - for example, papers which focussed on the detection and protection of children being maltreated – or where it was clear from the title that a solely child sample was involved. A number of studies were also excluded at this stage because the title clearly stated that they were examining long-term physical health outcomes of childhood maltreatment, rather than psychological or behavioural outcomes. Studies were also retained at this stage if they made any reference to trait-aggression or related terms – such as 'violence', 'hostility' or 'anger'. A number of studies were also identified which focussed on experiencing maltreatment in adulthood, such as elder abuse or abuse within relationships. Where it was clear from the title these papers focussed on the experiences of the 'victim' of this adulthood maltreatment, papers were excluded. However, where there was uncertainty regarding the papers focus or it was clear that the paper focussed on the perpetrator of adulthood maltreatment, papers were retained, as there was considered a higher likelihood that these papers may include a measure of participant's trait-aggression. Where there was any ambiguity regarding

the relevance of the paper or adherence to the inclusion criteria at any stage of the search papers were retained.

The remaining papers were then screened against the inclusion criteria by abstract and those which clearly did not meet criteria were excluded. Abstracts were screened for indication that they measured childhood maltreatment (again, at this stage, of any nature) and trait-aggression or related terms. Abstracts which clearly indicated that none or only one of the key variables of interest were involved were excluded.

The remaining studies were screened in their entirety for their suitability and their reference lists manually searched for further relevant articles. At this final stage only paper which met the exact criteria, previously outlined, were retained. This resulted in 18 articles being identified as suitable for inclusion in the review.

2.5 Data Extraction

The following information was extracted from all studies eligible for inclusion in the review and can be found in Table 1: reference details, country, primary aims of the research and whether measuring the relationship between CEM and trait-aggression was a primary or secondary aim, sample characteristics, measure of CEM and key details of its operational definition, measure of trait-aggression and key details of its operational definition, additional measures, study design/statistical analyses and key findings relevant to the aims of this review.

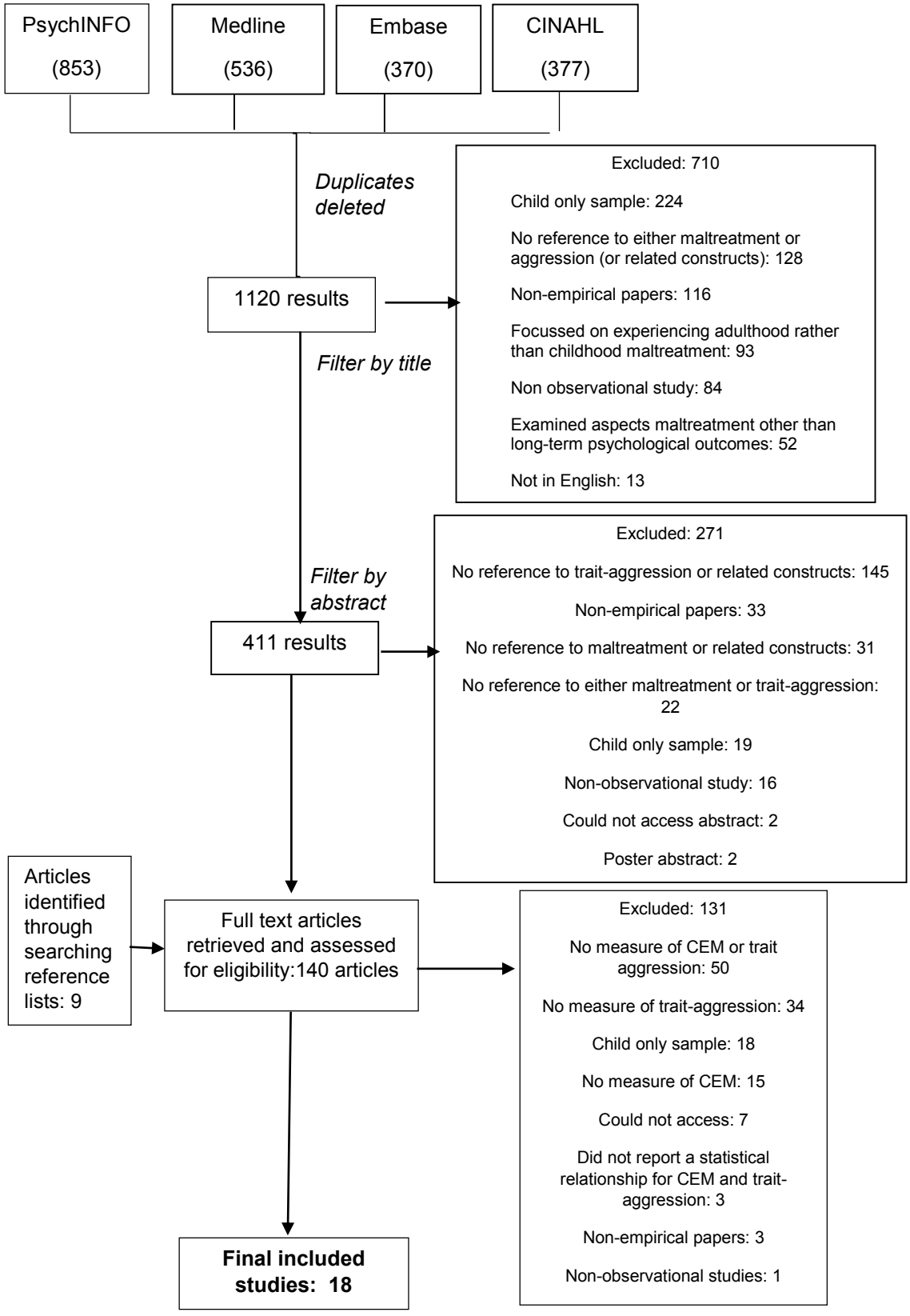

***Figure 1**. Diagrammatic representation of the search process*

Table 1: Description of reviewed studies

Reference: 1st Author (year)/ country	Study aims: Primary aims(was measurement of CEM, trait-aggression relationship a primary or secondary study aim)	Sample Characteristics: number of participants (%female/male)/ Population/ Mean age (SD/range)	Emotional maltreatment measure: type of CEM measured/age cut-off/perpetrator	Trait-Aggression measure/operationalisation of trait-aggression/recall period	Additional Measures	Study design/ statistical analysis	Relevant findings
Allen (2011) USA	To assess the role of self-capacities as a mediator between childhood psychological abuse and adulthood aggression (primary)	236 (female 58%; male 42%) undergraduate students 19.9 yrs (1.95)	CCMS – psychological abuse scale CEA only, aged ≤ 13yrs, by primary maternal figure, primary paternal figure and other adult/older adolescent (measured separately, then totalled score for analyses)	PAI-AGG Combined behavioural (verbal and physical aggression) and cognitive dimensions, no specified recall period	IASC	Cross-sectional ANOVA, correlations, hierarchical regression analyses.	CEA significantly associated with verbal AG (.19*), physical AG (.32*), overall AG (.32*) and aggressive attitude (.31*).
Allen et al. (2013) USA	To test borderline symptoms as meditational pathways between childhood maltreatment and suicide potential.	260 (female 56.5%;male 43.5%) undergraduate students 19.3 yrs (2.1)	CCMS – psychological abuse scale CEA only, age and perpetrator	PAI-AGG As in Allen (2011)	IASC SPI	Cross-sectional Correlations, multiple mediation	CEA significantly associated with AG (.33*)

	(secondary)		as in Allen (2011)				
Briere & Runtz (1990) USA	To examine the relationship between childhood abuse and psychosocial dysfunction. (primary)	277 female undergraduate students NR	FEQ – Psychological maltreatment scale CEA, aged ≤ 14yrs, by mother/father (measured separately, then totalled score for analyses)	Aggression/Anger Scale (developed for this study by study authors) Combined behavioural (physical and verbal), affective and cognitive dimension, no specified recall period	Self-esteem, dysfunctional sexual behaviour scales (developed for this study by study authors)	Cross-sectional Correlations	CEA was not significantly associated with AG.
Carli et al. (2013) Italy	To examine correlates of trait-aggressiveness in prisoners and whether aggression and impulsivity are associated with childhood maltreatment. (primary)	1356 male prisoners 39.6 yrs (10.7)	CTQ CEA and CEN, during 'childhood and adolescence', by non-specified adult	BGLHA Behavioural dimensions only (combined physical, verbal and 'antisocial behaviours involving disciplinary action at school or work'), across adolescence and adulthood	MINI BIS CD-RISC	Cross-sectional Logistic regression	CEA significantly associated with AG (.34*) CEN significantly associated with AG (.24*)
Chen et al. (2012) USA	To test the moderating effects of childhood maltreatment in the relationship	2752 (58.5% female; 41.5% male) general population 38.18 yrs (6.01)	CTQ CEA and CEN - age and perpetrator, as in Carli (2013)	LHA Combination of behavioural (physical, verbal) and affective	SIP-AEQ/NER	Cross-sectional Correlations, multiple moderation	CEA significantly associated with AG (0.26**)

	between social information processing/negative emotional response and aggression. (secondary)			dimensions, aged ≥18yrs			CEN significantly associated with AG (0.19**)
Crawford & Wright (2007) USA	To examine interpersonal schemas as mediators between childhood psychological abuse and relationship aggression. (primary)	301 (female 52%; male 47%) undergraduate students 20.37 yrs (NR)	LEQ CEM (combined separate CEA and CEN subscales), aged <15yrs, by adults or individuals at least five years older than respondent	AQ Combined behavioural (physical, verbal and sexual aggression), cognitive and affective dimensions, no specified recall period	YSQ CAST-6; IDA	Cross-sectional Hierarchical multiple regression, mediation	CEM accounted for 9.8% of the variance in AG ($F(1,280)= 30.38$**)
Degue et al. (2010) USA	To compare risk factors for sexual coercion and aggression (secondary)	360 male prisoners 32.1 yrs (10.2)	CTQ CEA and CEN - age and perpetrator, as in Carli (2013)	AQ Combined behavioural (physical, verbal), cognitive and affective dimensions, no specified recall period	RAPE Scale IRI SES	Cross-sectional Correlation, logistic regression	CEA significantly negatively associated with AG (-.38**) CEN significantly negatively associated with AG (-.32**)

Garno et al. (2013) USA	To identify predictors of trait aggression in people with Bipolar Affective Disorder. (primary)	100 (49% female; 51% male) inpatients and outpatients with a diagnosis of Bipolar Affective Disorder. 41.18 yrs (12.71)	CTQ CEA and CEN - age and perpetrator, as in Carli (2013)	BGA Operationalised as in Carli et al. (2013)	HDRS YMRS SCID	Cross-sectional Correlations, stepwise multiple regression	CEA significantly associated with AG (.42**) CEN significantly associated with AG (.29**)
Hoglund & Nicholas (1995) USA	To examine the relationship between shame, guilt and anger in those exposed to abusive family environments (primary)	208 (49% female; 51% male) undergraduate students 20.18 yrs (range 17 - 45)	PASI CEA, recall period not specified, mother and father (measured separately, then totalled score for analyses)	BDHI Behavioural dimensions only (combined physical, verbal and indirect aggression), no specified recall period	TOSCA STAS AX	Cross-sectional Two-way ANOVA	CEA had a significant main effect on AG (F (1,104) = 12.43**)
Morimoto & Sharma (2004) USA	To examine the impact of parental verbal aggression on self-esteem, aggression, depression and interpersonal sensitivity. (primary)	233 (female 72.5%; male 27.5%) undergraduate students 18.9 yrs (NR)	PMS CEA, aged $\leq$ 14yrs, by mother/father (measured separately, then totalled score for analyses)	AQ Combined behavioural (physical only) and affective dimensions, no specified recall period	CTS FACES II PBI CSI BDI RSE IIP	Cross-sectional T-tests, correlations, regression analyses	CEA significantly associated with AG for females (.27**) No significant association found for males.

Nicholas & Bieber (1996) USA	To examine parental abusive and supportive behaviours and their relationship to hostility and aggression. (primary)	216 (female 47%; male 53%) undergraduate students 20.6 yrs (NR)	EASE-PI CEA, recall period not specified, mother and father (measured and analysed separately)	BDHI Operationalised as in Hoglund and Nicholas (1995)	-	Cross sectional ANOVA; Chi-square	A significant group difference between the levels of AG in those with low vs high CEA by mothers and fathers (mothers: F(1, 140) = 4.741*; fathers: F(1, 129) = 12.267**)
Nicholas & Rasmussan (2006) USA	To examine the relationship between childhood maltreatment, witnessing inter-parental violence, familial alcohol misuse with depression and aggression. (primary)	298 (48% female; 52% male) undergraduate students females 20.03 yrs (NR) males 20.17 yrs (NR)	EASE-PI CEA - age and perpetrator as in Nicholas & Beiber (1996)	BDHI – Operationalised as in Hoglund and Nicholas (1995)	CAST-6 CTS CCDS	Cross-sectional Correlations, multiple regression	For females paternal CEA was a significant predictor of AG (t=3.29, â =.42**). CEA did not significantly predict AG for males.
Roy (2009) USA	To examine risk factors for suicide attempts in cocaine dependent patients. (secondary)	406 (22% female; 77% male) abstinent cocaine dependent patients Suicide attempters - 43.53 yrs (7.81)	CTQ CEA and CEN - age and perpetrator, as in Carli (2013)	BGLHA Operationalised as in Carli (2013)	SCID	Cross-sectional T-tests, ANOVA, logistic regression	CEA significantly associated with AG (.42**) CEN

		Non-attempters - 45.61 yrs (7.81)					significantly associated with AG (.22**)
Roy & Janal (2007) USA	To examine risk factors for suicide attempts in alcohol dependent patients. (secondary)	499 (17% female; 83% male) alcohol dependent patients Suicide attempters - 44.6 yrs (2.2) non-attempters - 51.1 yrs (1.8)	CTQ CEA and CEN - age and perpetrator, as in Carli (2013)	BGLHA Operationalised as in Carli (2013)	Psychiatric Interview	Cross-sectional T-tests, correlations, logistic regression	EA significantly associated with AG (r=0.47**) CEN significantly associated with AG (r=0.39**)
Sansone et al. (2012) USA	To examine the relationship between type of childhood maltreatment and aggressive and violent behaviour in adulthood (primary)	342 (68% female; 32% male) patients receiving medical care at a primary care centre 50.01 yrs (15.50)	Childhood trauma assessment (developed for this study by its' authors) CEA, aged <12yrs, by a non-specified adult	Aggressive Behaviour Questionnaire (developed for this study by study authors) Behavioural dimensions only (physical and verbal), aged ≥18yrs		Cross-sectional ANOVA; regression analysis	CEA significantly predicted AG (β = 0.15, t = 2.32*)
Sarchiapone, Carli, Cuomo, & Roy (2007) Italy	To examine whether more childhood trauma would be reported by those who had attempted suicide compared to those	108 (61% female;39% male) people with major depressive disorder Suicide attempters 43.7 yrs (15.3) Non-attempters 39.2 yrs (13.4)	CTQ CEA and CEN - age and perpetrator, as in Carli (2013)	BGA Operationalised as in Carli (2013)	HDRS MINI	Cross-sectional T-tests, logistic regression	CEA significantly associated with AG (.32*) No significant

	who had not. (secondary)						relationship found between CEN and AG reported
Sarchiapone, Carli, Cuomo, Marchetti, et al. (2007) Italy	To examine the relationship between childhood trauma and aggression. (primary)	540 male prisoners 40.03 yrs (10.36)	CTQ CEA and CEN - age and perpetrator, as in Carli (2013)	BGLHA Operationalised as in Carli (2013)	Psychiatric interview File review	Cross-sectional Logistic regression	CEA significantly associated with AG (0.42**) No significant relationship found between CEN and AG reported
Sarchiapone, Jaussent et al. (2009) France/Italy	To examine whether aggression was a mediator between childhood trauma and suicidal behaviour and to compare groups from Italy and France (secondary)	396 (72% female;28% male) French suicide attempters, 103 (74% female;26% male) Italian Suicide attempters, 88 (58% female;42% male) Italian Psychiatric control group. French suicide attempters 40.47 yrs (13.52) Italian suicide attempters 38.6 yrs (12.04) Control group 41.49 yrs (12.05)	CTQ CEA and CEN - age and perpetrator, as in Carli (2013)	BGLHA Operationalised as in Carli (2013)		Cross-sectional Mann Whitney tests, correlations	CEA significantly associated with AG for French suicide attempters (.13**), Italian suicide attempters (.32**) and control group (.42**)

							CEN significantly negatively associated with AG for Italian suicide attempters (-.18*) and control group (-.25*)

Note: AG=aggression; AQ-Aggression Questionnaire (Buss & Perry, 1992); AX=Anger Expression Scale (Spielberger et al., 1985); BDHI= Buss-Durkee Hostiltiy Inventory (Buss & Durkee, 1957); BDI=Beck Depression Inventory(Beck, 1987); BGLHA= Brown Goodwin Assessment for Lifetime History of Aggression (Brown, Goodwin, Ballenger, Goyer & Major, 1979); BIS=Barratt Impulsivity Scale (Barratt, Stanford, Kent & Alan, 1997); CCDS= Costello and Comrey Depression Scale (Costello & Comrey, 1967); CAST-6=Children of Alcoholics Screening Test (Hodgins, Maticka-Tyndale, Guebaly, & West, 1993); CCMS=Comprehensive Childhood Maltreatment Scale (Higgins & McCabe 2001); CD-RISC=Connor Davidson-Resilience Scale (Connor & Davidson, 2003); CEA=Childhood emotional abuse; CEM=Childhood emotional maltreatment; CEN=Childhood emotional neglect; CSI=Coping Strategy Indicator (Amirkhan, 1990); CTS=Conflict Tactics Scale (Straus & Hamby, 1997); CTQ=Childhood Trauma Questionnaire (Bernstein & Fink, 1998); FACES II= Family Adaptability an Cohesion Scale (Olson, Portner, & Bell, 1982);FEQ=Family Experiences Questionnaire (Briere & Runtz, 1991); EASE-PI= Exposure to Abusive and Supportive Environments Parenting Inventory (Nicholas & Bieber, 1997); HDRS= Hamilton Depression Rating Scale (Hamilton, 1967); IASC=Inventory of Altered Self Capacities (Briere, 2000); IDA=Index of Dating Abuse (Hudson & McIntosh, 1981); IIP=Inventory of Interpersonal Problems (Horowitz, Rosenberg,Baer, & Ureno, 1988); IRI= Interpersonal Reactivity Index (Davis, 1980); LEQ=Lifetime Experiences Questionnaire (Gibb et al., 2001); LHA-Lifetime History of Aggression Questionnaire (Coccaro, Berman, & Kavoussi, 1997); MINI=Mini-International Neuropsychiatric Interview (Sheehan et al., 1997); NR=Not reported; PASI= Parent Abuse and Support Inventory (Nicholas & Beiber, 1991); PAI-AGG=Personality Assessment Inventory-Aggression Scale (Morey, 1991); PBI =Parental Bonding Instrument (Parker, Tupling, & Brown, 1979); PMS=Psychological Maltreatment Scale

(Briere & Runtz, 1988); RAPE-scale (Bumby,1996); SCID= Structured Clinical Interview for DSM-IV (First, Spitzer, Gibbon, & Williams, 2012); RSE=Rosenberg Self-Esteem Scale (Rosenberg, 1965); SES=Sexual Experiences Survey (Koss & Oros, 1982); SIP-AEQ= Social Information Processing – Attribution and Emotional Response Questionnaire (Coccaro, Noblett, & McCloskey, 2009); SPI=Suicide Potential Index (Morey, 1991); TOSCA= Test of Self-Conscious Affect (Tangney, 1989); STAS=State-Trait Anger Scale (Spielberger, Jacobs, Russell & Crane, 1983) ; YMRS= Young Mania Rating Scale (Young, Biggs, Ziegler, & Meyer, 1978); YSQ=Young's Schema Questionnaire (Young, 1999); *p<.05, **p<.01

2.6 Quality Criteria

Included studies were rated in relation to their ability to address the aims of the current review. There are a number of quality criteria and checklists for the assessment of observational studies described within the literature, which vary widely in their focus and tend to have not been developed in a psychometrically rigorous manner. As a result, there is no clear agreement or recommendations regarding which tool is most suitable for appraising the quality of observational research (Jarde, Losilla & Vives, 2012). A number of assessment measures were reviewed with regards to their suitability for this review, however, none were identified which suitably addressed its' needs or aims. Therefore, quality criteria were developed specifically for this review. This was done in consultation with recommendations from the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) project (Vandenbroucke et al. 2007). STROBE guidelines highlight the importance of assessing research methodology within the context of its contribution to reducing vulnerability to biases. Jarde et al. (2012) identified six areas of quality considered important to reducing susceptibility to bias: representativeness, selection, measurement, data collection, statistics and data analysis and funding. These recommendations provided a framework from which ten equally weighted criteria were developed for the current review: sampling strategy, sample size, sample representativeness, measure of emotional maltreatment, measure of aggression, additional measures, suitability of statistical analysis, management of confounding variables, interpretation of results and sophistication of theoretical and statistical model. These were then rated using the following rating system based on criteria proposed by the Scottish Intercollegiate Guidelines Network (SIGN; 2011): 'well-covered' (3 points), 'adequately addressed (2 points), 'poorly addressed (1 point) and 'not addressed/not relevant' (0 points). Papers were given a total score out of 30. Individual and total ratings are intended as an indication of methodological quality of studies specifically within the context of the review aims. The ratings do not allow direct comparisons to be made between studies but are instead intended to provide a gauge of each studies relative strengths and limitations with regards to the review aims. The full quality criteria can be found in Table 2. Each study was rated by the

first author using these pre-defined criteria. Two co-raters also independently reviewed and rated eight articles each, using the same criteria. There was good overall agreement between raters with agreement on 72% of items (Kappa = 0.61, $p<0.001$).

Table 2: *Quality Criteria Rating Guidelines*

Quality Criteria	*Description*
1. Sampling strategy	**WC**: There is a clear, detailed description of the sampling and recruitment methods used and these substantially minimises the likelihood of selection bias. The risk of selection bias is deemed minimal based on the information available. **AA**: An outline of sampling and recruitment methods is provided, which is sufficient for the reader to establish what strategies were used (although there may be a lack of detail in its description). These methods adequately reduce selection bias. The risk of selection bias is deemed moderate based on the information available. **PA**: There is a lack of clarity in describing how the sample were targeted and recruited into the study and/or the risk of selection bias is deemed moderate based on the information available. **NA/NR**: The sampling strategy is not reported.
1.1 Sample size	**WC:** Power was calculated a priori and is reported. If this power calculation is not present, this item may be considered as 'well-covered' if there is enough information present (i.e. regarding statistical analysis used, number of variables etc) to determine whether sample size was sufficient to enable power of at least 0.8 (significance level .05) for the estimated effect size. If the paper does not indicate an estimated effect size, this item may still be rated well-covered if the study is sufficiently powered detect even a small effect size, given the type of analysis used etc. **AA:** The number of participants is sufficient to enable power of at least .7 (significance level.05) for the estimated effect size. If the paper does not indicate an estimated effect size, this item may still be rated adequately addressed if the study is sufficiently powered to detect a medium effect size (taking into

	consideration the type of analysis used, number of variables etc.). **PA:** The study reports that it is underpowered. In the absence of a power calculation or estimated effect size, achieving sufficient power (ie. At least .70, significance level 0.5) with the given sample size is considered highly unlikely when taking into account the available information. Taking into account all available information, it is unlikely that even large effect sizes would be detected. **NA/NR:** The sample size is not reported.
1.2 Sample representativeness *Notes: Where details of the characteristics of the sample population are not clearly outlined within the journal article, this information was obtained from elsewhere and judgements regarding representativeness made based on this information.* *Key characteristics by sample type:* *General population: age, gender, socio-economic status, marital status, level of educational attainment* *Clinical samples: demographic characteristics (as in general population), common co-morbid psychiatric diagnoses and/or diagnoses of personality disorder as relevant to specific population and substance misuse* *Forensic: demographic characteristics (as in general population), diagnoses of psychiatric and/or personality disorder, substance misuse, number of offences, index offence type (e.g. violent, sexual, other), length of current detention.*	**WC**: Relevant demographic and/or clinical characteristics of the sample are clearly described and are considered to be a largely a representative cross-section of the studies target population with regards to most key characteristics (see left). Inclusion/exclusion criteria are specified. Based on the available information, the sample is considered sufficiently representative that results could be generalised to the target population with relative confidence. **AA**: The sample and its' representativeness are adequately described and the sample is considered reasonable representative of the target population on most characteristics. However, there may be a small number of deviations in representativeness. Based on the available information, the sample is considered sufficiently representative to allow tentative generalisations to the target population but there are some limitations to this. **PA**: There is a lack of detail regarding the sample and it's representativeness of the target population or the sample is considered to differ substantially from the target population with regards to key characteristics (for example, demographic groups might be extremely under-represented or entirely absent). Based on the available information, the sample is considered largely unrepresentative of the target-population and ability to generalise results to the target population is considered either extremely limited or not possible. **NA/NR**: Details of the samples characteristics are not provided.
2. Measure of emotional maltreatment	**WC**: The measure used to examine childhood emotional maltreatment has robust statistical validity and reliability for use with the study

Note: Where sufficient information regarding the psychometric properties of measures was not available within the paper, where possible this was obtained from elsewhere and judgements made based on the quality and quantity of available evidence for each measure.	population. There is evidence to suggest that the measure has been developed to a high psychometric standard. A minimum of internal consistency, test-retest reliability and a statistical measure of construct/concurrent validity are available for the measure. The majority of reliability scores fall within the good to excellent range (i.e. Cronbach's alpha and test-retest reliability statistic of >.8) and concurrent validity has been determined through comparison with an established measure of CEM. The measure has been and standardised with a population sufficiently similar to that used within the study. **AA**: The measure used to examine childhood emotional maltreatment has reasonable validity and reliability for use with the study population. The measure has been developed to a good psychometric standard (although evidence may be of a lesser quality/quantity than for those measured well-covered). A minimum of internal consistency, test-retest reliability and a statistical measure of construct/concurrent validity are available for the measure. The majority of the reliability scores fall within the moderate to good range (i.e. Cronbach's alpha and test-retest reliability statistic of >0.7 - <0.8) and concurrent validity has been determined through comparison with an established measure of CEM. The measure has been and standardised with a population sufficiently similar to that used within the study. **PA**: The measure used to examine childhood emotional maltreatment has questionable or extremely low validity and reliability for use with the study population OR the measure is unstandardised (for example, has been developed specifically for the study with little information regarding standardisation or psychometric properties). The majority of the reliability scores fall below the moderate range (i.e. Cronbach's alpha and test-retest reliability statistic of <0.7). **NA/NR**: There is no available information regarding the validity or reliability of the measure of childhood emotional maltreatment.
2.1 Measure of trait-aggression	Criteria description as in section 2.

2.2 Additional Measures	Criteria description as in section 2.
3. Data Analyses	**WC**: Data analysis methods are described clearly and in detail and are appropriate to the study questions/aims and properties of the data (e.g. parametric/non-parametric measures are used where appropriate). Confidence intervals, p-values and/or effect sizes are fully reported where appropriate to analyses. **AA**: Data analysis methods used are appropriate to the study question/aims and properties of the data. Reporting of results is sufficient to allow some interpretation, however, there may be a small amount of relevant information missing (e.g. effect sizes may not be reported). **PA**: Data analysis methods are not appropriate to the study question/aims and properties of the data OR there is a lack of clarity regarding what analyses are used. Reporting of the data is not sufficiently detailed to allow it to be interpreted by the reader. **NA/NR**: Data analysis methods are not reported.
3.1 Confounding factors *Note: Given the variation between the aims and design of studies reviewed and the different populations involved, it is not possible to provide an exhaustive list of potential confounding variables. However, the previously outlined lists of 'key characteristics' (see box 1.2.) are also considered key potential confounding factors to their relative populations. Additionally, childhood emotional abuse or neglect (where not a primary study variable), childhood physical abuse, childhood physical neglect and childhood sexual abuse should be considered as key confounding variables.*	**WC**: A comprehensive selection of confounding variables relevant to the target-population and study aims (see left) are identified and acknowledged. Attempts to control for these (either through design or statistical analyses) are made and are clearly described. **AA**: A small number of key confounding variables (for example, key demographic factors) are identified and acknowledged. Attempts to control for these (either through design or statistical analyses) are made and are outlined. **PA**: The identification and acknowledgement of confounding factors is extremely limited or not present. A minimal number (i.e. no more than two) of potential confounding factors are controlled for (either through design or statistical analyses). **NA/NR**: Confounding variables are not acknowledged, described or addressed.
4. Interpretation	**WC**: There are clearly described links between the data, its interpretation and conclusions drawn and these are discussed within the context of the existing literature. Limitations of the study, generalisability of results and

	implications are acknowledged and discussed clearly and in detail. **AA**: There is adequate information for readers to be able to understand links between the data and conclusions drawn. There is adequate discussion of limitations, generalsability and study implications. **PA**: There is a lack of clarity regarding how conclusions have been arrived at from the results available. Discussion regarding limitations, generalisablilty and implications of the study is poor. **NA/NR**: Results and conclusions do not appear to be based on the data reported.
5. Sophistication of theoretical model	**WC**: The model tested in the study is theoretically sophisticated. The model is based on explaining, rather than describing, the occurrence of variables and is clearly grounded in and developed from established psychological theory and research. The model demonstrate comprehensive consideration and inclusion of a variety of relevant explanatory variables, covariates and confounders and their interactions. **AA**: The model tested shows adequate theoretical sophistication. The model is based on explaining, rather than describing, the occurrence of variables and it is adequately grounded in existing psychological theory and research. A small number of variables and their interactions are included. **PA**: A basic theoretical model is tested at based on describing, rather than explaining the relationship between variables. **NA/NR**: There is no clear statistical or theoretical model or only descriptive statistics are reported.

Note: CEM= childhood emotional maltreatment; WC = well-covered; AA = adequately addressed; PA = poorly addressed and NA/NR = not addressed/not relevant

3. *Results*

3.1 Study Characteristics

All studies (n=18) reviewed utilised a cross-sectional design. The majority (n=15) of the studies took place in the USA, with the remainder taking place in Italy (n=2) or Italy and France (n=1). 14 of the studies used mixed gender samples, three used male

only samples and one a female only sample. Nine studies used community samples, eight of these were student samples and one recruited from the general population. Six studies used clinical samples, either recruiting from physical healthcare settings (n=1), mental health services (n=3) or substance misuse services (n=2). The remaining three studies recruited from a prison population. The mean sample size was 502.3 and ranged from 100 to 2752. All studies used self-report measures of childhood emotional maltreatment and aggression. Eleven of the reviewed studies examined the relationship between childhood emotional maltreatment and trait-aggression as a primary aim of the study.

As expected, there was some variation in the manner in which trait-aggression was operationalised. Ten studies used a measure of solely behavioural constructs represent trait-aggression; four studies used a combined measure of behavioural and affective constructs; two a combination of behavioural and cognitive constructs and two a combination of behavioural, cognitive and affective constructs. Similarly, there was variation in the operational definition of childhood emotional maltreatment, with regards to age range and perpetrator. Twelve studies required participants to report their experience of childhood emotional maltreatment across childhood and adolescence with no specific age range, two studies used a recall period of 13 years old, two a recall period of 14 years old or under, one study a recall period up until the age of twelve and one study up a recall period up until the age of 15 years old. With regards to perpetrators, nine studies did not specify who the perpetrators of emotional maltreatment were. Five studies asked about maltreatment perpetrated by 'mothers' and 'fathers' separately, with three out of these then totalling these scores and two retaining them as separate scores for analyses. Two studies asked about emotional maltreatment perpetrated by primary maternal, primary paternal and other adult or older adolescent, then combined these scores and the remaining two studies asked about emotional maltreatment perpetrated by non-specified adults and individuals at least five years older than the respondent.

3.2 Study Quality

Quality ratings for each of the 18 included studies can be found in Table 3. Total quality ratings ranged from 13/30 to 28/30. Sampling strategy was the lowest scoring criterion across all studies, followed by sample representativeness and theoretical sophistication of the model investigated. Data analysis was the highest scoring criterion, followed by measure of emotional maltreatment and interpretation of results. The overall quality ratings indicated that, with regards to the systematic review question the study by Chen et al. (2012) was the most methodologically robust. Particular strengths included its use of a large sample size recruited from the general population, good controlling of confounding variables and a relatively sophisticated statistical and theoretical model. This particular study found support for a significant positive correlation between emotional abuse and aggression and a significant positive correlation between emotional neglect and aggression.

3.3 Sampling Strategy

Six studies were rated in the 'not addressed' range as they did not report what sampling strategy was used. Eight studies were rated as 'poorly addressed' as, in these studies, sampling strategies were generally not clearly defined and were not considered to adequately reduce selection bias.

Two studies were rated in the 'well-covered' category. Both studies provided clear descriptions of how the sample was recruited and both were considered to use sampling strategies which were both appropriate to their research design and were likely to increase the likelihood of recruiting a sample representative of their study and target population. The remaining studies (n= 3) were rated as 'adequately addressed'.

3.4 Sample Size

None of the studies reviewed reported a-priori power calculations. Therefore, it was not possible to accurately ascertain whether studies had a sufficient sample size. In

the absence of this information, ratings regarding the suitability of sample size were made based on the information reported, such as the statistical analyses used.

Six studies were rated as ‘well-covered’ with regards to sample size. These studies had sample sizes ranging from 277 to 2752. The sample size of those studies rated ‘adequately addressed’ (n=9) ranged from 236 to 587, whilst the sample size of those studies rated ‘poorly addressed’ (n=3) ranged from 108 to 499.

3.5 Sample Representativeness

In the category of sample representativeness, the majority of studies (n=13) were rated as 'poorly addressed'. For eight studies, this was largely due to the use of undergraduate student samples to represent the general population. Due to homogeneity of demographic characteristics within these samples and in student samples more generally, these were not considered to be adequately representative of the general population. A number of studies which received this rating also provided very limited information regarding the demographic characteristics of their sample, resulting in difficulties establishing their representativeness. Similarly, in a small number of studies it was not sufficiently clear who the target population was, again causing difficulties in assessing sample representativeness. All studies rated 'poorly addressed' also neglected to compare the demographic composition of their sample with the population it was intended to represent. Four studies which used clinical psychiatric samples (either mental health or substance misuse) were rated as 'poorly addressed' and were judged to not fully consider or report common co-morbid psychological or personality disorders. A further issue with the representativeness of clinical samples was that they consisted of those receiving treatment and, therefore, may not have been typical representations of those with similar difficulties in the community.

Two studies rated as 'well-covered' in relation to sample representativeness. These studies recruited from prison populations and differed from the others reviewed in that it provided clear inclusion and exclusion criteria, a detailed description of the

demographic characteristics of the sample as well as taking into consideration and reporting a wide range of additional characteristics relevant to this specific population - including psychiatric diagnoses, substance misuse, education, employment and conviction type. The remaining three studies were considered to 'adequately address' representativeness.

3.6 Measure of Childhood Emotional Maltreatment

Across the study articles reviewed, the information provided regarding the psychometric properties of measures administered was limited. Where this information was not provided it was obtained from the wider literature and ratings were made based on this information.

All studies used self-report measures of childhood emotional maltreatment, with the Childhood Trauma Questionnaire (CTQ) being the single most frequently used measure (n=9). The CTQ has been widely used within the maltreatment literature and good test-retest reliability and high internal consistency have been established (Bernstein et al., 1994). Therefore, studies using this measure were rated as 'well-covered'. Although less widely used than the CTQ, the Comprehensive Childhood Maltreatment Scale (CCMS) and the Exposure to Abusive and Supportive Environments Parenting Inventory (EASE-PI) have also demonstrated robust psychometric properties (Higgins & McCabe, 2001; Nicholas & Bieber, 1991). Thus, the four studies which used these measures were also rated as 'well-covered'. One study used the Lifetime Experiences Questionnaire (LEQ; Gibb et al., 2001) to measure emotional maltreatment. The available literature indicates that this measure has reasonable psychometric properties, so it was rated as 'adequately addressed'. The remaining four studies were rated as 'poorly addressed', primarily due to limited available information regarding the psychometric properties of their measures.

3.7 Measure of Trait-Aggression

The majority of studies (n= 15) were rated in the 'adequately addressed' range for this criterion. These studies used either the Brown-Goodwin Lifetime History of Aggression Questionnaire (BGLHA, n=7), the Buss Durkee Hostility Inventory (BDHI, n=3), the Aggression Questionnaire (AQ, n=3) or the Aggression Scales of the Personality Assessment Inventory (PAI-AGG, n=2). Review of the available literature indicated that overall these measures displayed acceptable psychometric properties with regards their measurement of trait-aggression (Biaggio, Supplee & Curtis, 1981; Buss & Durkee, 1957; Buss & Perry, 1992 Brown, Goodwin, Ballenger, Goyer & Major, 1979; Morey, 1991). The Life History of Aggression used by Chen et al. (2012) was rated as 'well-covered', as it has been indicated to have more robust reliability and validity (Coccaro, Berman, & Kavoussi, 1997). Two studies were rated as 'poorly addressed'. This was because a scale or measure developed by the authors was used and there was sparse information available regarding their validity or reliability.

3.8 Additional Measures

Studies used a range of additional measures depending on their individual aims. Seven studies were rated as 'adequately addressed' with regards to their additional measures, as they used established measures with at least adequate reliability and validity. Four studies were rated as 'well covered' for their use of additional measures using psychometrically robust and established measures. Four studies were rated as 'poorly addressed'. In two of these cases clinical interview or file reviews were used and no information provided regarding inter-rater reliability. In the remaining paper the additional measure consisted of one question formulated specifically for the study, again with no available information regarding psychometric properties. Three studies received a 'not addressed' rating in this category, as they did not use any measures in addition to those use to assess emotional maltreatment and trait-aggression.

3.9 Data analysis

Across studies, data analysis was a relative strength. 12 studies were rated as ‘well-covered’ as they were considered to use appropriate statistical techniques to address their research aims and descriptions of the data analysis were comprehensive. The remaining studies (n=6) were rated as ‘adequately addressed’. These studies used adequate data analysis techniques but reporting lacked the detail that were included in the studies rated ‘well-covered’ (for example, inclusion of effect sizes or confidence intervals).

3.10 Confounding Variables

In this criterion two studies were rated as 'well-covered'. These studies explicitly acknowledged and controlled for a range of confounding factors including demographic variables, psychological factors, maltreatment types and variables commonly associated with aggression and maltreatment. Confounding factors were controlled for through design and statistical analyses.

Six studies were rated as 'poorly addressed'. Five of these studies used clinical or prison populations and were generally rated lower because they were not considered to have sufficiently acknowledged or controlled for common co-morbid psychological or personality disorders, which may have had an impact on their outcome variables. The remaining study (n=1) was rated so because of a general lack of acknowledgement of confounding factors, only controlling for gender and physical abuse.

The remaining studies (n=10) were rated as 'adequately addressed'. In these studies there was some acknowledgement of and attempts to address demographic

confounding factors and all controlled for different abuse types. Some of these studies also addressed co-morbid psychological disorders but were not deemed to have done so to a sufficient extent to be rated as 'well-covered'. The majority used statistical methods to control for confounding factors.

3.11 Interpretation

Interpretation of results was a relative strength of the majority of studies, with 11 studies being rated as 'well-covered', one 'adequately addressed' and five as 'poorly addressed'. The higher scoring papers generally included a fuller interpretation of their results within the context of previous research, acknowledging and discussing limitations, generalisations and clinical or research implications where relevant. The lower scoring papers tended to be more descriptive in nature, lacking in interpretation or were deemed to lack clarity regarding how results and interpretations were linked.

3.12 Model Sophistication

Four studies were rated as 'well-covered' in this category. These studies utilised models of reasonable sophistication, which incorporated a number of different variables and were driven by a clear theoretical framework. These studies tended to examine the causal pathways of relationships involving more than two variables, and used relatively sophisticated means of statistical testing (i.e. hierarchical regression, mediation analysis). Those rated as 'adequately addressed' (n=9) were considered to be less complex or used less sophisticated statistical testing but still looked at explaining mechanisms rather than only relationships. Those rated as 'not addressed ' (n=5) described relationships or characteristics of a group using basic statistical analyses.

3.13 Study Findings: the relationship between emotional maltreatment and aggression

13 of the included studies which measured the relationship between CEA and adulthood aggression (n=17) found a statistically significant positive relationship between childhood emotional abuse and adulthood aggression. An additional two studies reported statistical significance between group differences between those who had experienced low levels of emotional abuse compared to those who had experienced high levels (i.e. those who had experienced higher levels of abuse, also reported higher levels of adulthood aggression). It was possible to establish effect sizes for twelve of these studies. Based on Cohen's (1988) benchmarks for magnitude of effect sizes: two studies indicated a small effect size for the relationship between emotional abuse and adulthood aggression (Chen et al., 2012; Morimoto & Sharma, 2004); eight reported medium effect sizes (Allen, 2011; Allen, Cramer, Harris & Rufino, 2012; Carli et al., 2014; Garno, Gunawardane & Goldberg, 2008; Roy, 2009; Roy & Janal 2007; Sarchiapone, Carli, Cuomo & Roy, 2007; Sarchiapone, Carli, Cuomo, Marchetti, et al., 2007). One study (Degue, DiLillo & Scalora. 2010) found a statistically significant negative relationship between childhood emotional abuse and adulthood aggression (i.e. higher levels of emotional abuse were associated with lower levels of aggression) with a medium effect size. Briere and Runtz (1990) found no significant relationship between emotional abuse and aggression.

Three studies reported mixed findings. Morimoto and Sharma (2004) found significant positive associations between emotional abuse and aggression for females in their sample, with a small effect size but did not find a statistically significant relationship between these variables for males. Nicholas and Rasmussan (2006) found that for females paternal emotional abuse significantly predicted aggression, however, maternal emotional abuse did not. For males, the authors found no significant relationship between maternal or paternal abuse and subsequent aggression levels. Sarchiapone et al. (2009) found medium effect sizes in two of their groups (Italian suicide attempters and Italian psychiatric controls) and a small effect

size in one group (French suicide attempters).

Fewer studies (n= 9) measured the relationship between childhood emotional neglect and trait-aggression. Of the studies that did, five found a statistically significant positive relationship between emotional neglect and aggression. Within these studies, four had a small effect size (Carli et al., 2014; Chen et al., 2012; Garno et al., 2013; Roy, 2009) and one a medium effect size (Roy & Janal, 2007). Sarchiapone et al. (2009) again reported mixed findings with regards to emotional neglect, reporting a significant negative relationships, with small effect sizes in Italian suicide attempters and psychiatric controls and no significant relationship for French Suicide attempters. They also reported that, in analyses of females, there were no significant relationships between emotional neglect and aggression in any of the three groups. In males they reported no significant relationship in Italian suicide attempters or French suicide attempters but a significant negative relationship for Italian psychiatric controls with a medium effect size. Degue et al. (2010) also found a statistically significant negative correlation relationship between emotional neglect and aggression, with a medium effect size. Additionally, one study found no statistically significant relationship between CEN and trait-aggression (Sarchiapone, Carli et al. 2009; Sarchiapone et al., 2007).

Only one study (Crawford & Wright, 2007) used a combined emotional maltreatment score, comprising emotional abuse and neglect. This study found that in a regression model emotional maltreatment accounted for 2.1% of the variance in aggression (a small effect size), while in their mediation model it accounted for 9.8% of the variance (also a small effect size).

3.14 Influence of additional variables

A number of studies used models which aimed to explain the relationship between emotional maltreatment and aggression in terms of their interaction with other variables. In a number of cases, these models indicated that emotional maltreatment was associated with increased levels of adulthood aggression through the partial or

full mediating or moderating effects of other variables. Variables which these models indicated to mediate or moderate the relationship between the emotional maltreatment and aggression included: affective symptoms, a tendency for negative emotional response, hostile interpretation bias, self-capacities, family dysfunction, and schemas related to a lack of trust, lack of self-control, difficulties inhibiting affect and a sense of entitlement. Only one study examined which moderating variables were associated with decreased levels of adulthood aggression - these included an individual's coping skills and increased family cohesion.

Table 3: Ratings of study quality

Study	Quality Criterion										
	1	1.1	1.2	2	2.1	2.2	3	3.1	4	5	Study Total
Allen (2011)	PA	AA	PA	WC	AA	WC	WC	AA	WC	WC	**23**
Allen et al. (2013)	PA	AA	PA	WC	AA	WC	WC	AA	WC	WC	**23**
Briere & Runtz (1990)	PA	WC	PA	PA	PA	PA	AA	AA	PA	PA	**14**
Carli et al. (2013)	WC	WC	WC	WC	AA	AA	WC	AA	WC	AA	**26**
Chen et al. (2012)	WC	WC	AA	WC	WC	AA	WC	WC	WC	WC	**28**
Crawford & Wright (2007)	PA	WC	PA	AA	WC	WC	WC	AA	WC	WC	**24**
Degue et al. (2010)	AA	AA	AA	WC	WC	AA	WC	AA	WC	AA	**24**
Garno et al. (2013)	PA	AA	AA	WC	AA	AA	AA	PA	WC	AA	**20**
Hoglund & Nicholas (1995)	NA	WC	PA	PA	AA	AA	AA	AA	WC	AA	**18**

Morimoto & Sharma (2004)	PA	AA	PA	PA	WC	WC	WC	AA	WC	AA	**21**
Nicholas & Beiber (1996)	NA	AA	PA	WC	AA	NA	AA	PA	WC	AA	**16**
Nicholas & Rasmussan (2006)	PA	AA	PA	WC	AA	AA	WC	WC	WC	AA	**21**
Roy (2009)	NA	PA	PA	WC	AA	PA	WC	PA	PA	PA	**14**
Roy & Janal (2007)	NA	PA	PA	WC	AA	PA	WC	PA	PA	PA	**14**
Sansone et al. (2012)	AA	AA	PA	PA	PA	NA	WC	AA	AA	AA	**16**
Sarchiapone, Carli, Cuomo & Roy (2007)	PA	PA	PA	WC	AA	AA	WC	PA	PA	PA	**16**
Sarchiapone, Carli, Cuomo, Marchetti et al. (2007)	AA	WC	WC	WC	AA	PA	AA	AA	AA	AA	**22**
Sarchiapone, Jaussent et al. (2009)	NA	AA	PA	WC	AA	NA	AA	PA	PA	PA	**13**
Criterion total	18	37	24	36	36	30	46	31	41	34	-

4. Discussion

4.1 Summary of Findings

This systematic review aimed to better understand the nature and strength of the relationship between childhood emotional maltreatment and adulthood aggression. As reported, a number of studies have investigated this relationship with mixed findings. The majority of studies reviewed found there to be a positive association between childhood emotional abuse, childhood emotional neglect or combined measure of emotional maltreatment and adulthood aggression. However, this was not consistent across studies with some reporting mixed findings, one study reporting a negative association between the two variables and others reporting no significant relationship. Effect sizes also varied between studies, ranging from small to medium.

There does not appear to be a clear or consistent pattern of differences between papers which found significant positive relationships and those which reported different findings (either in terms of population studied, research design or methodological strengths and limitations). A small number of studies reported differences between genders and nationalities but other studies of similar or greater methodological quality did not replicate these findings, therefore, it is not possible to draw any firm conclusions from these findings. There also does not appear to be any clear or consistent pattern which may explain the differences in effect sizes between studies. Thus, variation in findings may be a result of methodological inconsistencies between individual studies, such as sample size or measures used to assess the variables of interest.

Additionally, despite there being reasonable evidence to indicate that emotional maltreatment is positively associated with aggression, in a number of studies emotional maltreatment did not continue to independently predict aggression when included in regression, mediation and moderation models. This indicates that the relationship between emotional maltreatment and aggression may be more complex

than one of direct cause and effect and that other variables may be involved in this process. However, due to the heterogeneity between studies which examined causal pathways it was not possible to systematically review the effect of these additional variables.

4.2 Limitations of reviewed research

Despite indication that emotional maltreatment in childhood is related to increased levels of trait-aggression in adulthood, results need to be interpreted within the context of the studies methodological limitations. As outlined, the most common methodological limitations related to sampling strategy, sample representativeness and the sophistication of theoretical and statistical models.

It is likely that the poor quality of sampling strategies used across studies lead to selection biases, which in turn led to the generally weak representativeness of samples. Such weaknesses may result in findings with limited generalisability, a limitation which was acknowledged in most of the studies. The use of undergraduate student samples was particularly prominent in the reviewed studies. Using student samples has many practical benefits. However, the use of student samples has been criticised for a number of reasons. It has been hypothesised that outcomes from studies using student samples may not be representative of the wider population (Peterson, 2001) and, as illustrated in the studies reviewed, student samples tend to be demographically homogeneous. Thus, they do not tend to be representative of the more diverse general population in most cases and this may negatively impact on external validity. Sears (1986; 2008) proposed that another limitation of using student samples is that, due to their life stage, their attitudes are not yet stable and may be variable or contradictory. This may be relevant to studying traits such as aggression, which may be influenced by attitudes. Additionally, it has been found that younger adults may report higher levels of emotional maltreatment than older participants (Baker & Festinger, 2011). Again it has been hypothesised that these differences may be a result of the developmental stage of younger adults, who may view their parent's behaviours more critically as a means of facilitating their move

toward independence. Given that student samples are largely made up of younger adults, this too may bias results and reduce their representativeness.

The theoretical and statistical sophistication of models used within the reviewed studies was also a relative weakness. Whilst identifying associations between variables and potential risks for later difficulties is of benefit, a more comprehensive understanding of the causal processes between variables is essential. The use of more sophisticated and comprehensive theoretical and statistical models has been identified as being valuable in both increasing our theoretical knowledge about such processes but also in more effectively addressing such difficulties through the development and application of appropriate clinical intervention (Mackinnon & Luecken, 2010).

The majority of authors acknowledged that a limitation of their study was their reliance on self-report retrospective measures to assess childhood maltreatment. Some have proposed that the reliability of such measures might be compromised by difficulty recalling childhood events and inaccurate representations or interpretations of these (Baker & Festinger, 2011). Due to their retrospective nature, it is also logistically difficult to establish the accuracy of individual's ratings of their experience. However, a high degree of consistency between sibling reports of maltreatment has been reported on retrospective measures, providing some indication of their reliability (Bifulco, Brown, Lillie, & Jarvis, 1997).

The use of cross-sectional research means that it is not possible to infer causality between the variables of interest. There are a number of methodological reasons why prospective longitudinal studies are generally not possible in research regarding childhood maltreatment. One reason is that severe childhood maltreatment is frequently not reported or does not become apparent during the period it occurs. Therefore, it would be difficult to identify and recruit participants for longitudinal research in this area. There are also ethical issues surrounding studying such a vulnerable group as maltreated children that limit opportunity for longitudinal research. Thus, although there are some limitations to cross-sectional research design

in this area, the use of cross-sectional research is likely to provide the most practical and ethical opportunity to study these issues.

The reviewed research also failed to fully acknowledge the topic of emotional neglect. Although the outcomes between emotionally abusive and neglectful behaviours may be similar (i.e. both may be associated with aggression), the nature and strength of this relationship and the mechanisms by which it arises may differ. For example, it has been proposed that emotional neglect is more likely to result in aggression through its influence on emotion regulation skills; whilst emotional abuse may do so through its impact on vigilance to social threat (Lee & Hoaken, 2007).

A further limitation of the reviewed research was the lack of cross-study congruence in the operational definitions and subsequent measurement of both childhood emotional maltreatment and trait-aggression. This inconsistency limits the potential for studies to be compared, their findings integrated and wider generalisations to be made.

4.3 Limitations of systematic review

This review itself also has limitations which may have influenced its findings. Studies were limited to those in the English language. It is possible that relevant literature in other languages exists but was not identified, therefore, the review may not be entirely comprehensive. Additionally, the quality criteria used to evaluate studies was designed specifically for this review. Consequently, it has not undergone any standardisation or psychometric evaluation. A review of systematic review rating tools by Jarde et al. (2012) identified that the use of non-standardised poorly developed tools to review study quality is a limitation of most systematic reviews of observational studies. The authors point out that if the tools used are inadequate at accurately assessing methodological quality, then the findings of systematic reviews are also likely to be unreliable. In the case of this paper, efforts were made to address such issues by consulting tools which were highlighted as being of a more robust quality and by consulting STROBE guidelines.

4.4 Implications for future research

The outcomes of this review indicate that future research regarding the relationship between childhood emotional maltreatment may benefit from addressing some of the sampling and representation issues detailed here. As highlighted, further research in this area would also benefit from agreed operational definitions of both childhood emotional maltreatment and trait-aggression. The defining and measurement of trait-aggression and the dimensions which comprise it, in particular, may benefit from further research to both advance understanding of this construct as well as to improve the reliability and consistency of future research in this area. Although a small number of studies examined clinical or prison populations, the populations studied tended to be diverse resulting in difficulties comparing conclusions about these particular populations beyond the sample. It may be that levels of the variables of interest differ in these populations and that further more methodologically robust research with these populations may assist in increasing understanding of this topic. As identified, it may also be of value to further examine the long-term impacts of emotional neglect separate to those of abuse, both in relation to aggression and to other long-term outcomes. To date, relatively few studies have explored the relationship between childhood emotional maltreatment and trait-aggression as a primary aim and the evidence base would benefit from further research focussed specifically on this relationship. In relation to this, the literature regarding the causal pathways by which emotional maltreatment may lead to aggression and other variables relevant to this relationship is also limited. Variables indicated within this review to be of potential relevance include those related to family functioning, individual cognitive variables particularly related to interpersonal functioning and those related to the experience and management of emotions. Future research may benefit from further developing and testing these models.

4.5 Conclusion

This review aimed to examine the relationship between childhood emotional maltreatment and adulthood aggression. Findings indicate that emotional maltreatment in childhood is associated with increased levels of aggression in adulthood. However, the literature base is still relatively small and there are a number of methodological limitations within it. Additionally, research regarding the causal pathways which may contribute to this process is in its infancy. Future focus and research in this area may lead to an increased understanding of these theoretical issues but also to the development of more effective identification of such difficulties and more effective and targeted clinical intervention.

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Childhood emotional maltreatment and adulthood trait-aggression: The mediating roles of hostile attribution bias and emotional regulation.[2]

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Abstract

The present study examined whether hostile attribution bias and emotion regulation mediated the relationship between childhood emotional maltreatment and adulthood trait-aggression. 42 men were recruited from British forensic mental health services. Participants completed measures of childhood maltreatment, hostile attribution bias, emotion regulation and aggression. Additionally staff were asked to complete a measure of observer-rated aggression for each participant. Mediation analyses were conducted to explore the proposed model. Results indicated that emotion regulations had a significant indirect effect on the relationship between emotional abuse and self-reported aggression but not between emotional neglect and self-reported aggression. No statistically significant results were found regarding the mediating or indirect effect of hostile attribution bias between either emotional abuse or emotional neglect and aggression. Additionally, no significant effects were detected using the staff-rated measure of aggression. Findings support previous research which has found emotion regulation to mediate the relationship between emotional abuse and self-reported aggression. The findings regarding hostile attribution bias differ somewhat from previous findings in that this construct was not found to be significantly associated with emotional maltreatment. Replication of this study using a larger sample may be of benefit. Additionally further research regarding the pathways from emotional maltreatment, particularly emotional neglect, to trait-aggression is necessary. The findings indicate that the effects of emotional maltreatment should be taken into consideration when assessing people who display difficulties with aggression. Additionally, it may be of benefit for interventions for those who display aggression and have experienced emotional abuse to target emotion regulation difficulties.

***Key Words**:* Childhood emotional abuse; Childhood emotional neglect; Hostile attribution bias; Emotion regulation; Aggression; Mentally disordered offenders

Introduction

Childhood emotional abuse (CEA) has been defined as verbalisations or other non-contact behaviours directed toward a child by an individual older than them which are devaluing, degrading or threatening in nature; while childhood emotional neglect (CEN) has been defined as the failure of caregivers to meet a child's fundamental emotional and psychological requirements, for example by not providing positive, supportive, nurturing or loving interactions (Bernstein & Fink, 1998). For the purpose of this paper, the term childhood emotional maltreatment (CEM) refers to the combined experience of both CEA and CEN. CEM has been found to be positively associated with a range of adverse outcomes in adulthood, including low self-esteem, lack of perceived interpersonal support, personality disorders, mood disorders and anxiety disorders (Bilfulco, Moran, Baines, Bunn, & Stanford, 2002; Etain et al., 2010; Festinger & Baker, 2010; Johnson et al., 2001; Spertus, Yehuda, Wong, Haligan &, Seremetis, 2003; Wright, Crawford & Del Castillo, 2009).

Trait-aggression refers to the relatively stable, personality-level tendency for an individual to behave in a physically and/or verbally aggressive manner. Whilst the behavioural element of trait-aggression is crucial to its definition, researchers have proposed that it is underpinned by associated tendencies to experience cognitions related to hostility and to feel and express anger (Rippon, 2000). Thus, the current study considers trait-aggression in line with Buss and Perry's (1999) theoretical definition as the combined tendencies to engage in aggressive behaviour, to experience anger and to experience cognitions related to or supportive of aggressive behaviour. Trait-aggression may be one particularly damaging adulthood outcome of CEM and a positive relationship between CEM and adulthood trait-aggression has been demonstrated in community (Allen, 2011; Allen, Cramer, Harris, & Rufino, 2013, Chen, Coccaro, Lee, & Jacobson, 2012), clinical psychiatric (Garno, Gunawardane, & Goldberg, 2008; Roy, 2009; Roy & Janal, 2007; Sarchiapone, Carli,

Cuomo, & Roy, 2007) and forensic (Carli et al., 2014; Sarchiapone et al., 2009) populations.

Despite research demonstrating an association between CEM and trait-aggression, our understanding of why this relationship exists is limited. To date, studies have been largely descriptive with few researchers examining the causal pathways by which CEM may lead to trait-aggression. However, researchers who have examined these processes have identified a small number of potential mediating and moderating variables. Allen (2011) found that emotion regulation, disturbances of identity and difficulties relating to others mediated the relationship between childhood emotional abuse (CEA) and adulthood aggression. Crawford and Wright (2007) found that negative internal working models related to distrust, entitlement, inadequate self-control and affect inhibition partially mediated the relationship between CEM and aggression. Morimoto and Sharma (2004) reported that adaptive social skills and levels of family cohesiveness moderated the relationship between CEA and aggression, with those reporting higher levels of adaptive coping skills and family cohesiveness displaying lower levels of aggression. In a large scale community based study, Chen et al. (2012) found that levels of CEA strengthened the association between hostile attribution bias and aggression, for those who reported low and moderate levels of CEA but not those who reported high levels. Similarly, they found that CEA and childhood emotional neglect (CEN) strengthened the relationship between negative affect and aggression. These studies provide some preliminary evidence about possible mediating and moderating variables in the relationship between CEM and aggression. In particular they indicate the value of investigating constructs related to emotion regulation and social cognition.

Greater difficulties with emotion regulation have been reported in those who have experienced CEM (Goldsmith & Freyd, 2005; Gratz, Bornovalova, Delany-Brumsey, Nick & Lejeuz, 2007). Gratz and Roemer (2004) described emotion regulation as being a multi-dimensional construct combining an individual's capacity to: recognise, comprehend and accept their own emotions; engage in goal-oriented and functional behaviour when experiencing negative emotional states, to engage in

effective emotion regulation strategies and adaptive responses to negative emotions. Theories regarding the cause of the relationship between CEM and aggression tend to focus on the influence of early attachment relationships. Positive and stable early attachment relationships have been posited as being of central importance in the development of adaptive emotion regulation skills, through processes such as care-giver co-regulation, comforting and validation of affect and modelling, teaching and reinforcement (Cole, Dennis, Smith-Simon & Cohen, 2009; Leerkes, Blankson & O'Brien, 2009; Mikulincer, Shaver, & Pereg 2003). CEM is thought to be related to patterns of insecure attachment (Egeland, Sroufe & Erickson, 1983; Lyons-Ruth, Melnick, Bronfman, Sherry, & Llanas, 2004). Due to a lack of positive and nurturing interactions with the caregiver, children who experience CEM may have limited opportunities to develop adaptive emotion regulation skills. Additionally, children who are exposed to CEM are likely to experience heightened levels of distress, which they may be unable to process without caregiver support. This could result in a state of constant emotional arousal, which may further disrupt the development of emotion regulation skills, resulting in chronic difficulties self-regulating affect (Lyons-Ruth et al., 2004).

The majority of the existing literature regarding emotion regulation and aggression focuses on difficulties in regulating anger (Roberton, Daffern & Bucks, 2012). Whilst it is widely hypothesised that difficulties regulating anger are associated with aggression, there are relatively few studies examining this relationship in adults. However, support for this hypothesis may be found in the large number of studies which have found increased aggressive behaviour to be associated with greater levels of anger (Cornell, Peterson, & Richards, 1999; Fives, Kong, Fuller, & DiGiuseppe, 2011; Robinson & Wilkowski, 2010). Fewer studies still have examined the relationship between difficulties regulating emotions other than anger and aggression in adults, although a greater number of studies have demonstrated a relationship between the two constructs in children (Cohn, Jakupcak, Seibert, Hildebrandt, & Zeichner, 2010; McLaughlin, Hatzenbuehler, Mennin, & Nolen-Hoeksema, 2011; Roll, Koglin, & Petermann, 2012). With regard to the adult population, Tull, Jakupcak, Paulson and Gratz (2007) found that difficulties expressing emotion and

attempts to escape uncomfortable cognitions and affect were associated with higher levels of aggression in males. This continued to be the case even once the effects of trait-anger had been controlled for. These findings suggest that the primary difficulty for those who display aggression may be regulation of emotion rather than the experience of anger itself. Similar results have been found in forensic samples, where individuals may be expected to display more frequent and severe aggression (Roberton et al., 2014; Tager, Good, & Brammer, 2010).

Explanations for the relationship between emotion regulation and aggression largely centre on the premise that aggression is a maladaptive strategy used to regulate unpleasant emotions (Roberton et al., 2012). Thus, in the absence of adaptive emotion regulation skills, individuals may try to escape, get rid of or resolve unpleasant emotions by using aggression. Support for such theories is demonstrated by an empirical study which found that individuals who believed engaging in aggression in response to anger-provoking stimulus would reduce their anger, were at increased likelihood of reacting to provocation with aggression (Bushman, Baumeister, & Phillips 2001). In this way, the use of aggression may be viewed as a means of regulating emotions through externalising uncomfortable internal states.

Taking into consideration its demonstrated relationship with both CEM and trait-aggression, it is proposed that emotion regulation may mediate the relationship between these two variables. This mediatory relationship has previously been demonstrated in undergraduate students (Allen, 2011). Crawford and Wright's (2007) finding that the schema of inadequate self-control partially mediated the relationship between CEM and aggression may also provide support for this theory; as this schema represents an individual's poor estimation of their own capacity to manage feelings of frustration, which may be closely related to emotion regulation abilities.

Hostile attribution bias (HAB) is defined as a tendency for individuals to interpret hostile intent in others behaviours in ambiguous interpersonal interactions (Dodge, 2006). HAB is thought to be underpinned by a range of cognitive errors, socio-cognitive scripts and schemas biased towards detecting and interpreting interpersonal threat and, as such, is believed to be relatively stable and likely to generalise across a range of interpersonal scenarios and relationships (Dodge, 1993). Understanding of the relationship between CEM and HAB in adulthood is limited, as the empirical literature predominantly involves child samples and prioritises the study of the relationship between childhood physical abuse and attributional biases (Luke & Banarjee, 2013). Nonetheless, significant positive correlations between CEA and HAB have been reported in both a community sample and in a sample of men enrolled in an intervention programme for perpetrators of intimate partner violence and a weaker but significant positive correlation reported between CEN and HAB (Chen et al., 2012; Jin, Eagle & Keat, 2008). Thus, there is some empirical evidence which indicates that CEM may predict later aggression but this evidence is limited so should be interpreted with caution.

Again, much of the research regarding the relationship between HAB and aggression uses child and adolescent samples. This literature primarily reports a significant relationship between HAB and aggression but it's generalisability to adults is not clear (De Castro, Veerman, Koope, Bosch, & Monshuwer, 2002). A number of studies have identified a relationship between violence and HAB in university students (Epps & Kendall, 1995), forensic populations (James & Seager, 2006) and adults receiving inpatient psychiatric care (McNiel, Eisner, & Binder, 2003; Waldheter, Jones, Johnson, & Penn, 2005). However, these studies do not take into account non-physical forms of aggression. Where studies have involved adult samples, they have found that those who report higher levels of HAB also report higher levels of aggression (Chen et al., 2012; Coccaro, Noblett, & McCloskey, 2009). This relationship has also been supported by findings from a small number of experimental studies using samples of adults who have offended (Copello & Tata, 1990; Smith & Waterman, 2003, 2004). For example, Smith and Waterman (2003, 2004) found that in both individuals who had committed violent offences and a

control group of students, those with higher levels of trait-aggression were more likely to attend to words relating to aggression. In a study using self-report measures, Lim, Day, & Casey (2010) found that those who had committed violent offences were more likely to evaluate ambiguous interpersonal situations as being threatening and to react in an aggressive manner, when compared with those who had committed other types of offence.

Once more, attachment theory is significant in explaining how CEM, HAB and aggression may be related. It has been posited that through early attachment relationship the child develops a schematic representation of how others will behave toward them (Bowlby, 1982). These schemas are likely to influence the manner in which future social information is interpreted. Crick and Dodge's (1994) model of social information processing (SIP) proposes six consecutive phases by which the interpretation of social information occurs: encoding, attribution, identification of objectives, production of potential responses, appraisal of potential responses and performing a response. Through early repeated exposure to abusive or rejecting social interactions, as may be the case in CEM, a belief that interactions with others presents a threat is reinforced. Consequently, a dysfunction may develop at the attribution stage of SIP, causing the child to become hyper-vigilant to signs of interpersonal threat and to anticipate this as a protective mechanism (Crick, & Dodge, 1994; Dodge, 2003). This may, in turn, lead to an increased likelihood of aggressive responding as a means of defence against perceived interpersonal threat.

Previous research has, therefore, indicated potential associations between the variables of CEM, HAB, emotion regulation and trait-aggression. However, these variables have not previously been examined within the same theoretical model. The importance of including both cognitive and affective variables in models explaining aggression was highlighted by Riggs (2010), who proposed a conceptual model to explain the pathways by which CEA may lead to aggression. Rigg's model proposes that CEA may influence the development of insecure attachment patterns, contributing toward future difficulties regulating emotions and the development of

maladaptive schemas - including the development of cognitive biases, such as HAB. These difficulties then contribute toward the development and maintenance of dysfunctional coping strategies. As the child develops, these schemas and coping strategies disrupt their interpersonal functioning, which subsequently lead to a range of difficulties in adult relationships, including possible interpersonal aggression.

The empirical literature in this area is limited by a number of factors. The majority of studies investigating these variables in adults involve student samples. Results from such studies may be limited in their generalisability, particularly to clinical populations and it students may be expected to display lower levels of the variables of interest. Previous research in this field has largely neglected to take into account forensic mental health populations. However, studies have found that forensic mental health participants may score higher on measures of hostile attribution bias than community samples (Coccarro et al., 2009; Edwards & Bond, 2012) and experience more difficulties with emotion regulation (Hornsveld & Kraaimaat, 2012). Although the vast majority of individuals with severe and enduring mental health difficulties do not display aggression, studies have found that the presence of psychotic illnesses (commonly experienced by people receiving treatment in forensic mental health services) may increase risk of aggression, particularly physical aggression (Volavka, 2014). Therefore, research in this area may be particularly beneficial in assisting to explain why some individuals with mental health problems may be at increased risk of behaving aggressively. Furthermore, although previous studies have not investigated prevalence rates of CEM in forensic mental health populations, studies have found a statistically significant relationship between CEA and psychotic symptoms in both clinical and non-clinical populations (Ackner, Skeate, Patterson, & Neal, 2013). Therefore, the variables of interest may be of particular relevance to this group.

An additional limitation of the current literature is its neglect to take into account the long-term effects of CEM. Yet, it has been proposed that – in addition to occurring alone - CEM is likely to underlie most types of abuse and neglect and may, therefore,

be the most prevalent type of maltreatment (Claussen & Crittenden, 1991). Additionally, some studies have found CEM to be more predictive of future negative outcomes than other abuse types (Kaplan et al., 1999). As such, CEM is thought to be both prevalent and destructive and, for these reasons, it is particularly important that we continue to further our understanding of it. Studies have also failed to take into account the individual effects of CEN, with most either including a global measure of CEM or only examining the effects of CEA. However, it has been proposed that the pathways by which CEA and CEN may lead to aggression may differ. It may, therefore, be of benefit to examine the individual impact of both CEA and CEN (Shaffer, Yates, & Egeland, 2009).

To the author's knowledge, no study to date has comprehensively investigated the mediating roles of both emotion regulation deficits and HAB on the relationship between CEM and trait-aggression within the same model. Therefore, the primary aim of the current study is to test the proposed model in an attempt to further understand the causal pathways by which CEM may lead to aggression. Further to this, the study aims to address gaps in the existing literature by investigating these variables using a forensic mental health sample and by examining the individual effects of both CEA and CEN.

Methodology

Power

The proposed method of analysis – the bias corrected bootstrapping approach – does not necessitate a specific sample size. However, with this method, the reliability of the confidence intervals produced is expected to increase with sample size; therefore, larger sample sizes are advised to increase the likelihood of data being representative of the target population and to increase the reliability of findings (Hayes, 2013). The required sample size was estimated in accordance with recommendations for sample

sizes required for detecting mediation effects (Fritz & MacKinnon, 2007). Medium effect sizes were considered likely to be obtained, as medium effect sizes had been found in previous studies in this area (Berzenski & Yates, 2010; Jin et al., 2008; Sarchiapone et al., 2009; Simourd & Mamuza, 2000; Roy, 2009). It was estimated that with a medium effect size (r=.3), to achieve a power of 0.8, a sample size of 71 would be required. Forty-two participants were recruited. Therefore, power was not met.

Participants

Participants were men recruited from medium secure, low secure and community forensic mental health services across two health boards. Participants were eligible for inclusion if they were male, aged 18 and over, were deemed by qualified staff to have capacity to consent and sufficient cognitive ability to understand and cognitively process study related information. Exclusion criteria were a lack of English proficiency, learning disability or brain injury of a nature which would impair ability to cognitively process study related information or provide consent. Participants were also excluded if they were acutely psychotic or distressed, either at the time of recruitment or at the time of data collection. Additionally, members of staff were requested to complete one questionnaire regarding each patient participant. Inclusion criteria for staff were that they had had regular clinical contact in the previous six weeks with the relevant participant.

The mean age of participants was 42 years (SD 12.4, range 19 - 67). 38.1% (n= 16) of the total sample were recruited from community forensic mental health teams, 35.7% (n= 15) were recruited from medium secure wards and 26.3% (n= 11) were recruited from low secure wards. Reported primary diagnoses consisted of schizophrenia (25.5%, n = 25), bipolar affective disorder (19%, n = 8), not disclosed (9.5%, n= 4), personality disorder not otherwise specified (4.8%, n = 2) schizo-

affective disorder (2.4%, n = 1), psychosis not otherwise specified (2.4%, n = 1) and delusional disorder (2.4%, n = 1).

Design

The study used a cross-sectional design. Four questionnaires were administered to participants to measure: childhood emotional maltreatment, emotion regulation difficulties, hostile attribution bias and trait-aggression. Staff participants also completed one observer report questionnaire regarding each participant's levels of aggression.

Measures

Demographic Information

Participant demographic information was collected using a covering sheet compiled by the researcher and included age, primary psychiatric diagnosis, ethnic group and the level of service participants were receiving treatment in (i.e. community, low secure or medium secure).

Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998)

For the purpose of this study, CEA and CEN were operationalised through use of the emotional abuse and emotional neglect subscales of the Childhood Trauma Questionnaire (CTQ). The CTQ is a self-report measure of childhood maltreatment, which consists of 28 items related to emotional abuse, emotional neglect, physical abuse, physical neglect and sexual abuse, which are rated with regards to their presence and frequency on a five-point Likert scale (ranging from ‘never true’ to

'very often true'). The CTQ can be scored to provide totals for each of the five subscales (consisting of five items each) or a total maltreatment score consisting of sum of the responses of all subscales. In addition, the measure includes three items to assess minimising or denying response styles. Bernstein and Fink (1998) provide cut-off scores for the CTQ, which categorise each maltreatment type as either: 'None (or Minimal)', Low (to Moderate), Moderate (to Severe) or Severe (to Extreme). Subscale and total scores can also be considered on a continuum.

Accordingly, CEA was operationalised as participant's retrospective self-report of the presence and frequency of verbal assaults directed towards them by adult family members, their perception that adult family members held negative thoughts or feelings toward them and their own belief that they had experienced CEA. CEN was operationalised as whether and to what extent participants perceived family members provided protection and support, were emotionally available to them and valued them. Higher scores on the subscales represented higher levels of CEA or CEN. The frequency of emotionally abusive and emotionally neglectful behaviours were considered during childhood and adolescence up until the age of sixteen years old. As the present study was concerned with the continua of the relationships between the four variables of interest, the continuous scores derived from the emotional abuse and emotional neglect sub-scales were used for the purpose of analyses. The continuous scores from the remaining subscales were also included as covariates and the minimisation and denial items used to assess levels of under-reporting.

Good test-retest reliability and high internal consistency have been established for the CTQ (Bernstein et al., 1994). Cronbach's alpha coefficients in the current study were .86 for the emotional abuse subscale, .85 for the emotional neglect subscale, .87 for the physical abuse subscale, .66 for the physical neglect subscale and .94 for the sexual abuse subscale.

The Hostile Interpretations Questionnaire (HIQ; Mamuza & Simourd, 1997)

Hostile attribution bias was operationalised and measured through the HIQ. The HIQ consists of seven short descriptions of emotionally ambiguous social scenarios, involving a fictional character. Respondents are required to answer five questions regarding each scenario, responding on a five point Likert scale. The measure can be scored in a variety of ways. It can be scored to provide a measure representing the level of hostile attribution in specific interpersonal scenarios - including interactions with family or intimate partners, authority figures, strangers, work colleagues and friends. The measure can also be scored to provide a measure of four individual dimensions of HAB: 'overgeneralization', 'attribution of hostility, 'hostile reaction' and 'external blame'. Overgeneralization measures the extent to which the respondent interprets pervasive hostility in social situations based on limited information; attribution of hostility refers to the level of hostile intent they ascribe to others with which they interact across the range of interpersonal scenarios; hostile reaction measures the individuals perceived probability that they would respond with hostility to an interpersonal situation which they interpreted as hostile and external blame measures the extent to which the respondent would hold the other party responsible for their own hostile response. These four subscales can be summed to provide a total score, representing the individual's level of HAB.

This current study used the HIQ total score. Thus, HAB was operationalised as a combination of: the degree to which the participant was likely to overgeneralise hostile intent, the amount of hostile intent they were likely perceive, the likelihood that they would respond in a hostile manner to perceived interpersonal threat and the degree to which they would attribute their own hostile response to other parties involved in the interaction. Participant's level of HAB were considered on a continuum, with higher total scores representing greater levels of HAB.

The HIQ has been indicated to have acceptable construct validity and internal consistency (Simourd & Mamuza, 1997). This measure benefits from being developed for, and trialled with, individuals who have violently offended (Mamuza & Simourd, 2000). The authors state that the measure is less transparent than other measures assessing similar constructs – which may make it less vulnerable to the effects of social desirability. Cronbach's alpha coefficient in the current study was .93 for the HIQ total score.

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)

The DERS is a self-report questionnaire, comprised of 36 items which measure ability to regulate emotions and are based on the previously outlined theoretical definition of emotion regulation provided by Gratz and Roemer (2004). The measure includes six subscales relating to individual components of emotion regulation: 'non-acceptance of emotional response' (NONACCEPT), 'difficulties engaging in goal directed behaviours' (GOALS), 'impulse control difficulties (IMPULSE), 'lack of emotional awareness' (AWARE), 'limited access to emotion regulation strategies (STRATEGIES)' and 'lack of emotional clarity' (CLARITY). Responses are made on a five-point Likert scale ranging from 'almost never' to 'almost always.

In line with DERS, the current study operationalised emotion regulation as the overall amount of time (with no specified recall period) that the participant felt that they did or did not experience critical thoughts toward themselves for experiencing negative emotions (NONACCEPT); have difficulties attending to work or being productive when experiencing negative emotions; (GOALS), have difficulties maintaining control of their emotions and behavior's when experiencing negative emotions (IMPULSE); have difficulties attending to and acknowledging their emotions (AWARE); have difficulties recognizing and interpreting their emotions (CLARITY) and their perception of their own abilities to effectively manage or

resolve negative emotions (STRATEGIES). Scores on these scales were summed to provide a continuous score of overall emotion regulation difficulties, with greater scores representing greater impairments in emotion regulation abilities.

Adequate predictive validity and construct validity, good test-retest reliability and high internal consistency have been demonstrated (Gratz & Roemer, 2004). For the purpose of this study the continuous total regulation score was used in analyses. Cronbach's alpha coefficient in the current study was .92 for the DERS total score.

The Buss-Perry Aggression Questionnaire – Short Form (BPAQ-SF; Bryant & Smith, 2001)

Trait-aggression was measured using the BPAQ-SF. The BPAQ-SF is a 12 item, self-report measure, which measures four individual elements of trait-aggression using three-item subscales of physical aggression, verbal aggression, anger and hostility, as well as providing a total trait-aggression score combining these elements. Responses are given on a five point Likert scale, ranging from 'extremely characteristic' of me to 'extremely uncharacteristic of me'. There is no time-frame reference specified for this measure, as it is concerned with overall aggressive tendencies across the lifespan rather than aggression over a limited period – which may represent state rather than trait-aggression.

Accordingly, the current study operationalised trait-aggression as to what degree the participants felt it was characteristic of them to physically assault or threaten to physically harm others (physical aggression); to engage in verbal altercations (verbal aggression); to get angry or lose their temper (anger) and to experience bitter or resentful thoughts (hostility). The total aggression score was considered on a continuum, with higher scores representing greater levels of trait-aggression.

The Buss-Perry Aggression Questionnaire was originally developed as a 29 item (Buss & Perry, 1992). A study regarding the measures psychometric properties, found it to have moderate to high internal reliability and test-retest reliability of at least seven months (Harris, 1997). However, this questionnaire was criticised for poor goodness of fit between the four elements proposed both in the general population (Bryant & Smith, 2001) and in forensic populations (Williams, Boyd, Cascardi & Poythress, 1996). Consequently, the aggression questionnaire was modified to the 12-itemed short form version by Bryant and Smith (2001). Bryant and Smith found the modified measure to have an acceptable goodness of fit and improved validity of the four constructs measured, when compared to the original measure. A study using a forensic mental health sample (Diamond, Wang & Buffington-Vollum, 2005) also found that the short form questionnaire displayed adequate goodness of fit (GFI .96). Cronbach's alpha coefficient in the current study was .75 for the BPAQ-SF total score.

The Ward Anger Rating Scale (WARS; Novaco, 1994)

The WARS was completed by staff participants as an observer rated measure of participant's aggression. The WARS consists of two separate scales (parts A and B) which were developed to be completed by a staff member who has observed participants' behaviour during the previous week. Part A consists of seven observable behavior's relevant to aggression in populations with severe and enduring mental health problems within ward settings including: 'antagonistic behaviour', verbal aggression', 'physical aggression', 'emotional or behavioral lability' 'paranoid attitude, 'psychotic symptoms' and 'self-aggression'. These are summed to form an index of `angry–aggressive behaviours'. Part B consists of seven items regarding emotional attributes related to anger that staff rate on a five-point scale (0–4)., the sum of these produces an `anger-attributes index'. For the purpose of this study staff were asked to rate named participant's aggression over the past six weeks using Part A of the WARS and continuous scores from Part A were used in analyses.

Thus, observer-report aggression was operationalised as staff perceptions of the participant as being physically aggressive or threatening physical harm toward others, objects or themselves, losing their temper, being verbally abusive, expressing mistrust of others, expressions of mistrust or resentment toward others and expression of psychotic symptoms associated with harming others over the previous six weeks. The operational definition for observer-rated aggression differed from that of self-reported aggression in that it focused solely on the explicit and observable expressions of aggression and had a recall period of the previous six weeks. This difference was, in part, due to a lack of identified observer-rated instruments which measure the internal experiences of hostility and anger, in combination with aggressive behaviour. It is likely that this is a result of the difficulties that would be involved in obtaining reliable observer-rated reports of others' internal experiences. A time-limited recall period was considered more appropriate than an open time-frame, due to the potential variation in the amount of time that staff would have known individual patients and to promote consistency of reporting across participants.

Part A of the WARS has been indicated to have average inter-rater reliability and good concurrent, discriminant and predictive validity have been demonstrated in a forensic mental health sample (Doyle & Dolan, 2006). Cronbach's alpha coefficient in the current study was .87 for the WARS Part A score.

Ethical Considerations

Ethical approval was sought and granted by an NHS Research Ethics Committee. Data were collected between November 2013 and June 2014.

Procedure

Qualified staff members (Senior Charge Nurses, Clinical Psychologists and Psychiatrists) were asked to identify individuals who met eligibility criteria. Those identified as eligible to participate were initially approached and informed about the study by core members of their forensic mental health teams. For those who expressed an interest in participating, the member of staff then facilitated an initial meeting with the researcher. During this meeting, further information was provided about the study and individuals were provided with a participant information sheet. At this stage, a further appointment was made (at least twenty-four hours after the first) with those who were still interested in participating. During this further appointment, informed consent was taken and study measures administered. Due to potential literacy difficulties within this population, all participants completed questionnaires with the researcher who read questions aloud to them. Additionally, with participants consent, their named nurse (or equivalent) was approached through managerial or supervisory staff, and asked to complete the observer-rated measure. For staff who agreed to this, informed consent was obtained and data collected during a face-to-face session with the researcher.

Data Screening

There were no individual data items missing. Two participants (4.8%) did not consent for staff to complete the WARS regarding them. These participants were excluded from analyses involving this measure.

The distribution of data was assessed visually, using Q-Q plots and histograms, and statistically, using skewness and kurtosis statistics and the Shapiro Wilk test. This analysis indicated that CTQ subscale scores for childhood physical abuse (CPA), childhood physical neglect (CPN), childhood sexual abuse (CSA) and the WARS

Part A total score were significantly positively skewed. Additionally, the Shapiro Wilk test indicated that CEA, CEN and CSA subscales and the WARS Part A scores were not normally distributed. Attempts to transform data using log transformations did not substantially improve normality across all data. As normality of distribution of data could not be assumed across all measures, non-parametric Spearman's correlation analyses were used in initial analyses.

Data Analysis

SPSS version 19 and 'MEDIATE', a PASW macro (Hayes & Preacher, 2013; downloadable from: http://afhayes.com/spss-sas-and-mplus-macros-and-code.html), were used to conduct mediation and indirect effect analyses. This macro allows the simultaneous analyses of mediation and specific indirect effects on a dependent variable in models with one or more independent variables and one or more mediating variables. In mediation analysis if the independent variable (in this case CEA/CEN) and dependent variable (in this case observer rated or self-reported aggression) are indicated to be significantly related, mediation effects are being assessed (Hayes, 2013). If there is no significant relationship between the independent and dependent variables, then indirect effects are assessed. Effects were investigated using bias corrected and accelerated confidence intervals with bootstrap samples. A mediation or indirect effect is considered to be significant if the upper and lower bounds of the confidence intervals do not contain zero, at the confidence level ($p < .05$). In the current study, bias corrected confidence intervals set at 95% based on 5000 bootstrap samples were used to assess indirect effects of CEA and CEN on observer and self-reported trait-aggression, through the mediating effects of HAB and emotion regulation (further information regarding statistical analyses employed can be found in Chapter 3). The proposed multiple mediation models are presented in Figure 1.

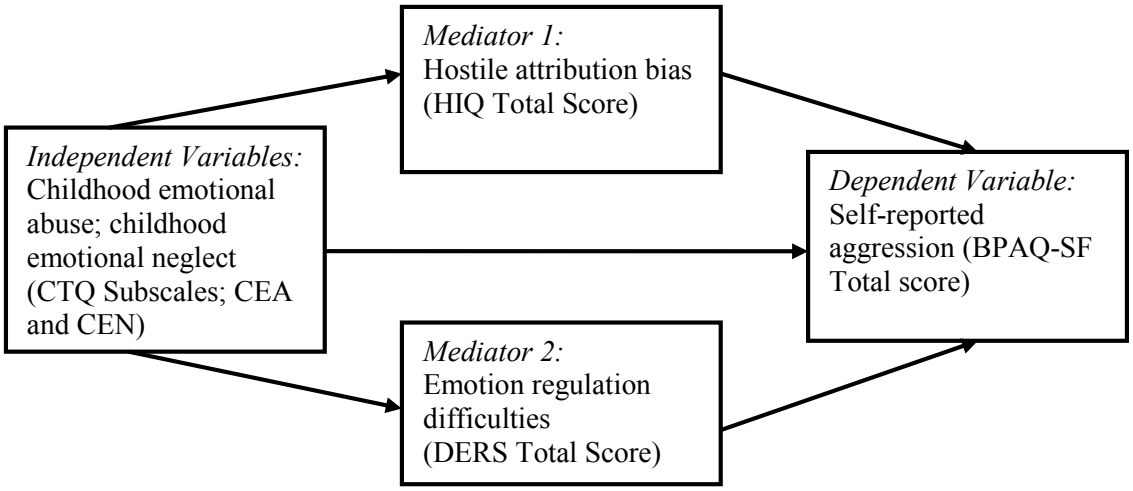

Figure 1: Proposed model 1 – with self-reported aggression as dependent variable

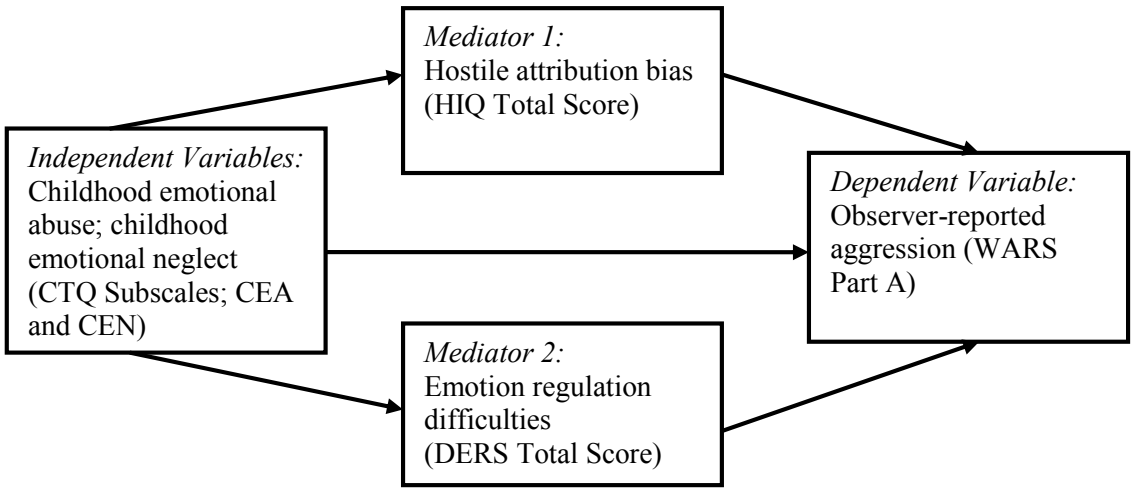

Figure 2: Proposed model 2 – with observer-reported aggression as dependent variable

Results

Descriptive statistics

Means, standard deviations and ranges of scores across measures are presented in Table 1. The mean scores for all childhood trauma types were in the Low (to Moderate) range. 27.5% (n=11) of participants scored in the Moderate (to Severe)

range or above for CEA and 22.5% (n=9) scored in the Moderate (to Severe) range or above for CEN. 45% (n= 18) of participants endorsed at least one item on the Minimization and denial subscale of the CTQ. These levels of CEA and CEN in this study are lower would be expected, taking into the account the existing literature regarding emotional maltreatment in people with psychotic illnesses (Ackner et al., 2013). However, levels of CEA, CEN and minimisation/denial were comparable to those found in a study involving a mixed forensic and general mental health sample of individuals with psychotic illnesses with a similar demographic make-up to the current study (Bosqui et al., 2014).

Mean scores on the HIQ indicated medium to high levels of HAB within the sample (Simourd & Mamuza, 2002). The DERS, BPAQ-SF and WARS do not provide cut-off scores, however, higher scores are indicative of higher levels of difficulties with emotion regulation and higher levels of self or observer rated aggression respectively.

Table 1: Means, standard deviations and ranges of scores

Measure	Mean (SD)	Range
CTQ – emotional abuse scale	10.4 (5.7)	5 - 23
CTQ- Emotional neglect scale	10.6 (4.6)	5 – 21
CTQ - Physical abuse scale	8.6 (5.0)	5 – 21
CTQ – Physical neglect scale	8.7 (3.8)	5 – 21
CTQ – Sexual abuse scale	7.2 (4.5)	5 - 25
DERS (Total)	76.8 (21.2)	36-124
HIQ (Total)	70.9 (18.6)	33-107
BPAQ (Total)	27.0 (8.1)	16-50
WARS (Part A, total)	1.9 (2.7)	0-11

Bivariate correlations

Results for Spearman's correlation analyses can be found in Table 2. Spearman's correlations found a number of significant relationships between variables. CEA was found to be significantly correlated with all other maltreatment types (CEN $r_s = .451$, $p = 0.01$; CPA $r_s = .365$, $p = 0.05$; CPN $r_s = .455$ $p = 0.05$; CSA $r_s = .489$ $p = 0.01$) and emotion regulation difficulties ($r_s = .549$, $p = 0.01$). CEN was found to be significantly positively correlated with CPN, and CSA ($r_s = .619$, $p = 0.01$; $r_s = .404$ $p = 0.01$ respectively) and emotion regulation difficulties ($r_s = .360$, $p = 0.05$). However, neither was significantly associated with aggression or HAB. Staff ratings of participant aggression (measured by the WARS) and participant self-report aggression (measured by the BPAQ-SF) were also significantly positively correlated ($r_s = .469$, $p = 0.05$). All relationships were positive with the exception off that between CEN and HAB, with CEN being found to have a very weak negative relationship with HAB. Both proposed mediators, emotion regulation difficulties and HAB, were found to be significantly positively correlated with aggression ($r_s = .519$, $p = 0.01$; $r_s = .387$, $p = 0.05$ respectively). Participant age was not found to be significantly associated with any other variables.

Table 2: Bivariate correlations between childhood emotional maltreatment, Hostile attribution bias, emotion regulation and aggression

	CEA	CEN	CPA	CPN	CSA	HIQ	DERS	BPAQ-SF	WARS	Age
CEA	-	.451**	.365*	.455**	.489**	.202	.549**	.282	.006	.223
CEN		-	.296	.619**	.404**	-.015	.360*	.229	.261	-.022
CPA			-	.491**	.499**	-.047	.164	.313*	.328*	.077
CPN				-	.446**	.080	.304	.453**	.198	.099
CSA					-	.233	.307*	.261	.277	.284
HIQ						-	.357*	.387*	.115	-.134
DERS							-	.519**	.219	-.220
BPAQ-SF								-	.469**	-.266
WARS									-	-.310
Age										-

Note: CEA, childhood emotional abuse; CPA, childhood physical abuse; CSA, childhood sexual abuse; CEN, childhood emotional neglect; CPN, Childhood physical neglect; HIQ, Hostile Interpretations Questionnaire (mean score); DERS, Difficulties in Emotion Regulation Scale (total score); BPAQ-SF, Buss-Perry Aggression Questionnaire – Short Form (total score); WARS, Ward Anger Rating Scale * $p < 0.05$; ** $p < 0.01$

Mediation Analyses

Due to the lack of any significant associations between the WARS and all other variables of interest in proposed mediation model 2 (see Figure 2), it was decided not to run this proposed model. As correlation analyses found no positive correlation between CEN and HIQ ($r_s = .015$, $p = 0.927$), CEN was not included as a separate independent variable in model 1, as had been originally proposed, although was retained as a covariate. As a result, a separate simple mediation model was run to assess the mediating effect of DERS on the relationship between CEN and BPAQ (see figures 3 and 4, for diagrams of the revised models).

Model 1: CEA/CEN, hostile attribution bias, emotion regulation and self-reported aggression

The MEDIATE macro was used to assess whether emotion regulation and hostile attribution bias mediated the relationship between CEA and CEN on the dependent variable of participant self-reported aggression. CTQ sub-scales for CEN, CPA, CPN, and CSA were included as covariates, to control for their effects (see chapter 3). The output from the mediation analysis is presented in the following order in Table 3: HIQ and DERS scores were separately regressed onto CEA, CEN, CPA, CPN and CSA to assess pathways from the independent variables and covariates to mediators. Following this, the BPAQ-SF was regressed onto HIQ, DERS, CEA, CEN, CPA, CPN and CSA (to test the pathway from independent variables/covariates and mediators to the dependent variable).

The first section of Table 3 shows that the independent variable and covariates did not predict HIQ score either in combination ($F(5,36)=.9640$, $p=.4526$) or independently. The second section of the table shows that DERS score was significantly predicted by CEA, CEN, CPA, CPN and CSA ($F(5, 36)=4.6238$, p.0023). However, only CEA emerged as a significant independent predictor ($t=2.0693$, $p=.0064$). The third section of Table 3 shows the coefficients for BPAQ-SF scores regressed onto HIQ, DERS, CEA, CEN, CPA, CPN and CSA. Within this model, only DERS score was a significant predictor, with higher levels of self-rated aggression being associated with higher levels of difficulties with emotion regulation. This model for predicting trait-aggression was statistically significant ($F(7, 34) = 4.6293$, $p = .0010$), suggesting that the model accounted for a significant proportion of the variance in the BPAQ-SF. Only emotion regulation (DERS) was a significant predictor in this model ($t=1890$, p .0061). An adjusted R^2 of .3826 indicated that the independent variable and the 4 covariates accounted for 38.3% of the variance in BPAQ-SF scores. The omnibus direct effect of the independent variable and covariates on BPAQ-SF scores was non-significant ($F(1, 34)=2.3711$, $p=1.329$, R^2 .0357).

The bias accelerated bootstrap confidence intervals for the indirect effects from CEA and CEN to self-reported aggression through difficulties in emotion regulation and HAB were examined (see table 3). Only the confidence intervals for the indirect effect from CEA to self-reported aggression through difficulties with emotion regulation did not contain a zero value (lower BC CI = .0779; upper BC CI = 1.0907). Therefore, it was concluded that CEA exerted a significant indirect effect on self-reported aggression through emotion regulation difficulties, even when other maltreatment types were controlled for.

Table 3: Regression models for predicting HAB and emotion regulation from CEA and childhood maltreatment covariates and trait-aggression from CEA, childhood maltreatment covariates, and HAB and emotion regulation

Outcome and Predictors	*B* coefficient	SE	*t*	*p*
Outcome=HIQ				
Constant	63.6883	8.1304	7.8333	<.0001
CEA	.6881	.7295	.9433	.3518
CEN	-.4924	.8051	-.6116	.5447
CPA	-1.3462	.8586	-1.5680	.1256
CPN	1.0120	1.2335	.8204	.4174
CSA	1.3677	1.1792	1.1598	.2538
Outcome= DERS				
Constant	50.7879	7.9586	6.3815	<.0001
CEA	2.0693	.7141	2.8979	.0064
CEN	1.0235	.7881	1.2986	.2023
CPA	.4952	.8404	.5893	.5623
CPN	-.7061	1.2074	-.5848	.5623
CSA	-.5043	1.1543	-.4369	.6648
Dependent variable=BPAQ				
Constant	3.8880	4.9278	.7890	.4356
HIQ	.0925	.0633	1.4627	.1527
DERS	.1890	.0633	2.9245	.0061
CEA	-.4334	.2815	-1.5398	.1329
CEN	-.1125	.2918	-.3855	.7023
CPA	.5430	.3151	1.7231	.0939
CPN	.5155	.4381	1.1766	.2475
CSA	-.1347	.4224	-.3190	.7517

Table 4: Bootstrap confidence intervals for the indirect effects of CEA on participant self-reported aggression through HAB and emotion regulation. Results of multiple mediation analysis

Variables	Effect	SE	BCA bootstrap CI	
			Lower	Upper
IV=Emotional abuse				
DERS	.3911	.2498	.0779	1.0907
HIQ	.0647	.1284	-.0832	.4098

Note. SE=standard error; BCA=bias corrected and accelerated, CI=confidence intervals. Confidence intervals are based on 5000 samples

Model 2: CEN, emotion regulation and self-reported aggression

Model two used a simple mediation analysis to assess whether emotion regulation mediated the relationship between CEN and self-reported trait-aggression. CEA, CPA, CPN and CSA were included as covariates.

The output from the simple mediation analysis is presented in the following order in Table 5: DERS scores were separately regressed onto CEA, CEN, CPA, CPN and CSA to assess pathways from the independent variables and covariates to the mediator. Following this, the BPAQ-SF was regressed onto DERS, CEA, CEN, CPA, CPN and CSA (to test the pathway from independent variables/covariates and mediator to the dependent variable). The first section of table five shows the same results as found in the second section of table 3, with the DERS score being significantly predicted by the combination of CEN and all four covariates (F (5, 36) =4.6238, p.0023) but only CEA emerging as a significant predictor. The second section of table 5 shows the coefficients for BPAQ-SF scores regressed onto DERS, CEN, CEA, CPA, CPN and CSA scores. Once more, within this model only DERS score was a significant predictor (t = 3.7821, p=.0006), with higher levels of self-

rated aggression being associated with higher levels of difficulties with emotion regulation.

This model for predicting trait-aggression was statistically significant (F (6, 35) = 4.8852, p = .0010), suggesting that the simple mediation model accounted for a significant proportion of the variance in the BPAQ-SF and an adjusted R^2 of .3625 indicating that the independent variable and the 4 covariates accounted for 36.3% of the variance in BPAQ-SF scores. The omnibus direct effect of the independent variable and covariates on BPAQ-SF scores was non-significant (F (1, 35) =.4601, p=.5020, R^2 = .0072).

The bias accelerated bootstrap confidence intervals for the indirect effects from CEN to self-reported aggression through difficulties in emotion regulation were examined (see Table 6). The confidence intervals for the indirect effect from CEn to self-reported aggression through difficulties with emotion regulation contained a 0 value (lower BC CI = -.1588; upper BC CI = .7746). Therefore, it was concluded that CEN did not exert a significant indirect effect on self-reported aggression through emotion regulation difficulties.

Table 5: Regression models for predicting emotion regulation from CEN and childhood maltreatment covariates and trait-aggression from CEN, childhood maltreatment covariates and emotion regulation

Outcome and Predictors	*B* coefficient	SE	*t*	*P*
Outcome=DERS				
Constant	50.7879	7.9586	6.3815	<.0001
CEN	1.0235	.7881	1.2986	.2023
CEA	2.0683	.7141	2.8979	.0065
CPA	.4952	.8484	.2893	.5594
CPN	-.7061	1.2074	-.5848	.5623
CSA	-.5043	1.1543	-.4369	.6648
Dependent variable=BPAQ				
Constant	7.8409	4.1872	1.8726	.0695
DERS	.2272	.0601	3.7821	.0006
CEN	-.1971	.2906	-.6783	.5020
CEA	-.4487	.2858	-1.5702	.1254
CPA	.3996	.3043	1.3130	.1977
CPN	.6361	.4372	1.4548	.1546
CSA	.0111	.4171	.0265	.9790

Table 4: Bootstrap confidence intervals for the indirect effects of CEN on participant self-reported aggression emotion regulation. Results of multiple mediation analysis

Variables	Effect	SE	BCA bootstrap CI	
			Lower	Upper
IV=Emotional neglect				
DERS	.2325	.2259	-.1588	.7746

Discussion

The current study attempted to contribute to the knowledge base by evaluating the mediating roles of HAB and emotion regulation difficulties in the relationship between CEM and aggression. The study expanded on the existing research in this area by including both cognitive and affective mediating variables within the same statistical model; by examining the effects of CEA and CEN separately; by controlling for the effects of other childhood maltreatment types and by including a forensic mental health sample. Results of the multiple mediation analysis provided support for a significant specific indirect effect of emotion regulation difficulties in the relationship between CEA and aggression, even after controlling for other forms of maltreatment. No significant mediation or indirect effects were found in the relationship between CEN, emotion regulation difficulties and aggression. Furthermore, findings of the present study did not support HAB as a significant mediator in the relationship between either CEN and aggression or CEA and aggression.

The results of this study provide further support for Allen's (2011) findings that difficulties with emotion regulation mediate the relationship between CEA and aggression in a student sample. The current findings provide some initial evidence that this particular pathway from CEA to aggression, may be generalisable to clinical psychiatric populations, particularly those within forensic mental health settings. The current results are also consistent with Riggs' (2012) theoretical model, that experiencing emotional abuse in childhood may prohibit the development of effective emotion regulation, possibly through its disruption of attachment relationships, which results in an increased tendency toward reacting aggressively in emotionally provocative situations.

Conversely, no significant mediation or indirect effect of emotion regulation was found in the relationship between CEN and aggression. No existing empirical

research regarding this specific mediatory relationship against which to compare these findings could be identified; however, they are considered surprising in light of the theoretical literature. It has been proposed that, even in the absence of abusive behaviours, experiences of neglect in childhood may be especially pertinent to the development of difficulties self-regulating emotions, due to limited opportunities to engage in the kind of responsive and nurturing social interactions which would support the development of adaptive emotion regulation skills (Fox & Calkins, 2003; Lee & Hoaken, 2007). It may also be of note that the relationship between CEN and aggression was not statistically significant, despite a number of previous studies finding significant relationships between these variables (Carli et al., 2013; Chen et al., 2012; Garno et al., 2013, Roy, 2009; Roy & Janal, 2007). There does not seem to be a clear theoretical explanation for the lack of significant mediatory relationship in this case and it is possible that this is a result of methodological limitations within the current study, such as an insufficient sample size to achieve statistical power. Results from the minimisation and denial scale of the CTQ suggested that a substantial minority of participants may have minimised their experiences of maltreatment to some degree. It has been proposed that individuals may deny or minimise experiences of childhood maltreatment experiences as a protective coping mechanism and that this strategy may actually be associated with more positive outcomes (Raphael, Widon. & Lange, 2011). Additionally, when compared to previous research which has used the CTQ with similar clinical populations, the prevalence and mean scores of both CEA and CEN were lower than might be expected (Ackner et al. 2012; Roy, 2009; Sarchiapone et al., 2007). Collectively, this information suggests that there may have been some under-reporting of CEM in this study. Therefore, it is possible that the lack of significance detected in both the correlation analyses related to CEM and the subsequent mediation analyses were a result of minimising response styles.

The literature regarding childhood physical maltreatment indicates that, whilst experiences of neglect in childhood may exert an influence on aggression through their negative impact on the development of emotion regulation skills, experiences of abuse may be more likely to increase levels of aggression through their effect on

HAB (Lee & Hoaken, 2007). Similarly, it was hypothesised that those who experienced CEA may adapt to their environment by becoming hyper-vigilant to signs of interpersonal threat to their emotional well-being. It was proposed that this hyper-vigilance might, in turn, lead to increased likelihood to engage in aggression as a protective mechanism against this predicted threat. However, as HAB was not a significant mediator between either CEA or CEN and aggression, the results from the current study were not consistent with this theory. In line with the majority of previous studies in this field, the relationship between HAB and aggression was positive and significant (Chen et al., 2012; Coccaro et al, 2009; Coppello & Tata, 1990). However, in contrast to the two studies which have previously measured the relationship between CEA and HAB, association between CEA and HAB was not statistically significant (Chen, et al., 2012; Jin, Eagle & Keat, 2008). Again, such inconsistencies in findings may have been consequences of methodological limitations and under-reporting of maltreatment experiences. However, further explanation for these findings is suggested by Chen et al. (2012). Chen and colleagues found that CEA strengthened the relationship between HAB and aggression for those who had experiences low and moderate levels of CEA but not those with higher levels. It was proposed that this may have been because those who experienced higher levels of maltreatment learn to behave instinctively in response to negative emotions associated with perceived threat, as a means of protection and defence, rather than relying on cognitive processing to guide their behaviour. Some support for this theory is provided by results from experimental neuro-biological research, which has found that maltreated children displayed increased activity in the right-amygdala when cognitively processing pictures of angry faces (McCrory et al., 2013). The role of right-amygdala has been implicated in influencing generalised, unrefined and instinctual reactions to social stimulus; rather than the comprehensive, and analytic social information processing thought to be performed by the left-amygdala (Markowitsch, 1998). Additionally, activity in the right-amygdala has been found to increase when faced with stimuli associated with threat or anxiety (Markowitsch, 1998). Thus, when those who have experienced childhood abuse are faced with interpersonal interactions, feelings of anxiety or fear may be triggered, resulting in them processing social information in a quick, automatic manner, in turn

leading to important contextual information being missed and attribution errors being made. Due to the small sample size it was not possible to explore whether this was the case in the current study.

The findings regarding CEN and HAB are perhaps less surprising. It may be hypothesised that, if emotional interactions with others are limited, the child will not necessarily experience the kind of interactions which would support the development of schemas or cognitive biases associated with threat. Additionally, neglectful care-giving may not be so strongly associated with the feelings of fear, perception of threat and unpredictability that might be associated with being raised in an emotionally abusive environment. Support for this hypothesis can be found in research conducted with children, which found that children who experienced physical abuse displayed biases in their reactions to angry facial expressions and that those who were neglected did not display this bias, although did experience general difficulties discriminating between emotions (Pollak, Cicchetti, Hornung & Reed, 2000). However, it should be noted that, in contrast to the present study which found no notable relationship between CEN and HAB; the only study which was identified to have measured the relationship between these two variables found them to be significantly and positively correlated (Chen et al., 2012).

The findings of this study should be interpreted within the context of its methodological limitations. As mentioned, recruitment did not achieve the recommended sample size of 71 (Fritz & McKinnon, 2007). This is reflective of some of the challenges associated with recruiting from this population. Due to the variety and complexity of issues related to mental health, personality, substance misuse and risk forensic mental health patients can be challenging to engage and recruit into research studies for both practical and ethical reasons (Fitzpatrick et al., 2010). As power was not met, it is possible that Type II errors have been made. Due to the small sample size, caution should be taken with regard to generalising results to the wider forensic mental health population. Although, a cross-sectional retrospective design provided the most practical and ethical means by which to

assess the proposed model, this research design limits the interpretation of causality between variables, as it is not possible to establish in which order they occurred. The use of mediation analyses is important in contributing to our understanding of proposed causal pathways between variables but also does not allow one to infer causality (Hayes, 2013).

A further limitation was reliance on participant self-report. Self-report measures may be influenced by a number of inaccurate responding styles including minimisation, exaggeration, recall bias and socially desirability. The analysis of minimisation and denial subscale scores of the CTQ provided a means by which to gauge the accuracy of participants reporting. Research regarding the reliability of retrospective self-report of traumatic childhood experiences has produced varying results, with some providing evidence that such measures are reliable and others indicating that they may be particularly vulnerable to the effects of under-reporting - either through intentional minimisation or inaccurate recall (Hardt & Rutter, 2004). Similarly, the observer-rated WARS was considered to be a useful addition to the current study, providing a means by which to gauge the accuracy of participants self-reports of aggression. The finding that the WARS and the BPAQ-SF scores were significantly positively correlated provide some objective support that participants were not substantially over or under-reporting aggression. However, in contrast to the BPAQ-SF, the WARS was not found to be significantly associated with any of the primary variable of interest. Whilst the BPAQ-SF measures trait-aggression, including internal processes such as cognitions related to aggression, over a lifetime; the WARS is only able to give a measure of observable manifestations of aggression over a shorter time frame (in this case, the previous six weeks). Thus, the two measures assess slightly different constructs. Therefore, it may be that the differences in findings are a result of observer-rated measures being unable to access internal information, such as hostile related cognitions, which play an important role in the manifestation of observable aggression (Anderson & Bushman, 2002). Additionally, the WARS is designed to be used in a ward setting. As 35.7% of participants were based in the community, it is possible that the observer-reports for this sub-group

may have been less reliable due to the reduced amount of time staff were able to directly observe participant's behaviour.

The route from CEM to aggression is a complex topic which has seldom been studied. As such, there are multiple directions which future research may take. Firstly, future research may benefit from replicating the current study with adequate sample sizes, to allow more robust conclusions to be drawn. Additionally, further longitudinal research would be of benefit in addressing some of the limitations regarding implied causality. Experimental research methods may also provide a means by which to study HAB and emotion regulation difficulties, which may be less prone to reporting biases. This study used a global measure of emotion regulation difficulties. However, emotion regulation is a complex construct and is believed to consist of a number of individual but interconnected processes (Koole, 2009). Given the significant results obtained regarding the role of emotion regulation, further research might attempt to identify and further clarify which specific aspects of emotion regulation are pertinent to this relationship. Similarly, further consideration might be given to aspects of social information processing, other than HAB, which may be involved in this process. Furthermore, emotion regulation and HAB are only two possible mediating factors in what is likely to be a complex, multivariable relationship and future research aimed at identifying other mediating and moderating variables in this relationship and assessing their impact in combination might be useful. Finally, the current study and a small number of previous studies have indicated that CEA and CEN may have different outcomes or may exert similar effects through different pathways. Therefore, future research would benefit from analysing the effects of CEA and CEN separately, rather than as a combined measure of CEM which has largely been the case previously.

The findings of this study have a number of implications for clinical practice. The results suggest that particular attention should be paid to identifying experiences of CEM in those who present as having difficulties with aggression, particularly those receiving treatment forensic mental health services. The results indicate that

interventions which target difficulties in emotion regulation might be especially beneficial for those who have experienced CEA and who have difficulties with aggression, as emotion regulation difficulties are likely to play a perpetuating role in this relationship. The existing evidence base for interventions for forensic mental health populations is limited; however, a small number of studies have provided evidence for the utility of cognitive behavioural therapy (CBT) in addressing difficulties related to anger and aggression in this group (Haddock et al., 2004; Stermac, 1986). In light of the current findings, CBT strategies which support the development of adaptive cognitive and behavioural emotion regulation strategies and the development of problem rather than emotion orientated coping strategies may be of particular benefit. Dialectical Behavioural Therapy (DBT) has been proposed as a useful treatment for the kind of complex presentations often found in forensic populations and is reported to be used in a number of forensic mental health settings (Berzins & Tressman, 2004). The evidence base regarding the use of DBT with forensic populations has indicated that it may be useful in reducing anger and aggression, however small sample sizes and a lack of comparison groups within the evidence base mean that such results should be interpreted with caution (Evershed et al., 2003). Lastly, despite results regarding CEN being inconclusive, the finding that CEN may contribute to aggression through different processes to CEA suggests that the most effective targets for psychological intervention may differ depending on the nature of early adverse experiences.

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Chapter 3: Extended Methodology

Data screening

Analyses of data normality and distribution were carried out to establish whether parametric or non-parametric methods should be used for initial correlation analyses, which were required to identify covariance and multicollinearity of variables, as well as their suitability for inclusion in further mediation analysis.

Outliers

Howitt and Cramer (2011) advise that scores should be considered extreme outliers if they are greater or equal to the interquartile range multiplied by three. Two scores were detected which met this criteria. In both cases the scores were on the variable of childhood sexual abuse (CSA) and both were substantially greater than the scores on this measure from the remainder of the sample.

There is some debate within the literature regarding how outliers should be dealt with in cases where they are a result of genuine variation within the data; with some arguing that outliers are an important part of the data set and others proposing that they should be removed or transformed before further analyses are conducted (Osborne & Overbay, 2004). Correlation and regression analyses (on which the proposed method of mediation analysis is based) are particularly susceptible to the biasing effects of outlying scores, which may result in skewed parameter estimates and increased error rates. Therefore, for the purposes of the current study it was not desirable to retain the outliers as they were (Field, 2013). Anscombe (1960) proposed outliers could be dealt with by completely remove outlying scores and others have proposed similar 'trimming' techniques, whereby either individual outlying scores or all data from an individual with outlying scores are removed (Field, 2013). However, Ghosh and Vogt (2012) state that this is never an

appropriate way to deal with data, as it contradicts the fundamental value of random sampling. Taking this into account and given the already small sample size in the current study, it was decided not to take this approach due to the potential negative impact on statistical power and increased likelihood of a Type II error. Therefore, it was decided that the most appropriate approach to managing the outliers in the current study was through winsorisation. Winzorisation techniques involve replacing extreme values in the data set with values which are closer to the rest of the data set, so as they are no longer extreme outliers. The benefits of this approach are that it decreases the biasing properties of the outlier without resorting to completely discarding it and, in turn, neglecting important information. There are a variety of methods to winsorize data, in the case of the current study it was decided to replace the two scores with the next highest non-outlying score in the data set which is not significantly outlying as recommended by Field (2013). Thus, the outlying CSA scores of 25 and 20 were replaced with the next highest subscale score of 15.

Distribution of Data

Whilst visual analyses of distribution are recommended for large samples (i.e. N>200) due to their sensitivity to produce statistically significant results as a result of small deviations; it is advised that in smaller samples it may be of additional benefit to examine statistical representations of distribution (Field, 2013). Therefore, visual analyses of Q-Q plots and histograms were used in addition to statistical scores of skewness, kurtosis and normality to analyse data distribution (see Table 7). Visual analysis of Q-Q plots and histograms indicated that scores from the DERS, HIQ and BPAQ-SF were normally distributed, while scores form the remaining measures and scales (CEA, CEN, CPA, CPN, CSA and WARS) appeared to be effected by skewness and kurtosis.

To assess levels of skewness and kurtosis statistically, skewness and kurtosis statistics for all variables were converted into standardised z-scores. This allowed a p-value to be calculated to evaluate whether they differed significantly from zero to

establish whether the assumption of normality of distribution was adhered to. The following equations were used to convert the statistics into z-scores:

$$Z_{\text{skewness}} = \frac{\text{skewness statistic} - 0}{\textit{standard error of skewness}} \qquad Z_{\text{kurtosis}} = \frac{\text{kurtosis statistic} - 0}{\textit{standard error of kurtosis}}$$

Tabachnick and Fidell (2013) recommend that conservative alpha levels of <0.1 (z-score, >2.58) are used to detect statistically significant skewness and kurtosis within small to medium sample sizes. Using these guidelines, it was indicated that the variables of CEA, CPA, CPN, CSA and WARS were significantly positively skewed. All z-scores for kurtosis were non-significant.

The Shapiro-Wilk test assesses the degree to which a distribution deviates from normal and whether this is significant and is recommended for samples of less than 50 participants (Field, 2013). A non-significant result for the Shapiro-Wilk test indicates that data have a normal distribution. The Shapiro-Wilk statistics for CEA (W(40)= .844, p<.001) CPA, (W(40)= .752, p<.001), CPN, (W(40)= .808, p<.001), CSA, (W(40)= .611, p<.001) and WARS, (W(40)= .731, p<.001) scores indicated that the distribution of these variables deviated were significantly from a normal distribution.

Table 7: Statistical tests of normality

Variable	Skewness Z-score	Kurtosis Z-score	Shapiro-Wilk/p-value
CEA	2.57*	-.21	.844/.000*
CEN	2.28	-.23	.900/.002*
CPA	3.55*	.60	.752/.000*
CPN	3.60*	2.23	.808/.000*
CSA	4.30*	1.38	.611/.000*
DERS	.74	-.61	.977/.579
HIQ	-.60	-1.10	.968/.322
BPAQ-SF	1.75	.44	.950/.073
WARS	4.27*	.273	.731/.000*

Z >2.58, significant at p<.01; S-W statistic significant at p<.01

Data Transformation

In some cases data transformations can improve the normality of distribution for variables, as well as addressing other assumption violations, such as non-linearity and outliers (Leech, Barrett & Morgan, 2004). Log and square root transformations were carried out on data and distribution analyses were then re-run on the transformed data to assess whether transformations had improved distribution. Re-analyses found that the normality of CEA had substantially improved using both types of transformation and no longer deviated statistically form normal. However, the distribution of CPA, CPN, CSA and WARS remained statistically non-normal after both transformations. As transformations did not improve the distribution of the majority of variables, it was decided that the original untransformed data would be used in further analysis and that, as not all variables were normally distributed, non-parametric analyses would be used for correlation analyses.

Covariance

The term covariate refers to variables which are not part of the main statistical model but which may exert an effect on the dependent variable, either directly or through confounding effects when combined with other variables. Including covariate variables in mediation models allows for their effects to be controlled for and assessed. As high rates of co-occurrence of maltreatment types have been documented in other studies (Higgins & McCabe, 2000; Kim & Chichetti, 2010), covariance between the models primary variables (CEA, CEN, DERS, HIQ, BPAQ-SF and WARS scores), other maltreatment measured by the CTQ (CPA, CPN and CSA) and participant age was assessed for, using Spearman's correlation analyses (see Chapter 2, Table 1 for results). CPA and CPN scores were significantly associated with BPAQ-SF scores, so it was decided to include these variables as covariates within the mediation model. Although CSA scores were not significantly

associated with BPAQ-SF scores, they were significantly associated with all other maltreatment types. Therefore, it was decided to also include CSA as a covariate, due to the potential confounding effects it may have had on these other variables. Participant age was not significantly associated with any other variables and was therefore not included as a covariate in further analyses.

Multicollinearity

Multicollinearity is present when there is a strong statistical relationship between independent, predictor and/or mediator variables. Some degree of collinearity between variables is inevitable and if this is weak then it is unlikely to be problematic. However, higher levels of multicollinearity may result in an increase in the size of standard errors, resulting in unreliable regression coefficents and decreasing the likelihood that these will be representative of the target population (Hayes, 2013). High levels of multicollinearity may also mask the effects of stronger predictors by limiting the size of the correlation coefficient, making it more difficult to establish the unique effects of individual variables (Hayes, 2013). One proposed means of assessing levels of collinearity is by examining correlation coefficients for variables with strong correlations. Using this method, variables with a correlation of .80 or greater are usually considered to have high levels of collinearity. However, it is has been proposed that this method may not be thorough enough to detect more subtle but nonetheless potentially problematic levels of multicollinearity and, for this reason, that it may also be useful to examine the Variance Inflation Factor (VIF) and tolerance statistics (Field, 2013). The Variance Inflation Factor describes the strength of the linear relationship between variables, while the tolerance statistic is the VIFs reciprocal (i.e. 1/VIF) and signifies quantity of the independent variable/s that is not predicted by other independent, mediator or covariate variables included in analyses. Guidelines regarding interpretation of the VIF and tolerance statistic indicate that the level of multicollinearity may be problematic if: the VIF statistic is larger than 10, the average VIF statistic across variables is substantially larger than 1 and the tolerance level is below 0.2.

Inspection of the results of correlation analysis in the current study found that none of the variables had a relationship of .80 or above. Review of the VIF and tolerance statistics found that there were no VIF values greater than 10, the average VIF value was not substantially larger than 1 (average VIF = 2.132) and none of the tolerance levels were less than 0.2 (see Table 8). These results indicate that the levels of multicollinearity between variables were not problematic and were unlikely to have a substantial biasing effect on further statistical analyses.

Table 8: Variance Inflation Factor and tolerance statistics for all primary variables and covariates

Variable	Tolerance statistic	VIF
CEA	.410	2.438
CEN	.506	1.976
CPA	.408	2.452
CPN	.357	2.801
CSA	.514	1.945
DERS	.510	1.963
HIQ	.738	1.355

Mediation analyses

Mediation refers to a scenario whereby the relationship between an independent and dependent variable occurs, either partially or fully, through another (mediator) variable. Mediation analyses allow for the significance of the indirect effect (i.e. the influence of the independent variable on the dependent variable through the mediating variable) to be assessed (Hayes, 2013). Traditionally, the Baron and Kenny (1986) causal steps approach was used to assess for mediating effects. This involved a series of regression analyses which established the individual predictive relationships between each of the variables before comparing the indirect effect with the direct effect (i.e. the relationship between independent and dependent variable). If this indicated that the direct effect is significant reduced when the indirect effect is taken into account, it was concluded that mediation was likely to have taken place. Despite being popular in the empirical literature, this approach has been criticised for lacking statistical power and failing to analyse the actual mediation relationship,

instead inferring it through testing a number of separate relationships – rather than testing the full process simultaneously. Another commonly used method to assess mediation relationships is the Sobel test (Sobel, 1982), a parametric method which does allow the full mediation process to be assessed simultaneously. However, as this is a parametric method it is only suitable for data which meet parametric assumptions.

More recently Preacher and Hayes (2008) developed, the bias-corrected bootstrapping approach to mediation analysis, an approach which addressed some of the limitations of previous approaches. This is approach allows for the indirect effects of one or more mediators to be measured directly and simultaneously. Additionally, this approach does not necessitate that the independent variable must be significantly associate with the dependent variable, as the authors propose that it may be that all or the majority of the influence of the independent variable on the dependent variable occurs through indirect effects. The benefit of including proposed mediating variables in one model, rather than assessing in separate models is that it allows for the measurement of the individual effects of each mediator, while controlling for the effects of the other mediators included in the model. By doing this, the chances of attributing a significant indirect effect, where one does not actually exist (i.e. committing a type 1 error) is reduced. Additionally, it allows for the size of relative indirect effects of individual mediators to be compared (Preacher & Hayes, 2008). The use of bias-corrected and accelerated bootstrapping, allows the analyses to be carried out on data which does not meet parametric assumptions. Bootstrapping is a re-sampling method which randomly selects individual scores from the sample data, in each case replacing the score before selecting again, so as scores may be selected more than once. The data are re-sampled a set number of times, with 5000 samples being recommended by Preacher and Hayes (2008), to produce a number of smaller 'bootstrap' samples. The bootstrap samples are then ordered by size and this is used to estimate a confidence interval (most commonly of 95%) of the combined samples, which is termed the percentile bootstrap confidence interval – providing an empirical estimation of the sampling distribution. An additional process, known as the bias corrected and accelerated confidence interval,

makes a further ‘correction’ to the sample dependent on the distribution and skew of the bootstrap estimates and is proposed to result in more accurate confidence intervals (Hayes, 2103). Confidence intervals can then be assessed to establish whether a significant indirect effect is present, which is considered to be the case if the confidence interval does not contain a zero value. For example, if a 95% confidence interval is used then if the upper and lower boundaries of the confidence interval do not contain zero then it can be concluded with 95% confidence that there is a significant effect, as it indicates the size of the effect is not zero. Fritz, Taylor and McKinnon (2012) have suggested that bias corrected bootstrapping is too liberal with regards to the alpha level which is usually around .07, and that by not performing this, the chances of committing a 1 error may be reduced. Consequently, it is advised that if power is a primary issue to use the bias corrected bootstrapping approach and if the possibility of type 1 error is a primary issue to use the percentile bootstrap (Hayes & Scharkow, 2013). Taking this information into consideration, alongside the aims of the current research, the small sample size and its potentially limited power and the non- normal distribution of data the bias-corrected and accelerated bootstrapping approach to mediation analysis was deemed most appropriate for the current study.

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Thesis Appendices

Appendix A

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Divide your article into clearly defined sections. Three levels of headings are permitted. Level one and level two headings should appear on its own separate line; level three headings should include punctuation and run in with the first line of the paragraph.

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State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

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Appendix B

Participant Information Sheet

Project: The role of hostile attributions, emotion and negative childhood experiences in aggression.

You are being invited to take part in a research study. Before you decide if you would like to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. If there is anything that is not clear, or if you would like more information please do not hesitate to contact me.

What is the purpose of this study?

The study aims to understand the relationship between negative or traumatic experiences in childhood; the way individuals view the behaviour of others; the way individuals manage their emotions and aggressive behaviour in adulthood. It is hoped that the findings of the study will give us a clearer understanding of some of the possible factors which lead people to behave aggressively, which may in turn help to prevent or manage such behaviours in future.

This research is being conducted as part of an educational qualification.

Why have I been invited to take part?

This study is being carried out with people receiving treatment at _____. Your clinical team has identified you as being eligible to participate.

Do I have to take part?

No, it is entirely up to you whether or not to take part in the study. If you do decide to take part, you will be asked to sign a consent form, although you are still free to withdraw at any time and without giving a reason. Equally, you may decide not to take part at all. Your decision to take part or not, and the answers that you give if you do decide to take part, will not affect the service you receive from the NHS or any of your legal rights.

What will I have to do if I take part?

If you decide to take part, you will be invited to meet with the researcher, Joelle Cowie. This meeting will take place in a quiet room at _____. The session should take around 45 minutes.

When we meet, we will first read through this participant information sheet and the consent form. You will be given an opportunity to ask any questions you have about the study and if you decide to take part, you will need to sign the consent form.

Then, together with the researcher, you will complete four different questionnaires and answer a few question about yourself (such as, your age, ethnicity etc.). These questionnaires are designed to assess: whether you have experienced negative or traumatic childhood experiences; how you understand other peoples behaviour; how you think about and deal with your emotions and your experience of aggression.

If you have any difficulties with reading or writing you can still take part as the researcher can assist you in completing the questionnaires.

The researcher would also meet with one of the nurses or another staff member who knows you well and ask them to help to complete one further questionnaire about whether you have displayed aggression recently.

If you decide to take part, your RMO (Responsible Medical Officer) at _____will be sent a letter to inform them that you are taking part, to be put in your clinical file.

What are the potential disadvantages of taking part?

The disadvantages or risks of taking part are minimal. However, it is possible that some of the questions you are asked may identify areas of difficulty or feelings that you had not thought about before. If you are worried about this or have any questions about participating in the study I am more than happy to discuss this with you before you decide whether you want to take part. I will be available to discuss any difficulties that may arise during participation. Remember that you would be entitled to stop at any time if you felt uncomfortable or upset during our meeting.

What are the possible benefits of taking part?

Taking part is unlikely to benefit you directly. However, it is hoped that findings will help to improve our understanding of some of the difficulties people may experience

What will happen to the information I give?

Any information you give will be treated with the strictest confidence. All information will be anonymised and held in a locked drawer, in a secure office on NHS premises. Your name will not be used on any of the information and instead you will be given a research code number to ensure confidentiality. Only the research team mentioned below will have access to the data. If you disclose information during participation that causes concern about your safety, or the safety of others, this information will be shared with your clinical team. If you disclose information regarding illegal activity, then this information may also be shared with relevant professionals. Where possible, you would be fully informed of this decision and your data would remain anonymous

When the study is written up, your name and any information which may identify you will be removed so there is no possibility of you being identified.

What will happen to the results of the research study?

The research is being conducted as part of a Doctorate in Clinical Psychology and will be written up in the form of a thesis, a copy of which will be stored at the University of Edinburgh's Library. The study may also be presented for publication at a later date. A summary of results will be made available to your clinical team who will be happy to share with you the findings if you were interested to find out more.

What do I do next if I want to take part?

You will be given at least 24 hours to decide if you would like to take part - and you can take longer to think about it if you wish to. With your permission, I will arrange to meet with you again at_____so you can tell me whether or not you would like to take part. If you tell me you would like to take part, I will then arrange another appointment with you to complete the consent form and questionnaires.

Who has reviewed the study?

The East of Scotland Research Ethics Committee REC 1, which has responsibility for scrutinising all proposals for medical research on humans in Tayside, has examined the proposal and has raised no objections from the point of view of medical ethics. It is a requirement that your records in this research, together with any relevant records, be made available for scrutiny by monitors from the University of Edinburgh, NHS Tayside or NHS Lothian, whose role is to check that research is properly conducted and the interests of those taking part are adequately protected.

What can I do if I would like to make a complaint?

If you believe that you have been harmed in any way by taking part in this study, you have the right to pursue a complaint and seek any resulting compensation through The University of Edinburgh and NHS Lothian who are

acting as the research sponsor. Details about this are available from the research team. Also, as a patient of the NHS, you have the right to pursue a complaint through the usual NHS process. To do so, you can submit a written complaint to the Patient Liaison Manager, Complaints Office NHS Lothian Complaints Team, Waverley Gate, 2nd Floor, 2-4 Waterloo Place, Edinburgh EH1 3EG or telephone: 0131 536 3370. Note that the NHS has no legal liability for non-negligent harm. However, if you are harmed and this is due to someone's negligence, you may have grounds for a legal action against NHS Lothian but you may have to pay your legal costs.

Contacts for Further Information

Many thanks for taking the time to read this information sheet. If you would like any further information or have any questions please do not hesitate to contact me, Joelle Cowie, Trainee Clinical Psychologist. You can do this through the staff on your ward.

If you would like to discuss this study with someone independent of the study team please contact: _____ on: _____or email: _____

Participant Consent Form

Project: The role of hostile attributions, emotion and negative childhood experiences in aggression.

Name of Researcher: Joelle Cowie

Please initial box

1 I confirm that I have read and understand the information sheet dated _____ (version _) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2 I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my NHS care being affected. ☐

3 I give consent for my key worker (or equivalent) to complete a questionnaire about me. ☐

4 I give consent for my RMO (Responsible Medical Officer) to be informed of my participation in the study . ☐

5 I understand that relevant sections of my medical records and data collected during the study may be looked at by the trial researchers and individuals from the Sponsors (University of Edinburgh or NHS Lothian) and NHS Tayside where it is relevant to my taking part in this research. I give permission for these individuals to have access to my study data. ☐

6 I agree to take part in the above study. ☐

Name of Participant Date Signature

Person taking consent Date Signature

Staff Information Sheet

Project: The role of hostile attributions, emotion and negative childhood experiences in aggression.

You are being invited to take part in a research study. Before you decide if you would like to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. If there is anything that is not clear, or if you would like more information, please do not hesitate to contact me.

What is the purpose of this study?

The study aims to understand the relationship between negative or traumatic experiences in childhood; the way individuals view the behaviour of others; the way individuals manage their emotions and aggressive behaviour in adulthood. It is hope that the findings of the study will give us a clearer understanding of some of the possible factors which lead people to behave aggressively, which may in turn help to prevent or manage such behaviours in future.

This research is being conducted as part of an educational qualification.

Why have I been invited to take part?

You have been invited to take part because a client who you key work or have worked with regularly for the past six weeks has agreed to participate in the study. This person has consented to a relevant member of staff completing a questionnaire regarding their behaviour.

Do I have to take part?

No, it is entirely up to you whether or not to take part in the study. You will be given at least 24 hours to decide if you would like to take part. If you do decide to take part you will be asked to sign a consent form, although you are still free to withdraw at any time and without giving a reason. Equally, you may decide not to take part at all. Your decision to take part or not, and the answers that you give if you do decide to take part, will not impact on your employment in any way.

What will I have to do if I take part?

If you decide to take part, you will be invited to meet with me, Joelle Cowie. This meeting will take place at _____, at a time which is convenient to you. You would complete a short questionnaire asking about a named client's displays of aggression and anger in the past six weeks. The session should take no longer than ten minutes.

What are the potential disadvantages or risks of taking part?

There are no known risks associated with taking part in the study. If any concerns arise at any stage of participation, I am happy to discuss these with you.

What are the possible benefits of taking part?

Taking part is unlikely to benefit you directly. However, it is hoped that findings will help to improve our understanding of some of the difficulties this client group may experience

What will happen to the information I give?

Any information you give will be treated with the strictest confidence. All information will be anonymised and held in a locked drawer in a secure office on NHS premises. Your name will not be used on any of the information and instead the questionnaire you complete will be given a research code number to ensure confidentiality. Only the research team mentioned below will have access to the data. If you disclose information during participation that causes concern about your safety, or the safety of others, this information will be shared with relevant professionals. You would be fully informed of this decision and your data would remain anonymous.

When the study is written up, your name and any information which may identify you will be removed so there is no possibility of you being identified.

What will happen to the results of the research study?

The research is being conducted as part of a Doctorate in Clinical Psychology and will be written up in the form of a thesis, a copy of which will be stored at the University of Edinburgh's Library. The study may also be presented for publication at a later date. A written summary of results will be made available to your team.

What do I do next if I want to take part?

If you do decide to take part then please inform me using the contact details below. I will then contact you to arrange an appointment. Please also complete the consent form attached and bring it with you to this appointment.

Who has reviewed the study?

The East of Scotland Research Ethics Committee REC 1, which has responsibility for scrutinising all proposals for medical research on humans in Tayside, has examined the proposal and has raised no objections from the point of view of medical ethics. It is a requirement that your records in this research, together with any relevant records, be made available for scrutiny by monitors from the University of Edinburgh, NHS Tayside or NHS Lothian, whose role is to check that research is properly conducted and the interests of those taking part are adequately protected.

What can I do if I would like to make a complaint?

If you believe that you have been harmed in any way by taking part in this study, you have the right to pursue a complaint and seek any resulting compensation through The University of Edinburgh and NHS Lothian who are acting as the research sponsor. Details about this are available from the research team. Also, as a patient of the NHS, you have the right to pursue a complaint through the usual NHS process. To do so, you can submit a written complaint to the Patient Liaison Manager, Complaints Office NHS Tayside Complaints and Feedback Team, Level 9, Ninewells Hospital, Dundee, DD1 9SY or telephone: 0800 027 5507. Note that the NHS has no legal liability for non-negligent harm. However, if you are harmed and this is due to someone's negligence, you may have grounds for a legal action against NHS Lothian but you may have to pay your legal costs.

Contacts for Further Information

Many thanks for taking the time to read this information sheet. If you would like any further information or have any questions please do not hesitate to contact me, Joelle Cowie, on: _____ or email: _____

If you would like to discuss this study with someone independent of the study team please contact: -_____on: _____ or email: ____

Staff Consent Form

Project: The role of hostile attributions, emotion and negative childhood experiences in aggression.

Name of Researcher: Joelle Cowie

Please initial box

1	I confirm that I have read and understand the information sheet dated _____ (version _) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my present or future employment being effected.	☐
3	I understand that relevant sections of data collected during the trial may be looked at by the trial researchers and individuals from the Sponsors (University of Edinburgh or NHS Lothian) and NHS Tayside where it is relevant to my taking part in this research. I give permission for these individuals to have access to my study data.	☐
4	I agree to take part in the above study.	☐

Name of Participant	Date	Signature
Person taking consent	Date	Signature

EoSRES

NHS SCOTLAND
Research Ethics Service

East of Scotland Research Ethics Service (EoSRES) REC 1
Tayside Medical Sciences Centre (TASC)
Residency Block C, Level 3
Ninewells Hospital & Medical School
George Pirie Way
Dundee DD19SY

Date:
Your Ref:
Our Ref:
Enquiries to:
Direct Line:
Email:

Dear Miss Cowie

Study Title:	**An examination of the mediating role of hostile attribution bias and emotion regulation in the relationship between childhood emotional maltreatment and aggression in a forensic mental health population.**
REC reference:	**13/ES/0071**
Protocol number:	**N/A**
IRAS project ID:	**115019**

Thank you for your letter of 02 August 2013. I can confirm the REC has received the documents listed below and that these comply with the approval conditions detailed in our letter dated 29 July 2013

Documents received

The documents received were as follows:

Document	Version	Date
Other: Covering email with response		02 August 2013
Protocol	2	02 August 2013
Response to Request for Further Information		02 August 2013

Approved documents

The final list of approved documentation for the study is therefore as follows:

Document	Version	Date
Evidence of insurance or indemnity		17 July 2012
Evidence of insurance or indemnity		22 June 2013
Evidence of insurance or indemnity		
GP/Consultant Information Sheets	1	20 May 2013
Investigator CV		27 May 2013
Other: CV - Dr Suzanne O'Rourke		
Other: CV - Emily Newman		