Thesis Portfolio

Intrusive Memories in Depression and Posttraumatic Stress Disorder

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Abstract

Intrusive memories have been identified in the adult literature as not unique to posttraumatic stress disorder (PTSD) but a transdiagnostic process common to many psychological disorders, including depression. However, there remains a lack of consensus regarding the prevalence of intrusive memories in adult depression and research exploring this experience in adolescence is extremely limited. The current thesis portfolio aimed to estimate the prevalence of intrusive memories in adult depression through meta-analysis and to explore this experience in young people with PTSD and depression through empirical research. The meta-analysis revealed a pooled prevalence estimate of 76.0% (95% CI 59.4 – 89.4%), with indication that depressed adults are at comparable risk of intrusive memories as adults with PTSD and at increased risk compared to healthy controls (risk ratio of 2.94, 95% CI 1.53 – 5.67). A total of 49 young people participated in the empirical research, comprised of 13 with PTSD (with or without comorbid depression), 11 with depression and 25 non-clinical controls. Intrusive memories were reported by 92.3% of the PTSD group (95% CI 77.8 – 100%), 54.5% of the depressed group (95% CI 25.1 – 83.9%) and 28.0% of the control group (95% CI 10.4 – 45.6%), assessed through structured interview via telephone or video call. Intrusive memories experienced by clinical participants were characterised by accompanying negative emotional experience and appraisals of psychological abnormality and negative self-evaluation, whilst strong sensory quality was identified as a distinctive feature of intrusive memories in PTSD. Intrusive memories are therefore revealed as a common experience in adult and adolescent depression and highlighted as a potential target for cognitive intervention in both depression and PTSD. Routine screening for intrusive memories may provide valuable clinical information. Larger-scale study is recommended to affirm findings and further research is required to evaluate therapeutic interventions. Findings are discussed with reference to cognitive models of PTSD.

Statement of Collaboration for Empirical Paper

Design and data collection for the presented empirical paper was completed in collaboration with Aleksandra Kralj (Trainee Clinical Psychologist, University of East Anglia). Participants completed a structured interview exploring intrusive memories and intrusive thoughts, from which the intrusive thoughts measures administered form the subject of the collaborator's thesis. Data analysis and manuscript preparation were completed independently.

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Chapter One

Introduction to the Thesis Portfolio

Presented in this thesis portfolio are two distinct papers; a meta-analysis measuring the prevalence of intrusive memories in adult depression and an empirical paper exploring the experience of intrusive memories in young people with posttraumatic stress disorder (PTSD), depression or their comorbid presentation. These papers are followed by an extended chapter considering methodology, which provides further information regarding empirical study design, ethical considerations and research governance. An extended results chapter then examines statistical assumptions alongside the choice of statistical tests employed and reports additional analyses. The portfolio closes with a discussion chapter drawing together the results of the meta-analysis and empirical research, considering the theoretical and clinical implications of findings within the context of the existing literature and outlining the strengths and limitations with directions for future research.

Although a recommended first line therapeutic intervention for both adults and young people presenting with depression (National Institute of Health and Care Excellence [NICE], 2009; NICE, 2015), meaningful change is not realised for all through cognitive behaviour therapy (CBT) and rates of relapse and recurrence remain high (Hofmann, Asnaani, Vonk, Sawyer & Fang, 2012; Weisz, McCarty & Valeri, 2006). As such, attention has turned in the recent literature to the identification of the effective components of cognitive interventions and among these, the experience of intrusive memories. Intrusive memories are defined as memories that occur spontaneously and interrupt conscious thought (Brewin, Dalgleish & Joseph, 1996). Well documented as a central feature of PTSD, intrusive memories are increasingly recognised as a transdiagnostic phenomenon, commonly experienced in many psychological disorders including depression (Harvey, Watkins, Mansell & Shafran, 2004). In the adult literature, parallels observed in the experience of intrusive memories between

adults with depression and adults with PTSD, including in the high distress ratings reported and endorsement of negative accompanying emotions, coupled with suggestion that intrusive memories may play a role in the course and maintenance of depression, have sparked interest in the potential value of intrusive memories as a cognitive treatment target in depression (Brewin, Gregory, Lipton & Burgess, 2010; Brewin, Reynolds & Tata, 1999; Newby & Moulds, 2011; Newby & Moulds, 2012). However, there exists wide variation in reports of the prevalence of intrusive memories in the adult depression literature and research examining this experience in young people is extremely limited, rendering the potential application of targeted interventions largely unknown.

The meta-analysis presented provides an estimate of the prevalence of intrusive memories in adult depression, with aim to inform of the proportion of this population for whom cognitive interventions targeting intrusive memory experience may be of value. The empirical study firstly aimed to explore the experience of intrusive memories in young people with depression, extending existing research with adults to an adolescent population, and secondly looked to provide a comprehensive picture of intrusive memories as experienced by young people with PTSD, given predominance in the current literature of research employing adult participants. Comparison with a non-clinical control group provided insight into intrusive memories as experienced by young people without depression or PTSD and allowed evaluation of the clinical significance of findings.

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PART ONE

META-ANALYSIS

Chapter Two

Meta-Analysis

TITLE

The Prevalence of Intrusive Memories in Adult Depression: A Meta-Analysis.

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Abstract

Background: Intrusive memories are frequently observed in depression but there remains wide variation in the published literature as to their prevalence.

Objective: The objective of the current meta-analysis was to analyse the prevalence of intrusive memories in adult depression and to explore methodological factors and moderator variables influencing this prevalence rate.

Method: The databases PsycINFO, PsycARTICLES, MedLine, PubMed, CINAHL and Embase were searched for relevant articles, published up to and including July 2016. Studies measuring point prevalence of intrusive memories in adults aged 18 years or above with depression were included and assessed for quality. Meta-analysis was completed under a random effects model.

Results: Seven studies measuring point prevalence of intrusive memories in adult depression were included. The overall pooled prevalence estimate calculated was 76.0% (95% CI 59.4 – 89.4%), reducing to 66.0% (95% CI 51.0 – 79.5%) when restricted to intrusive memories experienced within the week prior to assessment. Between-groups analyses indicated that adults with depression are as likely to experience intrusive memories as adults with PTSD and more likely to experience intrusive memories than healthy controls (risk ratio of 2.94, 95% CI 1.53 – 5.67).

Limitations: The strength of conclusions is limited by the small number of studies included. Consideration of the relationship between depression, intrusive memories and trauma exposure is required.

Conclusions: Intrusive memories are experienced by a large majority of adults with depression and may therefore be an important target for cognitive intervention. Larger scale measurement of clinical outcome is needed with identification of individual factors predicting treatment response.

Keywords: Prevalence, Depression, Intrusive Memory, Meta-analysis

Highlights

- An estimated 76.0% of adults with depression report intrusive memories.
- Depressed adults are more likely to report intrusive memories than healthy controls.
- The prevalence of intrusive memories in depression is comparable to that in PTSD.
- Intrusive memories may be an important target for intervention in adult depression.

The Prevalence of Intrusive Memories in Adult Depression: A Meta-Analysis

Considered globally to be the leading cause of disability, depression is not only among the most debilitating of mental health difficulties for affected individuals but an identified target for advancing mental health care worldwide (World Health Organization [WHO], 2009, 2013). The most recent National Health Survey for England estimated the lifetime prevalence of depression at 19% in adults aged over 16 years (Craig et al., 2014). Therapeutic interventions within a cognitive behavioural framework are recommended in the psychological treatment of depression at all stages of severity under a stepped-care model and numerous studies have been presented in recent years attesting to their efficacy (National Institute for Health and Care Excellence [NICE], 2009). Although highly researched, evidence comparing the effectiveness of cognitive behaviour therapy (CBT) to other psychological interventions is mixed and rates of relapse and recurrence following treatment remain high (Hofmann et al., 2012; Richards, 2011; Vittengl et al. 2007). Cuijpers et al. (2013) report a large effect size in the superiority of CBT over control samples in their recent meta-analysis but describe considerable publication bias and argue that the efficacy of CBT in the treatment of depression has been overestimated. The authors' indication of the need to resolve inconsistencies in definitions of CBT is reflected in a trend in recent research toward identification of the effective components of cognitive interventions.

Of recent interest in the adult depression literature has been the experience of intrusive memories, defined as uninvited memories that occur spontaneously and intrude on conscious thought (Brewin et al., 1996a). Intrusive memories have long been considered central to posttraumatic stress disorder (PTSD), listed in diagnostic criteria alongside other involuntary re-experiencing symptoms including recurring dreams and 'flashbacks' or reliving with dissociation (American Psychiatric Association [APA], 2013; WHO, 1992). However, with increasing recognition that experience of intrusive memories is not unique to

PTSD, evidence of this experience as common to many psychological disorders is growing with a move toward viewing intrusive memories as a transdiagnostic process (Harvey et al., 2004). The first to examine intrusive memories in depression, Kuyken and Brewin (1994) interviewed depressed women with histories of childhood abuse. They reported intrusive memories in approximately 85% of their sample accompanied by high avoidance, with higher scores for intrusiveness and avoidant behaviour associated with increased depression severity. Brewin et al. (1996b) later replicated these findings in a mixed sex sample of depressed adults. They identified intrusive memories following a range of negative life events, evidencing that this experience is not exclusive to survivors of abuse. Comparing adults with depression to adults with PTSD and a non-clinical control group, matched for histories of life events and trauma, Reynolds and Brewin (1998) reported a range of intrusive cognitions in all groups. Exploring intrusive memories in greater depth, they observed frequent intrusive memories and comparable levels of associated avoidance across matched samples of adults with depression and adults with PTSD (Reynolds & Brewin, 1999). Further, whilst dissociative re-experiencing continues to be considered a hallmark of PTSD, the experience of highly vivid intrusive memories with accompanying feelings of reliving and physiological sensation is one shared by adults with depression (Reynolds & Brewin, 1999; Patel et al., 2007).

Over the last two decades, researchers have assessed many aspects of intrusive memories in depression, including memory characteristics, content and qualities (e.g. Newby & Moulds, 2011a; Newby & Moulds, 2012; Parry & O'Kearney, 2014; Williams & Moulds, 2007a), memory appraisals (e.g. Newby & Moulds, 2010; Starr & Moulds, 2006) and cognitive avoidance (e.g. Newby & Moulds, 2011b; Williams & Moulds, 2007b). Further, longitudinal research has reported intrusive memories to be predictive of depressive symptomology six months later, a relationship that holds when severity of depression at

baseline is controlled (Brewin et al., 1999). Indeed, recognition that distressing intrusive memories are frequently observed in depression and may be implicated in its course and maintenance has sparked interest in the potential utility of cognitive interventions targeting this experience. However, there remains wide variation in the published literature as to the prevalence of intrusive memories in depression, thus rendering the potential application of this research programme unknown. The primary aim of the current study was to conduct a meta-analysis to provide a best estimate of the prevalence of intrusive memories in adults with depression with a view to evaluating the potential value of this experience as a target for cognitive intervention. It must be acknowledged that, as is common in meta-analysis, the review presented here includes a small number of studies and it is therefore prudent to outline the limitations this brings. IntHout et al., (2015) observed that of 2,009 meta-analyses reporting dichotomous outcomes, selected from the Cochrane Database of Systematic Reviews published between the years 2009 and 2013, the number of studies included ranged from 2 to 7 studies, with a mean average of 4 studies. Performing a meta-analysis with a small number of studies under a random-effects model increases the risk of error in estimating between-studies variance, inviting suggestion that meta-analysis with small numbers of studies should be avoided. However, Borenstein et al. (2009) argue that providing a statistical review of results with known limitations, albeit with likely high heterogeneity, is preferable to not doing so and thus leaving conclusions to be drawn unconcernedly from individual studies without systematic review. Although it must be recognised that the sample sizes of selected studies and the total number of studies included in a meta-analyses may result in significant between-studies heterogeneity, thus raising questions regarding reliability, it is also observed that combining several small studies in meta-analysis can achieve more accurate effect size estimates than can a single large study alone (IntHout et al., 2012). Thus, despite the limitations discussed, the current meta-analysis feels timely to

provide initial indication of the potential application of rapidly expanding research exploring the experience of intrusive memories in adult depression. As recommended by Schmidt and Hunter (2015), this paper will serve to synthesise the results of the extant literature, inviting update as research in this field continues to grow.

Assessment of the prevalence of intrusive memories is challenged by methodological differences across studies including sample selection, assessment of depression, handling of comorbid difficulties including PTSD and, in particular, the operationalisation and assessment of intrusive memories. This study therefore also aimed to explore the potential factors influencing the prevalence rate, including moderator variables and methodological variation, particularly with regard to sample selection and identification of intrusive memories. Hedges and Pigott (2004) highlight that moderator analyses in meta-analysis can be considered conceptually as tests of interaction and thus have reduced power in comparison to tests of main effects. This is particularly relevant in meta-analyses with small numbers of studies, where the power achieved for tests of main effects may already be relatively low. Moderator analyses are often presented to exclude an interaction between the observed effect size and an identified possible moderator, thus caution should be exercised in interpreting null results (Hedges & Pigott, 2004). Moderator analyses included in the current study are therefore presented as exploratory, making tentative initial indication as to the impact of potential moderators to guide future meta-analysis in this field.

Method

The current review was conducted in line with the meta-analysis of observational studies in epidemiology guidelines (MOOSE; Stroup et al., 2000) and utilised the preferred reporting items for systematic reviews and meta-analyses framework (PRISMA; Moher et al., 2009) to record the search process and paper selection.

Literature Search

An initial literature search of the databases PsycINFO, PsycARTICLES, MedLine, PubMed, CINAHL and Embase was conducted in July 2016 to identify published research measuring the point prevalence of intrusive memories in adult depression. Articles were selected where the search terms (*intrusi** OR *involuntary*) AND (*memor**) AND (*depress** OR *dysthymi**) appeared within the title or abstract. The search was restricted to peer-reviewed articles published in English. Studies were included that (a) provided a measure of the prevalence of intrusive memories in; (b) a sample of adults aged 18 years or over; (c) with clinical depression, as assessed through screening or through use of diagnostic measures. Studies were excluded where (a) the sample consisted exclusively of adults with depression who report experience of intrusive memories; (b) the sample was selected for mental or physical health comorbidity or trauma exposure; or where (c) experimental manipulation occurred prior to measurement of the prevalence of intrusive memories, including where retrieval of intrusive memories was cued. Articles identified through the initial search were screened for eligibility by the first author through inspection of the title and abstract. Identified articles were read in full by the first and second authors, with any disagreements resolved through discussion. The reference sections of selected papers were then hand searched.

Quality Assessment

Quality assessment of the seven included studies was guided by the criteria offered by Richardson et al. (1999), adapted for appraisal of articles considering prevalence of symptomology, as opposed to disease prevalence, with hierarchy of levels identified prior to assessment. Each article was rated green (criterion fully met), amber (criterion partially met) or red (criterion not met) against each quality criterion, as detailed in Supplementary Material A. All articles were assessed independently by two reviewers to determine whether (a) the

clinical sample of adults with depression was clearly defined and recruited against explicit diagnostic criteria; (b) the sample was representative, assessed according to source of participant recruitment (community sampling vs. clinical recruitment only); (c) consideration was given to comorbid PTSD in the assessment and inclusion of participants; (d) the experience of intrusive memories was clearly operationalised; and (e) a clearly identified time frame for point prevalence was given. An overall quality rating was then calculated for each article, with green ratings scoring 2, amber ratings scoring 1 and red ratings scoring 0, giving a total score out of a possible maximum of 10.

Statistical Analysis

All analyses were performed in OpenMeta[Analyst] (Wallace et al., 2012). The primary variable of interest across studies was the prevalence of intrusive memories in adults with depression. This was considered a measure of effect size with a single prevalence estimate extracted from each study, presented as percentages to aid comprehension. Where depressed samples were split into trauma-exposed depressed (TED) and depressed adults without trauma (DWT), these groups were combined to give a single prevalence estimate. With prevalence estimates as high as 96.0% (Newby & Moulds, 2010), the Freeman-Tukey double arcsine transformation was performed (Freeman & Tukey, 1950), as recommended by Barendregt et al. (2013) to avoid weighting bias where prevalence estimates approach upper and lower limits. To allow comparison of the prevalence across groups in controlled samples, estimates of the prevalence of intrusive memories in adults with PTSD and in healthy control samples (HC) were extracted, where available. Where control samples were split into recovered depressed and never depressed, these groups were combined to give a single prevalence estimate. With one study reporting prevalence of 100% in PTSD, risk ratios are presented rather than odds ratios (Deeks et al., 2011).

Considerable heterogeneity was expected given the inclusion of studies with diverse demographics including in severity of depression, recruitment from community and clinical settings with some participants accessing pharmaceutical or psychological treatment and variation in the assessment of intrusive memories. In acknowledgement of this, a random-effects model was employed, with each sample supposed to provide a prevalence estimate from among the range of possible prevalence rates observed within the population and weighted according to the inverse of its variance (Borenstein et al., 2009; DerSimonian & Laird, 1986). The heterogeneity of studies included in each analysis was tested through use of the Q statistic, to determine the proportion of variance that may be attributed to sampling error, and the I^2 statistic (Higgins & Thompson, 2002), to assess between-studies variability. Confidence intervals are provided to supplement point estimate I^2 statistics to account for bias observed when the number of studies included in a meta-analysis is small (von Hippel, 2015), calculated according to the formulae offered by Borenstein et al. (2009).

Results

Search Results

The results of the literature search and overview of paper selection are presented in Figure 1. The initial search generated 368 unique results that were screened for eligibility by the first author. The 32 identified articles were read in full by the first and second authors (Supplementary Material B), with any disagreements resolved through discussion, resulting in identification of 9 eligible papers. The reference sections of these articles were hand searched, revealing one additional paper. Where more than one paper presented the same data, paper selection was based on the inclusion of a comparison group, if applicable, or earliest publication date; this resulted in the exclusion of three papers. This gave a final sample of seven original articles to be included in the meta-analysis involving a total of 262 adults with depression, marked by asterisks in the reference list (Table 1).

Consideration of Publication Bias

Given the inclusion of fewer than 10 studies, a funnel plot was not generated, in line with Anzures-Cabrera and Higgins' (2010) recommendations. Other statistical approaches were instead considered but the measure of prevalence of intrusive memories was invariably among a range of outcome variables in the included studies and was often not the variable of primary focus. Taking a statistical measure of publication bias based on the prevalence rates reported therefore felt less appropriate and a formal measure of publication bias is therefore not presented. Although the observed prevalence rate may be less likely to have directly impacted on paper publication, the findings of the current meta-analysis should be considered alongside the possibly that studies recording a low prevalence rate may have obtained insufficient data to measure the outcome variable of interest and may therefore have remained unpublished.

Methodological Quality

Following the rating of each study against the five identified quality criteria, the initial rate of agreement between the first and second authors was 86%. Disagreements were resolved through discussion reaching consensus. Agreed quality ratings are presented in Table 2. All studies fully met or partially met at least four of the five quality criteria, with a minimum overall quality rating assigned of five and a maximum assigned of nine. Full descriptions of the assessment of depression, measurement of the prevalence of intrusive memories and assessment of PTSD across studies are provided in Tables 3, 4 and 5, respectively.

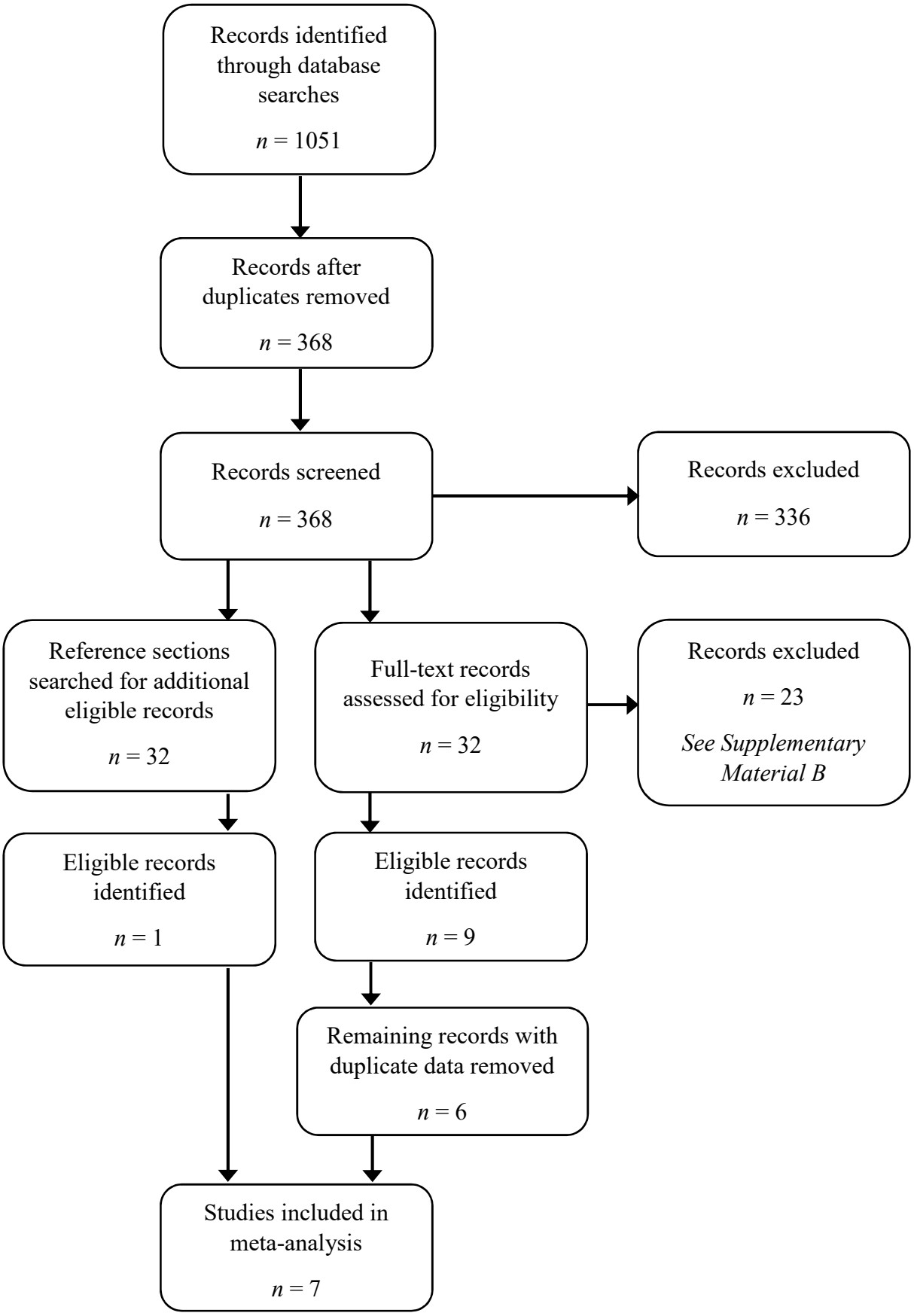

Figure 1: *Search Strategy and Paper Selection Documented Within the PRISMA Framework.*

Table 1

Methodological and Sample Characteristics of Included Studies

Study	Country	Overall sample		Depressed sample			Control sample			
		N (*n* males)	Mean age (SD, range)	Recruitment	*N* (*n* males)	Mean age (SD)	Type	Recruitment	*N* (*n* males)	Mean age (SD, range)
Birrer et al. (2007)	Switzerland	65 (*7*)	*Not reported*	Clinical, multiple and community	TED 20 (2) DWT 19 (4)	TED 44 (10) DWT 46 (1)	PTSD	Clinical, multiple and community	26 (*1*)	39 (10)
Brewin et al. (1996b)	United Kingdom	31 (*10*)	*See depressed*	Clinical, multiple	31 (*10*)	41 (12)	None			
Newby & Moulds (2010)	Australia	85 (*35*)	24.26 (6.05)	Community	25 (*8*)	25.48 (7.22)	RD and ND	Community	RD 30 (*12*) ND 30 (*15*)	RD 25.07 (6.55) ND 22.43 (3.80)

Table 1 continued

Methodological and Sample Characteristics of Included Studies

Study	Country	Overall sample		Depressed sample			Control sample			
		N (*n* males)	Mean age (SD, range)	Recruitment	*N* (*n* males)	Mean age (SD)	Type	Recruitment	*N* (*n* males)	Mean age (SD, range)
Parry & O'Kearney (2014)	Australia	87	35.67 (16.42)	Clinical, multiple and community	29 (*11*)	38 (17.43)	PTSD and HC	Clinical, multiple and community	PTSD 28 (*13*) HC 30 (*13*)	PTSD 33 (15.90) HC 36 (15.97)
Patel et al. (2007)	United Kingdom	39 (*13*)	*See depressed*	Clinical, multiple	39 (*13*)	38.36 (8.13)	None			
Reynolds & Brewin (1999)	United Kingdom	105 (*40*)	41.7 (13.1)	Clinical, multiple	62 (*23**)	42.2 (13.9) [a]	PTSD	Clinical, multiple	43 (*17*)	*Not reported*
Smets et al. (2014)	Belgium	102	*Not reported*	Clinical, single	37 (*11*)	39.32 (12.26)	HC	University students	65 (*14*)	19.28 (2.33)

Abbreviations: DWT, depression without trauma; HC, healthy controls; ND, never depressed; PTSD, posttraumatic stress disorder; RD, recovered depressed; TED, trauma-exposed depressed.

Note. Clinical, multiple refers to recruitment from more than one clinical setting whilst clinical, single refers to recruitment from a single clinical setting.

[a] Data taken from Brewin, Reynolds & Tata (1999), reporting on the same sample.

Table 2

Methodological Quality Ratings

Study	Quality criteria					Overall quality rating
	Clearly defined target population	Representative sample	Consideration of comorbid PTSD	Operationalisation of intrusive memories	Assessment of intrusive memories	
Birrer et al. (2007)						5
Brewin et al. (1996b)						6
Newby & Moulds (2010)						7
Parry & O'Kearney (2014)						9
Patel et al. (2007)						7
Reynolds & Brewin (1999)						9
Smets et al. (2014)						6

Note. Each article was rated green (criterion fully met), amber (criterion partially met) or red (criterion not met) against each quality criterion, detailed in Supplementary Material A.

Table 3

Assessment of Depression in Included Studies

Study	Instrument for depression diagnosis	Instrument for assessment of depression severity	Depression severity Mean (SD)			Between groups comparison of depressive symptom severity
			Depressed	PTSD	Healthy controls	
Birrer et al. (2007)	DID ≥ 15 and BDI ≥ 11 and Report of low mood or anhedonia	DID and BDI	TED BDI 24 (8.5) DID 27 (9.2) DWT BDI 20 (6.7) DID 23 (7.2)	BDI 19 (9.6) DID 22 (9.2)		No significant group differences
Brewin et al. (1996b)	DSM-III-R interview	HADS	13.9 (*not reported*)			
Newby & Moulds (2010)	SCID-I (DSM-IV criteria)	BDI-II	28.60 (8.61)		RD 12.23 (7.06) ND 6.03 (3.72)	Depressed > RD** Depressed > ND** RD > ND*
Parry & O'Kearney (2014)	SCID (DSM-IV criteria) and CES-D ≥ 16	CES-D	29.52 (12.25)	27.71 (11.53)	10.17 (7.64)	Depressed = PTSD Depressed > HC*** PTSD > HC***

Table 3 continued

Assessment of Depression in Included Studies

Study	Instrument for depression diagnosis	Instrument for assessment of depression severity	Depression severity Mean (SD)			Between groups comparison of depressive symptom severity
			Depressed	PTSD	Healthy controls	
Patel et al. (2007)	SCID (DSM-IV criteria)	BDI	33.68 (7.94)			
Reynolds & Brewin (1999)	SCID (DSM-IV criteria)	BDI	27.8 (10.1)	*Not reported*		Depressed = PTSD [a]
Smets et al. (2014)	Psychiatrist diagnosis and BDI-II ≥ 20 and MDQ (DSM-IV criteria)	BDI-II	33.8 (10.0)		11.2 (7.7)	Depressed > HC*** [b]

Abbreviations: BDI, Beck Depression Inventory; CES-D, Centre for Epidemiological Depression Scale; DID, Diagnostic Inventory for Depression; DSM, Diagnostic and Statistical Manual of Mental Disorders; DWT, depression without trauma; HADS, Hospital Anxiety and Depression Scale; HC, healthy controls; MDQ, Major Depression Questionnaire; ND, never depressed; PTSD, posttraumatic stress disorder; SCID, Structured Clinical Interview for DSM-IV-TR for Axis I Disorders; RD, recovered depressed; TED, trauma-exposed depressed.

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

[a] Mean reported for overall sample = 26.9 (10.9) but not reported for PTSD group.

[b] Calculated as not reported

Table 4

Assessment of Intrusive Memories and Measures of Prevalence in Included Studies

Study	Method of assessment of intrusive memories	Timeframe for prevalence	Prevalence of intrusive memories N (%)		
			Depressed	PTSD	Healthy controls
Birrer et al. (2007)	Intrusion Questionnaire, adapted from Intrusion Interview (Michael et al., 2007)	Current experience, timeframe not stated	TED 20 (100%) DWT 17 (90%) Combined 37 (94.9%)	26 (100%)	
Brewin et al. (1996b)	Semi-structured interview	Current experience, timeframe not stated	27 (87.1%)		
Newby & Moulds (2010)	Semi-structured interview	Previous week with prompt for '*most recent*' if none reported. Intrusive memories experienced more than a year ago excluded.	24 (96.0%)		RD 24 (80.0%) ND 22 (73.3%) Combined 46 (76.7%)

Table 4 continued

Assessment of Intrusive Memories and Measures of Prevalence in Included Studies

Study	Method of assessment of intrusive memories	Timeframe for prevalence	Prevalence of intrusive memories N (%)		
			Depressed	PTSD	Healthy controls
Parry & O'Kearney (2014)	Intrusive Memory Questionnaire, adapted from Intrusive Memory Interview (Hackmann et al., 2004)	Previous week	14 (48.3%)	22 (78.6)	7 (23.3%)
Patel et al. (2007)	Semi-structured interview	Previous week with prompt for experience during a '*typical week*' or during last depressive episode if none reported.	17 (43.6%)		
Reynolds & Brewin (1999)	Semi-structured interview	Previous week	45 (72.6%)	42 (97.7%)	
Smets et al. (2014)	Semi-structured interview	Previous week	27 (73.0%)		34 (52.3%)

Abbreviations: DWT, depression without trauma; ND, never depressed; PTSD, posttraumatic stress disorder; RD, recovered depressed; TED, trauma-exposed depressed.

Table 5

Assessment of PTSD and Trauma Exposure in Included Studies

Study	Instrument for PTSD diagnosis	Exclusion of PTSD	Trauma exposure	PTSD severity Mean (SD)			Between groups comparison of PTSD symptom severity
				Depressed	PTSD	HC	
Birrer et al. (2007)	PDS (DSM-IV criteria) ≥ 15, including persistent re-experiencing of a traumatic event with avoidance, arousal and interference in functioning.	Control group	TED *n* = 20 (51%)	TED 21 (10.9) DWT 21 (7.0)	31 (6.3)		PTSD > TED* PTSD > DWT* TED = DWT
Brewin et al. (1996b)	*Not assessed*		*Not assessed*				
Newby & Moulds (2010)	SCID-I (DSM-IV criteria)	Excluded	*Not assessed*				
Parry & O'Kearney (2014)	PDS (DSM-IV criteria)	Control group	TED *n* = 12 (41%) Trauma-exposed healthy controls *n* = 17 (57%)	21.48 (12.97)	28.32 (12.04)	6.05 (5.64)	PTSD > Depressed* PTSD > HC*** Depressed > HC***

Table 5 continued

Assessment of PTSD and Trauma Exposure in Included Studies

Study	Instrument for PTSD diagnosis	Exclusion of PTSD	Trauma exposure	PTSD severity Mean (SD)			Between groups comparison of PTSD symptom severity
				Depressed	PTSD	HC	
Patel et al. (2007)	SCID (DSM-IV criteria)	Included Depression with PTSD *n* = 3	*Not assessed*	33.68 (7.94)			
Reynolds & Brewin (1999)	SCID (DSM-IV criteria) and Posttraumatic symptom scale	Control group	*Not assessed*	*Not reported*			
Smets et al. (2014)	Psychiatrist diagnosis	Included TED *n* = 1	*Not assessed*				

Abbreviations: DSM, Diagnostic and Statistical Manual of Mental Disorders; DWT, depression without trauma; HC, healthy controls; PDS, Post-traumatic Diagnostic Scale; PTSD, posttraumatic stress disorder; SCID, Structured Clinical Interview for DSM-IV-TR for Axis I Disorders; TED, trauma-exposed depressed.
Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

Pooled Prevalence

Prevalence of intrusive memories reported in the seven studies included was pooled to obtain an overall prevalence estimate of 76.0% (95% CI 59.4 – 89.4%), with considerable heterogeneity observed between studies, I^2 = 87.6% (95% CI 76.86 – 93.40%), $Q(6) = 48.53$, $p < .001$ (Figure 2). Removing each study in turn to assess the impact on the model obtained prevalence estimates ranging from 71.8% (95% CI 54.7 – 86.3%) to 80.7% (95% CI 66.0 – 92.2%), indicating that the overall prevalence estimate was not unduly affected by any one study. Considerable heterogeneity continued to be observed in all analyses (Table 6).

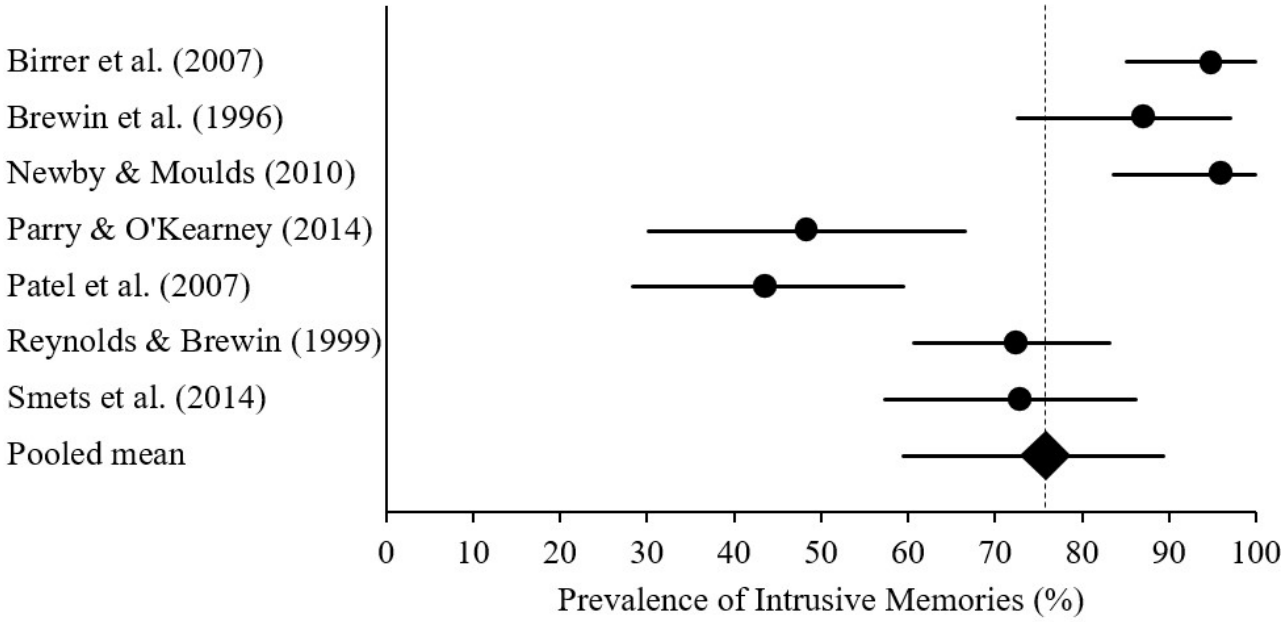

Figure 2: *Forest Plot of Pooled Mean Prevalence with 95% Confidence Intervals.*

Table 6

Leave One Out Analysis

Study omitted	Meta-analysis		Heterogeneity	
	Prevalence estimate (95% CI)	Standard error	I^2 (95% CI)	Q (df)
Birrer et al. (2007)	71.8% (54.7 – 86.3%)	0.088	85.3 (70.0 – 92.8)	34.13*** (5)
Brewin et al. (1996b)	74.0% (54.8 – 89.5%)	0.100	89.0 (78.7 – 94.3)	45.48*** (5)
Newby & Moulds (2010)	71.9% (54.3 – 86.7%)	0.091	87.18 (74.4 – 93.6)	38.99*** (5)
Parry & O'Kearney (2014)	79.8% (63.2 – 92.6%)	0.092	87.08 (74.2 – 93.5)	38.71*** (5)
Patel et al. (2007)	80.7% (66.0 – 92.2%)	0.082	83.20 (64.7 – 92.0)	29.76*** (5)
Reynolds & Brewin (1999)	76.6% (55.8 – 92.5%)	0.109	89.65 (80.2 – 94.6)	48.33*** (5)
Smets et al. (2014)	76.5% (56.8 – 91.8%)	0.104	89.68 (80.2 – 94.6)	48.44*** (5)

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

Sensitivity Analyses

The analysis was run only including the five studies in which depression was assessed via clinical interview against explicit diagnostic criteria by the research team (Table 3). It is possible that the use of self-report measures and acceptance of unconfirmed diagnoses made by referring clinicians may have resulted in the inclusion of participants presenting with symptoms falling outside of clinical significance. However, the prevalence estimate obtained was 71.6% (95% CI 50.5 – 88.9%) and therefore close to the overall prevalence estimate, with considerable heterogeneity remaining between studies, I^2 = 88.2% (95% CI 75.1 – 94.4%), $Q(4) = 34.01$, $p < .001$.

Of the seven studies included, four controlled for the presence of PTSD, excluding adults with PTSD from the sample or from the depression group, where a control sample of adults with PTSD was employed (Table 5). Adjusted prevalence estimates were calculated for those studies that did not exclude comorbid PTSD but where the number of participants with comorbid PTSD was reported, making the conservative assumption that each of these participants reported intrusive memories. The analysis was run with these adjusted prevalence rates entered and with the one study excluded that did not exclude on the basis of PTSD and did not report the number of participants meeting criteria for this diagnosis. This gave a prevalence estimate of 73.5% (95% CI 53.1 – 89.8), with considerable heterogeneity, I^2 = 90.58 (95% CI 82.2 – 95.0%), $Q(5) = 53.05$, $p < .001$, and thus close to the overall prevalence estimate.

Estimates reported in the five studies with a point prevalence defined as occurring within the previous week were pooled (Table 4), obtaining a prevalence estimate of 68.4% (95% CI 49.2 – 85.0%), with considerable heterogeneity, I^2 = 86.00% (95% CI 69.3 – 93.6%), $Q(4) = 28.57$, $p < .001$. Included in this analysis were two studies that asked first for intrusive memories in the previous week but, where none were reported, provided prompts;

Newby and Moulds (2010) prompted for the most recent intrusive memory, limited to those occurring within the previous 12 months, whilst Patel et al. (2007) prompted for intrusive memories from a 'typical' week or experienced during the last depressive episode. With these studies excluded, the prevalence estimate reduced to 66.0% (95% CI 51.0 – 79.5%), with heterogeneity falling below significance, I^2 = 64.21 (95% CI 0.0 – 89.7%), $Q(2) = 5.59$, p = .06.

Finally, the analysis was run using only the five studies that measured the prevalence of intrusive memories via interview, which may be assumed to have allowed the researchers to confirm participants' understanding of the concept of intrusive memories prior to assessing their experience. The prevalence estimate obtained was very close to the overall prevalence estimate calculated, at 75.9% (95% CI 58.0 – 90.2%) with considerable heterogeneity, I^2 = 85.38% (95% CI 67.7 – 93.4%), $Q(4) = 27.36$, $p < .001$.

Moderator Analyses

Given the significant heterogeneity observed between studies, moderator analyses were conducted to explore whether this may be accounted for by differences in sampling or handling of comorbid PTSD. However, in acknowledgement of the small number of studies included and relatively small overall sample size, these analyses should be considered exploratory.

A meta-regression analysis was conducted to evaluate the effect of sampling on the prevalence of intrusive memories, given that the sole use of clinical recruitment may be considered to compromise the representativeness of sampling. This analysis revealed no significant difference between solely clinical samples and community or mixed samples, β = -0.17 (95% CI -0.50 – 0.16), p = .31. Running the analysis with the three studies that employed community sampling, either alone or alongside clinical recruitment, resulted in a prevalence estimate of 83.6% (95% CI 49.5 – 100%), with considerable heterogeneity, I^2 =

92.0% (95% CI 79.8 – 96.8%), Q(2) = 25.05, p < .001. Analysing those studies only recruiting from clinical sites achieved a prevalence estimate of 69.8% (95% CI 52.1 – 85.0%), I^2 = 81.69% (95% CI 52.5 – 92.9%), $Q(3) = 16.38$, $p < .001$.

Secondly, a meta-regression analysis was run to explore the effect of controlling for the presence of PTSD on the prevalence of intrusive memories. This analysis revealed no significant difference in prevalence of intrusive memories between samples that excluded comorbid PTSD and those that did not, $\beta = -0.14$ (95% CI -0.48 – 0.19), $p = .41$. Running the analysis with only the four studies controlling for PTSD achieved a prevalence estimate of 81.3% (95% CI 57.9 – 96.5%), with considerable heterogeneity, $I^2 = 90.24$ (95% CI 78.0 – 95.7), $Q(3) = 30.73$, $p < .001$. Run for the remaining three studies that did not exclude adults with PTSD from the depressed group, a prevalence estimate of 69.0% (95% CI 42.0 – 90.4%) was obtained, again with considerable heterogeneity, $I^2 = 88.12$ (95% CI 66.8 – 95.7), $Q(2) = 16.84$, $p < .001$. This analysis indicates that when comorbid PTSD is controlled for, a large majority of adults with depression continue to report intrusive memories.

Between Groups Analyses

Risk ratios were analysed for the experience of intrusive memories in depression against adults with PTSD and healthy controls. For the three studies including a comparison group of adults with PTSD, risk ratios between the prevalence estimates recorded in depression and those recorded in PTSD were pooled to obtain an overall risk ratio of 1.25 (95% CI 0.99 – 1.58), approaching significance at $p = 0.06$ with considerable heterogeneity between studies, I^2 = 79.8% (95% CI 36.0 – 93.6%), $Q(2) = 9.90$, $p = .007$. This suggests a trend toward an increased risk of experiencing intrusive memories in PTSD than in depression.

For the three studies including a group of healthy controls, risk ratios between the prevalence estimates recorded in adults with depression and those without were pooled to

obtain an overall risk ratio of 2.94 (95% CI 1.53 – 5.67), with heterogeneity falling below significance, I^2 = 0% (95% CI 0.0 – 94.9%), $Q(2) = 1.135$, $p = .57$. The zero value of I^2 here should be considered with caution given the small number of studies included in this analysis and the wide confidence interval presented. The risk ratio calculated was significant at $p = .001$ and indicates that adults with depression are significantly more likely to experience intrusive memories than healthy controls.

Discussion

A growing trend in recent years, research aiming to identify the effective components of cognitive interventions has seen consideration of intrusive memories as a transdiagnostic process, observed not only in PTSD but across a range of mental health presentations. The suggestion that intrusive memories occur frequently in depression and may play a role in its course and maintenance has inspired thought as to the potential utility of this experience as a cognitive target for intervention. However, the likely impact of such interventions has been obscured by the lack of consistency in observed prevalence across studies. To address this disparity, the current meta-analysis aimed to calculate an overall estimate of the prevalence of intrusive memories in adult depression and to explore potential factors influencing this prevalence rate. A total of seven studies met the inclusion criteria, measuring the prevalence of intrusive memories in adults aged 18 years or over with clinical depression, yielding a total of 262 participants. The results indicate an overall prevalence estimate of 76.0% (95% CI 59.4 – 89.4%), remaining stable when each study was omitted in turn. The overall prevalence estimate was not markedly affected by the nature of recruitment sites (clinical vs. community or mixed sampling), assessment of depression (diagnostic interview vs. self-report) or assessment of intrusive memories (interview vs. questionnaire). These findings indicate that intrusive memories are reported by a large majority of adults with depression and therefore

indicate that the development of cognitive treatments targeting this experience may be of value.

Consideration of Heterogeneity

Studies were screened for inclusion against a list of criteria considering recruitment, sample selection and measurement of intrusive memory prevalence with the aim of reducing heterogeneity and allowing comparison across papers. However, considerable heterogeneity was observed in the overall pooled prevalence analysis. This remained across all other analyses with the exception of the sensitivity analysis exploring the impact of the given time frame for intrusive memory identification. Specifically, the prevalence rate reduced to 66% (95% CI 51.0 – 79.5%) when restricted to intrusive memories occurring only within the week prior to assessment, with heterogeneity falling below significance. This indicates that when assessment is constrained to this measure of point prevalence, results across studies are comparable, whilst permitting inclusion of intrusive memories over a broader time frame introduces considerable variability.

Comparison of Intrusive Memories in Depression vs. PTSD

Of significant interest in the current review is the finding that controlling for PTSD within samples did not significantly alter the prevalence of intrusive memories, as revealed through meta-regression. Between-groups analysis examining studies that included a comparison sample of adults with PTSD obtained a risk ratio of 1.25, falling below significance, indicating that adults with depression are at comparable risk of experiencing intrusive memories as adults with PTSD. These findings provide some evidence that intrusive memories occur in depression independently of PTSD and highlight that the headline finding of high prevalence applies to depression both comorbid with and in the absence of PTSD. However, these findings must be considered with a degree of caution given the small number

of studies employing a PTSD comparison group and in the absence of sufficient information evidencing trauma exposure among samples.

Sampling

It may be suggested that clinical samples are more likely to be receiving active treatment in comparison to community or mixed samples. Of those employing clinical samples, Reynolds and Brewin (1999) recruited 62 participants, 49 of whom were prescribed medication and 19 were accessing psychological intervention (reported by Brewin et al., 1999), whilst all of the participants recruited by Smets et al. (2014) were receiving medication. However, Brewin et al. (1996b) and Patel et al. (2007) do not report this data. Moderator analyses comparing prevalence of intrusive memories in exclusively clinical samples with prevalence in community or mixed samples fell below statistical significance, indicating comparable prevalence rates. Whilst it must be acknowledged that this meta-regression compared just three against four studies, these findings make tentative suggestion that available treatments do not appear to alleviate the experience of intrusive memories. Further, the assumption can be made that the treatments accessed by research participants were not designed to target intrusive memories specifically, given the early stage of research into such interventions, and any impact on intrusive memory experience would therefore be most likely to be indirect. In longitudinal research, Brewin et al. (1999) observed experience of intrusive memories to be predictive of depression following a six month delay, independent of the severity of depression recorded at baseline; this suggests that intrusive memories may be implicated in the maintenance of depression and therefore if unaddressed, may contribute to the high rates of relapse. Thus, investigation of intrusive memories across interventions is indicated to explore further the therapeutic gains achieved with respect to intrusive memories by currently offered interventions for depression.

Clinical Relevance and Application

Estimates of the prevalence of intrusive memories in healthy controls ranged from 23% to 73% in studies employing a comparison sample, suggesting that intrusive memories are not uncommon among adults without mental health difficulties. However, between-groups analysis across studies that recruited adults with depression and a comparison sample of healthy controls revealed a risk ratio of 2.94 (95% CI 1.53 – 5.67). Although again calculated from a small number of studies, this finding was highly significant, indicating that adults with depression are significantly more likely to experience intrusive memories than adults without depression. Coupled with the suggestion above that adults with depression are at near comparable risk of intrusive memories as adults with PTSD, this finding supports the notion of intrusive memories as a transdiagnostic process and highlights this experience as of clinical importance in depression. From the introduction of cognitive therapy, the role of mental imagery in psychological difficulties has been acknowledged, with early observation that modifying distressing imagery can realise affective change (Beck, 1976). However, cognitive therapy in adult depression has typically focused on verbal restructuring and techniques exploring imagery have received less attention (Holmes et al., 2007; Wheatley & Hackmann, 2011). As discussed, intrusive memories are considered a diagnostic feature and hallmark of PTSD and cognitive treatments typically focus on intrusive experience. The current findings indicate that the application of such interventions may be extended to adults with depression. Such interventions include eye movement desensitisation and reprocessing (EMDR; Wood & Ricketts, 2013) and mindfulness-based cognitive therapy (Seagal et al., 2002; Ma & Teasdale, 2002). However, research exploring the efficacy of these approaches has not focused principally on intrusive memories and imagery rescripting has therefore been of primary focus in the research literature.

Imagery rescripting requires the client to revisit their memory, describing in detail the narrative and emotional content, and to construct an alternative scenario in collaboration with the therapist that offers a more positive outcome (Hackmann, 1998). In a series of papers, Wheatley and colleagues have explored the application of imagery rescripting to depression (Wheatley et al., 2009; Wheatley & Hackmann, 2011; Wheatley et al., 2007). Although acknowledging that questions remain regarding the underlying mechanisms by which change is achieved, Wheatley and Hackmann (2011) propose that imagery rescripting offers a powerful adjunct to CBT where distressing intrusive memories are reported to be present. Brewin et al. (2009) term this approach 'modular treatment', by which therapeutic components are matched to individual symptom profiles. They go on to propose imagery rescripting as a stand-alone, brief treatment for adults with depression experiencing intrusive memories, evidenced to be effective in reducing depressive symptomology with maintenance at one year follow-up. The current findings support such suggestions, indicating that for upwards of two thirds of adults with depression, imagery rescripting may prove a successful stand-alone intervention or a beneficial module to enhance cognitive interventions. However, questions remain regarding the underlying mechanisms by which change is achieved and Wheatley and Hackmann (2011) highlight the need to explore individual factors for consideration in identifying clients for whom imagery focused interventions may be appropriate. Brewin et al. (2009) call for larger scale investigation, preferably in the form of a randomised controlled trail, to strengthen preliminary findings and to evidence the applicability of interventions to a broader audience.

Limitations

Overall, the strength of conclusions that can be drawn from the current meta-analysis is restricted by the small number of studies measuring the prevalence of intrusive memories in depression and, in particular, the small number of studies including each of the two

comparison groups considered. Given the relatively small overall sample size, the moderator analyses presented should be considered exploratory. Roloff et al., (2013) observe that where the results of meta-analysis are inconclusive, additional study is typically recommended to enhance statistical power. However, they argue that where heterogeneity is anticipated between studies, for example in the collection of observational data such as that recorded in assessment of prevalence, running a single additional study, no matter its size, may prove insufficient to achieve the desired level of power. Rather, a preferable approach would be to update the presented meta-analysis as further research is published, rerunning the analyses to include the new data (Schmidt & Hunter, 2015; Schmidt & Raju, 2007).

The potential impact of trauma exposure and presentation of comorbid PTSD should also be considered when interpreting the current findings. Firstly, three studies did not exclude adults presenting with PTSD from the depression group (Brewin et al. 1996b; Patel et al., 2007; Smets et al., 2014), one of which did not assess for the presence of PTSD (Brewin et al., 1996b). In recognition that intrusive memories are considered a defining feature of PTSD (APA, 2013; WHO, 1992), it must be considered that the inclusion of adults with PTSD may have led to an overestimate of the prevalence of intrusive memories in depression. However, sensitivity analyses indicated that when utilising adjusted prevalence estimates to control for comorbid PTSD, a large majority of adults with depression continued to describe intrusive memories. Secondly, just two studies assessed trauma exposure within depressed and control samples (Birrer et al., 2007; Parry & O'Kearney, 2014), with only one of these reporting prevalence independently for trauma-exposed and non-trauma-exposed depressed participants (Birrer et al. 2007). Given the well documented link between adverse life events and the development of depression, attempts to fully partial out trauma exposure from the relationship between depression and intrusive memory prevalence may be somewhat futile and lacking in clinical relevance. However, research exploring this relationship further

would allow consideration of the impact of trauma exposure on intrusive memory prevalence and may provide useful information regarding the profiles of individuals likely to benefit from interventions targeting intrusive memories.

Conclusions

The current meta-analysis estimates a 76.0% point prevalence rate of intrusive memories in adult depression and highlights that adults with depression are at near comparable risk of experiencing intrusive memories as adults with PTSD. These findings indicate that intrusive memories are an experience shared by a large majority of adults with depression and may therefore be an important cognitive target for therapeutic intervention. The current results support the existing programme of research exploring the utility of imagery rescripting in depression and suggest that interventions addressing intrusive memories may be of clinical utility with depressed adults. As recommended by Brewin et al. (2009) and Wheatley and Hackmann (2011), larger scale investigation measuring clinical outcome is warranted to identify the profiles of individuals for whom such interventions may be appropriate and individual factors predicting treatment response, including the relationship between depression, intrusive memories and trauma exposure. Overall, given indication that intrusive memories may play a role in the course and maintenance of adult depression alongside the high prevalence rate noted here, it is encouraging to see a renewed and timely interest in intrusive memories and interventions targeting this experience.

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Supplementary Material A

Methodological Quality Assessment Criteria

Criteria 1

Clear definition of the target clinical population with recruitment against explicit diagnostic criteria for depression.

Green. Depression assessed against explicit diagnostic criteria by or confirmed by a member of the research team via interview.

Amber. Depression assessed by referring clinicians but not confirmed by the research team via interview, with or without explicit statement of diagnostic criteria.

Red. Depression assessed through use of self-report measures only OR inclusion of participants reporting depressive symptoms falling below clinical cut-offs on interview or questionnaire measures employed.

Criteria 2

Recruitment of a representative clinical sample, assessed according to sampling methods.

Green. Clinical sample recruited through community sampling OR a combination of community recruitment and recruitment from clinical settings.

Amber. Clinical sample recruited from clinical settings exclusively, including at least one out-patient setting.

Red. Clinical sample recruited exclusively from inpatient settings.

Criteria 3

Consideration of comorbid posttraumatic stress disorder.

Green. Assessment of PTSD against explicit diagnostic criteria with exclusion of participants identified or assignment to a comparison sample.

Amber. Assessment of PTSD against explicit diagnostic criteria but without exclusion OR assessment through use of self-report measures only, including those that exclude, retain or assign to a comparison group on this basis OR assessment by referring clinician but not confirmed by the research team.

Red. No assessment of PTSD.

Criteria 4

Clear operationalisation of intrusive memories.

Green. Definition allowing distinction of intrusive memories from other intrusive cognitions, including explicit description of memory for past events.

Amber. Unclear or ambiguous wording challenging the distinction of intrusive memories from other intrusive cognitions OR lack of explicit reference to past events.

Red. Definition not reported.

Criteria 5

Assessment of prevalence of intrusive memories.

Green. Clearly identified time frame referring to experience of intrusive memories in the previous week.

Amber. Wording referring to current experience but without a clearly identified time frame OR where experiences were first assessed within the last week but with prompts provided assessing experience outside of this time frame if current experience was not reported.

Red. Time frame identified is beyond experience in the previous week OR where wording refers to current and past experience or past experience only.

Supplementary Material B

Records Excluded Following Full-Text Review

Violation of Inclusion Criteria

No measure of the prevalence of intrusive memories.

Reynolds and Brewin (1998).

Spenceley and Jerrom (1997).

Watson et al. (2012).

Watson et al. (2013).

Sample of adults who are not clinically depressed.

Bywaters et al. (2004).

Both depression and the prevalence of intrusive memories were assessed but a prevalence figure was reported only for the full sample, including both those with depression and those without.

Williams and Moulds (2007a).

Williams and Moulds (2007b).

Williams and Moulds (2008).

Newby and Moulds (2011a).

Newby and Moulds (2011b).

Starr and Moulds (2006).

Meeting Exclusion Criteria

Sample consisting exclusively of adults with depression who reported experience of intrusive memories.

Moulds et al. (2008).

Newby et al. (2014).

Newby and Moulds (2012).

Sample selected for mental or physical health comorbidity or trauma exposure.

Kuyken and Brewin (1994).

Kuyken and Brewin (1999).

Carlier et al. (2000).

Experimental manipulation prior to measurement of the prevalence of intrusive memories, including where retrieval was cued.

Berle and Moulds (2014).

Raes et al. (2006).

Discussion Papers

Brewin (1998).

Brewin et al. (2010).

Ehring and Watkins (2008).

Holmes et al. (2016).

PART TWO

EMPIRICAL PAPER

Chapter Three

Empirical Paper

TITLE

Intrusive Memories in Children and Adolescents with Depression and Posttraumatic Stress Disorder.

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Abstract

Considered central to posttraumatic stress disorder (PTSD), intrusive memories are also common in adult depression but research with young people is extremely limited. A total of 13 adolescents with PTSD (with or without comorbid depression), 11 with depression and 25 non-clinical controls completed a structured interview via telephone or video call examining intrusive memories. Intrusive memories were reported by 92.3% of the PTSD group (95% CI 77.8 – 100%), 54.5% of the depressed group (95% CI 25.1 – 83.9%) and 28.0% of the control group (95% CI 10.4 – 45.6%). Intrusive memories in participants with PTSD and depression were distinguished from control participants by accompanying intense negative emotions and appraisals of psychological abnormality and negative self-evaluation. Intrusive memories in participants with PTSD were marked by heightened distress, whilst a trend toward higher distress was observed in participants with depression compared to controls. Strong sensory quality was a distinguishing characteristic of intrusive memories in PTSD. Intrusive memories are highlighted as a common experience in both adolescent PTSD and depression, assessment of which may provide valuable clinical information in presentations of low mood, with intrusive memories holding potential as a cognitive therapeutic target. Findings are considered exploratory due to small sample size with replication required.

Keywords: Intrusive Memory, Depression, Posttraumatic Stress Disorder, Children, Adolescents

Intrusive Memories in Children and Adolescents with Depression and Posttraumatic Stress Disorder

Involuntary re-experiencing of traumatic exposure is considered central to posttraumatic stress disorder (PTSD), experienced as recurring dreams, sensations of reliving and dissociation ('flashbacks'), intrusive memories or intense distress or arousal on exposure to trauma-related cues (American Psychiatric Association [APA], 2013; World Health Organization, 1992). Defined as uninvited, spontaneously occurring memories that disrupt conscious thought, intrusive memories have received growing interest in recent literature as a transdiagnostic process and are increasingly recognised as common to many psychological disorders, as opposed to an experience unique to PTSD (Brewin, Gregory, Lipton & Burgess, 2010; Harvey, Watkins, Mansell & Shafran, 2004). Given the well documented observation of negative memory bias in depression (Gaddy & Ingram, 2014), of particular focus has been the experience of intrusive memories in depressed adults. The reported prevalence has varied across studies but is estimated at 76% in a recent meta-analysis, indicating that intrusive memories are a shared experience for a large majority of adults with depression (Payne, Kralj, Young & Meiser-Stedman, 2017).

The National Institute for Health and Care Excellence (2009) recommends cognitive behaviour therapy (CBT) as a first line therapeutic intervention in adult depression across the spectrum of severity, seen to be effective in alleviating symptoms and to have enduring benefit beyond the end of treatment (Hollon et al., 2005; Lynch, Laws & McKenna, 2010). However, despite superiority over pharmaceutical treatments alone, rates of relapse remain high (Dobson et al., 2008; Fava et al., 2004). With efforts to identify the effective components of cognitive therapy, intrusive memories have been highlighted as a potential therapeutic target. Despite growing interest in adults, there remains little research exploring the experience of intrusive memories in adolescent depression. The adult literature will

therefore first be discussed, followed by consideration of intrusive memories as experienced by young people.

Intrusive Memories in Adult Depression

Recognising that many adults with depression report early adversity, Kuyken and Brewin (1994) were the first to examine intrusive memories in this population, conducting interviews with depressed female survivors of childhood abuse. Rated levels of intrusiveness and cognitive avoidance were observed to be related to greater severity of depressive symptoms. Brewin, Hunter, Carroll and Tata (1996a) further demonstrated that intrusive memories are experienced by both men and women and are not only consequent of abuse but present in depression following a range of negative life events. With aim to further explore the relationship between depressed mood and intrusive memory experience, Spenceley and Jerrom (1997) compared adults with depression to previously depressed adults and a non-clinical control group. Intrusiveness and avoidance associated with intrusive memories were rated as higher by the depressed group than by both comparison groups, suggesting that intrusive recall of negative life events is associated with depressed mood. Reynolds and Brewin (1998; 1999) later highlighted similarities in experience in matched-samples of adults with depression and adults with PTSD, with both groups reporting a range of intrusive cognitions including intrusive memories and associated cognitive avoidance. Coupled with the finding that the experience of intrusive memories is predictive of depressed mood following a six month delay, independent of initial symptom severity (Brewin, Reynolds & Tata, 1999), these early observations stirred interest in the role of intrusive memories in maintaining depression and the literature has since expanded rapidly.

Many parallels have been highlighted between the experience of intrusive memories in depression and that in PTSD, with both groups reporting intrusive memories that are vivid (e.g. Birrer, Michael & Munsch, 2007; Reynolds & Brewin, 1999); highly sensory in quality

(e.g. Newby & Moulds, 2012); and associated with negative emotions and distress (e.g. Newby & Moulds, 2011, Newby & Moulds, 2012). Whilst dissociative experience appears confined to PTSD, sensations of reliving and associated physiological sensation are shared in depression (Reynolds & Brewin, 1999). Indeed, Williams and Moulds (2007a) identified the 'here and now' quality of intrusive memories to be associated with intrusion-related distress and to be the strongest predictor of depression severity, beyond distress and associated negative emotions and independent of intrusion frequency. These findings stand in contrast with previous suggestion that this sense of 'nowness' is restricted to trauma memories (Michael, Ehlers, Halligan & Clark, 2005). As in PTSD (Ehlers & Steil, 1995), negative appraisals of both the content of intrusive memories and of the intrusive experience itself have been linked to intrusion-related distress and subsequent avoidance in depression, in addition to depressive symptom severity (Newby & Moulds, 2010; Starr & Moulds, 2006). Newby and Moulds (2010) suggest that adults with depression may perceive their intrusive experience as central to personal identity, mirroring observations in PTSD (Berntsen & Rubin, 2007). Together, these findings indicate that the recall characteristics, associated negative appraisals and employed cognitive avoidance strategies recognised in the maintenance of re-experiencing symptoms in PTSD may also maintain intrusive experience in depression (Dunmore, Clark & Ehlers, 1999; Dunmore, Clark & Ehlers, 2001; Newby & Moulds, 2011). It may be suggested that cognitive avoidance of negative intrusive memories limits effective processing and serves to maintain depression, as cognitive avoidance of traumatic material is thought to prevent emotional processing and maintain symptoms of PTSD (Williams & Moulds, 2007b).

Revised Dual Representation Theory

Revised Dual Representation Theory (DRT) differentiates between contextually-bound memory representations or C-reps (information attended to consciously during an

event stored in coherent, voluntarily accessible form) and sensory-bound memory representations or S-reps (information outside of conscious awareness stored in sensory form with incoherent structure). Whilst C-reps are stored in long-term memory, S-reps are typically transient. However, experiences of heightened arousal promote low-level processing, resulting in enduring S-reps which may be involuntarily accessed on exposure to trauma-related cues (experienced as intrusive memory). Involuntary retrieval of enduring S-reps triggers retrieval of corresponding C-reps, subjecting retrieval to conscious control (Brewin, Dalgleish & Joseph, 1996b; Brewin et al., 2010). Re-experiencing symptoms in PTSD are thought consequent of differential processing, with traumatic events resulting in enduring S-reps with weak or absent corresponding C-reps; outside of conscious control, intrusive memories are experienced as though happening in the present (Brewin et al., 2010). Intrusive memories in depression are understood to be processed as in regular autobiographical memory, with elevated distress associated with intrusive experience considered the result of attentional bias toward negative situational cues and negative appraisals of intrusive experience (Brewin et al., 2010; Ehlers & Clark, 2000).

Depression and Intrusive Memories in Young People

Negative life events are widely recognised as a risk factor in the development of depression, with the increased incidence of stressful life events observed in adolescence thought linked to the emergence of depressive disorders (Ge, Conger & Elder, 2001). Although established around adult presentations, dual representation models provide a valuable framework in which to understand the experiences of trauma-exposed young people (Meiser-Stedman, 2002). Mirroring the adult literature, Meiser-Stedman, Dalgleish, Yule and Smith (2012) evidence that intrusive memories in adolescence are not unique to trauma-exposed youth but a relatively common experience for young people following negative life events, as recorded in a community sample. It is indicated that the frequency and vividness of

intrusions are implicated in the maintenance of depressive symptoms, highlighting intrusive memories as a potential target for cognitive intervention for depression in young people. The primary aim of the current study was to explore the experience of intrusive memories in adolescent depression, extending existing exploration to a clinical population. Secondly, the study aimed to provide comprehensive review of intrusive memory experience in young people with PTSD, in acknowledgement that the weight of existing evidence is held within the adult literature. Finally, comparison was planned between young people with depression, young people with PTSD and non-clinical youth to allow evaluation of the potential value of intrusive memories as a therapeutic target for cognitive intervention.

Hypotheses

Hypothesis One. The prevalence of intrusive memories, their perceived intrusiveness and the frequency with which they are experienced would be higher in the clinical groups than in non-clinical youth, as evidenced in adult depression.

Hypothesis Two. Young people with PTSD and young people with depression would describe their intrusive memories as accompanied by stronger negative emotions than non-clinical youth, whilst only young people with PTSD would describe their intrusive memories as highly sensory in quality and report dissociative experience, as indicated by the extant literature and revised DRT (Brewin et al., 2010; Reynolds & Brewin, 1999)

Hypothesis Three. Clinical groups would appraise their intrusive memories more negatively than non-clinical youth, as indicated by cognitive models (Brewin et al., 2010; Ehlers & Clark, 2000).

Hypothesis Four. Physical sensations would not be unique to PTSD but an experience shared by young people with depression and non-clinical youth. While revised DRT would expect only individuals with PTSD to describe re-experiencing symptoms, Reynolds and Brewin (1999) suggest that such experiences are not unique to PTSD.

Hypothesis Five. Clinical and non-clinical youth would differ in the thought control strategies they use to manage their intrusive memories and in how effective they find them.

Method

Participants

Clinical groups. Participants were recruited to the clinical groups locally from Child and Adolescent Mental Health Services and Youth Mental Health Teams across Norfolk, Suffolk and Cambridgeshire and via recruitment posters displayed in General Practice surgeries. Participants were also recruited nationally through charitable and professional support organisations and via online advertising on social networking sites. Young people aged 11 to 18 years were approached by clinicians, where applicable, or invited to contact the research team directly. Young people were eligible to take part if they met diagnostic criteria for PTSD and/or Major Depressive Disorder (MDD). Exclusion criteria were (a) current psychotic disorder; (b) current drug or alcohol misuse; (c) learning disability; and (d) lack of fluency in English.

Control group. Participants were recruited to the control group locally from a secondary school in Norfolk with lower than average socioeconomic status, as indexed by eligibility for free school meals, and nationally via online advertising on social networking sites. Young people aged 11 to 18 were invited to contact the research team directly. Exclusion criteria were as listed above for the clinical groups with the additional requirement that young people with clinically significant depression or PTSD were excluded from the control group, as assessed via structured diagnostic interview and self-reported symptoms (see *Measures*).

Ethical Approval

Ethical approval for the current study was obtained from the National Research Ethics Service, Solihull NHS Research Ethics Committee (Reference 15/WM/0468).

Procedure

Participants first completed a questionnaire battery hosted online assessing trauma history and self-reported symptoms of depression. Secondly, a structured interview was conducted by telephone or via video call formally assessing for PTSD and MDD and exploring the experience of intrusive memories and thoughts, with the order of memory and thought schedules counterbalanced across participants. Please see Kralj, Payne, Young and Meiser-Stedman (2017) for discussion of intrusive thoughts.

Measures

Online measures.

Revised Child Anxiety and Depression Scale (RCADS). The RCADS (Chorpita, Yim, Moffitt, Umemoto & Francis, 2000) assesses MDD and anxiety disorders in young people aged eight to 18 years against diagnostic criteria. The depression subscale comprises 10 self-report items and was administered to evaluate between-group differences (Weiss & Chorpita, 2011). The RCADS demonstrates favourable validity in clinical samples and has received support for use in research capacities with non-clinical youth (Chorpita et al., 2000; Chorpita, Moffitt & Gray, 2005).

Child and Adolescent Trauma Screen (CATS). The CATS (Sachser et al., 2017) is a self-report tool assessing trauma history and post-traumatic stress symptoms in children aged seven to 17 years against the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria with good internal consistency (Cronbach's $\alpha = .92$). The first section of the CATS was administered to assess trauma exposure, in which respondents are asked whether they have experienced any of 14 traumatic events.

Diagnostic measures.

Anxiety Disorders Interview Schedule: Child version (ADIS-C). The ADIS-C (Silverman & Albano, 1996) is a structured diagnostic interview assessing anxiety and related

disorders, including MDD. Widely used in clinical research (Silverman & Ollendick, 2005), the ADIS-C is well evidenced to possess excellent reliability and validity (Silverman, Saavedra & Pina, 2001; Wood, Piacentini, Bergman, McCracken & Barrios, 2002). Interrater agreement on principal diagnosis based on information provided by a child alone has been found to be excellent (Lyneham, Abbott & Rapee, 2007), supporting the administration of MDD and PTSD subscales in the current study to confirm diagnoses without parallel administration of the parent form.

Intrusive memory interview schedule.

Participants were first provided with a definition of intrusive memories along with a narrative example. They were then asked to identify an intrusive memory, with a further descriptive prompt given if required. If more than one intrusive memory was reported, the most distressing was selected. If unable to identify an intrusive memory, the interview was terminated. See Appendix for the full interview schedule. For those reporting intrusive memory experience, each of the following measures was answered in relation to the selected intrusive memory.

Frequency. Participants rated how often the memory 'pops into' their mind, with options *once a week or less*, *several times a week*, *every day*, or *more than once a day*.

Duration. Participants estimated how long the memory stays in their mind, with options *a few seconds*, *a few minutes*, *up to an hour* or *more than an hour.*

Children's Revised Impact of Events Scale (CRIES). The CRIES (Children and War Foundation, 2005) is a 13-item self-report measure completed with respect to an identified past event, assessing PTSD symptomology in children aged eight years and above. Only the 4-item intrusiveness subscale was administered to assess intrusiveness. The CRIES holds good overall internal consistency (Cronbach's $\alpha = .80$) and good internal consistency for

intrusion items alone (Cronbach's α = .70), with intrusion and avoidance considered separable constructs (Smith, Perrin, Dyregrov & Yule, 2003).

Trauma Memory Quality Questionnaire (TMQQ). The TMQQ (Meiser-Stedman, Smith, Yule & Dalgleish, 2007) is an 11-item self-report measure assessing trauma memory quality in young people aged 10 to 18 years, examining visual quality and non-visual sensory features in addition to temporal context and verbal accessibility. The authors report good internal consistency (Cronbach's α > .75) and evidence that the TMQQ measures memory quality independent of frequency.

Associated emotions. Participants rated on a scale from 0 (*not at all*) to 100 (*very much*), how strongly they associate with their memory each of seven emotions (*anger*, *sadness*, *fear*, *guilt*, *helplessness*, *shame* and *anxiety*) identified as prominent within the adult PTSD and depression literature (Brewin et al., 1996a; Brewin et al., 1996b).

Distress. Participants rated how distressing they find their intrusive memory on a scale from 0 (*not at all*) to 100 (*very much*).

Associated physical sensations. Participants were given examples of physical sensations that may accompany intrusive memories and asked whether they experience these. Answers were coded as *physical sensations experienced* or *no physical sensations experienced*.

Feelings of reliving. Participants were asked whether their intrusive memory feels as though *it is something that is happening again now* or as though they are *looking back at something that happened in the past*.

Dissociative experience. Participants answered *true* or *false* to the following statements; '*when the memory pops into my head things seem unreal to me, as if I am in a dream or watching a film*' and '*when the memory pops into my head I feel different and far away from other people, even if people are with me*', adapted from the Acute Stress Checklist

for Children (Kassam-Adams, 2006), a self-report measure validated for use with children aged eight to 16. Participants then answered *true* or *false* to the following statement, designed to evaluate out-of-body experience; '*when the memory pops into my head, I feel as though I am floating outside of my body or looking at myself from a distance*'. Cronbach's alpha calculated for the three questions assessing dissociation indicated a very low level of internal consistency, α = .036, and each experience described was therefore considered separately.

Intrusive memory appraisals. Participants rated on a scale from 0 (*I don't believe this at all*) to 100 (*I am convinced that this is true*) to what extent they believe 10 statements adapted from the appraisals interview schedule developed by Newby and Moulds (2010), assessing perceived need to control the memory (three items, e.g. '*I must gain control of this memory*'), belief that the memory signals psychological abnormality (four items, e.g. '*having this memory means I'm going crazy*') and associated negative self-evaluation (three items, e.g. '*having this memory means that I'm not good enough*'). One item assessing perceived psychological abnormality was reverse scored. Cronbach's alpha was calculated for the full scale at α = .86, indicating a high level of internal consistency. Considering each of the subscales separately, internal consistency remained high: control appraisals α = .75; appraisals of psychological abnormality α = .82; negative self-evaluation α = .92.

Thought control. Participants indicated whether they *often*, *sometimes* or *never* use the following thought control strategies; rumination ('*I keep going over the memory in my mind, over and over again*'), suppression ('*I try to stop the memory or push it out of my mind*'), distraction ('*I try to do other things or think about other things to stop myself from thinking about the memory*') and replacement ('*I try to think about something nice instead*'). For those used, participants rated on a scale from 0 ('*I don't feel at all better*') to 100 ('*I feel completely better*'), how effective they find each strategy.

Data Analysis Plan

Where data met parametric assumptions, between-group quantitative comparisons were performed using one-way analysis of variance (ANOVA) and post-hoc Tukey's HSD tests accounting for multiplicity. Welch's *F* is reported where data violated the assumption of homogeneity of variance, with Games-Howell post-hoc tests. Distress ratings violated the assumption of normality and were transformed by √[(highest score + 1) – score] to adjust for negative skew. All other variables that violated the assumption of normality could not be transformed successfully and Kruskal-Wallis tests were therefore employed with pairwise comparisons adjusted for multiplicity. Between-groups categorical data was analysed using the chi-square test where all expected frequencies were greater than five and Fisher's exact test where this was violated. For all analyses, the α-level was set at .05. Given the small sample size and subsequently reduced power, effect sizes were calculated for all analyses including those that did not reach significance to inform future studies. Cohen's *d* was calculated for between-groups scores and Cohen's *h* for comparison of proportions, for both of which .2 is considered a small, .5 is considered a medium and .8 is considered a large effect size (Cohen, 1988).

Results

Participants

Forty-nine young people participated in the study, comprised of 39 females and 10 males and aged 11.02 to 18.94 years ($M = 15.01$, $SD = 1.73$). Sample demographics are presented in Table 1.

Clinical groups. Eleven young people met diagnostic criteria for MDD only on the ADIS-C, referred to throughout as the 'depressed group'. Six young people met criteria for PTSD only and seven met criteria for both MDD and PTSD. Given the high rate of comorbid

depression typically observed in PTSD (Kilpatrick et al., 2003), these groups were combined to form the 'PTSD group' (n = 13).

Control group. Twenty-eight young people were initially recruited to the 'control group'. Three of these young people obtained T-scores greater than 70 on the depression subscale of the RCADS, indicating clinically significant depressed mood, and were therefore excluded from analyses, giving a final control sample of 25 participants.

Age and Gender. There was no significant difference between the three participant groups in age, $F(2, 46) = 1.70$, $p = .20$, or in gender, Fisher's exact test, $p = .15$.

Depression

A significant association was observed between participant group and T-scores recorded on the depression subscale of the RCADS, Welch's $F(2, 16.90) = 48.60$, $p < .001$. Post-hoc tests revealed no significant difference between the PTSD and depressed groups ($p = .50$), whilst both clinical groups obtained higher scores than the control group (both ps < .001).

Trauma History

All participants in the PTSD group, 5 participants in the depressed group (45.5%) and 11 participants in the control group (44.0%) reported at least one traumatic experience, Fisher's exact test, $p < .001$. A significantly greater proportion of the PTSD group reported exposure to traumatic experiences than the depressed ($p = .001$, $h = 1.66$) and control groups ($p < .001$, $h = 1.69$). There was no significant difference in trauma exposure between the depressed and control groups ($p = .80$, $h = 0.03$).

Table 1

Sample Demographics and Characteristics with Between-Group Comparisons

Group	Number *N* (*n* males, %)	Age in years *M* (*SD*)	RCADS	CATS
			Total depression *T*- score *M* (*SD*)	Trauma exposure *N* (%)
Full sample	**49 (10, 20.4%)**	**15.01 (1.73)**		
PTSD group	13 (3, 23.1%)	15.15 (1.77)	74.85[a] (16.31)	13[a] (100%)
Depressed group	11 (0, 0%)	15.73 (1.11)	81.73[a] (13.31)	5[b] (45.5%)
Control group	25 (7, 28.0%)	14.62 (1.88)	46.20[b] (6.27)	11[b] (44.0%)
Subsample reporting intrusive memories	**25 (5, 20.0%)**	**15.14 (1.69)**		
PTSD-IM	12 (3, 25.0%)	15.49 (1.31)	75.25[c] (16.97)	12[c] (100%)
Depressed-IM	6 (0, 0%)	15.41 (1.44)	77.33[c] (11.09)	4[c] (66.67%)
Control-IM	7 (2, 28.6%)	14.29 (2.32)	49.14[d] (4.53)	6[c] (85.71%)

Abbreviations: CATS, Child and Adolescent Trauma Screen; Control-IM, participants in control group reporting intrusive memories; Depressed-IM, participants in depressed group reporting intrusive memories; PTSD, posttraumatic stress disorder; PTSD-IM, participants in PTSD group reporting intrusive memories; RCADS, Revised Child Anxiety and Depression Scale.

[a, b] Full sample means in a column without a common superscript letter differ significantly ($p < .05$).

[c, d] Subsample means in a column without a common superscript letter differ significantly ($p < .05$).

Intrusive Memory Experience

A total of 25 participants (51.0% of total sample) reported experience of intrusive memories, comprised of 12 participants in the PTSD group (92.3%, 95% CI 77.8 – 100%), 6 participants in the depressed group (54.5%, 95% CI 25.1 – 83.9%) and 7 participants in the control group (28.0%, 95% CI 10.4 – 45.6%), $\chi^2(2) = 14.22$, $p = .001$. A significantly greater proportion of participants with PTSD reported intrusive memories than control participants ($p < .001$, $h = 1.46$). A large effect size was observed between participants with PTSD and participants with depression ($h = 0.92$) and a medium effect size between participants with depression and control participants ($h = 0.55$). However, these comparisons did not reach significance ($p = .16$ and $p = .47$, respectively). Only those participants reporting experience of intrusive memories are included in the following analyses, referred to as the 'PTSD-IM', 'depressed-IM' and 'control-IM' groups. Given the relatively small number of participants included, these analyses should be considered exploratory.

Intrusive Memory Content

The content of intrusive memories was reviewed by the first and second authors against the DSM-5 definition of trauma (APA, 2013). Thus, trauma was considered exposure to actual or threatened death, sexual violence or serious injury. Potentially traumatic events were defined as reports that were suggestive of trauma but with insufficient information provided to discern whether traumatic exposure occurred. A total of 20 participants described intrusive memories of traumatic events or potentially traumatic events (Table 2), comprised of 11 participants in the PTSD-IM group (91.7%), five participants in the depressed-IM group (83.3%) and four participants in the control-IM group (57.1%).

Table 2

Content of Intrusive Memories

Event	PTSD-IM (n = 12)	Depressed-IM (n = 6)	Control-IM (n = 7)	Total (n = 25)
Illness or serious injury to self	2 (16.7%)	1 (16.7%)	0 (0%)	3 (12.0%)
Physical or sexual assault	4 (33.3%)	1 (16.7%)	0 (0%)	5 (20.0%)
Death, illness or serious injury to another	4 (33.3%)	1 (16.7%)	1 (14.3%)	6 (24.0%)
Traumatic interpersonal difficulties including serious bullying	1 (8.3%)	2 (33.3%)	2 (28.6%)	5 (20.0%)
Other traumatic event or potentially traumatic event	0 (0%)	0 (0%)	1 (14.3%)	1 (4.0%)
Non-traumatic event	1 (8.3%)	1 (16.7%)	3 (42.9%)	5 (20.0%)

Abbreviations: Control-IM, participants in control group reporting intrusive memories; Depressed-IM, participants in depressed group reporting intrusive memories; PTSD-IM, participants in PTSD group reporting intrusive memories.

Intrusive Memory Characteristics

Frequency and duration. The association observed between participant group and the frequency with which the identified intrusive memory was experienced approached significance, Fisher's exact test, $p = .09$ (Table 3). Ten participants in the PTSD-IM group (83.3%) reported their intrusive memory to occur several times a week or more, compared to one participant in the depressed-IM group (16.7%) and two participants in the control-IM group (28.6%). No association was observed between participant group and the duration for which intrusive memories stayed in mind, Fisher's exact test, $p = .49$ (Table 3).

Intrusiveness. A Kruskal-Wallis test revealed a significant association between participant group and CRIES intrusiveness subscale scores, $H(2) = 6.40$, $p = .04$ (Table 4). Intrusiveness was rated as significantly higher by the PTSD-IM group than by the control-IM group ($p = .04$, $d = 1.30$). There was no significant difference between intrusiveness scores in the depressed-IM and control-IM groups, although the observed effect size was large ($p = .84$, $d = 0.81$), and no significant difference between the clinical groups, with a medium effect size ($p = .71$, $d = 0.71$).

Table 3

Intrusive Memory Frequency and Duration

	PTSD-IM (n = 12)	Depressed-IM (n = 6)	Control-IM (n = 7)	Total (n = 25)
Frequency				
Once a week or less	2 (16.7%)	5 (83.3%)	5 (71.4%)	12 (48.0%)
Several times a week	6 (50.0%)	1 (16.7%)	1 (14.3%)	8 (32.0%)
Every day	1 (8.3%)	0 (0%)	0 (0%)	1 (4.0%)
More than once a day	3 (25.0%)	0 (0%)	1 (14.3%)	4 (16.0%)
Duration				
A few seconds	2 (16.7%)	0 (0%)	2 (28.6%)	4 (16.0%)
A few minutes	3 (25.0%)	4 (66.7%)	3 (42.9%)	10 (40.0%)
Up to an hour	3 (25.0%)	1 (16.7%)	2 (28.6%)	6 (24.0%)
More than an hour	4 (33.3%)	1 (16.7%)	0 (0%)	5 (20.0%)

Abbreviations: Control-IM, participants in control group reporting intrusive memories; Depressed-IM, participants in depressed group reporting intrusive memories; PTSD-IM, participants in PTSD group reporting intrusive memories.

Table 4

Characteristics of Intrusive Memories

	PTSD-IM (n = 12, 92.3%)	Depressed-IM (n = 6, 54.5%)	Control-IM (n = 7, 28.0%)	Between-group differences
CRIES[a] *M* (*SD*)	15.58 (3.70)	13.00 (3.58)	8.86 (6.28)	PTSD-IM > Control-IM*
TMQQ[b] *M* (*SD*)	34.42 (3.23)	28.00 (5.33)	28.14 (4.53)	PTSD-IM > Depressed-IM* PTSD-IM > Control-IM*
Emotion total[c] *M* (*SD*)	454.50 (139.61)	425.00 (120.12)	190.00 (109.09)	PTSD-IM > Control-IM** Depressed-IM > Control-IM**
Anger[d]	41.58 (29.16)	42.50 (35.74)	23.86 (34.27)	*No sig. diff.*
Sadness[d]	74.17 (27.78)	82.50 (12.55)	26.57 (23.39)	PTSD-IM > Control-IM* Depressed-IM > Control-IM*
Fear[d]	82.08 (30.41)	80.00 (14.14)	58.00 (35.21)	*No sig. diff.*
Guilt[d]	54.33 (37.91)	36.67 (25.82)	21.71 (30.01)	*No sig. diff.*
Helplessness[d]	81.00 (26.17)	64.17 (29.74)	21.86 (24.55)	PTSD-IM > Control-IM**
Shame[d]	45.92 (36.86)	43.33 (31.41)	15.14 (16.28)	*No sig. diff.*
Anxiety[d]	75.42 (29.96)	75.83 (33.83)	22.86 (26.28)	PTSD-IM > Control-IM* Depressed-IM > Control-IM*
Distress[d] *M* (*SD*)	87.92 (10.76)	72.50 (13.32)	37.86 (30.53)	PTSD-IM > Control-IM** PTSD-IM > Depressed-IM*
Appraisal total[e] *M* (*SD*)	503.25 (237.61)	449.83 (145.58)	193.00 (120.37)	PTSD-IM > Control-IM**
Control[e]	184.08 (94.77)	170.83 (40.55)	147.00 (109.54)	*No sig. diff.*
Psychological abnormality[f]	185.42 (105.19)	168.17 (69.66)	40.29 (47.69)	PTSD-IM > Control-IM** Depressed-IM > Control-IM*
Negative self-evaluation[e]	133.75 (103.27)	110.83 (80.65)	5.71 (9.76)	PTSD-IM > Control-IM* Depressed-IM > Control-IM*

Table 4 continued.

Characteristics of Intrusive Memories

	PTSD-IM (*n* = 12, 92.3%)	Depressed-IM (*n* = 6, 54.5%)	Control-IM (*n* = 7, 28.0%)	Between-group differences
Thought control				
N rumination (%)	9 (75%)	5 (83.3%)	4 (57.1%)	*No sig. diff.*
Effectiveness[d] *M* (SD)	15.56 (18.11)	16.20 (17.95)	15.00 (23.81)	
N suppression (%)	10 (83.3%)	5 (83.3%)	6 (85.7%)	*No sig. diff.*
Effectiveness[d] *M* (SD)	33.50 (20.56)	46.00 (26.08)	69.17 (47.79)	
N distraction (%)	12 (100%)	6 (100%)	5 (71.4%)	*No sig. diff.*
Effectiveness[d] *M* (SD)	45.42 (26.58)	68.33 (26.20)	76.20 (37.38)	
N replacement (%)	11 (91.7%)	4 (66.7%)	5 (71.4%)	PTSD-IM < Control-IM*
Effectiveness[d] *M* (SD)	35.45 (17.67)	55.00 (19.15)	86.00 (26.08)	

Abbreviations: Control-IM, control participants reporting intrusive memories; CRIES, Children's Revised Impact of Events Scale; Depressed-IM, depressed participants reporting intrusive memories; PTSD-IM, PTSD group participants reporting intrusive memories; TMQQ, Trauma Memory Quality Questionnaire.

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

[a b c d e f g] Ranges of possible scores: [a] 0 – 20; [b] 0 – 44; [c] 0 – 700; [d] 0 – 100; [e] 0 – 1000; [f] 0 – 300; [g] 0 – 400

Measures of Intrusive Memory Quality and Associated Emotions

Quality. A one-way ANOVA showed that TMQQ scores differed significantly by participant group, $F(2, 22) = 7.27$, $p = .004$ (Table 4). Scores obtained by the PTSD-IM group were significantly higher than those obtained by the depressed-IM ($p = .01$, $d = 1.46$) and control-IM groups ($p = .01$, $d = 1.60$). There was no significant difference between scores in the depressed-IM and control-IM groups ($p = 1$, $d = 0.03$). This indicates that intrusive memories experienced by young people with PTSD are higher in sensory quality than those experienced by young people with depression or non-clinical controls.

Associated emotions and distress. Ratings recorded for each of the seven emotions assessed were summed to obtain a total associated emotions score (maximum score of 700, Table 4). A one-way ANOVA revealed a significant association between this total score and participant group, $F(2, 22) = 10.15$, $p = .001$. The control-IM group recorded significantly lower ratings than the PTSD-IM ($p = .001$, $d = 2.11$) and depressed-IM groups ($p = .009$, $d = 2.05$), whilst there was no significant difference between the clinical groups ($p = .89$, $d = 0.23$).

Kruskal-Wallis tests were performed to explore each emotion individually. No significant relationship was observed between the strength of associated emotion and participant group for the emotions of anger, fear, guilt and shame, all ps > .05. There was a significant association between participant group and ratings of sadness, $H(2) = 10.50$, $p = .005$, with the control-IM group rating sadness associated with their intrusive memories as lower than the PTSD-IM ($p = .01$, $d = 1.85$) and depressed-IM groups ($p = .01$, $d = 2.98$), whilst the clinical groups did not differ from one another ($p = 1$, $d = 0.39$). A significant association was also observed between participant group and ratings of anxiety, $H(2) = 9.51$, $p = .009$. The control-IM group recorded lower anxiety ratings than the PTSD-IM ($p = .01$, $d = 1.87$) and depressed-IM groups ($p = .03$, $d = 1.75$), whilst again the clinical groups did not

differ from one another (p = 1, d = 0.01). Ratings of the strength of association between intrusive memories and helplessness differed significantly by group $H(2) = 11.97$, p = .003, with lower ratings recorded by the control-IM group than the PTSD-IM group (p = .002, d = 2.33), whilst pairwise comparisons between the PTSD-IM and depressed-IM (p = .87, d = 0.60) and between the control-IM and depressed-IM groups (p = .14, d = 1.55) fell below significance.

A one-way ANOVA revealed a highly significant association between participant group and ratings of distress associated with intrusive memories, Welch's $F(2, 11.81) = 12.31$, p = .001. The PTSD-IM group reported significantly higher levels of distress than the depressed-IM (p = .04, d = 1.27) and control-IM groups (p = .002, d = 2.19). The depressed-IM group also reported higher levels of distress than the control-IM group with large effect size of d = 1.47, approaching significance at p = .07.

Measures of Associated Experience

Physical sensations. Eleven participants in the PTSD-IM group (91.7%), 5 participants in the depressed-IM group (83.3%) and 4 participants in the control-IM group (57.1%) described their intrusive memories as accompanied by physical sensations, Fisher's exact test p = 0.20. A large effect size was observed between the PTSD-IM and control-IM groups (h = 0.84), a medium effect size between the depressed-IM and control-IM groups (h = 0.59), and a small effect size between the PTSD-IM and depressed-IM groups (h = 0.26).

Feelings of reliving. Five participants in the PTSD-IM group (41.7%), one participant in the depressed-IM group (16.7%) and one participant in the control-IM group (14.3%) reported sensations of reliving, Fisher's exact test p = .45. A medium effect size was observed between the PTSD-IM and control-IM groups (h = 0.63), and between the PTSD-IM and depressed-IM groups (h = 0.56), whilst a small effect size was observed between the depressed-IM and control-IM groups (h = 0.07).

Dissociative experience. All participants in the clinical groups and two participants in the control-IM group (28.6%) reported feeling '*different and far away from other people*' when their intrusive memory occurred, Fisher's exact test $p < .001$. Large effect sizes were observed between the PTSD-IM and control-IM groups and between the depressed-IM and control-IM groups (both $h = 2.01$).

Five participants in the PTSD-IM group (41.7%), four participants in the depressed-IM group (66.7%) and five participants in the control-IM group (71.4%) described feeling as though they were '*in a dream or watching a film*' when their intrusive memory occurred, Fisher's exact test $p = .45$. Four participants in the PTSD-IM group (33.3%), three participants in the depressed-IM group (50.0%) and three participants in the control-IM group (42.9%) described out of body experiences when their intrusive memory occurred, Fisher's exact test $p = .57$.

Intrusive Memory Appraisals

Scores recorded on all appraisal items were summed to obtain a total appraisal score (maximum score of 1000, Table 4). A one-way ANOVA revealed a significant association between total appraisals and participant group, $F(2,22) = 5.98$, $p = .008$. The PTSD-IM group recorded significantly higher scores than the control-IM group ($p = .007$, $d = 1.65$). Comparison of the depressed-IM and control-IM groups approached significance ($p = .06$, $d = 1.92$), whilst there was no significant difference between the clinical groups ($p = .85$, $d = 0.27$).

Additional ANOVA and Kruskal-Wallis tests were conducted to explore each of the appraisal categories separately. There was no significant association between control appraisals and participant group, $F(2, 22) = 0.37$, $p = .69$. However the association between appraisals of psychological abnormality and participant group was significant, $H(2) = 9.96$, $p = .007$. The PTSD-IM group obtained significantly higher scores than the control-IM group

(p = .008, d = 1.78), as did the depressed-IM group (p = .04, d = 2.14), whilst the clinical groups did not differ from one another (p = 1, d = 0.19). A significant association between appraisals of negative self-evaluation and participant group was also observed, $H(2) = 9.28$, p = .01, with the control-IM group recording significantly lower scores than the PTSD-IM (p = .01, d = 1.75) and depressed-IM groups (p = .04, d = 1.83). The clinical groups did not differ from one another (p = 1, d = 0.25).

Measures of Thought Control

No significant differences were observed in the proportion of participants within each group employing each of the memory control strategies assessed, all Fisher's exact tests $p >$ .45 (Table 4). All participants in the clinical groups and six participants in the control-IM group (85.7%) reported using at least one memory control strategy. A one-way ANOVA revealed no significant difference between groups in perceived effectiveness of rumination, $F(2, 15) = 0.00$, p = 1. All participants reporting use of rumination across groups gave ratings of 50 or lower (M = 15.61, SD = 18.17), indicating agreement that rumination was perceived as ineffective in intrusive memory control. Kruskal-Wallis tests revealed no significant association between participant group and the perceived effectiveness of suppression, $H(2) = 2.56$, p = .28, or of distraction, $H(2) = 4.82$, p = .09. However, a significant association was observed between participant group and perceived effectiveness of thought replacement, $H(2) = 8.24$, p = .02. Participants in the PTSD-IM group who employed replacement rated this strategy as significantly less effective than those who reported use of it in the control-IM group (p = .01, d = 2.27). No significant differences were observed between ratings in the depressed-IM and control-IM groups (p = .78, d = 1.35) or between those in the depressed-IM and PTSD-IM groups (p = .57, d = 1.06).

Discussion

The current study aimed to explore the experience of intrusive memories in young people presenting with depression and PTSD. Seeking to extend previous research engaging non-clinical youth (Meiser-Stedman et al., 2012), the between-groups design provided comparison of the experience of clinical groups to that of a community control sample, allowing consideration of the clinical relevance of intrusive memories and their potential utility as a target for cognitive intervention in both adolescent PTSD and depression.

Intrusive Memory Experience, Content and Characteristics

As expected, given the listing of involuntary re-experiencing among diagnostic criteria, the prevalence of intrusive memories in PTSD was observed to be very high, reported by all but one participant in the PTSD group. Intrusive memories were also highlighted as a common experience in adolescent depression, affecting more than half of the current sample and supporting the view of intrusive memories as a transdiagnostic process (Brewin et al., 2010; Harvey et al., 2004). The prevalence rate of 54.5% observed fell slightly lower than the rate of 76.0% calculated in adult depression in a recent meta-analysis (Payne et al., 2017). A large effect size between prevalence rates was observed in comparison of clinical groups, indicating a trend toward increased risk of intrusive memories for young people with PTSD. Despite comparable rates of trauma exposure to the depressed group, intrusive memories were reported by less than a third of the control group, representing a medium effect size. Whilst requiring replication within a larger sample, this finding makes tentative indication that young people with depression may be at increased risk of intrusive memories as compared to young people with similar trauma histories but not presenting with depressed mood, providing provisional support for the first hypothesis.

In contrast to expectation, no significant association was observed between participant group and the frequency or duration with which intrusive memories occurred. Screening for

the frequency of intrusive memories may therefore provide little indication of their impact on posttraumatic stress, as indicated in adult PTSD (Michael et al., 2005), or on depressed mood. However, the PTSD-IM group rated their intrusive memories as more intrusive than both the control-IM and depressed-IM groups; although comparison with the depressed-IM group did not reach statistical significance, a medium effect size was observed. Further, a large effect size was observed between the depressed-IM and control-IM groups in rated intrusiveness, representing a trend toward higher perceived intrusiveness in depression. This is consistent with early observation in the adult literature that rated levels of intrusiveness correspond with greater severity of depressive symptoms (Kuyken & Brewin, 1994; Spenceley & Jerrom, 1997), offering suggestion that intrusive re-experiencing in adolescence may be associated with depressed mood. Intrusive memories were not restricted to representations of traumatic experiences, consistent with the observation that negative but non-traumatic life events may give rise to intrusive memories (Meiser-Stedman et al., 2012).

Intrusive Memory Quality and Associated Emotions

The PTSD-IM group described their intrusive memories as higher in sensory quality than both the control-IM and depressed-IM groups. Further, no difference in sensory quality was observed between the depressed-IM and control-IM groups. This finding is consistent with the second hypothesis and supports the distinction drawn by cognitive theory between intrusive memories in PTSD and those in depression; the description of intrusive memories in the PTSD-IM group as highly sensory in quality with reduced verbal accessibility (as evidenced in TMQQ scores) is indicative of poorly contextualised but enduring S-reps whilst memories experienced intrusively but rated lower in sensory quality, as reported in the depressed-IM group, signal enduring S-reps embedded within contextual information and therefore subject to top-down control (Brewin et al., 2010). In line with previous research, whilst unpleasant emotional experience is sufficient for the development of enduring S-reps

and consequent intrusions (Brewin et al., 2010; Meiser-Stedman et al., 2012), strong sensory quality with reduced corresponding context can be seen to distinguish intrusive memories as experienced in PTSD from those experienced in depression and in non-clinical populations (Parry & O'Kearney, 2014).

It was anticipated that both of the clinical groups would describe their intrusive memories as accompanied by stronger negative emotions than non-clinical youth. This hypothesis was supported, with clinical participants obtaining higher overall emotion scores than the control group. Specifically, both clinical groups reported higher levels of sadness and anxiety related to their intrusive memories, whilst the PTSD-IM group also identified stronger feelings of helplessness. In addition, both of the clinical groups rated associated distress as higher than the control-IM group, marked by large effect sizes and highlighting the experience of intrusive memories as more burdensome in these clinical populations despite parallels in the frequency and duration of intrusive experience. In contrast to previous observation of comparable ratings of subjective distress in adults with PTSD and in depressed adults both with and without trauma histories (Birrer et al., 2007), the PTSD-IM group reported greater distress than the depressed-IM group. These findings point to the role of intrusive memory appraisals in subjective distress, as opposed to intrusive experience or trauma exposure alone.

Associated Experience

In line with the adult literature (Reynolds & Brewin, 1999) and the fourth hypothesis, physical sensations were not confined to PTSD but reported by a large majority of young people in the depressed-IM group and a small majority in the control-IM group. A sense of 'nowness' accompanying intrusive memories is highlighted in the adult literature as a defining feature of flashbacks and a significant predictor of PTSD (Birrer et al., 2007; Michael et al., 2005). This experience was reported by less than half of the PTSD-IM group,

suggesting a combination of flashbacks and intrusive memories without reliving. Further, just one participant in the depressed-IM group reported the sensation of reliving, contrasting with Williams and Moulds' (2007a) observation of 'here and now' quality as a significant predictor of depressive symptomology but supporting suggestion that reliving characterises intrusive memories as experienced in PTSD (Michael et al., 2005).

A very low level of internal consistency was observed across questions designed to assess dissociative experience, indicating that these questions were not loading on the same construct. Whilst it is interesting to note that both clinical groups identified with feeling '*different or far away*' when their intrusive memories occurred in comparison to the control-IM group, it is unclear, for example, whether this is a descriptive of dissociation or perhaps a feeling of emotional disconnection. Given the use of only a single question used in assessment to measure each of these phenomena, the weight that can be placed on these findings is very limited and caution must be exercised in drawing conclusions.

Intrusive Memory Appraisals

As anticipated by the third hypothesis, participants in the clinical groups endorsed stronger appraisals of psychological abnormality and negative self-evaluation than non-clinical youth, whilst not differing from one another, reinforcing the strong presence of negative appraisals surrounding the experience of intrusive memories in PTSD and depression (Ehlers & Steil, 1995; Newby & Moulds, 2010; Starr & Moulds, 2006; Williams & Moulds, 2008). These findings provide initial support for the application of cognitive theory as developed in the context of adult PTSD to both adolescent PTSD and depression, extending the proposal that maladaptive beliefs attached to intrusive memories may play an important role in impeding processing of negative experience and perpetuating associated distress (Ehlers & Clark, 2000). Unexpectedly, no differences were observed between participant groups in the perceived need to control intrusive memories. This finding stands in

contrast with previous research in which control appraisals have been seen to be higher in depressed adults as compared to both recovered and never depressed adults and have been linked to distress ratings and dysphoria (Newby & Moulds, 2010; Williams & Moulds, 2008). However, in addition to higher endorsement of control appraisals, depressed adults have been observed to engage in a greater number of passive thought management strategies, such as rumination, than adults without current depression (Newby & Moulds, 2010). This highlights the need to consider thought control behaviours and their perceived effectiveness alongside control appraisals.

Thought Control Strategies

In contrast to the fifth hypothesis, all thought control strategies listed were reportedly used by the majority of each participant group. Widespread recognition of rumination as an ineffective thought control strategy was observed, rated by all participant groups as highly ineffective. This finding was somewhat surprising given the well documented link between ruminative thought and the development of depression and anxiety and report of positive beliefs about rumination in depressed adults (McLaughlin & Nolen-Hoeksema, 2011; Watkins & Moulds, 2005). Consistent with observations made by Newby and Moulds (2010), in addition to rumination and suppression, the majority of the depressed-IM group also engaged in the active thought control strategies of distraction and replacement, rating these as effective (both mean ratings higher than 50). Although also engaging in active strategies, mean ratings of effectiveness recorded by the PTSD-IM group fell below 50, whilst the control group rated the effectiveness of these strategies very highly. These findings indicate that whilst all groups engage in the unhelpful practice of rumination, young people with depression and non-clinical youth have other thought control strategies perceived to be effective at their disposal while young people with PTSD display a perceived inability to control their intrusive memories.

Clinical Implications

Intrusive memories are evidenced as a common experience in adolescent depression and screening may provide valuable clinical information. Whilst experience of negative life events or traumatic experience can be expected to be covered in clinical assessment of young people presenting with depressed mood, identification and exploration of intrusive memory experience is likely less routine but indicated as of clinical value. As recognised in adult assessment (Michael et al., 2005), the findings suggest that simply recording presence and frequency may not provide good indication of the impact of intrusive memories. Compiling existing measures, the current study provides a relatively brief questionnaire battery providing broad assessment of intrusive memory experience which could feasibly be incorporated into routine clinical assessment. Development of a standardised measure assessing perceptions of reliving and dissociative experience in young people is called for, in acknowledgement of the lack of reliable measurement achieved here. These experiences are a potentially important avenue for further exploration and will be a necessary addition to achieve holistic assessment.

Secondly, in acknowledgement of distress ratings recorded by young people with depression, intrusive memories are revealed as a potential target for cognitive intervention. The current findings reaffirm strong sensory quality as a defining feature of intrusive memories in PTSD and provide initial indication that cognitive interventions with primary focus on contextualising sensory-based memory representations may not be directly applicable in depression. The provisional evidence presented here marks associated emotions and negative appraisals as features distinguishing intrusive memories experienced by young people with depression from those reported by their non-clinical peers, offering encouraging avenues for further investigation.

Finally, the current findings provide new insight into the appraisals made of intrusive memories by young people with PTSD, with strongly held beliefs that experiencing intrusive memories is a mark of psychological abnormality with negative impact on self-evaluation. This supports growing interest in the use of mindfulness-based approaches in adult PTSD (Banks, Newman & Saleem, 2015), resonating with the tenet of adopting a non-judgmental stance in view of ones thoughts (Kabat-Zinn, 2003), and indicates that such approaches may also be of benefit to adolescents. Mindfulness-based approaches considering the experience of intrusive memories in depression also deserve exploration, both alone and as an adjunct to CBT, given emergent evidence regarding the acceptability and efficacy of mindfulness practice with adolescents (Zoogman, Goldberg, Hoyt & Miller, 2015), building on the success observed with depressed adults (Khoury et al., 2013).

Limitations

The results of the current study should be considered exploratory given the small sample size and conclusions must therefore be drawn with some caution. Replication is required on a larger scale to explore further the relationship between intrusive memory characteristics and both posttraumatic stress and depressive symptomology, perhaps utilising regression analysis not feasible here. The cross sectional design captures experience at a single time point and does not permit consideration of causality. Future research would benefit from equal representation of gender across groups, given the overrepresentation of females in the current sample.

The example given to participants prior to identification of an intrusive memory detailed a traumatic experience (i.e. being hit by a car). The nature of this example may have implied that intrusive memories concern only traumatic experiences, perhaps leading to underreporting of memories concerning negative life events. As previously acknowledged, due to lack of available measures, feelings of reliving, physical sensations and dissociative

experience were each covered very briefly during the interview and thus the reliability of reports may be questioned.

Conclusion

The current study evidences intrusive memories as a common experience for young people presenting with clinical depression, resonating with the adult literature. For both young people with depression and those with PTSD, intrusive memories are experienced as highly intrusive and are accompanied by intense negative emotions, high levels of distress and appraisals of psychological abnormality and negative self-evaluation. Strong sensory quality is identified as a distinguishing characteristic of intrusive memories in adolescent PTSD not observed in depression. Intrusive memories are highlighted as a potential target for cognitive intervention with exploration required of the efficacy of treatments, including consideration of mindfulness-based approaches.

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Appendix

Intrusive Memories Interview Schedule

Definition and Identification of an Intrusive Memory

'Now we're going to talk about intrusive memories. Intrusive memories are memories about something that has happened to you sometime in the past that pop into your head without you choosing to think about them. Sometimes intrusive memories get in the way of your day to day activities and they can be difficult to control. Intrusive memories can be nice memories or unpleasant memories. Today, we are interested only in unpleasant intrusive memories. Some memories are in pictures, some are in sounds, some are in words and some are more like feelings, or a mixture. Here's an example. A year ago, Ashley was hit by a car when he was crossing the road. He has an intrusive memory about the car driving towards him. He remembers the colour of the car and can see the street around him. He can hear the tyres squealing and feels his stomach flip. This memory pops into Ashley's head several times a week and sometimes distracts him from his school work.'

'Do you know what I mean by intrusive memories?'

If no, additional examples will be given.

'*Now I'm going to ask you some questions about intrusive memories. I would like to remind you that taking part in this research study is voluntary. This means that you do not have to answer all of the questions if you would prefer not to. Please tell me if I ask you a question that you do not want to answer and I will move on to the next question.'*

'Do you experience intrusive memories?'

If no, *'do you have any memories that pop into your head about something upsetting or distressing that happened to you some time in the past?'*

If no, terminate intrusive memories interview.

If yes, *'can you describe your intrusive memory to me?'*

If more than one intrusive memory reported, identify the most distressing.

'Okay, now I'm going to ask you some questions about your memory. Please answer the questions about the memory you have just described to me.'

Intrusive Memory Characteristics

Frequency. *'How often does the memory pop into your head? Choose from once a week or less, several times a week, every day or more than once a day.'*

Duration. *'How long does the memory stay in your head for? Choose from a few seconds, a few minutes, up to an hour or more than an hour.'*

Intrusiveness. Children's Revised Impact of Events Scale – Intrusiveness subscale.

Intrusive Memory Quality and Associated Emotions

Sensory quality. Trauma Memory Quality Questionnaire.

Associated emotions. *'Please rate on a scale from 0 (not at all) to 100 (very much), how strongly you link each of these emotions with your memory.'*

'Anger?'

'Sadness?'

'Fear?'

'Guilt?'

'Helplessness?'

'Shame?'

'Anxiety?'

Distress. *'Now I'd like you to rate on the same scale, from 0 (not at all) to 100 (very much), how distressing you find your memory.'*

Associated Physical Sensations, Feelings of Reliving and Dissociation

Associated physical sensations. *'Sometimes, when intrusive memories pop into our heads, we have physical feelings in our bodies. Some examples are sweating, shaking, heart*

beating fast, feeling sick, feeling very hot or very cold, headaches or butterflies in the stomach. Do you have any physical feelings when your memory pops into your head?'

Feelings of reliving. *'When your memory pops into your head, does it feel as though it is something that is happening again now or does it feel like you're looking back at something that happened in the past?'*

Dissociation. *'I'd like you to answer true or false to the following sentences.'*

'When the memory pops into my head things seem unreal to me, as if I am in a dream or watching a film.'

'When the memory pops into my head I feel different and far away from other people, even if people are with me.'

'When the memory pops into my head I feel as though I am floating outside of my body or looking at myself from a distance.'

Intrusive Memory Appraisal

'I'd like you to tell me how strongly you believe that each of these statements is true for you and your intrusive memory. Please rate them on a scale from 0 (not true at all) to 100 (absolutely true).'

'I must gain control of this memory.'

'I should be able to get this memory out of my mind.'

'I should not be having this memory.'

'Having this memory means there is something wrong with me.'

'Having this memory means I'm going crazy.'

'Having this memory means I can't cope.'

'Having this memory means nothing, it's a normal reaction.'

'Because I can't control this memory, I am a weak person.'

'Having this memory means that I'm not good enough.'

'Having this memory means that I'm weird or not normal.'

Thought Control Strategies

'I'm going to describe some things that people do to try to control their intrusive memories. I'd like you to tell me whether each strategy is something that you do. You can answer often, sometimes or never. If you do use the strategy, I will ask you to rate how much better it makes you feel, on a scale from 0 (I don't feel better at all) to 100 (I feel completely better).'

Rumination. *'I keep going over the memory in my mind over and over again.'*

Suppression. *'I try to stop the memory or push it out of my mind.'*

Distraction. *'I try to do other things or think about other things to stop myself from thinking about the memory.'*

Replacement. *'I try to think about something nice instead.'*

Chapter Four

Extended Methodology

Sections included in this chapter under the headings of 'Sample Size Calculation', 'Structured Interviewing by Telephone' and 'Ethical Considerations' include information minimally changed from the corresponding thesis proposal (Payne, 2015). A flow chart of the study procedure is presented in Appendix C.

3.1 Sample Size Calculation

A target sample size of 26 participants per group was selected to achieve power of 80% to detect large effect sizes, based on the existing literature and consideration of clinical relevance, as follows. Comparing the frequency of intrusive memories between depressed and non-depressed adults, Spenceley and Jerrom (1997) report results corresponding to an effect size of $d = 1.95$ (equivalent to effect size $f = 0.95$), which would suggest just five participants per group to detect effect sizes of this magnitude between the depressed group and the control group (Appendix D). The existing literature indicates little difference between adults with PTSD and adults with depression on many measures of intrusive memory, with the exception of dissociation (Parry & O'Kearney, 2014; Reynolds & Brewin, 1998; Reynolds & Brewin, 1999). It was therefore decided to power the current study to detect only large effect sizes, as only differences of large magnitude between clinical groups would be of clinical interest. To detect an effect size of $d = 0.75$ (equivalent to effect size $f = 0.38$), 24 participants would be required in each group (Appendix E). Taking a conservative estimate of sample size, recruitment of a minimum of 26 participants per group was aimed for.

3.2 Recruitment

Given the time constraints imposed on the current study due to its completion in part-fulfilment of this thesis portfolio, a timeframe of one year beginning January 2016 and ending December 2016 was allocated for the recruitment phase. Two amendments to the

recruitment strategies employed were sought across this time frame to maximise participant numbers. Participants were recruited to the research study from NHS services, charitable and professional support organisations, a local secondary school and via online social networking sites across three phases of recruitment. A diagrammatic representation of recruitment is presented in Figure 3.1 and a timeline of methodological amendments shown in Table 3.1, with accompanying ethical approvals contained in Appendices F to L. Latest versions of participant information sheets are presented in Appendix M for clinical participants and in Appendix N for control participants. Latest versions of parent or carer, clinician and teacher information sheets are presented in Appendices O, P and Q, respectively.

3.2.1 Phase one. In the first phase of recruitment, young people aged 11 to 16 years were approached to take part in the research study. Phase one recruitment strategies were employed from January 2016, at which time approval for the research study was received from the Solihull NHS Research Ethics Committee (REC; Appendix F), with the first participant interviewed in June 2016. A total of 12 young people participated in the study in the first six months of recruitment, with five young people recruited to the clinical groups and seven to the control group.

3.2.1.1 Clinical groups. In the first phase of recruitment, participants were recruited to the clinical groups from Child and Adolescent Mental Health Services (CAMHS) and Youth Mental Health Teams across Norfolk, Suffolk and Cambridgeshire, including young people triaged but not accepted into a service. Clinical team leaders and service managers were initially approached by email (Appendix R), following which researchers attended clinical team meetings to present the research study, answer any questions and discuss practicalities around recruitment. Each recruiting team was asked to identify a clinician to collate referrals and act as a single point of contact for the research team. The majority of teams agreed to list the research study as a standing agenda item for clinical team meetings to

remind clinicians of inclusion and exclusion criteria and to identify potential participants on referral to the service. Potential participants were given participant and parent or carer information sheets by clinicians and verbal consent was sought for contact details to be passed to the research team.

3.2.1.2 Control group. Participants were recruited to the control group from a single secondary school in Norfolk. Given the association observed between lower socioeconomic status and higher rates of PTSD in some studies (Brewin, Andrews & Valentine, 2000), secondary schools approached were selected to represent low socioeconomic status, as indexed by eligibility for free school meals. Upward of 20 schools were contacted with initial contact made with headteachers by email (Appendix S). One school expressed interest and consented to act as a recruiting site, with no response received from the other schools approached. All students within the target age range at the recruiting school were sent research information sheets by internal school email including a hyperlink to a webpage on which to register their interest by leaving contact details.

3.2.2 Phase Two. Due to concerns regarding the low recruitment rate of participants to the clinical groups and sharp drop off in recruitment rate to the control group following a promising initial response, an amendment to the study protocol was applied for extending recruitment efforts to include online advertising. Recruitment during phase one indicated a higher number of young people consenting to initial contact in the control group and it was felt that offering a self-referral route to participation may also be appealing to young people interested in participating in the clinical groups. Phase two recruitment strategies were employed from July 2016, following approval of the protocol amendment requested (Appendix J). A total of 33 young people were recruited to the study in the four months following implementation of phase two strategies, comprising 14 clinical group and 19 control group participants.

3.2.2.1 Clinical groups. A dual recruitment strategy was employed whereby participants were recruited to the clinical group through NHS services and via online advertising. Recruitment via NHS services continued as described for phase one with the addition of posters displayed in waiting rooms and clinical areas directing those interested to contact the research team by email. Online recruitment was facilitated by charitable and professional support organisations, with initial contact made with service managers via email (Appendix P), and also promoted via social networking sites. Posters were displayed online directing interested young people to register their interest via the online survey platform Qualtrics (2005) or to send contact details to the research team by email (Appendix T).

3.2.2.2 Control group. A dual recruitment strategy was also employed for the control group, utilising school recruitment and online advertising. In addition to notification of the research study sent by email, posters were displayed at the recruiting school directing young people to send contact details to the research team by email. As for the clinical group, posters were shared online via social networking sites, again directing young people to contact the research team directly (Appendix U).

3.2.3 Phase Three. In light of the short fall in recruitment with reference to target numbers and only three months remaining of the recruitment phase, a second amendment was applied for to extend the age range to include young people aged 17 and 18 years. Further, given the boost in recruitment achieved through the use of posters displayed online and in recruiting services, the second amendment also included extension of the scope of advertising to include posters displayed within the community. In this phase of recruitment, clinical and control group recruitment posters were combined to create a single poster (Appendix V), allowing eligible young people exposed to the poster in any setting to register their interest in participating. These posters were displayed in work places such as youth centres and in public places including GP surgeries. As above, interested young people were invited to send

contact details to the research team directly. Phase three recruitment strategies were employed from November 2016, following approval of the second protocol amendment (Appendix L). A total of seven participants took part in the study in the final two months of recruitment following implementation of phase three strategies, with five young people recruited to the clinical groups and two to the control group.

Table 3.1

Timeline of Ethics Approval and Methodological Amendments

Date	Action
2nd December 2015	Application submitted to REC
16th December 2015	Attendance at REC meeting
31st December 2015	Provisional opinion from REC
8th January 2016	Resubmission to REC
19th January 2016	REC approval received (Appendix F)
9th February 2016	R&D approval received from NSFT (Appendix G)
9th March 2016	Letter of access received from NSFT (Appendix H)
9th March 2016	R&D approval received from CPFT (Appendix I)
21st June 2016	First participant interviewed
5th August 2016	Application submitted to REC for first substantial amendment
19th August 2016	REC approval received for first substantial amendment (Appendix J)
19th August 2016	R&D approval received from WSFT (Appendix K)
31st October 2016	Application submitted to REC for second substantial amendment
28th November 2016	REC approval received for second substantial amendment (Appendix L)
30th December 2016	Last participant interviewed
31st December 2016	Recruitment closed

Abbreviations. CPFT, Cambridgeshire and Peterborough NHS Foundation Trust; NSFT, Norfolk and Suffolk NHS Foundation Trust; R&D; Research and Development; REC, Research Ethics Committee; WSFT, West Suffolk NHS Foundation Trust

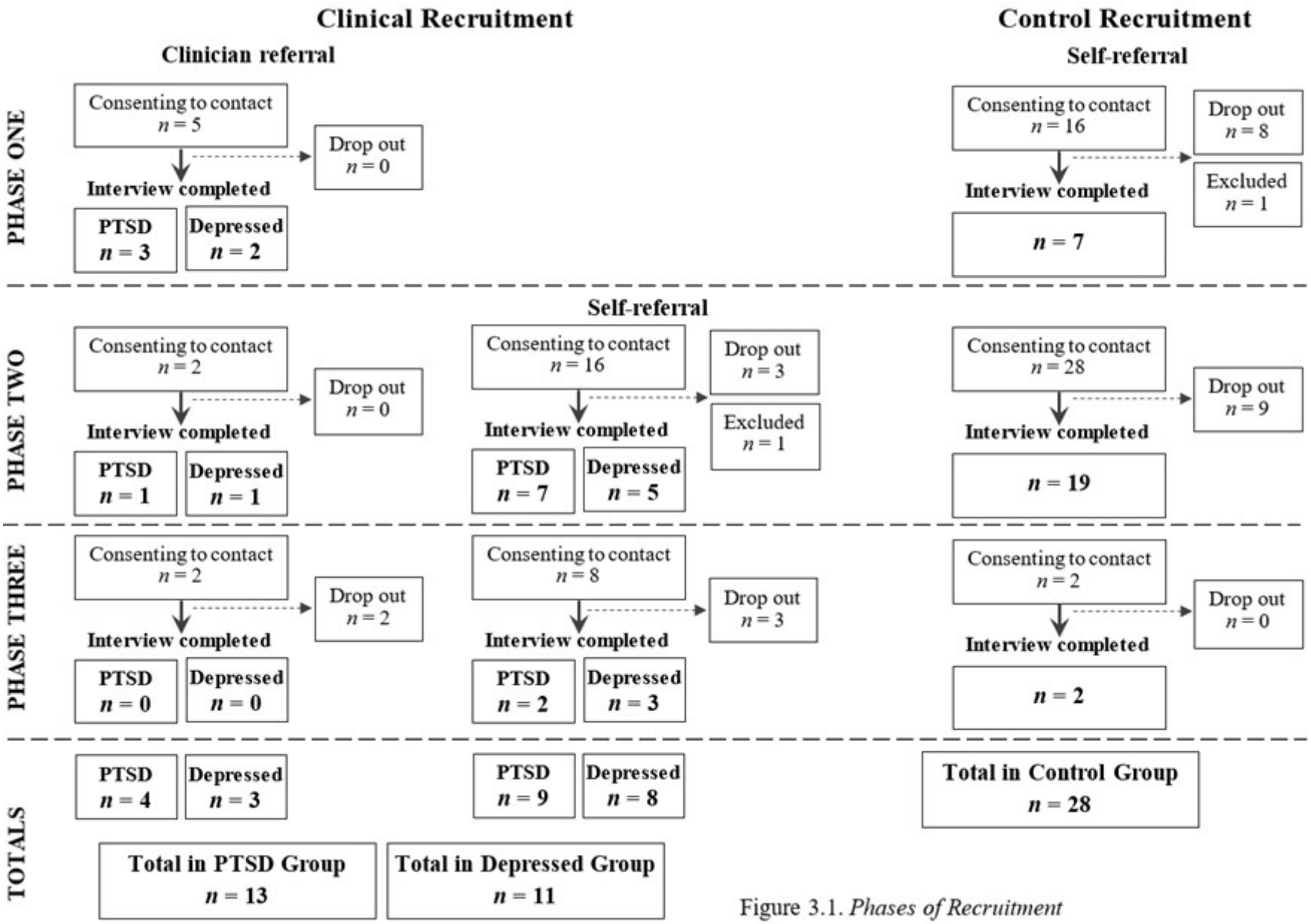

Figure 3.1. *Phases of Recruitment*

3.3 Structured Interviewing by Telephone

Measures included in the telephone interview are presented in Appendices W to Z and a flow chart of the full interview schedule is presented in Appendix AA.

Given the complexity of the construct of intrusive memories and the subtle distinctions drawn between intrusive phenomena, careful consideration of the assessment methods employed in research examining these experiences is advised (Brewin, Gregory, Lipton & Burgess, 2010). The first to explore intrusive memories in adolescents through use of questionnaires, Meiser-Stedman, Dalgleish, Yule and Smith (2012) acknowledge the possibility that the reliability of self-reports may have been compromised if participants confused intrusions with other cognitive processes. Addressing this methodological limitation, the current study employed a structured interview design, allowing researchers to ensure participants' understanding of intrusive memories and associated experiences and also affording the opportunity to confirm clinical presentations through use of structured diagnostic interviewing. Telephone interviewing allowed young people to participate within their own homes and at their preferred time of day without disruption to their schooling. The option was also given of completing the interview via video call, offering the same benefits of practicality and flexibility whilst also allowing visual interaction for those with a preference for this (Hanna, 2012). For researchers, telephone interviewing protected against lone working and allowed recruitment across a large geographical area across which face-to-face contact would not have been practicable.

Telephone interviewing has become an increasingly popular method in clinical research, offering a cost and time efficient alternative to face-to-face interviewing (Carr & Worth, 2001). Drawing comparison between self-report data collection methods, Rosenbaum, Rabenhorst, Reddy, Fleming and Howells (2006) found that rates of participation were greater when participants were offered standard telephone interviewing or automated

telephone interviewing using interactive voice technology as compared to when offered face-to-face interviewing or questionnaire completion. Further, rates of disclosure of sensitive information with respect to experience of abuse were comparable across groups. When compared to face-to-face interviewing, telephone interviewing has been observed to achieve data of equitable quality and is arguably preferable in exploration of sensitive topics due to the relative anonymity it affords research participants (Carr & Worth, 2001; Sturges & Hanrahan, 2004). Telephone interviewing has been successfully utilised in research with children and young people as young as 10 years of age assessing a range of sensitive and potentially distressing topics including symptoms of PTSD and depression (Kilpatrick et al., 2003), drug misuse (Shannon, Mathias, Marsh, Dougherty & Liguori, 2007), trauma history and victimisation (Becker-Blease, Turner & Finkelhor, 2010; Turner, Finkelhor, Hamby, Shattuck & Ormrod, 2011; Turner, Finkelhor & Ormrod, 2006) and violence in romantic relationships (Hamby & Turner, 2013).

Well evidenced in clinical research exploring the perspectives of multiple informants is lack of agreement between self-report and parent report in rating child emotional and behavioural difficulties (Achenbach, McConaughy & Howell, 1987; De Los Reyes & Kazdin, 2005). In the trauma literature, agreement between parent and child reports of trauma exposure and the impact of traumatic experience is documented to be poor, with symptoms of PTSD typically underreported by parents (Meiser-Stedman, Smith, Glucksman, Yule & Dalgleish, 2007; Stover, Hahn, Im & Berkowitz; 2010). Stover et al. (2010) suggest that poor concordance in reporting may point to limited communication between young people and their parents following trauma and thus a lack of awareness among parents of psychological symptoms and particularly of internalising symptoms, consistent with Comer and Kendall's (2004) report of greater parent-child informant agreement for readily observable symptoms as compared to internal phenomena. Of consideration in the literature has been the impact of

social desirability on reporting, with suggestion that the desire to present oneself favourably may stifle honesty in the description of symptoms (De Los Reyes & Kazdin, 2005). It was therefore important in the current study to consider the possible influence of the presence of others on answers given during the telephone interview, with the following arrangements made. Firstly, interview arrangements were outlined to potential participants in the study information sheets, thus highlighting to young people prior to entering the study that they would be answering questions regarding their internal experiences with a parent, carer or other adult in close proximity. Secondly, although a parent, carer or other adult was required to be available to each participant throughout the telephone interview, they were not required to be in the same room and participants were invited at the beginning of the interview to find a private space if they wished to do so. Finally, as in previous research (Kilpatrick et al., 2003), the interview was designed such that all but one question were of closed-ended format, requiring participants to choose from a set of given responses or to answer using a numerical scale. These provisions were made with aim to promote privacy in participation and to facilitate openness and honesty in interview responses.

3.4 Ethical Considerations

Ethical approval for the study was granted by the Solihull NHS Research Ethics Committee (Appendix F).

3.4.1 Consent. Participants aged 15 years or younger and 16 year old participants during the first and second phases of recruitment were required to provide the contact details of a parent or carer in addition to their own contact details when registering interest to participate in the study. As recommended by the British Psychological Society (BPS; 2014), informed consent was then sought from the parent or legal guardian for participants aged under 16 years, with accompanying assent obtained from the child. At the outset of the study and prior to widening the age range, informed consent was also sought from both the young

person and their parent or legal guardian for participants aged 16 years. Given the sensitive nature of the research interview and solely remote contact with researchers, it was felt important that a parent or guardian was present throughout the interview to contain any immediate distress (see *Distress* below). This protocol was amended at the time of expanding the age range to include 17 and 18 year olds, with consent sought only from the young person for participants aged 16 years or over but with an adult of 18 years or over required to be present at the time of the interview.

Full details of the study were provided via information sheets, advising that participation was voluntarily and that withdrawal was permitted at any time during the data collection phase. To ensure accessible wording, the information sheets were reviewed by inspire youth panel, a service user research review forum. A researcher made contact with interested families by telephone, a minimum of 48 hours after contact details were received. For participants aged 15 years or younger and for 16 year old participants during the first and second phases of recruitment, the researcher first gained verbal consent from the parent or carer and then verbal assent from the child. For participants aged 17 and 18 years and for 16 year old participants during the third phase of recruitment, the researcher gained verbal consent only from the young person. Corresponding electronic consent was then obtained, with hyperlinks sent by email to electronic consent and assent forms hosted on the web-based survey platform Qualtrics (2005; Appendices BB and CC).

3.4.2 Data Storage. The sensitive personal data collected in the current study was handled in accordance with the Data Protection Act (HM Government, 1998). Data collected electronically was stored on encrypted memory sticks with participant identifiable data stored separately to research data, which was identifiable only by assigned participant number. Interview responses were recorded on electronic spreadsheets and a password-protected, anonymised electronic database compiled. Research data will be stored for five years

following publication as recommended by the BPS (Cooper, Turpin, Bucks & Kent, 2005) and in line with legal requirement that data be kept no longer than necessary (HM Government, 1998). All participant identifiable information will be securely destroyed at the close of the study.

3.4.3 Confidentiality and Safeguarding. All information obtained remained confidential to the research team with the exception of feedback to clinical teams, if requested by participants. Families were informed via the study information sheets and by telephone prior to commencement of the interview that information sharing would be required if safeguarding concerns were identified. It was planned that if information was shared indicating safeguarding concern, researchers would share this information in line with Local Safeguarding Children Boards, NHS Trust and local authority protocols, in accordance with Working Together to Safeguard Children (HM Government, 2015). However, no safeguarding concerns were identified and this protocol was therefore not applied.

3.4.4 Coercion. Participants received a £5.00 voucher for Amazon in thanks for participation, sent electronically following completion of the research interview. This was considered a reasonable reward and was not felt coercive, as defined by the BPS (2014). No incentive was offered to parents or carers in return for permitting their child's participation in the study.

3.4.5 Distress. In a recent review, Jorm, Kelly and Morgan (2007) concluded that the risk of participating in mental health research is low, with positive responses to participation reported more commonly than negative reactions and no evidence to indicate long-term harm. In trauma-related research, as many as 80% of young people have described participation as positive (Ruzek & Zatzick, 2000). It was therefore felt unlikely that participants in the current study would find themselves unduly distressed as a result of their participation. However, in acknowledgement that the interview included discussion of negative past experiences, the

following provisions were introduced to minimise the risk of harm. Firstly, the interview was designed such that participants volunteered material for discussion. Secondly, for participants aged 15 years or younger and for 16 year old participants during the first and second phases of recruitment, a parent or carer was required to be available throughout the interview to contain any immediate distress. For participants aged 17 and 18 years and for 16 year old participants during the third phase of recruitment, an adult aged 18 years or over was required to be present and available, whether this be a relative, friend or professional. Lastly, a follow-up call was offered within the week following the interview, allowing families to share any concerns arising. It was made clear that the research team would be unable to offer longer-term support and participants were encouraged to contact their General Practitioner or clinical team, if appropriate, and provided with details of professional support organisations.

A challenge presented by telephone interviewing is the absence of visual clues through which the researcher may typically first notice if a participant begins to appear distressed. In the current study, this was managed in line with recommendations made by Pieper (2011). Researchers asked each participant at the beginning of the interview if they felt okay to proceed. Participants were informed that the interview need not be completed in one sitting, that they could request breaks at any time during the interview and that they may say 'pass' if questions were asked that they did not wish to answer. Throughout the interview, researchers listened for signs of possible distress, such as pauses or changes in tone or volume of speech. Where indicated, researchers offered breaks and asked the participant if they felt okay to continue.

3.4.6 Debriefing. At the end of the interview, participants were asked how they were feeling and informed that the end of the interview marked the end of their participation in the research and that no further contact would be made by the research team, as recommended by Pieper (2011). Participants in the clinical groups were given the option for material discussed

to be passed to their clinical team. They were advised that this was not a requirement of the research but was offered to avoid the need to recount their experience and to provide additional information to clinicians to inform support provided. All families were offered a follow-up telephone call, as outlined above. A standardised debrief was sent by email (Appendix DD) immediately after the interview, providing contact details of the research team and of support agencies. A standardised debrief was also sent by email to young people who expressed an interest in the research but were found to be ineligible to participate (Appendix EE).

3.4.7 Safeguarding Researchers. In developing the research protocol, it was felt important to consider the impact that the interviews may have on the researchers, given that the material shared had the potential to be upsetting with respect to recounts of traumatic or negative life experiences and discussion around distressing memories. In acknowledgement of this, the opportunity was arranged for researchers to contact the primary supervisor or collaborator by telephone following research interviews.

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Chapter Five

Extended Results

4.1 Software Packages

Data were compiled in Statistical Package for the Social Sciences (SPSS; International Business Machines Corporation [IBM Corp.], 2013). All analyses were performed in SPSS, with the exception of Fisher's exact tests and calculations of effect sizes, which were performed in R (R Core Team, 2015).

4.2 Consideration of Statistical Assumptions

4.2.1 Consideration of assumptions for quantitative data. One-way analysis of variance (ANOVA) is a statistical technique used to determine whether the means of three or more independent groups differ. One-way ANOVA is a parametric test and therefore requires the assumptions of parametric statistical analysis to be met, namely independence of data, measurement at interval level of higher, normally distributed sampling distribution and homogeneity of variance (Field, 2009). All quantitative data points recorded in the current empirical study were independent and measured at at least interval level, thus meeting the first two assumptions. The assumptions of normality and heterogeneity of variance were tested as below, with tests summarised in Tables 4.1 and 4.2 for full sample characteristics and intrusive memory measures, respectively.

Normality of the sampling distribution was estimating through examination of normality within the sample data. As recommended by Field (2009), histograms were first produced for each variable split across groups (Appendix FF). Visual examination suggested deviation from normality across most variables and Shapiro-Wilk tests were therefore run to provide a formal measure of distribution. Where the assumption of normality was violated, indicated by Shapiro-Wilk results where $p < .05$, transformations were applied in attempt to normalise the distribution. Where transformation was not possible, the non-parametric

Kruskal-Wallis test was employed with pairwise comparisons controlling for multiplicity, as recommended where the assumption of normality is violated. Homogeneity of variance was assessed through use of Levene's test, where $p < .05$ indicates violation (heterogeneity of variance). Where the assumption of homogeneity of variance was not met, Welch's ANOVA was conducted, a test that adjusts the residual degrees of freedom to accommodate heterogeneity of variance, with Games-Howell post-hoc tests, as suggested by Field (2009).

Variables meeting both the assumptions of normality and of homogeneity of variance were analysed with one-way ANOVA and post-hoc Tukey's HSD tests, accounting for multiple comparisons. Two variables violated both the assumption of normality and the assumption of homogeneity of variance, namely distress ratings and appraisals of negative self-evaluation. Successful transformation of distress ratings was achieved by √[(highest score + 1) – score] to adjust for negative skew, allowing analysis using Welch's ANOVA. Appraisals of negative self-evaluation could not successfully be transformed and a Kruskal-Wallis test was therefore used.

4.2.2 Consideration of assumptions for categorical data. Pearson's chi-square test or the chi-square test of independence is a non-parametric technique designed to test whether a relationship exists between two categorical variables. The chi-square test assumes independence of data and dictates that expected frequencies in contingency tables should be five or greater for sufficient statistical power. In larger contingency tables, the chi-square test may be applied where no more than 20% of cells have expected frequencies less than five (Field, 2009). Given the size of contingency tables constructed in the current analyses, the chi-square test was employed only where all expected frequencies were greater than five. Expected frequencies were calculated for all between-groups categorical data. Where the assumption of minimum expected frequencies was violated, indicating deviation from the chi-square distribution, Fisher's exact test was employed in analysis, as recommended as an

alternative statistical method for use in small samples with low expected frequencies (Field, 2009). Consideration of the assumption of minimum expected frequencies and choice of statistical tests are summarised in Tables 4.3 and 4.4 for full sample characteristics and intrusive memory measures, respectively. Post hoc comparisons of proportions across groups were performed in R using the 'power.2p2n.test' function of the 'pwr' package (Champely, 2009), implementing analyses outlined by Cohen (1988).

Table 4.1

Tests of Parametric Assumptions and Statistical Tests Employed for Sample Characteristics

	Shapiro –Wilk Test for Normality			Levene's Test for Homogeneity of Variance	Assumptions violated	Statistical test used
	PTSD	Depressed	Control			
Age[a]	$W = .92$, $p = .26$	$W = .88$, $p = .11$	$W = .98$, $p = .87$	$F(2, 46) = 1.77$, $p = .18$	None	One-way ANOVA
RCADS[a]						
Depression subscale[a]	$W = .97$, $p = .60$	$W = .96$, $p = .78$	$W = .97$, $p = .84$	**$F(2, 46) = 5.64$, $p = .006$**	HoV	Welch's F
Anxiety subscale[a]	$W = .89$, $p = .11$	$W = .91$, $p = .23$	$W = .92$, $p = .05$	**$F(2, 46) = 10.35$, $p < .001$**	HoV	Welch's F
CATS						
Number of trauma types[b]	$W = 96.$, $p = .76$	$W = .82$, $p = .12$	$W = .86$, $p = .06$	$F(2, 26) = 2.42$, $p = .11$	None	One-way ANOVA
Score[c]	$W = .93$, $p = .37$	$W = .87$, $p = .28$	$W = .90$, $p = .19$	$F(2, 25) = 1.24$, $p = .31$	None	One-way ANOVA

Abbreviations: CATS, Child and Adolescent Trauma Screen; HoV, Homogeneity of Variance; PTSD, posttraumatic stress disorder; RCADS, Revised Child Anxiety and Depression Scale.

[a] Analyses including the full sample ($n = 49$).

[b] Analyses including only those participants in each group reporting trauma exposure ($n = 29$).

[c] Excluding one participant in the PTSD group due to partial completion of the CATS ($n = 28$).

Table 4.2

Tests of Parametric Assumptions and Statistical Tests Employed for Measures of Intrusive Memories

	Shapiro –Wilk Test for Normality			Levene's Test for Homogeneity of Variance	Assumptions violated	Statistical test used
	PTSD-IM	Depressed-IM	Control-IM			
CRIES	***W* = .79, *p* = .007**	*W* = .93, *p* = .59	*W* = .90, *p* = .31	*F*(2, 22) = 3.37, *p* = .05	Normality	Kruskal-Wallis
TMQQ	*W* = .89, *p* = .13	*W* = .98, *p* = .94	*W* = .89, *p* = .27	*F*(2, 22) = 1.14, *p* = .34	None	One-way ANOVA
Emotions total	*W* = .88, *p* = .09	*W* = .1.00, *p* = .1.00	*W* = .93, *p* = .55	*F*(2, 22) = 0.02, *p* = .98	None	One-way ANOVA
Anger	*W* = .95, *p* = .61	***W* = .74, *p* = .01**	***W* = .77, *p* = .02**	*F*(2, 22) = 0.79, *p* = .47	Normality	Kruskal-Wallis
Sadness	***W* = .80, *p* = .01**	*W* = .87, *p* = .23	*W* = .92, *p* = .46	*F*(2, 22) = 0.87, *p* = .43	Normality	Kruskal-Wallis
Fear	***W* = .66, *p* < .001**	*W* = .98, *p* = .96	***W* = .77, *p* = .02**	*F*(2, 22) = 1.78, *p* = .19	Normality	Kruskal-Wallis
Guilt	*W* = .90, *p* = .15	*W* = .86, *p* = .18	***W* = .73, *p* < .01**	*F*(2, 22) = 1.42, *p* = .26	Normality	Kruskal-Wallis
Helplessness	***W* = .74, *p* < .01**	*W* = .87, *p* = .23	*W* = .86, *p* = .14	*F*(2, 22) = 0.01, *p* = .99	Normality	Kruskal-Wallis
Shame	*W* = .90, *p* = .14	*W* = .94, *p* = .66	***W* = .80, *p* = .05**[a]	*F*(2, 22) = 3.13, *p* = .06	Normality	Kruskal-Wallis
Anxiety	***W* = .81, *p* = .01**	***W* = .76, *p* = .02**	*W* = .87, *p* = .18	*F*(2, 22) = 0.02, *p* = .98	Normality	Kruskal-Wallis
Distress	***W* = .86, *p* = .05**[b]	*W* = .95, *p* = .70	*W* = .93, *p* = .56	***F*(2, 22) = 10.12, *p* = .001**	Normality and HoV	Welch's F with transformation

Table 4.2 continued

Tests of Parametric Assumptions and Statistical Tests Employed for Measures of Intrusive Memories

	Shapiro –Wilk Test for Normality			Levene's Test for	Assumptions	Statistical test used
	PTSD-IM	Depressed-IM	Control-IM	Homogeneity of Variance	violated	
Appraisals total	$W = .97, p = .92$	$W = .96, p = .83$	$W = .95, p = .73$	$F(2, 22) = 1.54, p = .24$	None	One-way ANOVA
Control appraisals	$W = .94, p = .46$	$W = .92, p = .51$	$W = .91, p = .40$	$F(2, 22) = 2.22, p = .13$	None	One-way ANOVA
Psychological abnormality	$W = .98, p = .98$	$W = .95, p = .74$	**$W = .76, p = .02$**	$F(2, 22) = 1.54, p = .24$	Normality	Kruskal-Wallis
Negative self-evaluation	$W = .92, p = .25$	$W = .91, p = .42$	**$W = .60, p < .001$**	**$F(2, 22) = 10.01, p = .001$**	Normality and HoV	Kruskal-Wallis
Effectiveness of						
Thought control						
Rumination	$W = .84, p = .06$	$W = .88, p = .29$	$W = .76, p = .05$	$F(2, 22) = 0.12, p = .89$	None	One-way ANOVA
Suppression	$W = .94, p = .54$	$W = .90, p = .42$	**$W = .65, p = .002$**	**$F(2, 22) = 7.71, p = .004$**	Normality and HoV	Kruskal-Wallis
Distraction	$W = .95, p = .60$	**$W = .78, p = .04$**	**$W = .73, p = .02$**	$F(2, 22) = 0.17, p = .85$	Normality	Kruskal-Wallis
Thought Replacement	$W = .94, p = .50$	$W = .86, p = .27$	**$W = .66, p = .003$**	$F(2, 22) = 0.26, p = .77$	Normality	Kruskal-Wallis

Note. All analyses include the subsample of participants reporting intrusive memories ($n = 25$).

Abbreviations: Control-IM, participants in control group reporting intrusive memories; CRIES, Children's Revised Impact of Events Scale; Depressed-IM, participants in depressed group reporting intrusive memories; HoV, Homogeneity of Variance; PTSD, posttraumatic stress disorder; PTSD-IM, participants in PTSD group reporting intrusive memories; TMQQ, Trauma Memory Quality Questionnaire.

[a] p value rounded from .045, significant.

[b] p value rounded from .048, significant.

Table 4.3

Consideration of Chi-Square Test Assumptions for Sample Characteristics

	Size of contingency table	Cells with expected frequencies less than five (%)	Assumptions violated	Statistical test used
Gender	2 x 3	2 (33.3%)	Expected frequencies	Fisher's exact test
CATS				
Trauma exposure	2 x 3	1 (16.7%)	Expected frequencies	Fisher's exact test
Intrusive memory experience	2 x 3	0 (0.0%)	None	Chi-square test

Note. All analyses include the full sample (n = 49).

Abbreviations: CATS, Child and Adolescent Trauma Screen.

Table 4.4

Consideration of Chi-Square Test Assumptions for Measures of Intrusive Memories

	Size of contingency table	Cells with expected frequencies less than five (%)	Assumptions violated	Statistical test used
Intrusive memory characteristics				
Frequency	4 x 3	11 (91.7%)	Expected frequencies	Fisher's exact test
Duration	4 x 3	12 (100%)	Expected frequencies	Fisher's exact test
Associated experience				
Physical sensations	2 x 3	4 (66.7%)	Expected frequencies	Fisher's exact test
Feelings of reliving	2 x 3	4 (66.7%)	Expected frequencies	Fisher's exact test
Dissociation				
In a dream of watching a film	2 x 3	4 (66.7%)	Expected frequencies	Fisher's exact test
Different and far away from other people	2 x 3	4 (66.7%)	Expected frequencies	Fisher's exact test
Floating outside of my body or looking at myself from a distance	2 x 3	5 (83.3%)	Expected frequencies	Fisher's exact test

Note. All analyses include the subsample of participants reporting intrusive memories (n = 25).

4.3 Additional Analyses

4.3.1 Anxiety. *T*-scores recorded on the anxiety subscale of the RCADS were seen to vary significantly by participant group, Welch's $F(2, 21.87) = 43.22$, $p < .001$. Post-hoc Games-Howell tests indicated no significant difference between the PTSD group ($M = 71.92$, $SD = 21.83$) and the depressed group ($M = 81.36$, $SD = 9.61$), $p = .36$, whilst both the PTSD group and the depressed group obtained significantly higher scores than the control group ($M = 47.72$, $SD = 11.01$) , $p = .005$ and $p < .001$, respectively. All participants in the depressed group obtained *T*-scores of 65 or above, indicating levels of anxiety at the borderline of clinical significance or higher, compared to nine participants (69.2%) in the PTSD group and two participants (8.0%) in the control sample.

4.3.2 Trauma Exposure. A total of 29 participants reported exposure to at least one traumatic experience, comprised of 5 participants (45.5%) in the depressed group and 11 participants (44.0%) in the control group, in addition to all 13 participants in the PTSD group. Exploring further the reported experiences of these trauma-exposed participants, a one-way ANOVA revealed significant association between participant group and the number of reported trauma types, $F(2, 26) = 7.07$, $p = .004$. Participants in the PTSD group reported a greater number of trauma types ($M = 4.08$, $SD = 1.89$) than the trauma-exposed depressed group (TED; $M = 2.00$, $SD = 1.00$), $p = .034$, and the trauma-exposed control group (TEC; $M = 2.00$, $SD = 1.00$), $p = .006$. No significance difference was observed between the TED and TEC groups in the number of trauma types reported, $p = 1$. The most frequently reported trauma category in all three trauma-exposed groups was witnessed violence towards others (Table 4.5).

A one-way ANOVA revealed a significant association between participant group and CATS score for those participants reporting trauma exposure, $F(2, 25) = 23.51$, $p < .001$. One participant in the PTSD group was not included in this analysis due to partial completion of

the CATS. Post-hoc Tukey tests revealed that both the PTSD group (M = 40.92, SD = 11.13) and the TED group (M = 31.00, SD = 6.04) obtained higher CATS scores than the TEC group (M = 13.91, SD = 8.58) , $p < .001$ and $p = .007$, respectively, indicating higher levels of post-traumatic stress symptoms (PTSS). Although analysis of scores across the PTSD group and the TED group indicated no significant difference, $p = .14$, a very large effect size was observed, $d = 1.11$, suggesting PTSS were notably higher in the PTSD sample than in the TED group.

Table 4.5

Trauma Exposure by Type and Category for Trauma-Exposed Participants

Trauma	*N* of participants (%)			
	PTSD group (*n* = 13)	TED (*n* = 5)	TEC (*n* = 11)	Total trauma-exposed (*n* = 29)
Natural disaster	**1 (7.7%)**	**0**	**1 (9.1%)**	**2 (6.9%)**
Accident	**4 (30.8%)**	**0**	**4 (36.4%)**	**8 (27.6%)**
Victim of violence	**7 (53.8%)**	**1 (20.0%)**	**4 (36.4%)**	**12 (41.4%)**
Robbed	0	0	0	0
Violence within family	3 (23.1%)	1 (20.0%)	1 (9.1%)	5 (17.2%)
Violence in community	6 (46.2%)	0	3 (27.3%)	9 (31.0%)
Attacked, stabbed, shot at or hurt badly	2 (15.4%)	0	0	2 (6.9%)
Witness to violence or death	**11 (84.6%)**	**2 (40.0%)**	**5 (45.5%)**	**18 (62.1%)**
Violence within family	4 (30.8%)	1 (20.0%)	3 (27.3%)	8 (27.6%)
Violence in community	6 (46.2%)	2 (40.0%)	1 (9.1%)	9 (31.0%)
Seeing someone attacked, stabbed, shot at, hurt badly or killed	5 (38.5%)	0	1 (9.1%)	6 (20.7%)
Any sexual violence	**7 (53.8%)**	**1 (20.0%)**	**1 (9.1%)**	**9 (31.0%)**
Sexual assault	6 (46.2%)	1 (20.0%)	0	7 (24.1%)
Rape	3 (23.1%)	0	1 (9.1%)	4 (13.8%)
Traumatic bereavement	**4 (30.8%)**	**1 (20.0%)**	**2 (18.2%)**	**7 (24.1%)**
Medical procedure	**5 (38.5%)**	**0**	**3 (27.3%)**	**8 (27.6%)**
War	**2 (15.4%)**	**0**	**0**	**2 (6.9%)**
Other	2[a] (15.4%)	2[ab] (40.0%)	2[a] (18.2%)	6 (20.7%)

Abbreviations: TEC, Trauma-exposed control; TED, Trauma-exposed depressed; PTSD, posttraumatic stress disorder.

[a] Reports of 'other' traumas were reviewed by the first and second authors. Traumas fitting under existing categories were coded accordingly and other potentially traumatic events were counted. Events not involving threat to life, physical integrity or threat of significant injury were not counted.

[b] Two participants in the TED group reported two 'other' traumas each.

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PART THREE
GENERAL DISCUSSION AND CRITICAL EVALUATION

Chapter Six

General Discussion and Critical Evaluation

The aim of this thesis portfolio was to estimate the prevalence of intrusive memories in adult depression by means of a meta-analysis and to explore the experience of intrusive memories in adolescent posttraumatic stress disorder (PTSD) and depression through empirical research. This chapter will firstly summarise the results obtained and consider these within the context of the extant literature. Methodological strengths and weaknesses will then be identified, followed by discussion of the theoretical and clinical implications and directions for future research. The chapter will close with an overall conclusion.

5.1 Summary of Findings in the Context of Existing Literature

The current meta-analysis highlighted intrusive memories as an experience shared by a large majority of adults with depression, revealing a 76.0% (95% CI 59.4 – 89.4%) point prevalence rate. Between-groups analyses indicated that adults with depression are at increased risk of experiencing intrusive memories as compared to non-clinical control samples (risk ratio of 2.94, 95% CI 1.53 – 5.67) and at comparable risk as adults with PTSD. Extending observation to an adolescent population, the current empirical paper provided evidence of intrusive memories as a common experience also for young people with depression, with 54.5% of the depressed group (95% CI 25.1 – 83.9%) reporting intrusive memories compared to 92.3% of the PTSD group (95% CI 77.8 – 100%) and 28.0% of the control group (95% CI 10.4 – 45.6%). Converting the prevalence rates recorded within the depressed and control groups to allow direct comparison to results of the meta-analysis revealed a risk ratio of 1.95 (95% CI 0.85 – 4.46), indicating that young people with depression may be at increased risk of experiencing intrusive memories as compared to non-clinical controls. Sensitivity analyses revealed that controlling for the presence of PTSD within depressed samples included in the meta-analysis did not impact the prevalence rate

calculated, suggesting that intrusive memories can occur independently of PTSD. This finding was supported by results obtained within the empirical paper, given that screening for PTSD was completed on entry to the study and excluded from the depressed sample. These findings support the adoption of a transdiagnostic view of intrusive memories and provide provisional support for the application of this approach to an adolescent population (Brewin et al., 2010; Harvey et al., 2004).

In the empirical paper, the majority of reported intrusive memories in all groups pertained to traumatic or potentially traumatic experience with no differences observed in frequency or duration with which these memories occurred. Intrusive memories in the clinical groups were differentiated from those reported by the control-IM group by intense negative emotions, elevated levels of accompanying distress and associated appraisals of psychological abnormality and negative self-evaluation. These findings are consistent with those of Moulds and colleagues in the adult literature who report greater distress and strength of negative emotions associated with intrusive memories in depressed adults as compared to never depressed adults and evidence negative appraisals to be linked to severity of depression independent of intrusion frequency (Newby & Moulds, 2011; Starr & Moulds, 2006). In line with current findings, comparable levels of distress and strength of negative emotional experience associated with intrusive memories has been observed across samples of depressed adults and adults with PTSD (Birrer et al., 2007; Parry & O'Kearney, 2014; Reynolds & Brewin, 1998; Reynolds & Brewin, 1999). Physical sensations were reported to accompany intrusive memories by a large majority of the PTSD-IM and depressed-IM groups and by a small majority of the control-IM group, echoing the adult literature with indication that this experience does not occur exclusively in PTSD (Reynolds & Brewin, 1999). Intrusive memories reported by the PTSD-IM group were unique in enhanced sensory

quality, reaffirming the status of sensory content as a defining feature of intrusive memory experience in PTSD (Parry & O'Kearney, 2014).

Considering other trends within the data, the dissociative experience of a feeling of distance from others when intrusive memories occur was strongly endorsed by the PTSD-IM and depressed-IM groups but described by just two participants in the control-IM group. A large minority of the PTSD-IM group felt that their intrusive memories had 'here and now' quality, whilst this experience was reported by just one participant in each of the depressed-IM and control-IM groups. A sense of 'nowness' accompanying intrusive memories and reduced awareness of the memory belonging to the past have been suggested as unique to trauma memories (Michael, Ehlers, Halligan & Clark, 2005). However, more recent investigation has revealed 'here and now' quality and reduced autonoetic awareness as a characteristic also of intrusive memories of non-traumatic events, associated with depressive symptomology (Williams & Moulds, 2007a), partially supported by the current findings in the report of sensations of reliving and experiences indicative of dissociation across groups. Previous studies have considered the role of the passive thought control strategies of rumination and suppression in the maintenance intrusive memories in both PTSD and depression (Ehlers & Clark, 2000; Starr & Moulds, 2006; Williams & Moulds, 2007b). However, in the current study, the majority of all groups reported use of each of the thought control strategies assessed, indicating that young people without mental health difficulties also engage in rumination and suppression and that clinical populations also employ the active thought control strategies of distraction and thought replacement. Between-group differences instead appeared to lie in the perceived effectiveness of thought control. Although rumination was universally considered ineffective, both the depressed-IM and control-IM groups reported use of other strategies rated to be effective, whilst the PTSD-IM group described a perceived inability to control their intrusive memories.

5.2 Theoretical Implications

This section includes information minimally changed from the corresponding thesis proposal in the description of cognitive models of PTSD (Payne, 2015).

As recognition of intrusive memories as a transdiagnostic process has grown, focus has moved away from their contribution solely to the development of PTSD and instead toward drawing theoretical distinction between adaptive responses and unhealthy responses following trauma exposure (Brewin, 2011). However, understanding of intrusive memories in typical autobiographical memory and in other mental health presentations including depression has been born out of cognitive models of PTSD, with Brewin and colleagues' dual representation theory (DRT; Brewin et al., 1996; Brewin et al., 2010) and Ehlers and Clark's (2000) cognitive model perhaps the most widely applied. Central to cognitive theories is the understanding that cognitive processing of traumatic experience is at least partially responsible for the disorganisation, incoherence and intrusive nature of trauma memories observed in PTSD (Brewin, 2001). The development of PTSD is thought to be consequent of differential processing of a traumatic event that provokes an enduring sense of current threat, despite the actual threat having passed. Specifically, this sense of current threat is believed to be the result of two processes: the nature of trauma memories laid down and appraisals of the traumatic experience and its sequelae (Ehlers & Clark, 2000). The following section will consider the theoretical implications of findings presented by the current meta-analysis and empirical paper, in the context of cognitive models of PTSD.

5.2.1 The nature of trauma memories. Considering first the nature of trauma memories, DRT proposes that trauma-related information is encoded, stored and retrieved by two distinct memory systems that operate in parallel (Brewin et al., 1996). Information consciously attended to during trauma is thought to be laid down as any other autobiographical memory, sufficiently processed to be represented in coherent form in long-

term memory and available to voluntary verbal recall. These memories are known as verbally accessible memories (VAMs) and are primarily accessed voluntarily, although involuntary access via trauma-related cues may also occur. In contrast, wider details of the traumatic event processed without conscious attention, such as sensory features and physiological experience, receive limited processing and are consequently represented in non-verbal, sensory form with incoherent structure. These situationally accessible memories (SAMs or trauma memories) are experienced as intrusive memories, involuntarily retrieved upon exposure to trauma-related cues. In their later revision, Brewin et al. (2010) differentiate between contextually-bound memory representations (C-reps) and sensory-bound representations (S-reps). C-reps are broadly equivalent to VAMs but renamed in recognition that they are not defined by verbal accessibility but by their placement in spatial and temporal context and their integration with autobiographical memory. S-reps are broadly equivalent to SAMs, their revised term acknowledging that they occur in healthy memory formation in addition to the formation of later intrusions. Although using different terms, Ehlers and Clark (2000) also acknowledge the role of encoding in adjustment following trauma. They detail that processing focused on sensory information during traumatic experience (termed data-driven processing) at the cost of meaningful processing considering the contextual aspects of the event (conceptual processing) renders memories unavailable to conscious recall but vulnerable to involuntary retrieval.

Revised DRT proposes that in regular autobiographical memory, initially formed S-reps allow higher level processing and the formation of C-reps. They then decay and are rendered near inaccessible. However, in response to highly emotive experience, S-reps are less transient and may be involuntarily accessed in the presence of perceptually-related cues and associated emotional states or following activation of corresponding C-reps. In healthy memory, S-reps of emotional events correspond to C-reps. Thus when S-reps are

involuntarily activated (experienced as intrusive memory), corresponding C-reps contextualise the sensory-based information and subject its retrieval to conscious control (Brewin et al., 2010). In the current meta-analysis, the assertion that intrusive memories feature in healthy memory is supported by the prevalence of intrusive memories observed across studies employing a non-clinical comparison sample. Although limited information was available regarding trauma exposure, prevalence estimates as high as 73% indicate that intrusive memories are not uncommon among adults without mental health difficulties. Furthermore, experience of intrusive memories was reported by 28.0% (95% CI 10.4 – 45.6%) of the control sample in the current empirical paper, extending this observation to an adolescent sample. The prevalence of intrusive memories observed in the current empirical paper was notably higher in the PTSD group than in the non-clinical control group and a trend toward increased prevalence in the PTSD group compared to the depressed group was observed. These findings matched expectations given the difference in rates of trauma exposure between groups, with all participants in the PTSD group naturally reporting trauma exposure compared to around 45% of the depressed and control groups. The majority of participants reporting intrusive memories in all groups described memories of traumatic or potentially traumatic events, supporting suggestion that highly emotive experience promotes the formation of enduring S-reps.

Intrusive memories in depression are thought to be processed as they are in typical autobiographical memory, with activation of S-reps by bottom-up (through exposure to sensory or emotional cues) and top-down (via corresponding C-reps) processes. In contrast, the vivid re-experiencing and dissociative symptoms present in PTSD are thought the result of differential processing. Specifically, in processing traumatic events, high levels of stress promote low-level sensory-based processing, resulting in enduring S-reps but weak C-reps. Without corresponding contextual information, S-reps are activated only on exposure to

related sensory and emotional sensation and are not subject to top-down control (Brewin et al., 2010). The formation of C-reps with adequate contextual information is recognised to become increasingly difficult with growing intensity of traumatic experience (Brewin, 2011). Consistent with this, in the current empirical paper, the PTSD-IM group rated their intrusive memories as higher in intrusiveness than the control-IM group. Activation of S-reps largely via bottom-up processing in PTSD may result in primarily intrusive recall, reflected in higher scores, whilst intrusive memories in non-clinical controls may be thought to occur both intrusively and with top-down control via corresponding C-reps. Additional evidence is provided in the assessment of the nature of intrusive memories, evidenced in scores obtained on the Trauma Memory Quality Questionnaire (TMQQ; Meiser-Stedman, Smith, Yule & Dalgleish, 2007), with higher scores obtained by the PTSD-IM group than by the depressed-IM and control-IM groups. Higher scores on this measure indicate high sensory quality but reduced temporal context and lack of verbal accessibility or, in other words, enduring S-reps with weak corresponding C-reps.

Despite the findings outlined above, physical sensations accompanying intrusive memories were not unique to PTSD, reported by all but one participant in the PTSD-IM group but also by a large majority of the depressed-IM group and a small majority of the control-IM group. Although caution is advised in interpreting this finding given assessment by means of a single question, the presence of accompanying physical sensations in both depressed and control samples suggests that it may not be the strength of sensory quality *per se* but the strength of sensory quality coupled with reduced contextual information and poor verbal accessibility that distinguishes intrusive memories as experienced in PTSD from those present in depression or in healthy memory. Revised DRT views dissociative experience as the result of activation of strong S-reps in the complete absence of corresponding C-reps or lack of integration with associated C-reps, resulting in intrusive memories being experienced

as though happening in the present, a phenomenon considered to be unique to PTSD (Brewin et al., 2010). Evidence offered by the current empirical paper here was again mixed, with the surprising results that less than half of the PTSD-IM group described their memories as having 'here and now' quality and one participant in each of the depressed-IM and control-IM groups identified with this experience. Limited weight can be given to findings regarding dissociation given the lack of available measure for assessing this experience in adolescents and the low internal consistency observed between the three questions asked. However, positive report of each dissociative symptom by at least one participant in each of the groups indicates that contrasting dissociation with no dissociation or reliving with no reliving in order to distinguish PTSD from other presentations may be too simplistic a distinction to make. As highlighted in the adult literature (Patel et al., 2007), methods of assessment of reliving and dissociation may lack sensitivity, whilst comparison between studies is challenged by lack of consistency in measurement. The current findings, coupled with observations from adult research (e.g. Patel et al., 2007; Reynolds & Brewin, 1999), indicate that sensations of reliving and dissociation are not fully accounted for in current cognitive models, with further exploration required to differentiate these experiences as observed in PTSD from that in other presentations.

5.2.2 Intrusive memory appraisals and control strategies. The current meta-analysis highlighted an increased risk of intrusive memories in adult depression as compared to non-clinical controls and the results of the empirical paper indicate a trend toward the same pattern in adolescents. Whilst strong sensory quality accompanied by weak contextual information is highlighted as the distinguishing feature of intrusive memories in PTSD, the sensory quality ratings recorded by the depressed-IM and control-IM groups in the empirical study presented were comparable. Thus, consistent with cognitive models, intrusive memories of traumatic experience and negative but non-traumatic life events appear born of

similar processing in young people without PTSD. This raises the question of how intrusive memories in depression can be distinguished from those present in typical autobiographical memory. Cognitive models consider the increased frequency and distress typically associated with intrusive memory experience in depressed adults relative to non-clinical controls to be consequent of biased attention toward negative situational cues and negative appraisals of experience that promote depressed mood, activating enduring S-reps and triggering intrusions (Ehlers & Clark, 2000). It is first important to note that no difference was observed between depressed-IM and control-IM groups in the frequency with which intrusive memories were experienced in the empirical paper. However, ratings of distress in the depressed-IM group were markedly higher than the control-IM group. Further, both the PTSD-IM and depressed-IM groups reported a greater strength of negative emotional experience associated with their intrusive memories than the control-IM group.

Ehlers and Clark (2000) propose that the ongoing, current sense of threat seen as characteristic of PTSD can be fuelled by negative appraisals of the traumatic event itself or negative appraisals of its sequelae, including appraisals of intrusive re-experiencing. Negative appraisals are thought to perpetuate the experience of intrusive memories, as opposed to their presence alone or the frequency with which they are experienced (Ehlers & Steil, 1995). The current empirical paper examined only appraisals of intrusive memories, with findings highlighting that young people with PTSD and young people with depression frequently believe their intrusive memories to signal psychological abnormality and report negative impact on self-evaluation. Acknowledging that events with personal significance are better remembered in typical autobiographical memory, Brewin (2011) highlights that memories of traumatic experience in PTSD become embedded with self-concept, thus maintaining the strength of memory representations and frequency of recall. Consistent with this and expanding application to depression, participants in the clinical groups viewed their intrusive

memories as having greater personal meaning than the control-IM group, as evidenced in identified appraisals, indicating that young people with PTSD and young people with depression may incorporate intrusive memory experience into their sense of self. The data presented here indicate that, given equitable ratings for appraisals of control across groups, it may be appraisals of personal significance (broadly signalling that intrusive memories are associated with 'being bad' or 'going mad') that maintain intrusive memory salience, rather than simply the want to control intrusive memory experience.

In the current sample, all participant groups endorsed control appraisals, with the majority of participants in each group reporting use of each of the strategies of rumination, thought suppression, distraction and thought replacement. Cognitive models propose that attempted behavioural and cognitive avoidance of intrusive memories prevents trauma memories from undergoing conscious processing and maintains their salience (Ehlers & Clark, 2000). In the current sample, and as emphasised by Ehlers and Clark (2000), thought control strategies in attempts to manage intrusive memories were perceived by the PTSD-IM group as futile. Interestingly, whilst rumination has often been depicted as a key maladaptive thought control strategy in both PTSD and depression (Elwood, Hahn, Olatunji & Williams, 2009; Olatunji, Naragon-Gainey & Wolitzky-Taylor, 2013), the majority of all groups reported use of rumination and with unanimous agreement that it is ineffective in intrusive memory control. These findings indicate that it is perhaps not the presence of a passive thought control strategy (e.g. rumination) that fuels intrusive experience but the absence of an active strategy (e.g. thought replacement) or perceived inability to use an active strategy effectively. However, it has also been considered within the adult literature that the form thought control strategies take contributes to PTSD severity, with greater intensity of symptoms linked, for example, to continued rumination and negative emotions accompanying periods of ruminative thought (Michael, Halligan, Clark & Ehlers, 2007). The current

methodology did not permit consideration of how thought control strategies are employed or accompanying emotional experience and further exploration is required to elaborate on the role such strategies play in the maintenance of intrusive memories.

5.3 Clinical Implications

5.3.1 Screening for intrusive memories. With re-experiencing recognised as central to PTSD (American Psychiatric Association [APA], 2013; World Health Organisation [WHO], 1992), clinical assessment of intrusive memories is common practice (Silverman & Albano, 1996; Weathers et al., 2013). However, it may be suggested that exploration of intrusive memories is less likely to feature in clinical assessment of depression, given the relatively recent emergence of research in this population. The current meta-analysis and empirical paper evidence the high prevalence of intrusive memories in both adult and adolescent depression, with the prevalence observed in depressed adults revealed to parallel that in adults with PTSD. Coupled with the high levels of distress reported by adolescents with depression in relation to their intrusive memories, screening for intrusive memories is indicated as of potential benefit in clinical assessment. Michael et al. (2005) emphasise the importance of assessing intrusive memory experience holistically, rather than simply enquiring as to the presence of intrusive memories and their frequency, in recognition that these factors alone are insufficiently predictive of the impact of intrusive experience.

The interview schedule employed here compiled existing measures and questions asked of participants in previous research to achieve a questionnaire battery lasting approximately 10 minutes in the assessment of intrusive memories (excluding time taken to complete diagnostic measures and assessment of intrusive thoughts), which could be integrated into clinical assessment. The pertinence of this recommendation was emphasised by a participant with depression in the current empirical study who stated that she had been open to mental health services for many years and had accessed several discrete interventions

for depression, none of which had explored her intrusive memories of past traumatic experience despite her describing these as the most distressing symptom, indicating the potential value of assessment of intrusive memories to inform psychological formulation. She was thoughtful that her clinical team may not have been aware of her intrusive experience, stating that she had found the structured research interview acceptable but that she would feel unable to raise the subject of intrusive memories herself in clinical interview. Although not formally evaluated, anecdotal feedback suggested that the interview schedule was acceptable to young people, with no reports of distress during interview and no requests to break from or terminate the interview. Developed from existing adult research, this approach is also likely to be of benefit in the assessment of adult depression.

5.3.2 Screening for trauma and psychological interventions. Although recommended as a psychological intervention of choice for depression in both adults and young people (NICE, 2009; NICE, 2015), cognitive behaviour therapy (CBT) is not effective for all, with high rates of relapse and recurrence and doubt over long-term benefit (Hofmann, Asnaani, Vonk, Sawyer & Fang, 2012; Weisz, McCarty & Valeri, 2006; Zhou et al., 2015). A growing body of literature evidences CBT for depression as less effective for adolescents with histories of trauma (Lewis et al., 2010), with this pattern of reduced response and observation of high relapse rates seen to persist into adulthood (Nanni, Uher & Danese, 2012). Although research in this field has focused primarily on childhood maltreatment in the form of abuse and neglect, consideration of trauma-focused CBT as opposed to depression-focused CBT is recommended in the treatment of young people reporting trauma histories (Gerson & Rappaport, 2013). Given the high rate of past traumatic experience recorded in the current empirical sample, this consideration may be applicable to a notable proportion of young people with depression, indicating that routine assessment of trauma exposure in adolescents presenting with depressed mood may aid treatment planning. As in the current

empirical paper, discussion around traumatic experience leads logically onto identification of intrusive memories, with many intrusive memories described in the current study relating to traumatic exposure. Thus, combining screening for trauma history with screening for intrusive memory experience would achieve rich information with efficient use of clinical time.

Brewin et al. (2009) advocates for 'modular treatments' in depression, in which therapeutic components or 'modules' are guided by individual symptom profiles. The current meta-analysis and empirical paper evidence the prevalence of intrusive memories in depression and distress associated with this experience in an adolescent sample, adding to the growing body of research considering the potential utility of intrusive memories as a therapeutic target in cognitive interventions. Two well established psychological interventions employed in the treatment of PTSD are exposure therapy (Foa & Rothbaum, 1998) and eye movement desensitisation and reprocessing (EDMR; Shapiro, 1989). Understood within the framework of revised DRT, repeated imaginal or in vivo exposure to traumatic material through activation of enduring S-reps promotes elaboration of weak corresponding C-reps, contextualising the memory and permitting voluntary recall (Brewin et al., 2010). However, in light of the current empirical findings and consistent with DRT, such approaches appear less applicable to intrusive memories in depression as sufficient contextual information appears to accompany sensory memory, evidenced in assessment of sensory quality. Rather, treatment approaches targeting intrusive memory appraisals and management strategies are indicated.

As mentioned above, an intervention for young people with promising initial support is trauma-focused CBT (TF-CBT), adopting a components-based approach to address childhood PTSD and trauma reactions, including emotional and behavioural difficulties (Deblinger, Cohen & Mannarino, 2012). The authors acknowledge that although trauma-

history is present, the young person may not be seeking support around posttraumatic stress symptoms but for associated difficulties, including depression. Research evaluating the application of TF-CBT in childhood PTSD has evidenced effectiveness in reduction of both posttraumatic stress symptoms and trauma-related depression (Cohen, Deblinger, Mannarino & Steer, 2004; Cohen, Mannarino & Knudsen, 2004; Lenz & Hollenbaugh, 2015), with guidance that this approach may be appropriate where trauma-related depression is identified (Cohen, Berliner & Mannarino, 2010). Although relatively untested in trauma-exposed young people presenting with depression but without other significant symptoms of PTSD, TF-CBT is worthy of consideration for use with this population (Gerson & Rappaport, 2013).

An alternative approach would be to consider trauma-focused adjuncts to CBT. One such treatment showing initial promise is imagery rescripting, in which the client is supported to revisit their memory and to construct an alternative story depicting a more positive outcome (Hackmann, 1998). The relevance of this approach is supported by observations of thought control strategies in the current empirical paper, with the non-clinical control group rating positive thought replacement as the most effective of thought control strategies. In the adult literature, imagery rescripting is highlighted as a supplementary module to CBT but also promoted as a stand-alone treatment providing brief, targeted intervention for intrusive memories in depression (Brewin et al., 2009; Wheatley & Hackmann, 2011).

A second addition to CBT also of potential benefit is the use of mindfulness-based practice, with growing interest in the application of mindfulness in the field of adult PTSD (Banks, Newman & Saleem, 2015; Kabat-Zinn, 2003). The principle advocated for in mindfulness-based practice of adopting a non-judgemental stance in view of one's own thoughts holds particular pertinence with the marked difference in appraisals identified in the current empirical paper between the clinical groups and the control group, with both young people with PTSD and young people with depression judging their intrusive memories to

have negative personal significance. Further, cognitive avoidance as observed in the current study defies the concept of mindful acceptance, considered in PTSD to contribute to the maintenance of symptoms (Thompson, Arnkoff & Glass, 2011). Application of mindfulness-based approaches to managing PTSD is relatively recent but is supported by positive early results evidencing reduction in posttraumatic stress symptoms and in depressive symptoms (Follette, Palm & Pearson, 2006; Kimbrough, Magyari, Langenberg, Chesney & Berman, 2010). With successful application to treating adult depression and initial evidence of acceptability with adolescents, mindfulness-based practice may also be valuable in targeting intrusive memories in depression (Ames, Richardson, Payne, Smith & Leigh, 2014; Burke, 2009; Khoury et al., 2013; Zoogman, Goldberg, Hoyt & Miller, 2015).

5.3.3 Normalising. Finally, an important observation within both the meta-analysis and empirical paper that has received remarkably limited attention in the existing literature is the prevalence of intrusive memories in adults and young people without mental health difficulties, evidencing this as a relatively common phenomenon in non-clinical populations. Given the appraisals reported by young people with PTSD and young people with depression in the current empirical study, representing beliefs that intrusive memories broadly signal 'badness' or 'madness', there is a clear role for normalising this experience in clinical practice.

5.4 Strengths

Emphasised within the current meta-analysis is the benefit of between-groups comparison, with the prevalence of intrusive memories in depression compared to the prevalence recorded in PTSD and considered within the context of non-clinical control samples. This gives weight to the prevalence rate reported with respect to clinical relevance, reflected in the risk ratios calculated. Recruitment of three, well defined participant groups allowing between-groups comparison is a strength of the empirical study design. In

acknowledgement of challenges to between-groups comparison identified within the meta-analysis, the empirical paper sought to achieve ecological validity in sampling whilst retaining clear distinction between participant groups. Given the high rate of comorbidity observed and lack of representativeness of 'pure' PTSD samples, young people with PTSD and comorbid depression were included in the PTSD group. Exclusion criteria were devised to be as least restrictive as possible, for example, permitting the inclusion of young people presenting with psychotic features in the clinical groups whilst excluding psychotic disorder. Further, to reduce overlap in depressive symptoms between the clinical groups and the control group, young people were excluded from the control group who did not meet diagnostic criteria for depression but who reported clinically relevant depressive symptoms.

The current empirical study utilised structured interviewing by telephone, affording a number of benefits. Firstly, conducting interviews with participants allowed administration of structured diagnostic tools assessing for PTSD and depression, ensuring the sample included only young people with clinically significant presentations and reducing the burden on collaborating clinicians by removing the need for formal diagnosis prior to referral as a barrier to participation. Secondly, although the current meta-analysis observed stability in the recorded prevalence rate across studies utilising self-report questionnaire assessment of intrusive memories and those employing interview methodology, use of interviews was felt important in the current empirical research with adolescents, given the complexity of the construct assessed. Use of interviews allowed other cognitive experiences, such as consciously retrieved autobiographical memories and intrusive images of imagined events, to be distinguished from intrusive memories and excluded. This addressed a limitation of previous research (Meiser-Stedman, Dalgleish, Yule & Smith, 2012), enhancing the reliability of results. Finally, telephone contact, as opposed to interviewing in person, allowed young people to participate within their own homes and at a time of their choice, thus

reducing the demands of participation and avoiding interruption to schooling whilst also protecting researchers from lone working and reducing research costs with respect to travel. Just one participant requested an interview via video call, indicating the acceptability to adolescents of communicating with researchers via telephone.

A strength of both the meta-analysis and empirical paper presented was clear consideration of comorbid PTSD in presenting depression, with understanding that overlooking this may artificially increase the observed prevalence of intrusive memories recorded. For studies included in the meta-analysis reporting the number of participants with comorbid PTSD but without exclusion, a conservative adjustment was applied in sensitivity analyses so as not to inflate the prevalence rate of intrusive memories in depression; each of these participants was assumed to have reported intrusive memories and was removed from analysis. As detailed above, all participants in the empirical study completed a structured diagnostic interview for PTSD, following which young people reporting depression but also meeting criteria for PTSD were allocated to the PTSD group, thus allowing representation of intrusive memory experience in depression presenting without comorbid PTSD. Further, addressing a methodological limitation identified within the meta-analysis and following examples set in previous research (Birrer et al., 2007; Parry & O'Kearney, 2014), the empirical paper assessed trauma exposure in all participants with aim to evaluate the impact of trauma exposure on intrusive memory experience. However, meaningful analyses were regrettably unachievable due to the small sample size.

5.5 Limitations and Directions for Future Research

Perhaps the principal limitation of the research presented was the relatively small number of studies assessing prevalence available for inclusion in the meta-analysis and the small sample size of clinical groups achieved in the empirical paper, restricting the strength of conclusions that can be drawn. Although the scope of the meta-analysis was determined by

the extant literature, factors contributing to low recruitment in the empirical research must be considered.

Firstly, feedback from contributing clinicians revealed some discomfort in using diagnostic terms, as listed on the research information sheets and therefore requiring discussion with families prior to referral. Recent guidelines published by the British Psychological Society (BPS; 2014) advocate for limiting use of medical language (e.g. 'depression') in favour of descriptive language (e.g. 'low mood'), reflected in the vision outlined by 'Future in Mind' in moving away from diagnostic labelling in young people's mental health care (Department of Health, 2015). Given that many CAMHS and Youth Mental Health teams practice within a systemic frame, where wider thought around presenting difficulties is emphasised over formal diagnosis (Dallos & Draper, 2000), this may have been a barrier to recruitment. In an effort to address this, wording was changed on revised information sheets to read 'low mood/depression' rather than simply 'depression'. Secondly, some clinicians were apprehensive regarding the content of the interview, expressing concern that young people may become distressed when asked about their intrusive memories, despite ethical approval and provisions to minimise the risk of harm. Reluctance to explore intrusive memory experience with young people for fear of causing distress may be a significant barrier to clinical application of the current findings and may be an important attitude to explore with clinicians in future research. A further consideration is the reorganisation of mental health services in recent years which has altered the demographic of young people seen within tier three provisions, largely restricting intake to those with complex presentations. The difficulties with which these young people present are less likely to be described sufficiently by a single diagnostic label and it may be more challenging for clinicians to identify a discrete presentation, such as depression (Taylor, 2015). It may therefore have been beneficial to recruitment to work more closely with tier

two and third sector organisations, where young people with less complex difficulties are now more likely supported. Finally, it may be considered that local developments within services, including changes to referral criteria and intake age, coupled with caseload pressures reflecting national challenges within the NHS may have limited clinicians' capacity to hold the research in mind.

In the current empirical paper, several between-group comparisons fell below significance despite large effect sizes. Replication is required within a larger sample to increase the statistical power afforded in analyses and test the reliability of the results obtained. Sufficient numbers would also support additional analyses including regression analyses, allowing further exploration between measures of intrusive memory experience and clinical presentation. As recommended above, recruitment of appropriate numbers would allow separate consideration of trauma-exposed depressed adolescents and young people presenting with depression in the absence of trauma exposure, a distinction highlighted as of potential significance in treatment planning (Gerson & Rappaport, 2013). Further, exploration of the relationship between depressive symptom severity and intrusive memory experience was not possible due to the small sample size achieved. Given observation in the adult literature of differences in intrusive memory experience associated with severity of depression, including in rated intrusiveness, cognitive avoidance and intrusive memory quality (Kuyken & Brewin, 1994; Williams & Moulds, 2007a), consideration of the impact of severity was planned in the current study in the inclusion of a measure of severity in addition to a diagnostic measure and is an avenue worthy of further attention in a larger sample. Lessons learned from the current empirical study indicate that recruitment of young people to all groups would best be achieved through online advertising utilising social media and via community advertising, adopting a self-referral model through which the majority of participants were recruited here.

Although the questionnaire battery devised in this empirical research covered many aspects of intrusive memories, there are developments which may be beneficial. Firstly, as aforementioned, whilst providing a narrative example to participants may have aided understanding of the concept of intrusive memories, featuring a traumatic event may have led participants to believe that intrusive memories are restricted to traumatic experience, thus preventing report of intrusive memories regarding non-traumatic experience. A simple modification may be to provide two examples, one of a traumatic event and the other of a non-traumatic event, or to explicitly state that intrusive memories may pertain to any event when providing participants with the definition. Secondly, due to a lack of available measures, sensations of reliving and physical sensations accompanying intrusive memories were assessed by means of a single question, whilst dissociation was assessed through three questions with internal consistency observed to be very poor, drawing into question the reliability of report. Despite such limited measurement, the data revealed some emergent between-groups differences, highlighting opportunity for further investigation of these experiences and the need to develop a standardised assessment tool. Development of a measure such as this may be supported by qualitative exploration of experiences accompanying intrusive memory retrieval. Finally, the questionnaire battery administered did not include consideration of the perspective from which memories are recalled; this was perhaps an oversight in development of the battery given suggestion in the adult literature that recall from a third person vantage perspective may be considered a form of cognitive avoidance and indication that such avoidance may serve to maintain intrusive experience (Kuyken & Moulds, 2009; Williams & Moulds, 2007b). Further, according to revised DRT, developing the ability to manipulate recall to assume different visual perspectives of the scene is indicative of C-rep formation (Brewin, 2014; Brewin & Burgess, 2014), and thus recall perspective prior to intervention may provide valuable clinical information. Inclusion

of the assessment of recall perspective would support holistic assessment of intrusive memory experience in future research.

Young people were recruited to the empirical research across a relatively broad age range from 11 to 18 years and it is therefore important to consider the developmental context of findings. Of consideration in the existing literature has been the manifestation of re-experiencing symptoms including intrusive memories from a developmental perspective, with some debate as to the similarities observed between adult and child populations and consequent implications for assessment and treatment. It is suggested that from middle childhood, reactions to traumatic experiences are broadly similar to those seen in adults, with children aged around eight years and above more able than younger children to notice their thoughts, relate these to earlier thoughts and emotional experiences, consider the long-term consequences of events and to engage in cognitive thought control strategies (Dyregrov & Yule, 2006; Salmon & Bryant, 2002), indicating that cognitive experiences across the age range studied can be assumed broadly comparable. However, it is recognised that family factors also play an important role for young people in facilitating or impeding adjustment following traumatic exposure, including parental support provided to the child in sharing posttraumatic reactions and parental reinforcement of effective coping strategies (Salmon & Bryant, 2002). It may be considered that such factors have greater influence for younger adolescents as compared to young people approaching adulthood and it is reasonable to assume that such factors may also play a role for young people in the management of intrusive memories of non-traumatic events. Dalgleish, Meiser-Stedman and Smith (2005) recommend the stratification of samples by age to inform understanding of the experience of posttraumatic symptoms from a developmental perspective. Subdividing the current sample by age was not possible due to participant numbers, thus future research would benefit from a larger sample stratified by age to examine the experience of intrusive memories across

adolescence. Further, broader understanding of strategies employed to manage intrusive memories may be achieved through inclusion of measures examining parental support.

The current empirical study and those included in the meta-analysis adopted cross-sectional designs, permitting assessment only of intrusive memory experience at a single time point. Although between-groups comparisons are of both theoretical and clinical importance, insight into the development of intrusive memories was not permitted and consideration of causality was precluded. Longitudinal research is warranted to explore the relationships between trauma exposure, intrusive memory experience and the development of depression and PTSD. Of particular interest in light of the current empirical results would be investigation concerning the role of intrusive memories in the development of depression and PTSD in trauma-exposed adolescents. The current results also support ongoing research into the utility of trauma-focused approaches and interventions targeting intrusive memories in both adult and adolescent depression.

5.6 Overall Conclusion

Long since accepted a hallmark of PTSD, the last two decades have seen growing recognition of intrusive memories as a transdiagnostic process, featured across a range of mental health presentations including depression. Pooling the prevalence rates reported in existing research, intrusive memories are highlighted here as an experience shared by a large majority of adults with depression, with a 76.0% point prevalence rate (95% CI 59.4 – 89.4%) estimated through meta-analysis. Depressed adults are seen to be at increased risk of experiencing intrusive memories as compared to non-clinical controls (risk ratio of 2.94, 95% CI 1.53 – 5.67) but at comparable risk as adults with PTSD. Intrusive memories are also revealed as a common experience in adolescent depression, reported by 54.5% (95% CI 25.1 – 83.9%) of the current sample, again representing increased risk as compared to the non-

clinical control sample (risk ratio of 1.95, 95% CI 0.85 – 4.46) and extending the view of intrusive memory experience as a transdiagnostic symptom to an adolescent sample.

Mirroring observation within the adult literature, intrusive memories experienced by young people with depression and young people with PTSD were discriminated from those described by young people in the non-clinical control group by strength of associated negative emotions, heightened levels of accompanying distress and endorsed appraisals of psychological abnormality and negative self-evaluation. Strong sensory quality with weak temporal context and lack of verbal accessibility defined intrusive memory experience in PTSD. These findings are consistent with cognitive theories of PTSD and support the application of dual representation models to both adolescent presentations of PTSD and depression. However, the empirical findings presented here must be considered with a degree of caution given the small number of participants and replication within a larger sample will be necessary to test the reliability of results.

Clinically, intrusive memories are put forward as a potential cognitive target for therapeutic intervention in depression, with value suggested in routine screening for trauma-exposure and intrusive memory experience. Continued research evaluating TF-CBT for young people and focused modules as adjuncts to depression-focused CBT (such as imagery rescripting and mindfulness-based practice) is supported. Future study would benefit from longitudinal design and development of a standardised measure to further assess dissociative experience, physical sensations and feelings of reliving across clinical and control populations.

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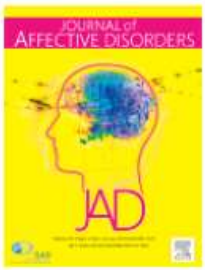

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If you are not able to use the templates via the links (or if you have any other template queries) please contact authortemplate@tandf.co.uk

References

Please use this reference guide when preparing your paper. An EndNote output style is also available to assist you.

Checklist: what to include

1. **Author details**. Please ensure everyone meeting the International Committee of Medical Journal Editors (ICMJE) requirements for authorship is included as an author of your paper. Please include all authors' full names, affiliations, postal addresses, telephone numbers and email addresses on the title page. Where available, please also include ORCiDs and social media handles (Facebook, Twitter or LinkedIn). One author will need to be identified as the corresponding author, with their email address normally displayed in the article PDF (depending on the journal) and the online article. Authors' affiliations are the affiliations where the research was conducted. If any of the named co-authors moves affiliation during the peer-review process, the new affiliation can be given as a footnote. Please note that no changes to affiliation can be made after your paper is accepted. Read more on authorship.
2. A non-structured **abstract** of no more than 200 words. Read tips on writing your abstract.
3. **Graphical abstract** (optional). This is an image to give readers a clear idea of the content of your article. It should be a maximum width of 525 pixels. If your image is narrower than 525 pixels, please place it on a white background 525 pixels wide to ensure the dimensions are maintained. Save the graphical abstract as a .jpg, .png, or .gif. Please do not embed it in the manuscript file but save it as a separate file, labelled GaphicalAbstract1.
4. You can opt to include a **video abstract** with your article. Find out how these can help your work reach a wider audience, and what to think about when filming.
5. 4-7 **keywords**. Read making your article more discoverable, including information on choosing a title and search engine optimization.
6. **Funding details**. Please supply all details required by your funding and grant-awarding bodies as follows:
   For single agency grants: This work was supported by the[Funding Agency] under Grant [number xxxx].
   For multiple agency grants: This work was supported by the [funding Agency 1]; under Grant [number xxxx]; [Funding Agency 2] under Grant [number xxxx]; and [Funding Agency 3] under Grant [number xxxx].
7. **Disclosure statement**. This is to acknowledge any financial interest or benefit that has arisen from the direct applications of your research. Further guidance on what is a conflict of interest and how to disclose it.
8. **Supplemental online material.** Supplemental material can be a video, dataset, fileset, sound file or anything which supports (and is pertinent to) your paper. We publish supplemental material online via Figshare. Find out more about supplemental material and how to submit it with your article.
9. **Figures.** Figures should be high quality (1200 dpi for line art, 600 dpi for grayscale and 300 dpi for color, at the correct size). Figures should be saved as TIFF, PostScript or EPS files. More information on how to prepare artwork.
10. **Tables.** Tables should present new information rather than duplicating what is in the text. Readers should be able to interpret the table without reference to the text. Please supply editable files.
11. **Equations**. If you are submitting your manuscript as a Word document, please ensure that equations are editable. More information about mathematical symbols and equations.
12. **Units.** Please use SI units (non-italicized).

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You must obtain the necessary permission to reuse third-party material in your article. The use of short extracts of text and some other types of material is usually permitted, on a limited basis, for the purposes of criticism and review without securing formal permission. If you wish to include any material in your paper for which you do not hold copyright, and which is not covered by this informal agreement, you will need to obtain written permission from the copyright owner prior to submission. More information on requesting permission to reproduce work(s) under copyright.

Disclosure statement

Please include a disclosure of interest statement, using the subheading "Disclosure of interest." If you have no interests to declare, please state this (suggested wording: *The authors report no conflicts of interest*). For all NIH/Wellcome-funded papers, the grant number(s) must be included in the disclosure of interest statement. Read more on declaring conflicts of interest.

Clinical Trials Registry

In order to be published in a Taylor & Francis journal, all clinical trials must have been registered in a public repository at the beginning of the research process (prior to patient enrolment). Trial registration numbers should be included in the abstract, with full details in the methods section. The registry should be publicly accessible (at no charge), open to all prospective registrants, and managed by a not-for-profit organization. For a list of registries that meet these requirements, please visit the WHO International Clinical Trials Registry Platform (ICTRP). The registration of all clinical trials facilitates the sharing of information among clinicians, researchers, and patients, enhances public confidence in research, and is in accordance with the ICMJE guidelines.

Complying with ethics of experimentation

Please ensure that all research reported in submitted papers has been conducted in an ethical and responsible manner, and is in full compliance with all relevant codes of experimentation and legislation. All papers which report *in vivo* experiments or clinical trials on humans or animals must include a written statement in the Methods section. This should explain that all work was conducted with the formal approval of the local human subject or animal care committees (institutional and national), and that clinical trials have been registered as legislation requires. Authors who do not have formal ethics review committees should include a statement that their study follows the principles of the Declaration of Helsinki.

Consent

All authors are required to follow the ICMJE requirements on privacy and informed consent from patients and study participants. Please confirm that any patient, service user, or participant (or that person's parent or legal guardian) in any research, experiment, or clinical trial described in your paper has given written consent to the inclusion of material pertaining to themselves, that they acknowledge that they cannot be identified via the paper; and that you have fully anonymized them. Where someone is deceased, please ensure you have written consent from the family or estate. Authors may use this Patient Consent Form, which should be completed, saved, and sent to the journal if requested.

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Please include all relevant safety precautions; and cite any accepted standard or code of practice. Authors working in animal science may find it useful to consult the International Association of Veterinary Editors' Consensus Author Guidelines on Animal Ethics and Welfare and Guidelines for the Treatment of Animals in Behavioural Research and Teaching. When a product has not yet been approved by an appropriate regulatory body for the use described in your paper, please specify this, or that the product is still investigational.

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Author Services website or contact us at authorqueries@tandf.co.uk.
Updated September 2016

Appendix C

Procedure Flow Chart

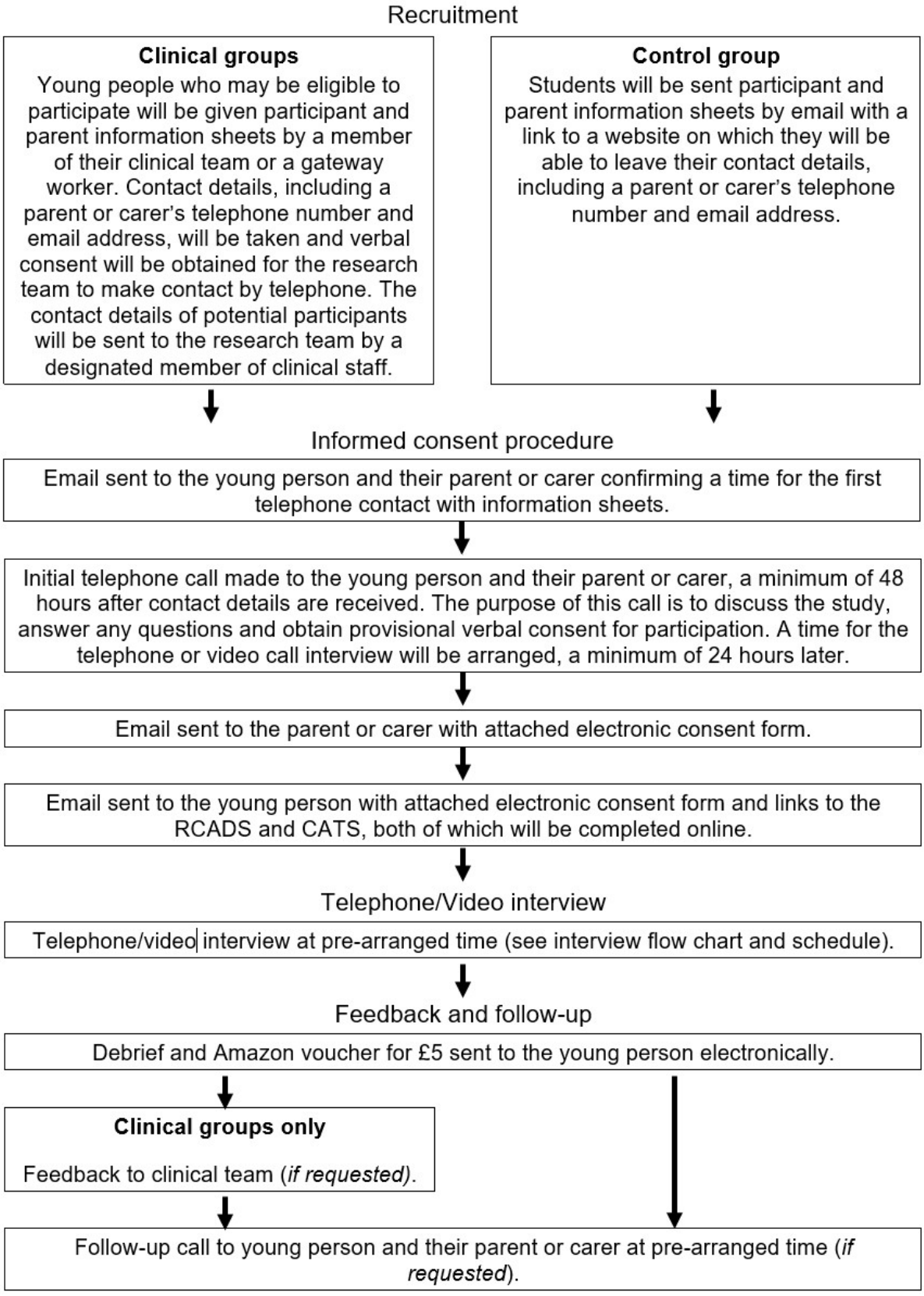
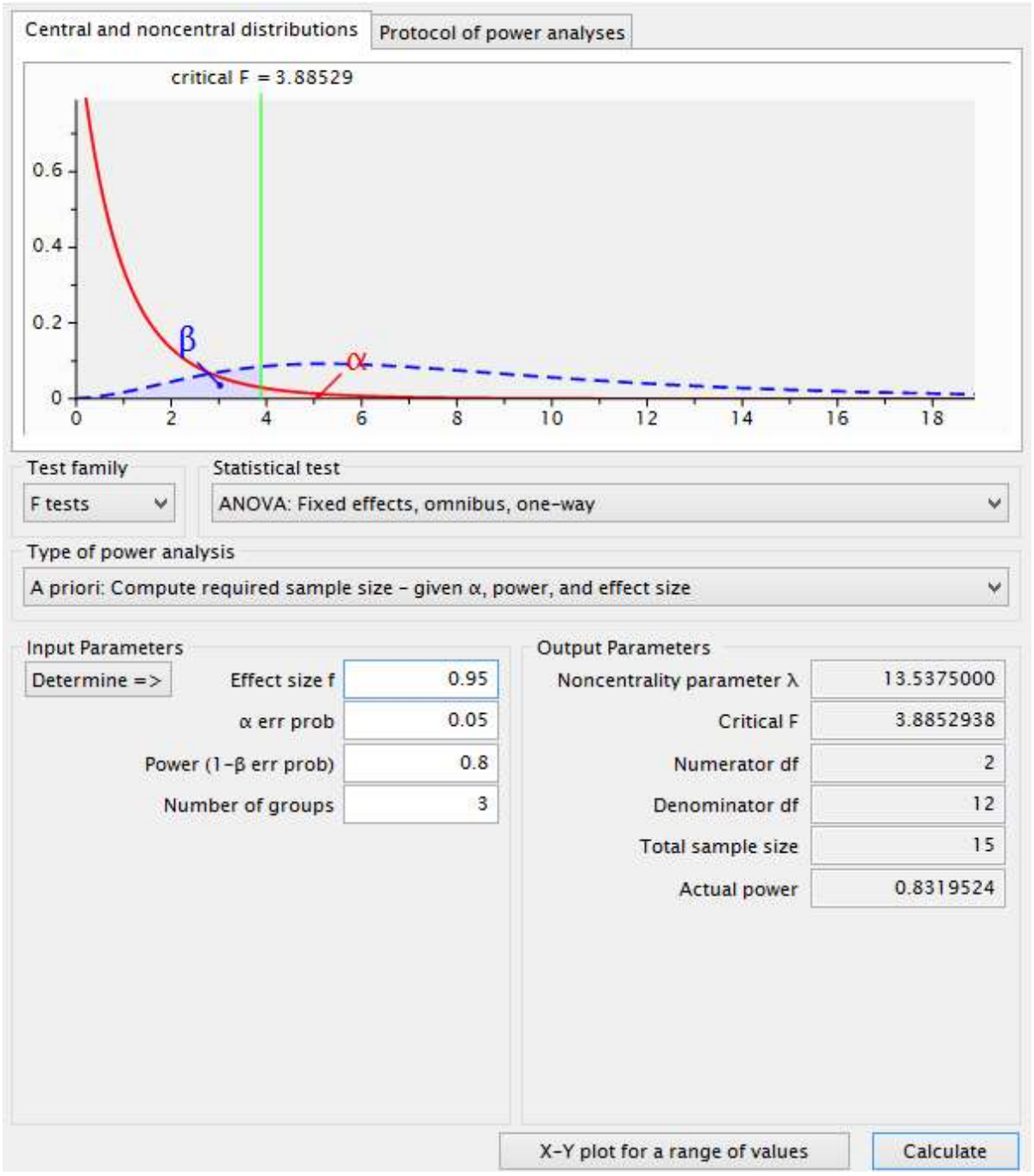


Figure C.1: *Procedure Flow Chart*.

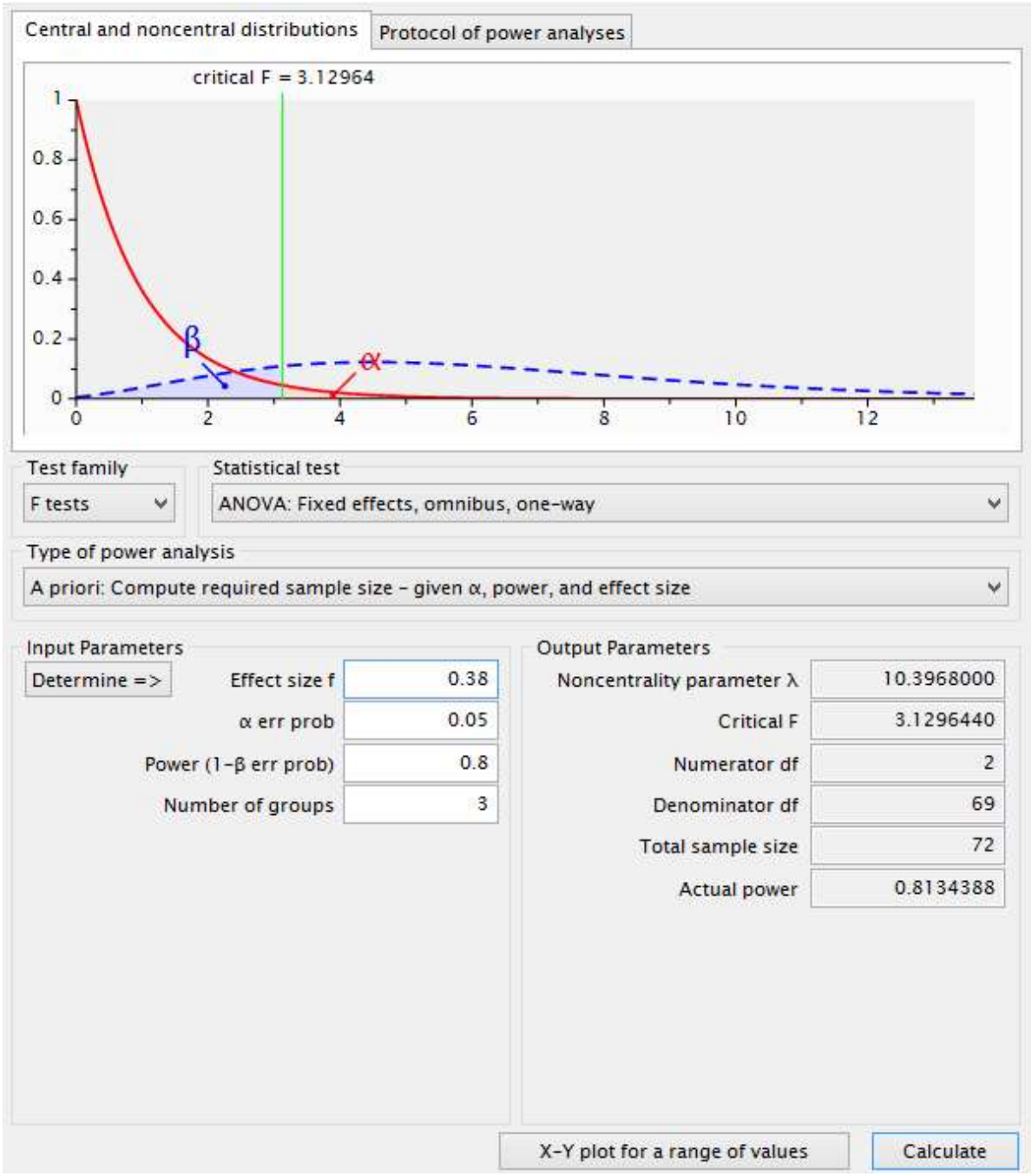
Appendix D

G*Power Output for Data Presented by Spenceley and Jerrom (1997)



Appendix E

G*Power Output for an Estimated Effect Size of $d = 0.75$ ($f = 0.38$)



Appendix F

Ethical Approval from Solihull NHS Research Ethics Committee

NHS
Health Research Authority

West Midlands - Solihull Research Ethics Committee
The Old Chapel
Royal Standard Place
Nottingham
NG1 6FS

Telephone: 0115 8839525

19 January 2016

Miss Aleksandra Kralj
Department of Clinical Psychology, Norwich Medical School
University of East Anglia
Norwich
NR4 7TJ

Dear Miss Kralj

Study title:	**Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).**
REC reference:	**15/WM/0468**
IRAS project ID:	**183282**

Thank you for your letter of 8 January 2016, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair and one other member.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to make a request to postpone publication, please contact the REC Manager, Joanne Unsworth, nrescommittee.westmidlands-solihull@nhs.net.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Conditions of the favourable opinion

The REC favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements. Each NHS organisation must confirm through the signing of agreements and/or other documents that it has given permission for the research to proceed (except where explicitly specified otherwise).

Guidance on applying for NHS permission for research is available in the Integrated Research Application System, www.hra.nhs.uk or at http://www.rdforum.nhs.uk.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of management permissions from host organisations

Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database within 6 weeks of recruitment of the first participant (for medical device studies, within the timeline determined by the current registration and publication trees).

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to contest the need for registration they should contact Catherine Blewett (catherineblewett@nhs.net), the HRA does not, however, expect exceptions to be made. Guidance on where to register is provided within IRAS.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Ethical review of research sites

NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	*Version*	*Date*
Covering letter on headed paper [Covering letter]		
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Evidence of insurance]	1.0	01 December 2015
GP/consultant information sheets or letters [Clinician information sheet]	1.2	12 November 2015
GP/consultant information sheets or letters [Clinical information sheet]	1.3	05 January 2016
Interview schedules or topic guides for participants [Intrusive memories interview]	1.1	02 December 2015
Interview schedules or topic guides for participants [Intrusive thoughts interview]	1.1	02 December 2015
Interview schedules or topic guides for participants [RCADS interview]	1.0	01 December 2015
Letter from funder [Letter from funder]	1.0	01 December 2015
Letter from sponsor [Letter from sponsor]	1.0	01 December 2015
Non-validated questionnaire [CATS questionnaire]	1.0	01 December 2015
Other [GCP certificate]	1.0	01 December 2015
Other [Invitation to participate for Headteachers]	1.2	12 November 2015
Other [Invitation to participate for clinical teams]	1.2	12 November 2015
Other [Feedback from internal review]	1.0	07 July 2015
Other [Feedback from internal review]	1.0	07 August 2015
Other [Student 2 GCP certificate]	1.0	01 December 2015
Other [Participant debrief]	1.3	02 December 2015
Other [Participant debrief for excluded participants]	1.0	02 December 2015
Other [Response to scientific review]	1.0	02 December 2015
Other [Explaining why we are inviting head teachers]	1.0	04 December 2015
Other [Information sheet for teachers]	1.3	05 January 2016
Other [Covering letter to address REC suggestions]	1.0	05 January 2016
Participant consent form [Clinical participant consent form]	1.3	05 January 2016
Participant consent form [Control participant consent form]	1.0	05 January 2016
Participant consent form [Parent consent form clinical]	1.3	05 January 2016
Participant consent form [Parent consent form control]	1.0	05 January 2016
Participant consent form [Clinical participant age 11-12 assent form]	1.0	05 January 2016
Participant consent form [Clinical participant age 13-16 assent form]	1.1	05 January 2016
Participant consent form [Control participant age 11-12 assent form]	1.0	05 January 2016
Participant consent form [Control participant age 13-16 assent form]	1.0	05 January 2016
Participant information sheet (PIS) [Information sheet for clinical groups aged 11-12]	1.0	05 January 2016
Participant information sheet (PIS) [Information sheet for clinical groups aged 13-16]	1.3	05 January 2016
Participant information sheet (PIS) [Information sheet for controls aged 11-12]	1.0	05 January 2016
Participant information sheet (PIS) [Information sheet for controls aged 13-16]	1.0	05 January 2016
Participant information sheet (PIS) [Parent information sheet]	1.3	05 January 2016

REC Application Form [REC_Form_02122015]		02 December 2015
Referee's report or other scientific critique report [Scientific review feedback]	1.0	02 December 2015
Research protocol or project proposal [Joint protocol]	2.1	05 January 2016
Summary CV for Chief Investigator (CI) [Chief Investigator CV]	1.0	01 December 2015
Summary CV for student [Student 1 CV]	1.0	04 December 2015
Summary CV for supervisor (student research) [Supervisor CV]		
Summary, synopsis or diagram (flowchart) of protocol in non technical language [Interview flowchart]	1.0	12 November 2015
Summary, synopsis or diagram (flowchart) of protocol in non technical language [Procedure flow chart]	1.1	05 January 2016
Summary, synopsis or diagram (flowchart) of protocol in non technical language [Interview flow chart]	1.1	05 January 2016
Validated questionnaire [CRIES questionnaire]	1.0	
Validated questionnaire [TMQQ questionnaire]	1.0	

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document *"After ethical review – guidance for researchers"* gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The HRA website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website:
http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/

HRA Training

We are pleased to welcome researchers and R&D staff at our training days – see details at
http://www.hra.nhs.uk/hra-training/

15/WM/0468	Please quote this number on all correspondence

With the Committee's best wishes for the success of this project.

Yours sincerely

pp.

Dr Rex J Polson
Chair

Email:nrescommittee.westmidlands-solihull@nhs.net

Copy to: *Mrs Sue Steel*
Dr Bonnie Teague, Norfolk and Suffolk NHS Foundation Trust

Appendix G

Research and Development Approval for Norfolk and Suffolk NHS Foundation Trust

Norfolk and Suffolk NHS
NHS Foundation Trust

Research and Development
The Knowledge Centre
Hellesdon Hospital
Drayton High Road
Norwich
NR6 5BE

Telephone 01603 421255
E mail: RDofficemailbox@nsft.nhs.uk

Miss Aleksandra Kralj &
Miss Alexandra Payne
Department of Clinical Psychology
Norwich Medical School
University of East Anglia
Norwich NR4 7TJ

9th February 2016

Dear Miss Kralj and Miss Payne,

Re: RD #16 183282 Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD)

Thank you for submitting the above project for local research governance approval. I am pleased to inform you that your project has been given full approval and you may begin your research at the following site:

- Norfolk & Suffolk NHS Foundation Trust

I have enclosed two copies of the Standard Terms and Conditions of Approval. Please sign both copies returning one copy to the Research and Development office, at the above address, and keeping the other in your study file. Failure to return the standard terms and conditions may affect the conditions of approval. Under the agreed Standard Terms and Conditions of Approval you must inform the R&D department of any proposed changes to this study and submit annual progress reports to the R&D department.

Any researcher(s) whose substantive employer is not the Norfolk & Suffolk NHS Foundation Trust must have a Letter of Access or Honorary Research contract and evidence of Good Clinical Practice (GCP) training before coming on site to conduct their research in this project. Please note that you cannot take part in this study until you have this documentation. If a Letter of Access / Honorary Research Contract has not been issued – please contact us immediately.

If you have any queries regarding this or any other project, please contact, Tom Rhodes, Senior Research Facilitator, at the above address.

The reference number for this study is: **RD #16 183282,** and this should be quoted on all correspondence.

Yours sincerely,

Bonnie Teague
Research Manager

Your research governance approval is valid providing you comply with the conditions set out below:

1. You commence your research within one year of the date of this letter. If you do not begin your work within this time, you will be required to resubmit your application.
2. You notify the Research and Development Office should you deviate or make changes to the approved documents.
3. You alert the Research and Development Office by contacting the address above, if significant developments occur as the study progresses, whether in relations to the safety of individuals or to scientific direction.
4. You complete and return the standard annual self-report study monitoring form when requested to do so at the end of each financial year. Failure to do this will result in the suspension of research governance approval.
5. You comply fully with the Department of Health Research Governance Framework and Trust Research Policies, and in particular that you ensure that you are aware of and fully discharge your responsibilities in respect to Data Protection, Health and Safety, financial probity, ethics and scientific quality. You should refer in particular to Sections 3.5 and 3.6 of the Research Governance Framework.
6. You ensure that all information regarding patients or staff remains secure and strictly confidential at all times. You ensure that you understand and comply with the requirements of the NHS Confidentiality Code of Practice, Data Protection Act and Human Rights Act. Unauthorised disclosure of information is an offence and such disclosures may lead to prosecution.
7. **UKCRN Portfolio Studies only**: You will make local Trust research team members aware that it is expected that the "first participant, first visit" date should be within 70 days of the full submission for Trust Research Governance Approval, and this date must be reported to the Research and Development office using the email address above. Delay to recruitment due to study-wide developments must be reported to the Trust as soon as possible.
8. **UKCRN Portfolio Studies only**: You will report and upload Trust recruitment to the UKCRN portfolio accurately and in a timely manner, and will provide recruitment figures to the Trust upon request.

Version Control

Document	Version	Date
Clinician Information Sheet	1.2	12/11/15
Clinical Information Sheet	1.3	05/01/16
Intrusive memories interview	1.1	02/12/15
Intrusive thoughts interview	1.1	02/12/15
RCADS interview	1	01/12/15
CATS Questionnaire	1	01/12/15
Invitation to participate: Head teachers	1.2	12/11/15
Invitation to participate: Clinical Teams	1.2	12/11/15
Participant debrief	1.3	02/12/15
Participant debrief for excluded participants	1	02/12/15
Information sheet for teachers	1.3	05/01/16
Consent Form: Clinical participant	1.3	05/01/16
Consent Form: Control participant	1.0	05/01/16
Consent Form: Parent clinical participant	1.3	05/01/16
Consent Form: Parent control participant	1.0	05/01/16
Consent Form: Clinical Participant Age 11-12 assent	1.0	05/01/16
Consent Form: Clinical Participant age 13-16 assent	1.1	05/01/16
Consent Form: Control Participant Age 11-12 assent	1.0	05/01/16
Consent Form: Control Participant age 13-16 assent	1.0	05/01/16
Information Sheet: Clinical Participant Age 11-12 assent	1.0	05/01/16
Information Sheet: Clinical Participant age 13-16 assent	1.3	05/01/16
Information Sheet: Control Participant Age 11-12 assent	1.0	05/01/16
Information Sheet: Control Participant age 13-16 assent	1.0	05/01/16
Information Sheet: Parent	1.3	05/01/16
Questionnaire: CRIES		
Questionnaire: TMQQ		

Appendix H

Letter of Access for Norfolk and Suffolk NHS Foundation Trust

Norfolk and Suffolk NHS
NHS Foundation Trust
Research and Development
The Knowledge Centre
Hellesdon Hospital
Drayton High Road
Norwich
NR6 5BE

Telephone 01603 421255
E mail: RDofficemailbox@nsft.nhs.uk

Alexandra Payne
C/O Postgraduate Research Office
Department of Psychological Sciences
Elizabeth Fry Building
University of East Anglia
Norwich
NR4 7TJ

9th March 2016

Dear Alex,

Re: NSFT Letter of Access for research - RD #16 183282 Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD)

This letter should be presented to each participating organisation before you commence your research at that site. The participating organisation is: **Norfolk and Suffolk NHS Foundation Trust**.

In accepting this letter, each participating organisation confirms your right of access to conduct research through their organisation for the purpose and on the terms and conditions set out below. This right of access commences on **9th March 2016** and ends on **30th September 2017** unless terminated earlier in accordance with the clauses below.

You have a right of access to conduct such research as confirmed in writing in the letter of permission for research from **Norfolk and Suffolk NHS Foundation Trust**. Please note that you cannot start the research until the Principal Investigator for the research project has received a letter from us giving confirmation from the individual organisation of their agreement to conduct the research.

The information supplied about your role in research at the organisation has been reviewed and you do not require an honorary research contract with the organisation. We are satisfied that such pre-engagement checks as we consider necessary have been carried out. Evidence of checks should be available on request to the organisation.

You are considered to be a legal visitor to the organisations premises. You are not entitled to any form of payment or access to other benefits provided by the organisation or this organisation to employees and this letter does not give rise to any other relationship between you and the organisation, in particular that of an employee.

While undertaking research through the organisation you will remain accountable to your substantive employer but you are required to follow the reasonable instructions of the organisation or those instructions given on their behalf in relation to the terms of this right of access.

Where any third party claim is made, whether or not legal proceedings are issued, arising out of or in connection with your right of access, you are required to co-operate fully with any investigation by the organisation in connection with any such claim and to give all such assistance as may reasonably be required regarding the conduct of any legal proceedings.

You must act in accordance with the organisations policies and procedures, which are available to you upon request, and the Research Governance Framework.

You are required to co-operate with the organisation in discharging its/their duties under the Health and Safety at Work etc Act 1974 and other health and safety legislation and to take reasonable care for the health and safety of yourself and others while on the organisations premises. You must observe the same standards of care and propriety in dealing with patients, staff, visitors, equipment and premises as is expected of any other contract holder and you must act appropriately, responsibly and professionally at all times.

If you have a physical or mental health condition or disability which may affect your research role and which might require special adjustments to your role, if you have not already done so, you must notify your employer and each organisation prior to commencing your research role at that organisation.

You are required to ensure that all information regarding patients or staff remains secure and *strictly confidential* at all times. You must ensure that you understand and comply with the requirements of the NHS Confidentiality Code of Practice and the Data Protection Act 1998. Furthermore you should be aware that under the Act, unauthorised disclosure of information is an offence and such disclosures may lead to prosecution.

You should ensure that, where you are issued with an identity or security card, a bleep number, email or library account, keys or protective clothing, these are returned upon termination of this arrangement. Please also ensure that while on the organisations premises you wear your ID badge at all times, or are able to prove your identity if challenged. Please note that the organisation(s) do not accept responsibility for damage to or loss of personal property.

This organisation may revoke this letter and any organisation(s) may terminate your right to attend at any time either by giving seven days' written notice to you or immediately without any notice if you are in breach of any of the terms or conditions described in this letter or if you commit any act that we reasonably consider to amount to serious misconduct or to be disruptive and/or prejudicial to the interests and/or business of the organisation(s) or if you are convicted of any criminal offence. You must not undertake regulated activity if you are barred from such work. If you are barred from working with adults or children this letter of access is immediately terminated. Your employer will immediately withdraw you from undertaking this or any other regulated activity and you MUST stop undertaking any regulated activity immediately.

Your substantive employer is responsible for your conduct during this research project and may in the circumstances described above instigate disciplinary action against you.

No organisation will indemnify you against any liability incurred as a result of any breach of confidentiality or breach of the Data Protection Act 1998. Any breach of the Data Protection Act 1998 may result in legal action against you and/or your substantive employer.

If your current role or involvement in research changes, or any of the information provided in your Research Passport changes, you must inform your employer through their normal procedures. You must also inform your nominated manager in each participating organisation] and [the R&D office] in this organisation.

Yours sincerely

Bonnie Teague

Research Manager

cc: Resourcing, NSFT HR

Appendix I

Research and Development Approval for Cambridgeshire and Peterborough NHS Foundation Trust

Cambridgeshire and Peterborough NHS
NHS Foundation Trust

Understanding mental health, understanding people

Research and Development Department

09 March 2016

R&D Ref: M00729

Ms. Aleksandra Kralj
Department of Clinical Psychology
Norwich Medical School
University of East Anglia
Norwich
NR4 7TJ

Joint Research Office
Box 277
Addenbrooke's Hospital
Hills Road
Cambridge
CB2 0QQ

Direct Dial: 01223 596472 ext 6472
E-mail: mary-beth.sherwood@cpft.nhs.uk
www.cpft.nhs.uk

Dear Aleksandra

Re: 15/WM/0468 Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).

In accordance with the Department of Health's Research Governance Framework for Health and Social Care, all research projects taking place within the Trust must receive a favourable opinion from an ethics committee and approval from the Department of Research and Development (R&D) prior to commencement.

R&D have reviewed the documentation submitted for this project, and has undertaken a **site specific assessment** based on the information provided in the SSI form, and I am pleased to inform you that we have no objection to the research proceeding within CPFT.

Sponsor: University of East Anglia

Funder: n/a

End date: 31.05.2017

Protocol: 2.1 05.01.2016

Conditions of Trust Approval:

- The project must follow the agreed protocol and be conducted in accordance with all Trust Policies and Procedures especially those relating to research and data management. Any mobile devices used must also comply with Trust policies and procedures for encryption.
- You and your research team must ensure that you understand and comply with the requirements of the NHS Confidentiality Code of Practice and the Data Protection Act 1998 and are aware of your responsibilities in relation to the Human Tissue Act 2004, Good Clinical Practice, the NHS Research Governance Framework for Health and Social Care, Second Edition April 2005 and any further legislation released during the time of this study.
- Members of the research team must have appropriate substantive or honorary contracts with the Trust prior to the study commencing. Any additional researchers who join the study at a later stage must also hold a suitable contract.
- You and your research team must provide to R&D, as soon as available, the date of first patient first visit.

HQ Elizabeth House, Fulbourn Hospital, Cambridge CB21 5EF
T 01223 726789 F 01480 398501 www.cpft.nhs.uk

In partnership with the University of Cambridge

If the project is a clinical trial under the European Union Clinical Trials Directive the following must also be complied with:

- the EU Directive on Clinical Trials (Directive 2001/20/EC) and UK's implementation of the Directive: The Medicines for Human Use (Clinical Trials) Regulations 2004;

- the EU Directive on Principles and Guidelines for Good Clinical Practice (EU Commission Directive 2005/28/EC); and UK's implementation of the Directive: The Medicines for Human Use (Clinical Trials) Amendment Regulations 2006;

Amendments
Please ensure that you submit a copy of any amendments made to this study to the R&D Department.

Annual Report
It is obligatory that an annual report is submitted by the Chief Investigator to the research ethics committee, and we ask that a copy is sent to the R&D Department. The yearly period commences from the date of receiving a favourable opinion from the ethics committee.

Please refer to our website www.cpft.nhs.uk for all information relating to R&D including honorary contract forms, policies and procedures and data protection.

Should you require any further information please do not hesitate to contact us.

Yours sincerely

Stephen Kelleher
Senior R&D Manager

2

Appendix J

Ethical Approval for First Substantial Amendment

NHS
Health Research Authority

West Midlands - Solihull Research Ethics Committee

The Old Chapel
Royal Standard Place
Nottingham
NG1 6FS

19 August 2016

Miss Aleksandra Kralj
Department of Clinical Psychology, Norwich Medical School
University of East Anglia
Norwich
NR4 7TJ

Dear Miss Kralj

Study title:	**Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).**
REC reference:	**15/WM/0468**
Amendment number:	**SA1**
Amendment date:	**18 July 2016**
IRAS project ID:	**183282**

The above amendment was reviewed at the meeting of the Sub-Committee held in correspondence on 10 August 2016.

Ethical opinion

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

Document	*Version*	*Date*
Notice of Substantial Amendment (non-CTIMP)	SA1	18 July 2016
Participant consent form [Parent or career]	1.4	15 July 2016
Participant consent form [Assent form for clinical participants aged 11 to 12]	1.1	15 July 2016
Participant consent form [Assent form for clinical participants aged 13 to 15]	1.2	15 July 2016
Participant consent form [Clinical participants aged 16]	1.4	15 July 2016
Participant information sheet (PIS) [Parent or career]	1.4	15 July 2016
Participant information sheet (PIS) [Clinical participants aged 11 to 12]	1.1	15 July 2016
Participant information sheet (PIS) [Clinical participants aged 13 to	1.4	15 July 2016

16]		
Research protocol or project proposal [(including appendix for posters and online information)]	3.0	18 July 2016

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

R&D approval

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

We are pleased to welcome researchers and R & D staff at our NRES committee members' training days – see details at http://www.hra.nhs.uk/hra-training/

15/WM/0468: Please quote this number on all correspondence

Yours sincerely

P P. GMartin

Dr Rex J Polson
Chair

E-mail: NRESCommittee.WestMidlands-Solihull@nhs.net

Enclosures: *List of names and professions of members who took part in the review*

Copy to: *R&D - Dr Bonnie Teague, Norfolk and Suffolk NHS Foundation Trust*
Sponsor - Mrs Sue Steel

West Midlands - Solihull Research Ethics Committee

Attendance at Sub-Committee of the REC meeting on 10 August 2016

Committee Members:

Name	*Profession*	*Present*
Dr Rex J Polson	Consultant Physician - Chair	Yes
Ms Gill Tomlinson	Quality Manager Radiology	Yes

Also in attendance:

Name	*Position (or reason for attending)*
Mr George R. Martin	REC Assistant (Minutes)

Appendix K

Research and Development Approval for West Suffolk NHS Foundation Trust

West Suffolk NHS
NHS Foundation Trust

Research & Development Department
West Suffolk Hospital Foundation Trust
Hardwick Lane
Bury St. Edmunds
IP33 2QZ
Tel: 01284 712790
Email: R&D@wsh.nhs.uk
19th August 2016

Miss Aleksandra Kralj
Department of Clinical Psychology,
Norwich Medical School
University of East Anglia
Norwich
NR4 7TJ

Dear Miss Kralj

Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).

R&D Ref: 2016OTH008 **Rec Ref;** 15/WM/0468 **IRAS No;** 183282

I am writing to confirm that the above project was reviewed by West Suffolk Hospital NHS Trust Research Operational Committee and has Trust Approval to proceed. At the meeting documentation listed below were approved for use at this site.

- Parent or Carer Consent Form v1.3 5th Jan 2016
- Clinical Info Sheet v1.3 5th Jan 2016
- Parent or Carer Information Sheet v1.3 5th Jan 2016
- Participant Assent Form v 1.1 5th Jan 2016
- Participant Consent Form v 1.3 5th Jan
- Participant Information Sheet for Clinical participants v 1.3 5th Jan 2016
- Participant Information Sheet for clinical participants 13 – 16 v 1.3 5th Jan 2016
- Study Protocol v2.1 5th Jan 2016
- HRA Approval letter 19th Jan 2016

You are reminded that the study must follow the approved protocol and that any proposed amendments must be submitted for review via the West Suffolk Hospital R&D Office for subsequent trust approval.

Approval is subject to compliance with the attached standard terms and conditions for research. You are required to comply in a timely manner with the project monitoring and auditing requirements of the Trust and may be asked to provide non-confidential information on the outputs and impact of the research.
We require that you **sign, date and return** the duplicate copy of this letter to the West Suffolk Hospital R&D Office to confirm your compliance with the Trust Policy and Procedures on Research Governance.

We also require that you provide the ROC with details of the progress of the research. This includes information on recruitment, evidence of informed consent, the conclusions drawn and the outcome of the research.

Yours sincerely

Mr Paul Oats
Research and Development Manager

Dr Emily Baker - *Senior Paediatric Clinical Psychologist*

Putting you first
University of Cambridge Associate Teaching Hospita

Appendix L

Ethical Approval for Second Substantial Amendment

NHS
Health Research Authority
West Midlands - Solihull Research Ethics Committee
The Old Chapel
Royal Standard Place
Nottingham
NG1 6FS

Please note: This is the favourable opinion of the REC only and does not allow the amendment to be implemented at NHS sites in England until the outcome of the HRA assessment has been confirmed.

28 November 2016

Miss Aleksandra Kralj
Department of Clinical Psychology,
Norwich Medical School
University of East Anglia
Norwich
NR4 7TJ

Dear Miss Kralj

Study title:	**Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).**
REC reference:	**15/WM/0468**
Amendment number:	**SA 2**
Amendment date:	**11 October 2016**
IRAS project ID:	**183282**

The above amendment was reviewed 21 November 2016 by the Sub-Committee in correspondence.

Ethical opinion

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

Document	*Version*	*Date*
Notice of Substantial Amendment (non-CTIMP)	SA 2	11 October 2016
Other [Combined recruitment poster for clinical and control groups]	1.0	21 October 2016
Other [Letter to charitable and professional support organisations]	1.1	21 October 2016
Participant consent form [Clinical Participants Aged 16 to 18]	1.5	21 October 2016

Participant consent form [Control Participants Aged 16 to 18]	1.1	21 October 2016
Participant information sheet (PIS) [Control Particpants aged 16 to 18]	1.0	21 October 2016
Participant information sheet (PIS) [Clinical Participants aged 16 to 18]	1.0	21 October 2016
Participant information sheet (PIS) [Clinician Information Sheet]	1.4	21 October 2016
Participant information sheet (PIS) [Parent and Carer Information Sheet]	1.5	21 October 2016
Research protocol or project proposal	4.0	21 October 2016

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

Working with NHS Care Organisations

Sponsors should ensure that they notify the R&D office for the relevant NHS care organisation of this amendment in line with the terms detailed in the categorisation email issued by the lead nation for the study.

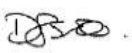
Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

We are pleased to welcome researchers and R & D staff at our NRES committee members' training days – see details at http://www.hra.nhs.uk/hra-training/

15/WM/0468:	**Please quote this number on all correspondence**

Yours sincerely



PP
Dr Rex J Polson
Chair

E-mail: NRESCommittee.WestMidlands-Solihull@nhs.net

Enclosures: *List of names and professions of members who took part in the review*

Copy to: *Dr Bonnie Teague, Norfolk and Suffolk NHS Foundation Trust*
Mrs Sue Steel

West Midlands - Solihull Research Ethics Committee

Attendance at Sub-Committee of the REC meeting on 21 November 2016

Committee Members:

Name	*Profession*	*Present*	*Notes*
Dr Rex J Polson (Chair)	Consultant Physician - Chair	Yes	
Ms Gill Tomlinson	Quality Manager Radiology	Yes	

Also in attendance:

Name	*Position (or reason for attending)*
Miss Daniella Sarno	REC Assistant
Miss Victoria Strutt	REC Manager

Appendix M

Participant Information Sheets for Clinical Participants

Information Sheet for Clinical Participants aged 11 and 12 years

Version 1.2, dated 21st October 2016

Study Title: Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).

Researchers: Aleksandra Kralj (Trainee Clinical Psychologist, University of East Anglia [UEA]), Alexandra Payne (Trainee Clinical Psychologist, UEA) and Dr. Richard Meiser-Stedman (Reader in Clinical Psychology, UEA).

We would like to invite you to take part in this research study. Before you decide if you would like to take part, it is important for you to know why the research is being done and what you would need to do. Please take some time to read this sheet or ask someone to read it to you so that you can decide if you want to take part or not. If you think you would like to take part, we will speak to you on the phone and answer any questions you have. You can talk to other people about the research if you would like to.

Why are we doing this research?
Sometimes we have thoughts or memories that pop into our heads without us choosing to think about them. We call these 'intrusive thoughts' and 'intrusive memories'. We would like to find out more about the intrusive thoughts and memories that young people have. We would like to know how they make young people feel, what they mean to them and how they cope with them. We hope that this study could help us to understand intrusive thoughts and memories a bit better and think about how we can help young people who are struggling with distressing thoughts and memories.

Why have I been asked to take part?
We would like you to take part because you are aged between 11 and 18 and because you have posttraumatic stress disorder or you are experiencing low mood/depression.

Do I have to take part?
No, taking part in the study is voluntary. It is up to you and your parents or carers whether you take part or not. Once we know you would like to take part, we will speak to you and your parent or carer on the phone and answer any questions you have. If you decide that you do want to take part, we will ask you and your parent or carer to complete a form to say that you are happy to take part. This is called a 'consent form'. If you do decide to take part, you can change your mind at any time without giving us a reason. If you decide that you do not want to take part, you do not have to. It is your decision whether you want to take part or not.

What will happen if I choose to take part?
Once you and your parents or carers have agreed for you to take part in the research, we will send you two sets of questions to fill in online. These questions will ask about your mood and about whether anything stressful or scary has happened in your life. We think it will take you about 30 minutes to answer these questions. We will then speak to you on the phone or by Skype video call (depending on which you would prefer). We will first ask you some more questions about your mood. We will then ask you if you have any intrusive thoughts and memories. If you do, we will ask you to describe them and to answer some questions about them. We expect this call to take up to 40 minutes but it does not need to be done all in one go. We will give you breaks if you would like them.

Is there anything risky about taking part?
Some of the thoughts or memories that you have might be upsetting or embarrassing. If you feel upset or embarrassed by any of the questions you do not have to answer them. We will always speak to you when your parent or carer is at home so that you can talk to them at any time during or after the call.

Are there any benefits of taking part?
You will be sent a £5 Amazon voucher to say thank you for taking part.

Who will you tell about the things that I say?
The things you tell us will be kept strictly confidential. This means that what you tell us will be kept private. We will not share anything you tell us with anyone outside of the research team. You will be given a code called a participant number. This is so that we know which information is yours but no-one else would be able to tell. If you are seeing a healthcare team, we will ask you whether you would like us to talk to your healthcare worker about anything that you have told us. For example, you might want us to talk to someone in Child and Adolescent Mental Health Services [CAMHS] or the Youth Mental Health Team. **The only time we would tell other people about what you have said is if you tell us something that makes us worried that you are not safe or that someone else is not safe. We will let you know if we need to tell someone else about what you have said.**

What will happen to the results of the research?
When the study is finished, we will write about some of the results in journals (magazines about research). We will not put your name in anything we write. If you would like to hear about what we find out, please tell us and we will write you a letter to let you know.

How do I let you know that I would like to take part?
If you would like to take part, please discuss this first with your parent or carer. If you have been told about the research by a healthcare worker, please ask your healthcare worker to pass your contact details on to us. You can also email us at the addresses provided below.

What if there is a problem?
If you have any problems with the study and would like to tell someone else about it, please contact: Dr. Richard Meiser-Stedman, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593601 or e-mail: r.meiser-stedman@uea.ac.uk. If you would like to make a complaint about the study, please contact:

Professor Ken Laidlaw, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593600 or e-mail: k.laidlaw@uea.ac.uk. You can also contact the Associate Dean for Research in the Faculty of Medicine and Health Sciences, University of East Anglia, Norwich, NR4 7TJ, tel: 01603 456161 or the Patient Advice and Liaison Service (PALS) team on free phone: 0800 279 2535.

Contact details for further information

If you want to find out more about the study or have any questions, please check with your parent or carer that they are happy for you to contact us.

Aleksandra Kralj and Alexandra Payne
Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ
Telephone: 07981 029282
Email: a.kralj@uea.ac.uk or Alexandra.payne@uea.ac.uk

Thank you for thinking about taking part in this research!

Information Sheet for Clinical Participants aged 13 to 15 years

Version 1.5, dated 21st October 2016

Study Title: Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).

Researchers: Aleksandra Kralj (Trainee Clinical Psychologist, University of East Anglia [UEA]), Alexandra Payne (Trainee Clinical Psychologist, UEA) and Dr. Richard Meiser-Stedman (Reader in Clinical Psychology, UEA).

We would like to invite you to take part in this 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 involves. Please read the information carefully or ask someone to read it to you so that you can decide if you want to take part or not. If you are interested in taking part, we will go through the information sheet with you on the phone and answer any questions you might have. You can talk to other people about the research if you wish.

What is the aim of this research?
The aim of this research project is to find out more about the intrusive thoughts and memories that young people have. These are thoughts and memories that pop into our heads and interrupt our day to day thoughts without us choosing to think about them. We are interested in how intrusive thoughts and memories make young people feel, what sense they make of them and how they cope with them. We hope that this study could help us to understand intrusive thoughts and memories a bit better and think about how we can help young people who are struggling with intrusive thoughts and memories.

Why have I been asked to take part?
We would like you to take part because you are aged between 11 and 18 and because you either have posttraumatic stress disorder or you are experiencing low mood/depression.

Do I have to take part?
No, participation in the study is voluntary. It is up to you and your parents or carers whether you take part or not. Once we know you are interested in taking part, we will contact you and your parent or carer by telephone and answer any questions you have about the research. If you decide that you do want to take part, we will ask you and your parents or carers to complete an electronic consent form to say that you are happy to take part. If you do decide to take part, you can change your mind at any time without giving us a reason. If you decide that you do not want to take part, we will respect your decision.

What will happen if I choose to take part?
Once you and your parents or carers have agreed for you to take part in the research, we will send you two questionnaires to fill in online. These questionnaires will ask questions about your mood and about whether anything stressful or scary has happened in your life. We expect these questionnaires to take you about 15 minutes to complete. A researcher will then contact you by phone to ask you some more questions about your mood and to ask about your intrusive thoughts and memories. You will be asked whether you have any intrusive thoughts and memories and asked to describe these. You will then be asked to

answer some questions about these. The phone call should take up to 40 minutes but it does not need to be done all in one go and we will give you breaks if you need them.

Is there anything risky about taking part?
The phone call involves talking about thoughts or memories that you may find upsetting or embarrassing. If you feel upset or embarrassed by any of the questions you do not have to answer them. We will ask you and your family to choose times for the interviews when a parent or carer is at home so that you can talk to them at any time during the phone call.

Are there any benefits of taking part?
You will be sent a £5 Amazon voucher to say thank you for taking part.

Who will you tell about the things that I say?
Everything you tell us will only be shared with other people in the research team and will be kept strictly confidential. This means that what you tell us will be kept private. You will be given a code called a participant number so that we know which information is yours but no-one else would be able to tell. We will not share your personal information with anyone outside of the research team. If you are currently seeing a clinical team (for example, Child and Adolescent Mental Health Services [CAMHS] or the Youth Mental Health Team), we will ask you whether you would like anything that you have told us to be passed on to the member of staff you are seeing. **The only time we would tell other people about what you have said is if you tell us something that makes us feel worried about your safety or about somebody else's safety. We will let you know if we need to tell anyone else about what you have said.**

What will happen to the results of the research?
When the study is finished, the researchers will write about some of the results in journals (magazines about research). You will not be named in anything we write. If you would like to hear about the findings of the research, please let us know and we will write you a letter to tell you what we have found.

How do I let you know that I am interested in taking part?
If you are interested in taking part, please discuss this first with your parent or carer. If you have been told about the research by a healthcare worker, please ask your healthcare worker to pass your contact details on to us. You can also email us at the addresses provided below.

What if there is a problem?
If you have any problems with the study and would like to tell someone else about it, please contact: Dr. Richard Meiser-Stedman, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593601 or e-mail: r.meiser-stedman@uea.ac.uk. If you would like to make a complaint about the study, please contact: Professor Ken Laidlaw, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593600 or e-mail: k.laidlaw@uea.ac.uk. You can also contact the Associate Dean for Research in the Faculty of Medicine and Health Sciences, University of East Anglia, Norwich, NR4 7TJ, tel: 01603 456161 or the Patient Advice and Liaison Service (PALS) team on free phone: 0800 279 2535.

Contact details for further information
If you want to find out more about the study or have any questions, please check with your parent or carer that they are happy for you to contact us.

Aleksandra Kralj and Alexandra Payne
Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ
Telephone: 07981 029282
Email: a.kralj@uea.ac.uk or Alexandra.payne@uea.ac.uk

Thank you for thinking about taking part in this research!

Information Sheet for Clinical Participants aged 16 to 18 years

Version 1.0, dated 21st October 2016

Study Title: Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).

Researchers: Aleksandra Kralj (Trainee Clinical Psychologist, University of East Anglia [UEA]), Alexandra Payne (Trainee Clinical Psychologist, UEA) and Dr. Richard Meiser-Stedman (Reader in Clinical Psychology, UEA).

We would like to invite you to take part in this 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 involves. Please read the information carefully or ask someone to read it to you so that you can decide if you want to take part or not. If you are interested in taking part, we will go through the information sheet with you on the phone and answer any questions you might have. You can talk to other people about the research if you wish.

What is the aim of this research?
The aim of this research project is to find out more about the intrusive thoughts and memories that young people have. These are thoughts and memories that pop into our heads and interrupt our day to day thoughts without us choosing to think about them. We are interested in how intrusive thoughts and memories make young people feel, what sense they make of them and how they cope with them. We hope that this study could help us to understand intrusive thoughts and memories a bit better and think about how we can help young people who are struggling with intrusive thoughts and memories.

Why have I been asked to take part?
We would like you to take part because you are aged between 11 and 18 and because you either have posttraumatic stress disorder or you are experiencing low mood/depression.

Do I have to take part?
No, participation in the study is voluntary. It is up to you whether you take part or not. Once we know you are interested in taking part, we will contact you by telephone and answer any questions you have about the research. If you decide that you do want to take part, we will ask you to complete an electronic consent form to say that you are happy to take part. If you do decide to take part, you can change your mind at any time without giving us a reason. If you decide that you do not want to take part, we will respect your decision.

What will happen if I choose to take part?
Once you have agreed for you to take part in the research, we will send you two questionnaires to fill in online. These questionnaires will ask questions about your mood and about whether anything stressful or scary has happened in your life. We expect these questionnaires to take you about 15 minutes to complete. A researcher will then contact you by phone to ask you some more questions about your mood and to ask about your intrusive thoughts and memories. You will be asked whether you have any intrusive thoughts and memories and asked to describe these. You will then be asked to answer some questions

about these. The phone call should take up to 40 minutes but it does not need to be done all in one go and we will give you breaks if you need them.

Is there anything risky about taking part?
The phone call involves talking about thoughts or memories that you may find upsetting or embarrassing. If you feel upset or embarrassed by any of the questions you do not have to answer them. We will ask you to choose a time for the interview when someone else is at home with you so that you can talk to them at any time during the phone call.

Are there any benefits of taking part?
You will be sent a £5 Amazon voucher to say thank you for taking part.

Who will you tell about the things that I say?
Everything you tell us will only be shared with other people in the research team and will be kept strictly confidential. This means that what you tell us will be kept private. You will be given a code called a participant number so that we know which information is yours but no-one else would be able to tell. We will not share your personal information with anyone outside of the research team. If you are currently seeing a clinical team (for example, Child and Adolescent Mental Health Services [CAMHS] or the Youth Mental Health Team), we will ask you whether you would like anything that you have told us to be passed on to the member of staff you are seeing. **The only time we would tell other people about what you have said is if you tell us something that makes us feel worried about your safety or about somebody else's safety. We will let you know if we need to tell anyone else about what you have said.**

What will happen to the results of the research?
When the study is finished, the researchers will write about some of the results in journals (magazines about research). You will not be named in anything we write. If you would like to hear about the findings of the research, please let us know and we will write you a letter to tell you what we have found.

How do I let you know that I am interested in taking part?
If you are interested in taking part and you have been told about the research by a healthcare worker, please ask your healthcare worker to pass your contact details on to us. You can also email us at the addresses provided below.

What if there is a problem?
If you have any problems with the study and would like to tell someone else about it, please contact: Dr. Richard Meiser-Stedman, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593601 or e-mail: r.meiser-stedman@uea.ac.uk. If you would like to make a complaint about the study, please contact: Professor Ken Laidlaw, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593600 or e-mail: k.laidlaw@uea.ac.uk. You can also contact the Associate Dean for Research in the Faculty of Medicine and Health Sciences, University of East Anglia, Norwich, NR4 7TJ, tel: 01603 456161 or the Patient Advice and Liaison Service (PALS) team on free phone: 0800 279 2535.

Contact details for further information
If you want to find out more about the study or have any questions, please check with your parent or carer that they are happy for you to contact us.

Aleksandra Kralj and Alexandra Payne
Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ
Telephone: 07981 029282
Email: a.kralj@uea.ac.uk or Alexandra.payne@uea.ac.uk

Thank you for thinking about taking part in this research!

Appendix N

Participant Information Sheets for Control Participants

Information Sheet for Control Participants aged 11 and 12 years

Version 1.1, dated 21st October 2016

Study Title: Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).

Researchers: Aleksandra Kralj (Trainee Clinical Psychologist, University of East Anglia [UEA]), Alexandra Payne (Trainee Clinical Psychologist, UEA) and Dr. Richard Meiser-Stedman (Reader in Clinical Psychology, UEA).

We would like to invite you to take part in this research study. Before you decide if you would like to take part, it is important for you to know why the research is being done and what you would need to do. Please take some time to read this sheet or ask someone to read it to you so that you can decide if you want to take part or not. If you think you would like to take part, we will speak to you on the phone and answer any questions you have. You can talk to other people about the research if you would like to.

Why are we doing this research?
Sometimes we have thoughts or memories that pop into our heads without us choosing to think about them. We call these 'intrusive thoughts' and 'intrusive memories'. We would like to find out more about the intrusive thoughts and memories that young people have. We would like to know how they make young people feel, what they mean to them and how they cope with them. We hope that this study could help us to understand intrusive thoughts and memories a bit better and think about how we can help young people who are struggling with distressing thoughts and memories.

Why have I been asked to take part?
We would like you to take part because you are aged between 11 and 18 and we would like you to be in our comparison group.

Do I have to take part?
No, taking part in the study is voluntary. It is up to you and your parents or carers whether you take part or not. Once we know you would like to take part, we will speak to you and your parent or carer on the phone and answer any questions you have. If you decide that you do want to take part, we will ask you and your parent or carer to complete a form to say that you are happy to take part. This is called a 'consent form'. If you do decide to take part, you can change your mind at any time without giving us a reason. If you decide that you do not want to take part, you do not have to. It is your decision whether you want to take part or not.

What will happen if I choose to take part?
Once you and your parents or carers have agreed for you to take part in the research, we will send you two sets of questions to fill in online. These questions will ask about your mood and about whether anything stressful or scary has happened in your life. We think it will take you about 30 minutes to answer these questions. We will then speak to you on the phone or by Skype video call (depending on which you would prefer). We will first ask you some more questions about your mood. We will then ask you if you have any intrusive thoughts and memories. If you do, we will ask you to describe them and to answer some questions about them. We expect this call to take up to 40 minutes but it does not need to be done all in one go. We will give you breaks if you would like them.

Is there anything risky about taking part?
Some of the thoughts or memories that you have might be upsetting or embarrassing. If you feel upset or embarrassed by any of the questions you do not have to answer them. We will always speak to you when your parent or carer is at home so that you can talk to them at any time during or after the call.

Are there any benefits of taking part?
You will be sent a £5 Amazon voucher to say thank you for taking part.

Who will you tell about the things that I say?
The things you tell us will be kept strictly confidential. This means that what you tell us will be kept private. We will not share anything you tell us with anyone outside of the research team. You will be given a code called a participant number. This is so that we know which information is yours but no-one else would be able to tell. **The only time we would tell other people about what you have said is if you tell us something that makes us worried that you are not safe or that someone else is not safe. We will let you know if we need to tell someone else about what you have said.**

What will happen to the results of the research?
When the study is finished, we will write about some of the results in journals (magazines about research). We will not put your name in anything we write. If you would like to hear about what we find out, please tell us and we will write you a letter to let you know.

How do I let you know that I would like to take part?
If you would like to take part, please discuss this first with your parent or carer. If you have been told about the research via your school, please follow the instructions in the email you were sent to leave your contact details online. You can also email us at the addresses provided below.

What if there is a problem?
If you have any problems with the study and would like to tell someone else about it, please contact: Dr. Richard Meiser-Stedman, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593601 or e-mail: r.meiser-stedman@uea.ac.uk. If you would like to make a complaint about the study, please contact: Professor Ken Laidlaw, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593600 or e-mail:

k.laidlaw@uea.ac.uk. You can also contact the Associate Dean for Research in the Faculty of Medicine and Health Sciences, University of East Anglia, Norwich, NR4 7TJ, tel: 01603 456161 or the Patient Advice and Liaison Service (PALS) team on free phone: 0800 279 2535.

Contact details for further information
If you want to find out more about the study or have any questions, please check with your parent or carer that they are happy for you to contact us.

Aleksandra Kralj and Alexandra Payne
Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ
Telephone: TBC
Email: a.kralj@uea.ac.uk or Alexandra.payne@uea.ac.uk

Thank you for thinking about taking part in this research!

Information Sheet for Control Participants aged 13 to 15 years

Version 1.1, dated 21st October 2016

Study Title: Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).

Researchers: Aleksandra Kralj (Trainee Clinical Psychologist, University of East Anglia [UEA]), Alexandra Payne (Trainee Clinical Psychologist, UEA) and Dr. Richard Meiser-Stedman (Reader in Clinical Psychology, UEA).

We would like to invite you to take part in this 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 involves. Please read the information carefully or ask someone to read it to you so that you can decide if you want to take part or not. If you are interested in taking part, we will go through the information sheet with you on the phone and answer any questions you might have. You can talk to other people about the research if you wish.

What is the aim of this research?
The aim of this research project is to find out more about the intrusive thoughts and memories that young people have. These are thoughts and memories that pop into our heads and interrupt our day to day thoughts without us choosing to think about them. We are interested in how intrusive thoughts and memories make young people feel, what sense they make of them and how they cope with them. We hope that this study could help us to understand intrusive thoughts and memories a bit better and think about how we can help young people who are struggling with intrusive thoughts and memories.

Why have I been asked to take part?
We would like you to take part because you are aged between 11 and 18 and because you don't have any mental health difficulties and we would like you to be in our comparison group.

Do I have to take part?
No, participation in the study is voluntary. It is up to you and your parents or carers whether you take part or not. Once we know you are interested in taking part, we will contact you and your parent or carer by telephone and answer any questions you have about the research. If you decide that you do want to take part, we will ask you and your parents or carers to complete an electronic consent form to say that you are happy to take part. If you do decide to take part, you can change your mind at any time without giving us a reason. If you decide that you do not want to take part, we will respect your decision.

What will happen if I choose to take part?
Once you and your parents or carers have agreed for you to take part in the research, we will send you two questionnaires to fill in online. These questionnaires will ask questions about your mood and about whether anything stressful or scary has happened in your life. We expect these questionnaires to take you about 15 minutes to complete. A researcher will then contact you by phone to ask you some more questions about your mood and to ask about your intrusive thoughts and memories. You will be asked whether you have any

intrusive thoughts and memories and asked to describe these. You will then be asked to answer some questions about these. The phone call should take up to 40 minutes but it does not need to be done all in one go and we will give you breaks if you need them.

Is there anything risky about taking part?
The phone call involves talking about thoughts or memories that you may find upsetting or embarrassing. If you feel upset or embarrassed by any of the questions you do not have to answer them. We will ask you and your family to choose times for the interviews when a parent or carer is at home so that you can talk to them at any time during the phone call.

Are there any benefits of taking part?
You will be sent a £5 Amazon voucher to say thank you for taking part.

Who will you tell about the things that I say?
Everything you tell us will only be shared with other people in the research team and will be kept strictly confidential. This means that what you tell us will be kept private. You will be given a code called a participant number so that we know which information is yours but no-one else would be able to tell. We will not share your personal information with anyone outside of the research team. **The only time we would tell other people about what you have said is if you tell us something that makes us feel worried about your safety or about somebody else's safety. We will let you know if we need to tell anyone else about what you have said.**

What will happen to the results of the research?
When the study is finished, the researchers will write about some of the results in journals (magazines about research). You will not be named in anything we write. If you would like to hear about the findings of the research, please let us know and we will write you a letter to tell you what we have found.

How do I let you know that I am interested in taking part?
If you are interested in taking part, please discuss this first with your parent or carer. If you have been told about the research via your school, please follow the instructions in the email you were sent to leave your contact details online. You can also email us at the addresses provided below.

What if there is a problem?
If you have any problems with the study and would like to tell someone else about it, please contact: Dr. Richard Meiser-Stedman, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593601 or e-mail: r.meiser-stedman@uea.ac.uk. If you would like to make a complaint about the study, please contact: Professor Ken Laidlaw, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593600 or e-mail: k.laidlaw@uea.ac.uk. You can also contact the Associate Dean for Research in the Faculty of Medicine and Health Sciences, University of East Anglia, Norwich, NR4 7TJ, tel: 01603 456161 or the Patient Advice and Liaison Service (PALS) team on free phone: 0800 279 2535.

Contact details for further information

If you want to find out more about the study or have any questions, please check with your parent or carer that they are happy for you to contact us.

Aleksandra Kralj and Alexandra Payne
Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ
Telephone: TBC
Email: a.kralj@uea.ac.uk or Alexandra.payne@uea.ac.uk

Thank you for thinking about taking part in this research!

Information Sheet for Control Participants aged 16 to 18 years

Version 1.0, dated 21st October 2016

Study Title: Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).

Researchers: Aleksandra Kralj (Trainee Clinical Psychologist, University of East Anglia [UEA]), Alexandra Payne (Trainee Clinical Psychologist, UEA) and Dr. Richard Meiser-Stedman (Reader in Clinical Psychology, UEA).

We would like to invite you to take part in this 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 involves. Please read the information carefully or ask someone to read it to you so that you can decide if you want to take part or not. If you are interested in taking part, we will go through the information sheet with you on the phone and answer any questions you might have. You can talk to other people about the research if you wish.

What is the aim of this research?
The aim of this research project is to find out more about the intrusive thoughts and memories that young people have. These are thoughts and memories that pop into our heads and interrupt our day to day thoughts without us choosing to think about them. We are interested in how intrusive thoughts and memories make young people feel, what sense they make of them and how they cope with them. We hope that this study could help us to understand intrusive thoughts and memories a bit better and think about how we can help young people who are struggling with intrusive thoughts and memories.

Why have I been asked to take part?
We would like you to take part because you are aged between 11 and 18 and because you don't have any mental health difficulties and we would like you to be in our comparison group.

Do I have to take part?
No, participation in the study is voluntary. It is up to you whether you take part or not. Once we know you are interested in taking part, we will contact you by telephone and answer any questions you have about the research. If you decide that you do want to take part, we will ask you to complete an electronic consent form to say that you are happy to take part. If you do decide to take part, you can change your mind at any time without giving us a reason. If you decide that you do not want to take part, we will respect your decision.

What will happen if I choose to take part?
Once you and have agreed for you to take part in the research, we will send you two questionnaires to fill in online. These questionnaires will ask questions about your mood and about whether anything stressful or scary has happened in your life. We expect these questionnaires to take you about 15 minutes to complete. A researcher will then contact you by phone to ask you some more questions about your mood and to ask about your intrusive thoughts and memories. You will be asked whether you have any intrusive thoughts and memories and asked to describe these. You will then be asked to answer some questions

about these. The phone call should take up to 40 minutes but it does not need to be done all in one go and we will give you breaks if you need them.

Is there anything risky about taking part?
The phone call involves talking about thoughts or memories that you may find upsetting or embarrassing. If you feel upset or embarrassed by any of the questions you do not have to answer them. We will ask you to choose a time for the interviews when someone else is at home with you so that you can talk to them at any time during the phone call.

Are there any benefits of taking part?
You will be sent a £5 Amazon voucher to say thank you for taking part.

Who will you tell about the things that I say?
Everything you tell us will only be shared with other people in the research team and will be kept strictly confidential. This means that what you tell us will be kept private. You will be given a code called a participant number so that we know which information is yours but no-one else would be able to tell. We will not share your personal information with anyone outside of the research team. **The only time we would tell other people about what you have said is if you tell us something that makes us feel worried about your safety or about somebody else's safety. We will let you know if we need to tell anyone else about what you have said.**

What will happen to the results of the research?
When the study is finished, the researchers will write about some of the results in journals (magazines about research). You will not be named in anything we write. If you would like to hear about the findings of the research, please let us know and we will write you a letter to tell you what we have found.

How do I let you know that I am interested in taking part?
If you are interested in taking part and you have been told about the research via your school, please follow the instructions in the email you were sent to leave your contact details online. You can also email us at the addresses provided below.

What if there is a problem?
If you have any problems with the study and would like to tell someone else about it, please contact: Dr. Richard Meiser-Stedman, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593601 or e-mail: r.meiser-stedman@uea.ac.uk. If you would like to make a complaint about the study, please contact: Professor Ken Laidlaw, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593600 or e-mail: k.laidlaw@uea.ac.uk. You can also contact the Associate Dean for Research in the Faculty of Medicine and Health Sciences, University of East Anglia, Norwich, NR4 7TJ, tel: 01603 456161 or the Patient Advice and Liaison Service (PALS) team on free phone: 0800 279 2535.

Contact details for further information
If you want to find out more about the study or have any questions, please check with your parent or carer that they are happy for you to contact us.

Aleksandra Kralj and Alexandra Payne
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Email: a.kralj@uea.ac.uk or Alexandra.payne@uea.ac.uk

Thank you for thinking about taking part in this research!

Appendix O

Information Sheet for Parents or Carers

Version 1.5, dated 21st October 2016

Study Title: Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).

Researchers: Aleksandra Kralj (Trainee Clinical Psychologist, University of East Anglia [UEA]), Alexandra Payne (Trainee Clinical Psychologist, UEA) and Dr. Richard Meiser-Stedman (Reader in Clinical Psychology, UEA).

We would like to invite your child to take part in this research study. Before you decide if you are happy for your child to take part, it is important for you to understand why the research is being done and what it involves. Please take the time to read this information sheet and discuss it with others if you wish. Thank you for reading this.

What is the aim of this research?
The aim of this research project is to find out more about the intrusive thoughts and memories that young people have. These are thoughts and memories that pop into our heads without us choosing to think about them. We are interested in how intrusive thoughts and memories make young people feel, what sense they make of them and how they cope with them. We hope that this study could help us to understand intrusive thoughts and memories a bit better and think about how we can help young people who are struggling with intrusive thoughts and memories.

Why has my child been asked to take part?
We are inviting children to take part who are aged between 11 and 18 and who either have posttraumatic stress disorder or they are experiencing low mood/depression **or** who don't have any mental health difficulties and who we would like to be in our comparison group.

Does my child have to take part?
No, participation in the study is voluntary. It is up to you and your child whether they wish to take part or not. Once we know your child is interested in taking part, we will contact you by telephone and answer any questions you have about the research. If you and your child decide to take part, we will ask you both to complete an electronic consent form. You can change your mind at any time and withdraw from the study without giving us a reason. If you and your child decide not to take part, we will respect your decision.

What will happen if my child chooses to take part?
We will send your child two questionnaires to fill in online. We expect these questionnaires to take about 15 minutes to complete. A researcher will then contact you by either phone or Skype video call to interview your child about their intrusive thoughts and memories. This interview should take up to 40 minutes but it does not need to be done all in one go and breaks will be offered.

What kind of questions will you be asking my child?
In the first online questionnaire, your child will be asked questions about their mood. In the second online questionnaire, your child will be asked whether they have ever experienced any of a list of stressful or scary events (yes or no responses). This will include accidents, physical and sexual abuse, and losing a loved one. In the phone interview, we will ask questions to check symptoms of depression and PTSD. Your child will then be asked to describe an intrusive thought and memory and asked a series of questions about these experiences, how these make them feel and how they cope with them.

Is there anything risky about taking part?
We believe that it is unlikely that your child will be distressed by taking part in this research. However, the phone call involves talking about thoughts or memories that your child may find upsetting or embarrassing. If your child feels upset or embarrassed by any of the questions they do not have to answer them. We will ask you to be at home during the interview in case your child feels upset. We will also speak to you at the end of the interview to talk through concerns, if you have any.

Are there any benefits of taking part?
Your child will be sent a £5 Amazon voucher to say thank you for taking part.

Who will you tell about the things my child says?
All information will be kept strictly confidential within the research team and stored anonymously. Your child will be given a participant number which we will use to identify their information. If your child is currently seeing a clinical team (for example, Child and Adolescent Mental Health Services [CAMHS] or the Youth Mental Health Team), we will ask you and your child whether you would like anything discussed to be passed on to your clinician. **The only time we would share what your child has said is if they tell us something that makes us feel worried about their safety or about somebody else's safety. We will let you and your child know if we need to tell anyone else about what your child has said.**

Is the study safe?
Yes. This study has been reviewed and given a favourable opinion by Solihull Research Ethics Committee.

What will happen to the results of the research?
When the study is finished, the researchers will write about some of the results in scientific journals. Your child will not be named in anything we write. If you would like to hear about the findings of the research, please let us know and we will write to you with the results.

How do I let you know that my child is interested in taking part?
If you and your child decide to take part and you have been told about the study by a healthcare worker, please ask your healthcare worker to pass your contact details on to us. If you have been told about the study via your child's school, please follow the instructions in the email sent to your child to leave your contact details online. Alternatively, please email us at the addresses provided below.

What if there is a problem?
If you have any problems with the study and would like to tell someone else about it, please contact: Dr. Richard Meiser-Stedman, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593601 or e-mail: r.meiser-stedman@uea.ac.uk. If you would like to make a complaint about the study, please contact: Professor Ken Laidlaw, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593600 or e-mail: k.laidlaw@uea.ac.uk. You can also contact the Associate Dean for Research in the Faculty of Medicine and Health Sciences, University of East Anglia, Norwich, NR4 7TJ, tel: 01603 456161 or the Patient Advice and Liaison Service (PALS) team on free phone: 0800 279 2535.

Contact details for further information
If you want to find out more about the study or have any questions, please contact us.

Aleksandra Kralj and Alexandra Payne
Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ
Telephone: TBC
Email: a.kralj@uea.ac.uk or Alexandra.payne@uea.ac.uk

Thank you for thinking about taking part in this research!

Appendix P

Information Sheet for Clinicians

Version 1.4, dated 21st October 2016

Study Title: Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).

Researchers: Aleksandra Kralj (Trainee Clinical Psychologist, University of East Anglia [UEA]), Alexandra Payne (Trainee Clinical Psychologist, UEA) and Dr. Richard Meiser-Stedman (Reader in Clinical Psychology, UEA).

Thank you for offering to help with this research study. Below is some information about the study. Should you have any questions about what you have read, please do not hesitate to contact us: a.kralj@uea.ac.uk or Alexandra.payne@uea.ac.uk.

What is the aim of this research?
The aim of this research project is to find out more about the intrusive thoughts and intrusive memories that young people have when they are depressed or when they have experienced a traumatic event. We are interested in how intrusions make young people feel, what sense they make of them and how they cope with them. We hope that by gaining a better understanding of young people's experience of intrusions we can evaluate whether they play a role in maintaining symptoms of PTSD and depression and whether intrusions may be an important target in cognitive therapy.

Who are we looking for to take part?
We are looking to recruit young people age 11 to 18 who have a diagnosis of PTSD and/or depression and who have a good understanding of English. We cannot include children who have obsessive compulsive disorder (OCD), substance misuse or dependence, current or previous experience of psychotic disorders, neurodevelopmental disorder or learning difficulties. We will also be recruiting a control sample from secondary schools.

How will young people get involved?
We would like to ask you, as a clinician working in local mental health services, to give information sheets about the research to anyone attending your service who is aged between 11 and 18 years and who has PTSD and/or depression. There will be one information sheet for young people and one for their parents or carers for those aged 15 years or younger. If the young person is interested in taking part, we will ask you to obtain verbal consent from them to pass on their contact details.

Do the young people you refer have to take part?
No, participation in the study is voluntary. We will respect their decision of they do not wish to take part.

What happens once the young person is in the study?
We will contact the young person and their parent or carer by telephone and answer any questions they have about the research. We will then ask them to sign an electronic consent

form. Once consent is obtained, young people will be asked to complete two questionnaires online and we will then interview the young person over the phone or via Skype about their intrusive thoughts and intrusive memories.

What will happen in the interview?
We expect the interview to take up to 40 minutes. In the first half of interview, we will ask questions to confirm the diagnosis of PTSD or depression. In the second half of the interview, we will ask about the young person's experience of intrusive thoughts and intrusive memories.

Are there any risks of young people taking part?
The interview involves talking about thoughts or memories that may be upsetting or embarrassing. If the child feels upset or embarrassed by any of the questions they do not have to answer them. We will ask young people aged 15 years or younger to choose times for the interviews when a parent or carer is at home so that they can talk to them if they feel upset at any time during the interviews. We will ask participants aged 16 to 18 years to choose a time when they will not be at home alone.

Are there any benefits of young people taking part?
We often find that participants like being involved in research, as it can be satisfying for them to know that they are helping add to the knowledge base for people with similar problems as them. Following the interview, the young person will be sent a £5 Amazon voucher to thank them for taking part.

What will happen if the researchers have any concerns about risk or if the young person makes a disclosure that gives the researchers concern for someone's safety?
On the participant and parent information sheets and at the start of the interview we will explain the confidentiality agreement. We will strictly follow Trust policies should any disclosures be made or if we become aware that there is a risk of harm to the young person or to someone else. Any concerns around risk or child safeguarding will be shared with clinical teams and other professionals, as necessary. We will also ask the young person at the end of the interview whether there is anything that they have shared with us that they would like us to pass on to their clinical team.

Is the study safe?
Yes. This study has been reviewed and given a favourable opinion by Solihull Research Ethics Committee.

What if there is a problem?
If you have any problems with the study and would like to tell someone else about it, please contact: Dr. Richard Meiser-Stedman, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593601 or e-mail: r.meiser-stedman@uea.ac.uk. If you would like to make a complaint about the study, please contact: Professor Ken Laidlaw, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593600 or e-mail: k.laidlaw@uea.ac.uk. You can also contact the Associate Dean for Research in the Faculty of Medicine and Health Sciences, University of East Anglia, Norwich, NR4 7TJ, tel: 01603

456161 or the Patient Advice and Liaison Service (PALS) team on free phone: 0800 279 2535.

Contact details for further information
If you want to find out more about the study or have any questions, please check with your parent or carer that they are happy for you to contact us.

Aleksandra Kralj and Alexandra Payne
Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ
Telephone: TBC
Email: a.kralj@uea.ac.uk or Alexandra.payne@uea.ac.uk

Thank you for reading this information sheet. We appreciate your help with our research study. Please do not hesitate to contact us if you would like to discuss any of the above.

Appendix Q

Information Sheet for Teachers

Version 1.4, dated 21st October 2016

Study Title: Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder (PTSD).

Researchers: Aleksandra Kralj (Trainee Clinical Psychologist, University of East Anglia [UEA]), Alexandra Payne (Trainee Clinical Psychologist, UEA) and Dr. Richard Meiser-Stedman (Reader in Clinical Psychology, UEA).

Thank you for offering to help with this research study. Below is some information about the study. Should you have any questions about what you have read, please do not hesitate to contact us: a.kralj@uea.ac.uk or Alexandra.payne@uea.ac.uk.

What is the aim of this research?
The aim of this research project is to find out more about the intrusive thoughts and intrusive memories that young people have when they are depressed or when they have experienced a traumatic event. Intrusions are thoughts or memories that pop into our heads without us choosing to think about them. They interrupt conscious thought and can be difficult to control. We are interested in how intrusions make young people feel, what sense they make of them and how they cope with them. We hope that by gaining a better understanding of young people's experience of intrusions we can evaluate whether they play a role in maintaining symptoms of PTSD and depression and whether intrusions may be an important target in cognitive therapy.

Who are we looking for to take part?
We are looking to recruit young people age 11 to 18 who have no mental health difficulties and who have a good understanding of English. We cannot include children who have obsessive compulsive disorder (OCD), substance misuse or dependence, current or previous experience of psychotic disorders, neurodevelopmental disorder or learning difficulties. We will also be recruiting young people with PTSD and depression from mental health services.

How will young people get involved?
We would like to ask you, as teachers, to give information sheets about the research to pupils aged between 11 and 18 years via your internal school email system. There will be one information sheet for young people and one for their parents or carers for those aged 15 years or younger. If the young person is interested in taking part, they will be able to leave their contact details online via the email sent out or they may contact us directly using the email address given on the information sheets.

Do your pupils have to take part?
No, participation in the study is voluntary. We will respect their decision of they do not wish to take part.

What happens once the young person is in the study?
We will contact the young person and their parent or carer by telephone and answer any questions they have about the research. We will then ask them to sign an electronic consent form. Once consent is obtained, young people will be asked to complete two questionnaires online and we will then interview the young person over the phone or via Skype about their intrusive thoughts and intrusive memories.

What will happen in the interview?
We expect the interview to take up to 40 minutes. In the first half of interview, we will ask questions to confirm that the young person does not have PTSD or depression. In the second half of the interview, we will ask about the young person's experience of intrusive thoughts and intrusive memories.

Are there any risks of young people taking part?
The interview involves talking about thoughts or memories that may be upsetting or embarrassing. If the child feels upset or embarrassed by any of the questions they do not have to answer them. We will ask young people aged 15 years and younger to choose times for the interviews when a parent or carer is at home so that they can talk to them if they feel upset at any time during the interviews. We will ask young people aged 16 to 18 years to choose a time when they will not be at home alone.

Are there any benefits of young people taking part?
Following the interview, the young person will be sent a £5 Amazon voucher to thank them for taking part.

What will happen if the researchers have any concerns about risk or if the young person makes a disclosure that gives the researchers concern for someone's safety?
On the participant and parent information sheets and at the start of the interview we will explain the confidentiality agreement. We will strictly follow school policies should any disclosures be made or if we become aware that there is a risk of harm to the young person or to someone else. Any concerns around risk or child safeguarding will be shared with other professionals, as necessary.

Is the study safe?
Yes. This study has been reviewed and given a favourable opinion by Solihull Research Ethics Committee.

What if there is a problem?
If you have any problems with the study and would like to tell someone else about it, please contact: Dr. Richard Meiser-Stedman, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593601 or e-mail: r.meiser-stedman@uea.ac.uk. If you would like to make a complaint about the study, please contact: Professor Ken Laidlaw, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593600 or e-mail: k.laidlaw@uea.ac.uk. You can also contact the Associate Dean for Research in the Faculty of Medicine and Health Sciences, University of East Anglia, Norwich, NR4 7TJ, tel: 01603 456161 or the Patient Advice and Liaison Service (PALS) team on free phone: 0800 279 2535.

Contact details for further information
If you want to find out more about the study or have any questions, please check with your parent or carer that they are happy for you to contact us.

Aleksandra Kralj and Alexandra Payne
Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ
Telephone: TBC
Email: a.kralj@uea.ac.uk or Alexandra.payne@uea.ac.uk

Thank you for reading this information sheet. We appreciate your help with our research study. Please do not hesitate to contact us if you would like to discuss any of the above.

Appendix R

Letter to Clinical Team Leaders and Service Managers

Version 1.2, dated 12th November 2015

Dear Clinical Team Leader/Service Manager,

We are writing to seek your support in recruiting young people to our research study, entitled 'Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder'. The aim of this research project is to find out more about the intrusive thoughts and intrusive memories that young people have when they are depressed or when they have experienced a traumatic event. Please find an information sheet attached giving full details of the study.

We would like to ask you and your team to give information sheets about the research to anyone attending your service who is aged between 11 and 16 years and who has PTSD and/or depression. If the young person is interested in taking part, we will ask you to obtain verbal consent from them to pass on their contact details. We will not ask you to provide any additional input and any questions asked by young people can be directed to us. We will strictly follow Trust policies should any disclosures be made and any concerns around risk or child safeguarding will be shared with clinical teams and other professionals, as necessary.

If you are interested in supporting us, we would like to arrange to meet with you to discuss the study and arrangements for recruitment in more detail. We would be grateful if you could register your interest by return email and we will contact you to arrange a time to meet. Please do not hesitate to contact us if you have any questions.

Thank you for your time and we look forward to working with you.

Alexandra Payne and Aleksandra Kralj
Trainee Clinical Psychologists

Supervised by Dr. Richard Meiser-Stedman
Reader in Clinical Psychology

Appendix S

Letter to Headteachers

Version 1,2, dated 12th November 2015

Dear Headteacher,

We are writing to seek your support in recruiting young people to our research study, entitled 'Intrusive cognitions in children and adolescents with depression and posttraumatic stress disorder'. The aim of this research project is to find out more about the intrusive thoughts and intrusive memories that young people have when they are depressed or when they have experienced a traumatic event. Please find an information sheet attached giving full details of the study.

We would like to ask you to send information sheets about the research to pupils aged between 11 and 16 years via your internal school email system. We will not ask you to provide any additional input and any questions asked by pupils can be directed to us. We will strictly follow school policies should any disclosures be made and any concerns around risk or child safeguarding will be shared with other professionals, as necessary.

If you are interested in supporting us, we would like to meet with you to discuss the study and arrangements for recruitment in more detail. We would be grateful if you could register your interest by return email and we will contact you to arrange a time to meet. Please do not hesitate to contact us if you have any questions.

Thank you for your time and we look forward to working with you.

Alexandra Payne and Aleksandra Kralj
Trainee Clinical Psychologists

Supervised by Dr. Richard Meiser-Stedman
Reader in Clinical Psychology

Appendix T

Clinical Participant Recruitment Poster

Version 1.1, dated 21st October 2016

Appendix U

Control Participant Recruitment Poster

Version 1.1, dated 21st October 2016

11–18 year olds needed!

We are doing research to help us understand thoughts and memories that young people might have.

Who?

You can take part if you are aged between 11 and 18

What?

The study involves two online questionnaires and a phone interview lasting up to 40 minutes

How?

Email your name, date of birth and phone number to **a.kralj@uea.ac.uk**

Anything else?

We will give you a £5 Amazon voucher to say thank you!

The study is being run by Aleksandra Kralj and Alexandra Payne, Trainee Clinical Psychologists at the University of East Anglia. The study has received ethical approval.

CPFT Cambridgeshire and Peterborough NHS Foundation Trust

Norfolk and Suffolk NHS Foundation Trust

Study on intrusive thoughts and memories
Send your name, date of birth and contact number to **a.kralj@uea.ac.uk**

Study on intrusive thoughts and memories
Send your name, date of birth and contact number to **a.kralj@uea.ac.uk**

Study on intrusive thoughts and memories
Send your name, date of birth and contact number to **a.kralj@uea.ac.uk**

Study on intrusive thoughts and memories
Send your name, date of birth and contact number to **a.kralj@uea.ac.uk**

Study on intrusive thoughts and memories
Send your name, date of birth and contact number to **a.kralj@uea.ac.uk**

Study on intrusive thoughts and memories
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Study on intrusive thoughts and memories
Send your name, date of birth and contact number to **a.kralj@uea.ac.uk**

Study on intrusive thoughts and memories
Send your name, date of birth and contact number to **a.kralj@uea.ac.uk**

Study on intrusive thoughts and memories
Send your name, date of birth and contact number to **a.kralj@uea.ac.uk**

Study on intrusive thoughts and memories
Send your name, date of birth and contact number to **a.kralj@uea.ac.uk**

Appendix V

Combined Participant Recruitment Poster

Version 1.0, dated 21st October 2016

11–18 year olds needed!

We are doing research to help us understand thoughts and memories that young people might have when they are feeling low or after a traumatic event.

Who?

You can take part if you are aged between 11 and 18.
We are looking for three groups of young people:

1) Young people with depression or who are experiencing low mood
2) Young people who have Posttraumatic Stress Disorder (PTSD) or who are experiencing stress after a traumatic event
3) Young people who do not have difficulties with low mood or posttraumatic stress and who would like to be in our 'comparison' group – **aged 17 or 18 only**.

What?

The study involves two online questionnaires and a phone interview lasting up to 40 minutes

How?

Email your name, date of birth and phone number to **a.kralj@uea.ac.uk** or **alexandra.payne@uea.ac.uk**

The study is being run by Aleksandra Kralj and Alexandra Payne, Trainee Clinical Psychologists at the University of East Anglia. The study has received ethical approval.

University of East Anglia

Study on intrusive thoughts and memories
Send your name, date of birth and contact number to a.kralj@uea.ac.uk

Study on intrusive thoughts and memories
Send your name, date of birth and contact number to a.kralj@uea.ac.uk

Appendix W

Revised Children's Anxiety and Depression Scale

Date: _____ **Name/ID:** _____

RCADS

Please put a circle around the word that shows how often each of these things happen to you. There are no right or wrong answers.

1. I worry about things	Never	Sometimes	Often	Always
2. I feel sad or empty	Never	Sometimes	Often	Always
3. When I have a problem, I get a funny feeling in my stomach	Never	Sometimes	Often	Always
4. I worry when I think I have done poorly at something	Never	Sometimes	Often	Always
5. I would feel afraid of being on my own at home	Never	Sometimes	Often	Always
6. Nothing is much fun anymore	Never	Sometimes	Often	Always
7. I feel scared when I have to take a test	Never	Sometimes	Often	Always
8. I feel worried when I think someone is angry with me	Never	Sometimes	Often	Always
9. I worry about being away from my parents	Never	Sometimes	Often	Always
10. I get bothered by bad or silly thoughts or pictures in my mind	Never	Sometimes	Often	Always
11. I have trouble sleeping	Never	Sometimes	Often	Always
12. I worry that I will do badly at my school work	Never	Sometimes	Often	Always
13. I worry that something awful will happen to someone in my family	Never	Sometimes	Often	Always
14. I suddenly feel as if I can't breathe when there is no reason for this	Never	Sometimes	Often	Always
15. I have problems with my appetite	Never	Sometimes	Often	Always
16. I have to keep checking that I have done things right (like the switch is off, or the door is locked)	Never	Sometimes	Often	Always
17. I feel scared if I have to sleep on my own.	Never	Sometimes	Often	Always
18. I have trouble going to school in the mornings because I feel nervous or afraid	Never	Sometimes	Often	Always
19. I have no energy for things	Never	Sometimes	Often	Always
20. I worry I might look foolish	Never	Sometimes	Often	Always
21. I am tired a lot	Never	Sometimes	Often	Always
22. I worry that bad things will happen to me	Never	Sometimes	Often	Always

23. I can't seem to get bad or silly thoughts out of my head.	Never	Sometimes	Often	Always
24. When I have a problem, my heart beats really fast	Never	Sometimes	Often	Always
25. I cannot think clearly	Never	Sometimes	Often	Always
26. I suddenly start to tremble or shake when there is no reason for this	Never	Sometimes	Often	Always
27. I worry that something bad will happen to me	Never	Sometimes	Often	Always
28. When I have a problem, I feel shaky	Never	Sometimes	Often	Always
29. I feel worthless	Never	Sometimes	Often	Always
30. I worry about making mistakes	Never	Sometimes	Often	Always
31. I have to think of special thoughts (like numbers or words) to stop bad things from happening.	Never	Sometimes	Often	Always
32. I worry what other people think of me	Never	Sometimes	Often	Always
33. I am afraid of being in crowded places (like shopping centers, the movies, buses, busy playgrounds)	Never	Sometimes	Often	Always
34. All of a sudden I feel really scared for no reason at all	Never	Sometimes	Often	Always
35. I worry about what is going to happen	Never	Sometimes	Often	Always
36. I suddenly become dizzy or faint when there is no reason for this	Never	Sometimes	Often	Always
37. I think about death	Never	Sometimes	Often	Always
38. I feel afraid if I have to talk in front of my class	Never	Sometimes	Often	Always
39. My heart suddenly starts to beat too quickly for no reason	Never	Sometimes	Often	Always
40. I feel like I don't want to move	Never	Sometimes	Often	Always
41. I worry that I will suddenly get a scared feeling when there is nothing to be afraid of	Never	Sometimes	Often	Always
42. I have to do some things over and over again (like washing my hands, cleaning or putting things in a certain order)	Never	Sometimes	Often	Always
43. I feel afraid that I will make a fool of myself in front of people	Never	Sometimes	Often	Always
44. I have to do some things in just the right way to stop bad things from happening	Never	Sometimes	Often	Always
45. I worry when I go to bed at night	Never	Sometimes	Often	Always
46. I would feel scared if I had to stay away from home overnight	Never	Sometimes	Often	Always
47. I feel restless	Never	Sometimes	Often	Always

Appendix X

Child and Adolescent Trauma Screen

Child and Adolescent Trauma Screen (CATS) - Youth Report

Name: _____ **Date:** _____

Stressful or scary events happen to many people. Below is a list of stressful and scary events that sometimes happen. Mark YES if it happened to you. Mark No if it didn't happen to you.

1.	Serious natural disaster like a flood, tornado, hurricane, earthquake, or fire.	☐ Yes	☐ No
2.	Serious accident or injury like a car/bike crash, dog bite, sports injury.	☐ Yes	☐ No
3.	Robbed by threat, force or weapon.	☐ Yes	☐ No
4.	Slapped, punched, or beat up in your family.	☐ Yes	☐ No
5.	Slapped, punched, or beat up by someone not in your family.	☐ Yes	☐ No
6.	Seeing someone in your family get slapped, punched or beat up.	☐ Yes	☐ No
7.	Seeing someone in the community get slapped, punched or beat up.	☐ Yes	☐ No
8.	Someone older touching your private parts when they shouldn't.	☐ Yes	☐ No
9.	Someone forcing or pressuring sex, or when you couldn't say no.	☐ Yes	☐ No
10.	Someone close to you dying suddenly or violently.	☐ Yes	☐ No
11.	Attacked, stabbed, shot at or hurt badly.	☐ Yes	☐ No
12.	Seeing someone attacked, stabbed, shot at, hurt badly or killed.	☐ Yes	☐ No
13.	Stressful or scary medical procedure.	☐ Yes	☐ No
14.	Being around war.	☐ Yes	☐ No
15.	Other stressful or scary event?	☐ Yes	☐ No

Describe: _____

Which one is bothering you the most now? _____

If you marked "YES" to any stressful or scary events, then turn the page and answer the next questions.

Mark 0, 1, 2 or 3 for how often the following things have bothered you in the last two weeks:

0 Never / 1 Once in a while / 2 Half the time / 3 Almost always

1.	Upsetting thoughts or pictures about what happened that pop into your head.	0	1	2	3
2.	Bad dreams reminding you of what happened.	0	1	2	3
3.	Feeling as if what happened is happening all over again.	0	1	2	3
4.	Feeling very upset when you are reminded of what happened.	0	1	2	3
5.	Strong feelings in your body when you are reminded of what happened (sweating, heart beating fast, upset stomach).	0	1	2	3
6.	Trying not to think about or talk about what happened. Or to not have feelings about it.	0	1	2	3
7.	Staying away from people, places, things, or situations that remind you of what happened.	0	1	2	3
8.	Not being able to remember part of what happened.	0	1	2	3
9.	Negative thoughts about yourself or others. Thoughts like I won't have a good life, no one can be trusted, the whole world is unsafe.	0	1	2	3
10.	Blaming yourself for what happened, or blaming someone else when it isn't their fault.	0	1	2	3
11.	Bad feelings (afraid, angry, guilty, ashamed) a lot of the time.	0	1	2	3
12.	Not wanting to do things you used to do.	0	1	2	3
13.	Not feeling close to people.	0	1	2	3
14.	Not being able to have good or happy feelings.	0	1	2	3
15.	Feeling mad. Having fits of anger and taking it out on others.	0	1	2	3
16.	Doing unsafe things.	0	1	2	3
17.	Being overly careful or on guard (checking to see who is around you).	0	1	2	3
18.	Being jumpy.	0	1	2	3
19.	Problems paying attention.	0	1	2	3
20.	Trouble falling or staying asleep.	0	1	2	3

Please mark "YES" or "NO" if the problems you marked interfered with:

1. Getting along with others	☐ Yes	☐ No	4. Family relationships	☐ Yes	☐ No
2. Hobbies/Fun	☐ Yes	☐ No	5. General happiness	☐ Yes	☐ No
3. School or work	☐ Yes	☐ No			

Appendix Y

Children's Revised Impact of Events Scale

Below is a list of comments made by people after stressful life Event. Please tick each item showing how frequently these comments were true for you *during the past seven days*. If they did not occur during that time please tick the 'not at all' box.

Name: …… Date: ……

		Not at all	Rarely	Some-times	Often
1.	**Do you think about it even when you don't mean to?**	**[ ]**	**[ ]**	**[ ]**	**[ ]**
2.	Do you try to remove it from your memory	[ ]	[ ]	[ ]	[ ]
3.	Do you have difficulties paying attention or concentrating	[ ]	[ ]	[ ]	[ ]
4.	**Do you have waves of strong feelings about it**	**[ ]**	**[ ]**	**[ ]**	**[ ]**
5.	Do you startle more easily or feel more nervous than you did before it happened?	[ ]	[ ]	[ ]	[ ]
6.	Do you stay away from reminders of it (e.g. places or situations)	[ ]	[ ]	[ ]	[ ]
7.	Do you try not talk about it	[ ]	[ ]	[ ]	[ ]
8.	**Do pictures about it pop into your mind?**	**[ ]**	**[ ]**	**[ ]**	**[ ]**
9.	**Do other things keep making you think about it?**	**[ ]**	**[ ]**	**[ ]**	**[ ]**
10.	Do you try not to think about it?	[ ]	[ ]	[ ]	[ ]
11.	Do you get easily irritable	[ ]	[ ]	[ ]	[ ]
12.	Are you alert and watchful even when there is no obvious need to be?	[ ]	[ ]	[ ]	[ ]
13.	Do you have sleep problems?	[ ]	[ ]	[ ]	[ ]

Note: Items in bold comprise the intrusiveness subscale.

Appendix Z

Trauma Memory Quality Questionnaire

Memory Questionnaire (TMQQ)

This is a questionnaire all about your memories of the frightening event. We would like to know what your memories feel and seem like. Please read each sentence and tell us how much you agree with each one, by ticking one box.

		Don't agree at all	*Don't agree a bit*	*Agree a bit*	*Completely agree*
1.	My memories of the frightening event are mostly pictures or images.	[ ]	[ ]	[ ]	[ ]
2.	I can't seem to put the frightening event into words.	[ ]	[ ]	[ ]	[ ]
3.	When I have memories of what happened I sometimes hear things in my head that I heard during the frightening event.	[ ]	[ ]	[ ]	[ ]
4.	When I remember the frightening event I feel like it is happening right now.	[ ]	[ ]	[ ]	[ ]
5.	When I think about the frightening event I can sometimes smell things that I smelt when the frightening event happened.	[ ]	[ ]	[ ]	[ ]
6.	I can talk about what happened very easily.	[ ]	[ ]	[ ]	[ ]
7.	I remember the frightening event as a few moments, and each moment is a picture in my mind.	[ ]	[ ]	[ ]	[ ]
8.	My memories of the frightening event are like a film that plays over and over.	[ ]	[ ]	[ ]	[ ]
9.	My memories of the frightening event are very clear and detailed.	[ ]	[ ]	[ ]	[ ]
10.	Remembering what happened during the frightening event is just like looking at photographs of it in my mind.	[ ]	[ ]	[ ]	[ ]
11.	When memories come to mind of what happened, I feel my body is in the same position as when the frightening event occurred.	[ ]	[ ]	[ ]	[ ]

Appendix AA

Interview Flow Chart

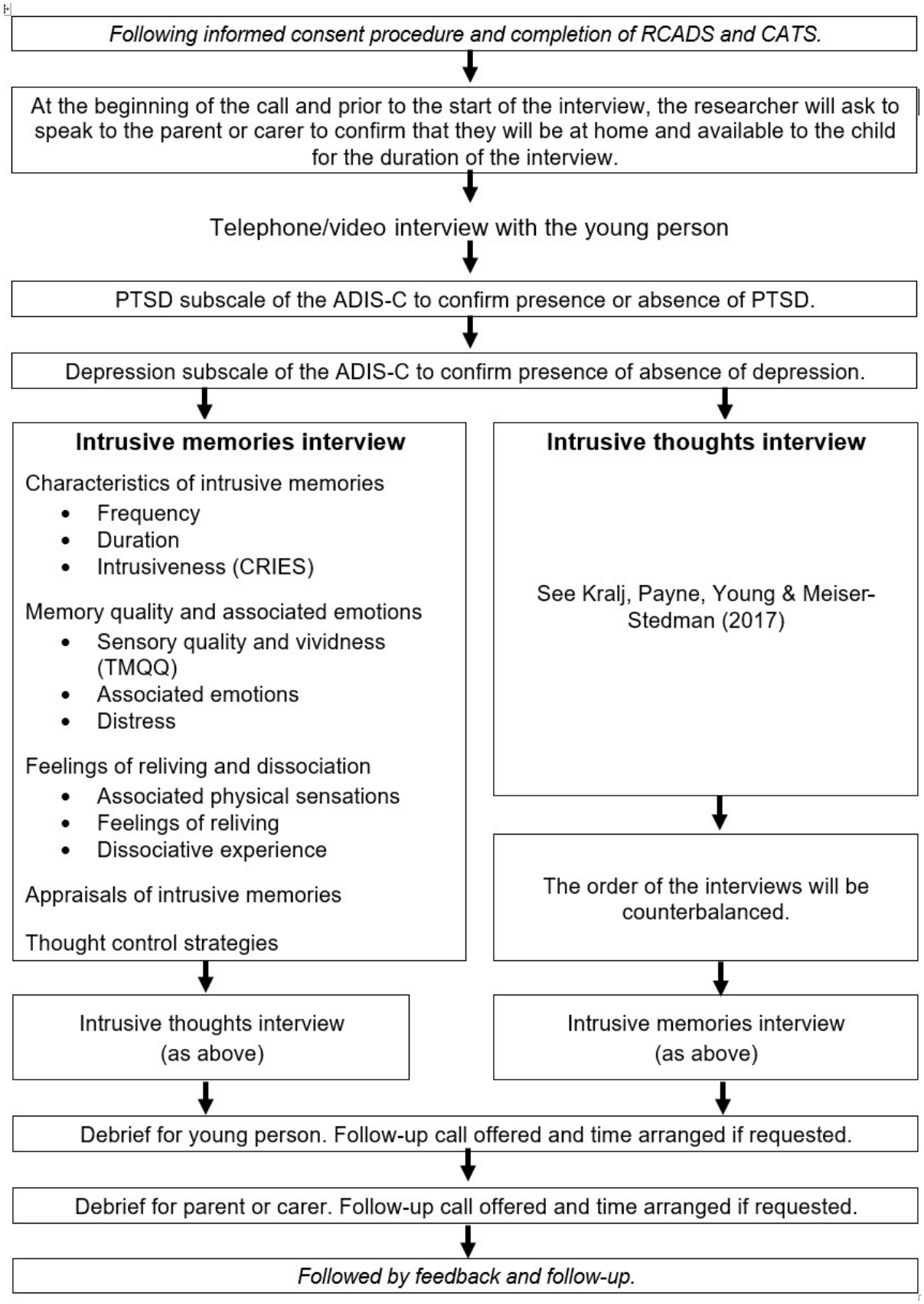


Figure AA.1: *Interview Flow Chart*.

Appendix BB

Participant Assent and Consent Forms

Assent Form for Clinical Participants aged 11 and 12 years

Version 1.2, dated 21st October 2016

Centre Number:

Study Number:

Patient Identification Number for this trial:

ASSENT FORM

Title of Project: Intrusive thoughts and memories in young people with depression and posttraumatic stress disorder (PTSD).

Names of Researchers: Aleksandra Kralj & Alexandra Payne

Please initial all boxes

1. I confirm that I have read and understand the information sheet dated 21st October 2016 (version 1.2) for the above study. I have had the time to think about the information, understand any risk involved with taking part and been able to ask questions about the study. ☐

2. I understand that taking part is voluntary (I can choose whether I want to take part or not) and that I am free to leave the study at any time without giving any reason, and without my medical care or legal rights being affected. ☐

3. I understand that my personal information will not be shared with anyone except the research team and my clinical team. I understand that if I say something which makes the researchers think that I or someone else is at risk of being harmed then the researchers will need to be share this with other people. ☐

4. I know how to contact the research team about the study if I need to, and how to get information about the results. ☐

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

Assent Form for Control Participants aged 11 and 12 years

Version 1.1, dated 21st October 2016

Centre Number:

Study Number:

Patient Identification Number for this trial:

ASSENT FORM

Title of Project: Intrusive thoughts and memories in young people with depression and posttraumatic stress disorder (PTSD).

Names of Researchers: Aleksandra Kralj & Alexandra Payne

Please initial all boxes

6. I confirm that I have read and understand the information sheet dated 21st October 2016 (version 1.1) for the above study. I have had the time to think about the information, understand any risk involved with taking part and been able to ask questions about the study. ☐

7. I understand that taking part is voluntary (I can choose whether I want to take part or not) and that I am free to leave the study at any time without giving any reason, and without my medical care or legal rights being affected. ☐

8. I understand that my personal information will not be shared with anyone except the research team. I understand that if I say something which makes the researchers think that I or someone else is at risk of being harmed then the researchers will need to be share this with other people. ☐

9. I know how to contact the research team about the study if I need to, and how to get information about the results. ☐

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

Assent Form for Clinical Participants aged 13 to 15 years

Version 1.3, dated 21st October 2016

Centre Number:

Study Number:

Patient Identification Number for this trial:

ASSENT FORM

Title of Project: Intrusive thoughts and memories in young people with depression and posttraumatic stress disorder (PTSD).

Names of Researchers: Aleksandra Kralj & Alexandra Payne

Please initial all boxes

11. I confirm that I have read and understand the information sheet dated 21st October 2016 (version 1.5) for the above study. I have had the time to think about the information, understand any risk involved with taking part and been able to ask questions about the study. ☐

12. I understand that taking part is voluntary (I can choose whether I want to take part or not) and that I am free to leave the study at any time without giving any reason, and without my medical care or legal rights being affected. ☐

13. I understand that my personal information will not be shared with anyone except the research team and my clinical team. I understand that if I say something which makes the researchers think that I or someone else is at risk of being harmed then the researchers will need to be share this with other people. ☐

14. I know how to contact the research team about the study if I need to, and how to get information about the results. ☐

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

Assent Form for Clinical Participants aged 13 and 15 years

Version 1.3, dated 21st October 2016

Centre Number:

Study Number:

Patient Identification Number for this trial:

ASSENT FORM

Title of Project: Intrusive thoughts and memories in young people with depression and posttraumatic stress disorder (PTSD).

Names of Researchers: Aleksandra Kralj & Alexandra Payne

Please initial all boxes

16. I confirm that I have read and understand the information sheet dated 21st October 2016 (version 1.1) for the above study. I have had the time to think about the information, understand any risk involved with taking part and been able to ask questions about the study. ☐

17. I understand that taking part is voluntary (I can choose whether I want to take part or not) and that I am free to leave the study at any time without giving any reason, and without my medical care or legal rights being affected. ☐

18. I understand that my personal information will not be shared with anyone except the research team. I understand that if I say something which makes the researchers think that I or someone else is at risk of being harmed then the researchers will need to be share this with other people. ☐

19. I know how to contact the research team about the study if I need to, and how to get information about the results. ☐

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

Consent Form for Clinical Participants aged 16 to 18 years

Version 1.5, dated 21st October 2016

Centre Number:

Study Number:

Patient Identification Number for this trial:

CONSENT FORM

Title of Project: Intrusive thoughts and memories in young people with depression and posttraumatic stress disorder (PTSD).

Names of Researchers: Aleksandra Kralj & Alexandra Payne

Please initial all boxes

21. I confirm that I have read and understand the information sheet dated 21st October 2016 (version 1.0) for the above study. I have had the time to think about the information, understand any risk involved with taking part and been able to ask questions about the study. ☐

22. I understand that taking part is voluntary (I can choose whether I want to take part or not) and that I am free to leave the study at any time without giving any reason, and without my medical care or legal rights being affected. ☐

23. I understand that my personal information will not be shared with anyone except the research team and my clinical team. I understand that if I say something which makes the researchers think that I or someone else is at risk of being harmed then the researchers will need to be share this with other people. ☐

24. I know how to contact the research team about the study if I need to, and how to get information about the results. ☐

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

Consent Form for Control Participants aged 16 to 18 years

Version 1.1, dated 21st October 2016

Centre Number:

Study Number:

Patient Identification Number for this trial:

CONSENT FORM

Title of Project: Intrusive thoughts and memories in young people with depression and posttraumatic stress disorder (PTSD).

Names of Researchers: Aleksandra Kralj & Alexandra Payne

Please initial all boxes

26. I confirm that I have read and understand the information sheet dated 21st October 2016 (version 1.0) for the above study. I have had the time to think about the information, understand any risk involved with taking part and been able to ask questions about the study. ☐

27. I understand that taking part is voluntary (I can choose whether I want to take part or not) and that I am free to leave the study at any time without giving any reason, and without my medical care or legal rights being affected. ☐

28. I understand that my personal information will not be shared with anyone except the research team. I understand that if I say something which makes the researchers think that I or someone else is at risk of being harmed then the researchers will need to be share this with other people. ☐

29. I know how to contact the research team about the study if I need to, and how to get information about the results. ☐

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

Appendix CC

Parent or Carer Consent Form

Version 1.5, dated 21st October 2016

Centre Number:

Study Number:

Patient Identification Number for this trial:

CONSENT FORM

Title of Project: Intrusive thoughts and memories in young people with depression and posttraumatic stress disorder (PTSD).

Names of Researchers: Aleksandra Kralj & Alexandra Payne

Please initial all boxes

31. I confirm that I have read and understand the information sheet dated 21st October 2016 (version 1.5) for the above study. I have had the time to think about the information, understand any risk involves with taking part and been able to ask questions about the study. ☐

32. I understand that taking part is voluntary and that my child is free to leave the study at any time without giving any reason, and without their medical care or legal rights being affected. ☐

33. I understand that my child's personal information will not be shared with anyone except the research team and my clinical team. I understand that if they disclose risk of harm to myself or others then the researchers will need to be share this with other people. ☐

34. I know how to contact the research team about the study if I need to, and how to get information about the results. ☐

35. I agree to be at home during the phone call. I agree to speak to the researchers at the beginning and the end of my child's phone interview. ☐

36. I agree to my child taking part in the above study. ☐

Appendix DD

Participant Debrief

Version 1.3, dated 18th July 2016

Study title: Intrusive cognitions in young people with depression and post-traumatic stress disorder (PTSD).

Thank you for taking part as a research participant in this study looking at intrusive thoughts and memories in young people with depression and PTSD.

The aim of this research project is to find out more about the intrusive thoughts and memories that young people have. These are thoughts and memories that pop into our heads and interrupt our day to day thoughts without us choosing to think about them. We are interested in how intrusive thoughts and memories make young people feel, what sense they make of them and how they cope with them. We hope that this study could help us to understand intrusive thoughts and memories a bit better and think about how we can help young people who are struggling with intrusive thoughts and memories.

If you have any questions or want to tell us how you found the study, please feel free to contact us. Our contact details are: Aleksandra Kralj (a.kralj@uea.ac.uk) and Alexandra Payne (Alexandra.payne@uea.ac.uk), Department of Clinical Psychology, University of East Anglia, Norwich, NR4 7TJ.

If you weren't happy with anything about the study and would like to tell someone else about it, please contact: Dr. Richard Meiser-Stedman, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593601 or e-mail: r.meiser-stedman@uea.ac.uk. If you would like to make a complaint about the study, please contact: Professor Ken Laidlaw, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593600 or e-mail: k.laidlaw@uea.ac.uk. You can also contact the Associate Dean for Research in the Faculty of Medicine and Health Sciences, University of East Anglia, Norwich, NR4 7TJ, tel: 01603 456161 or the Patient Advice and Liaison Service (PALS) team on free phone: 0800 279 2535.

If you have been upset by taking part in the study, we encourage you to contact us directly, speak to your GP or your clinical team (if you have one). Alternatively, you can contact Young Minds on 020 7089 5050 or visit their website www.youngminds.org.uk.

If you want to hear about what we found from the study when it is finished, let us know which email address you would like us to send the findings to.

To thank you for helping us with our research, we would like to give you a £5 Amazon voucher.

Thank you again for taking part!

Appendix EE

Debrief for Young People Found to be Ineligible to Participate

Version 1.0, dated 5th January 2016

Study title: Intrusive cognitions in young people with depression and post-traumatic stress disorder (PTSD).

Thank you for your interest in taking part as a research participant in this study looking at intrusive thoughts and memories in young people with depression and PTSD. We asked you to take part in this research because you are aged between 11 and 16 and because you either have posttraumatic stress disorder or depression **or** because you don't have any mental health difficulties and we asked you to be in our comparison group.

To take part in this research study, young people also needed to meet a list of other criteria. To find out whether you would be able to take part, we spoke to you on the telephone and asked you some questions. On this occasion, we decided that you would not be able to take part in this research study.

We want to express our thanks for your willingness to take part in this research study. Without people like you who are willing to help, research into common mental health problems would not be possible.

If you have any questions, please feel free to contact us. Our contact details are: Aleksandra Kralj (a.kralj@uea.ac.uk) and Alexandra Payne (Alexandra.payne@uea.ac.uk), Department of Clinical Psychology, University of East Anglia, Norwich, NR4 7TJ.

If you weren't happy with anything about the study and would like to tell someone else about it, please contact: Dr. Richard Meiser-Stedman, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593601 or e-mail: r.meiser-stedman@uea.ac.uk. If you would like to make a complaint about the study, please contact: Professor Ken Laidlaw, Department of Clinical Psychology, Norwich Medical School, University of East Anglia, Norwich NR4 7TJ, tel: 01603 593600 or e-mail: k.laidlaw@uea.ac.uk. You can also contact the Associate Dean for Research in the Faculty of Medicine and Health Sciences, University of East Anglia, Norwich, NR4 7TJ, tel: 01603 456161 or the Patient Advice and Liaison Service (PALS) team on free phone: 0800 279 2535.

If you have been upset by taking part in the study, we encourage you to contact us directly, speak to your GP or your clinical team (if you have one). Alternatively, you can contact Young Minds on 020 7089 5050 or visit their website www.youngminds.org.uk.

Thank you again for your interest!

Appendix FF

Histograms Produced in Assessment of Normality

Age

Figure FF.1. Age in years for the PTSD group.

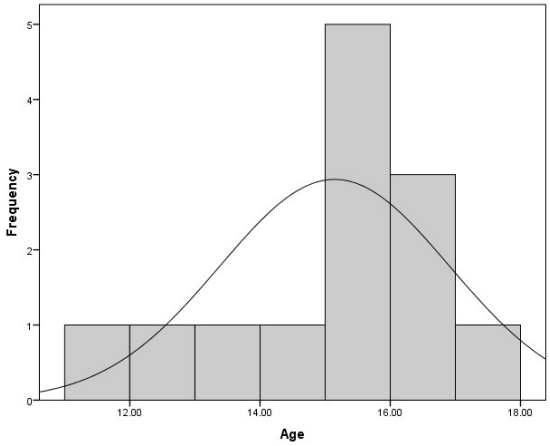


Figure FF.2. Age in years for the depressed group.

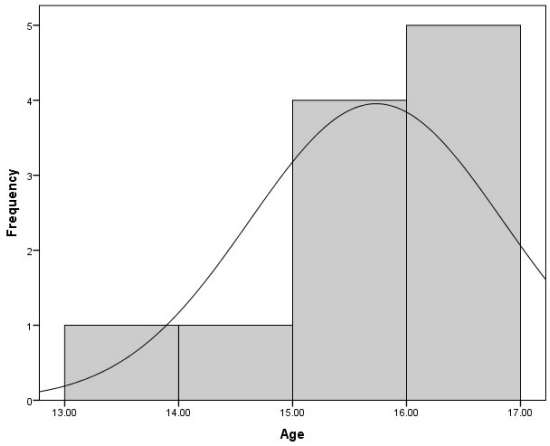
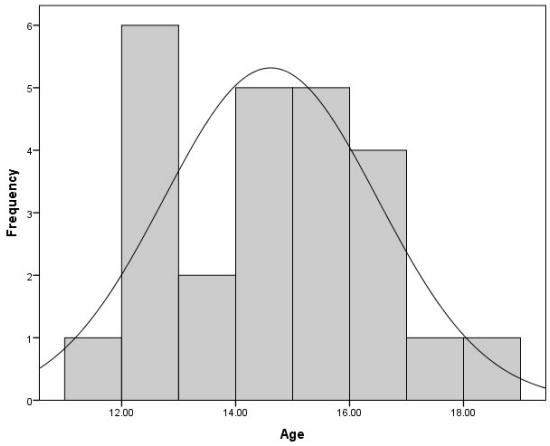


Figure FF.3. Age in years for the control group.



RCADS: Depression Subscale

Figure FF.4. *T*-scores on the depression subscale of the RCADS for the PTSD group.

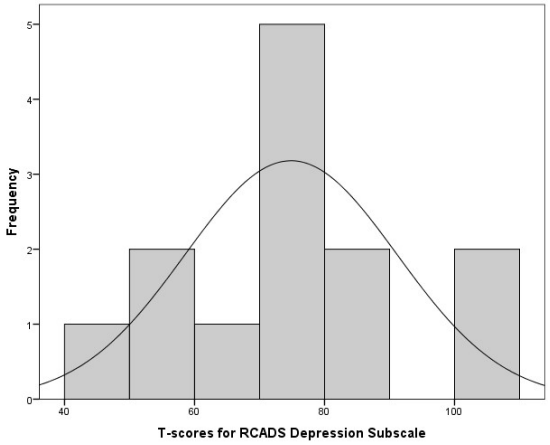


Figure FF.5. *T*-scores on the depression subscale of the RCADS for the depressed group.

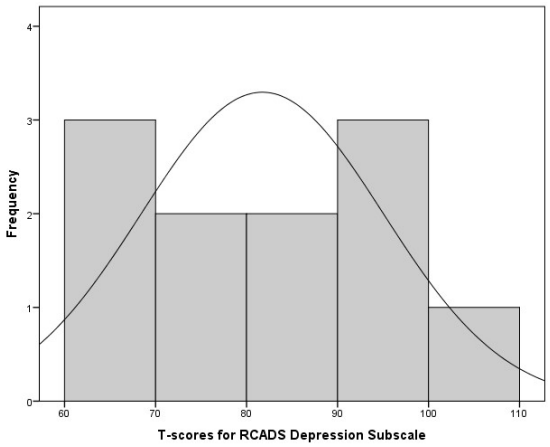
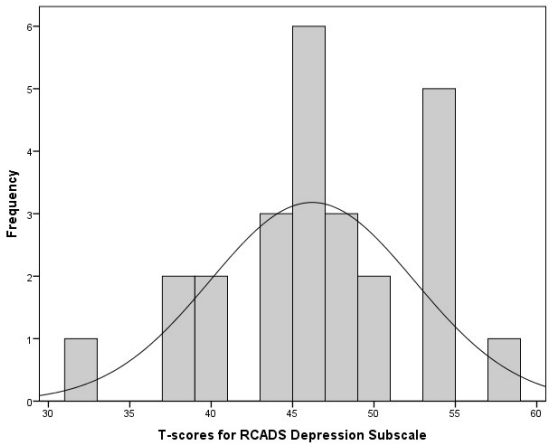


Figure FF.6. *T*-scores on the depression subscale of the RCADS for the control group.



RCADS: Anxiety Subscale

Figure FF.7. *T*-scores on the anxiety subscale of the RCADS for the PTSD group.

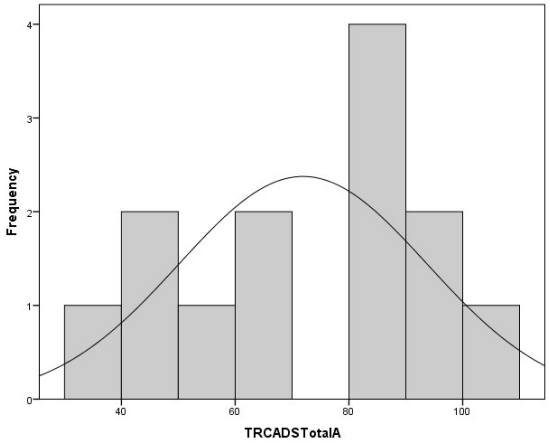


Figure FF.8. *T*-scores on the anxiety subscale of the RCADS for the depressed group.

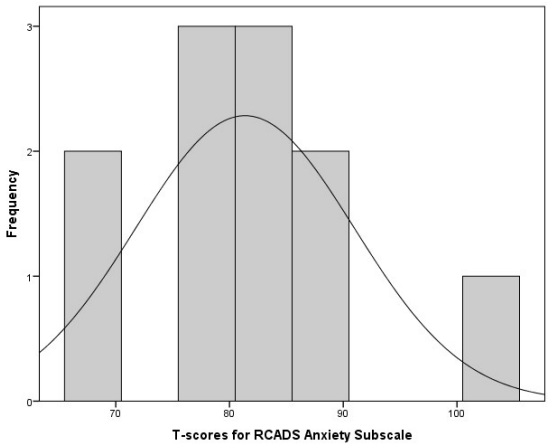
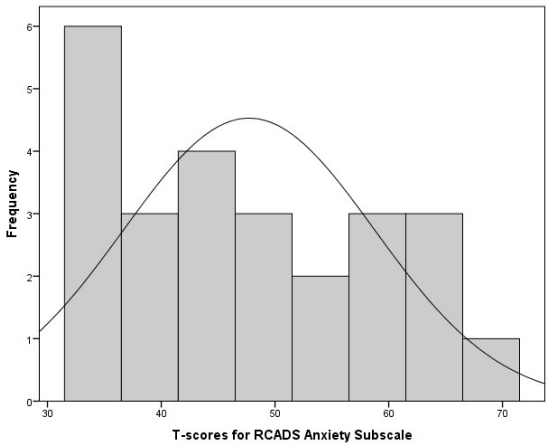


Figure FF.9. *T*-scores on the anxiety subscale of the RCADS for the control group.



CATS: Number of Trauma Types

Figure FF.10. Number of trauma types reported on the CATS for the PTSD group.

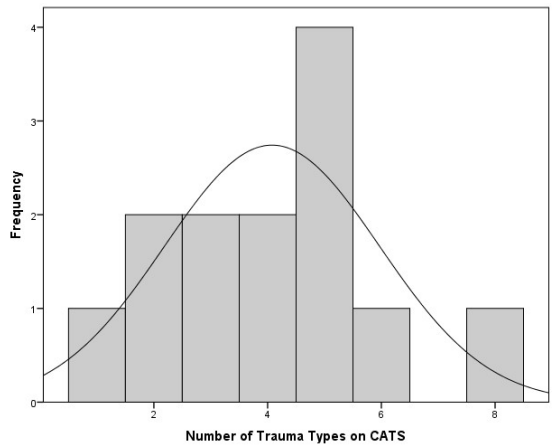


Figure FF.11. Number of trauma types reported on the CATS for the TED group.

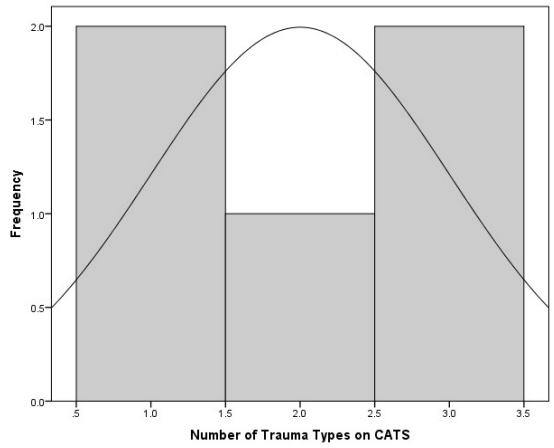
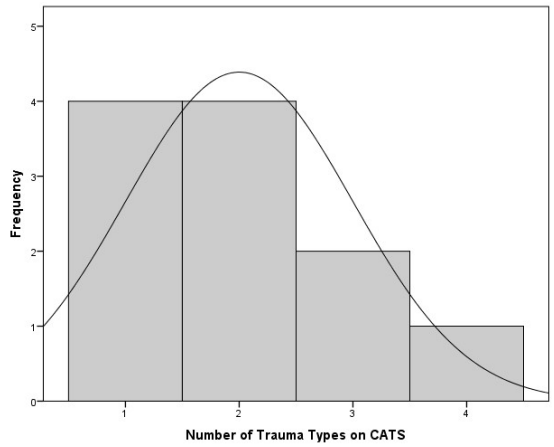


Figure FF.12. Number of trauma types reported on the CATS for the TEC group.



CATS Score

Figure FF.13. CATS score for the PTSD group.

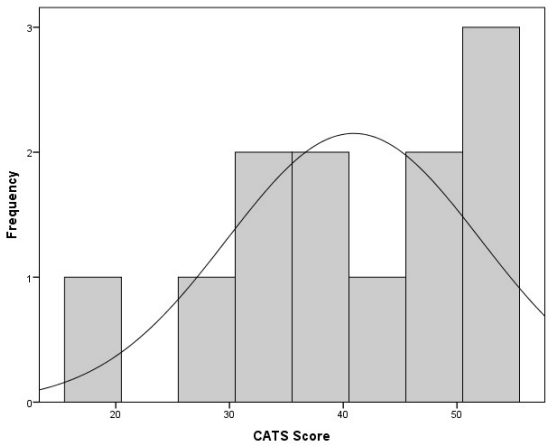


Figure FF.14. CATS score for the TED group.

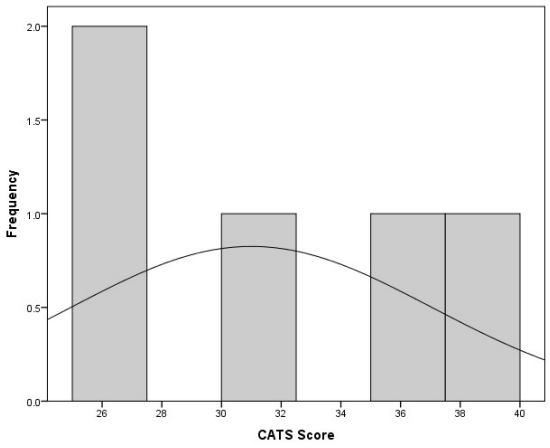
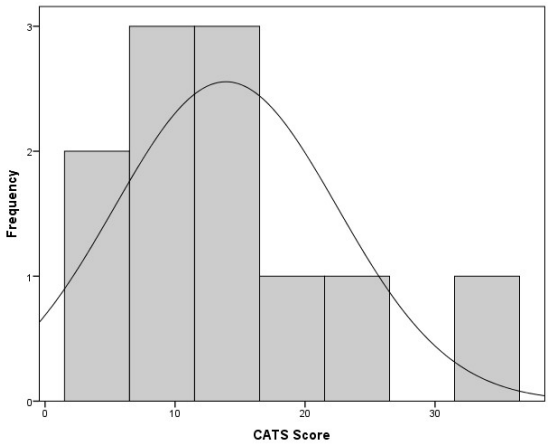


Figure FF.15. CATS score for the TEC group.



CRIES: Intrusive Subscale

Figure FF.16. CRIES intrusiveness subscale scores for the PTSD-IM group.

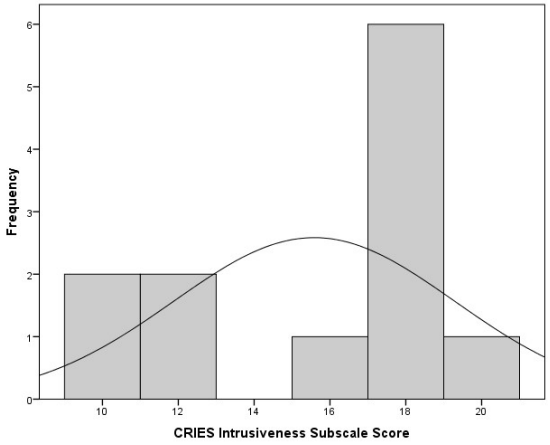


Figure FF.17. CRIES intrusiveness subscale scores for the depressed-IM group.

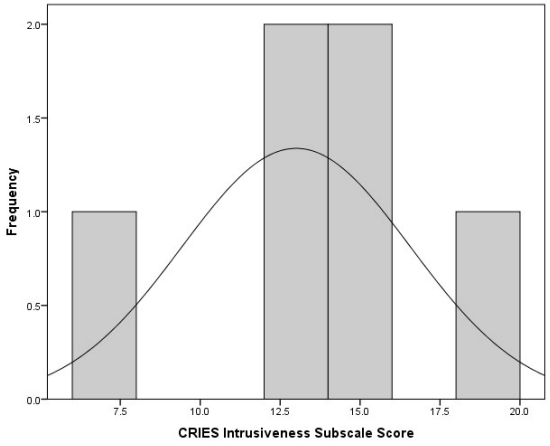
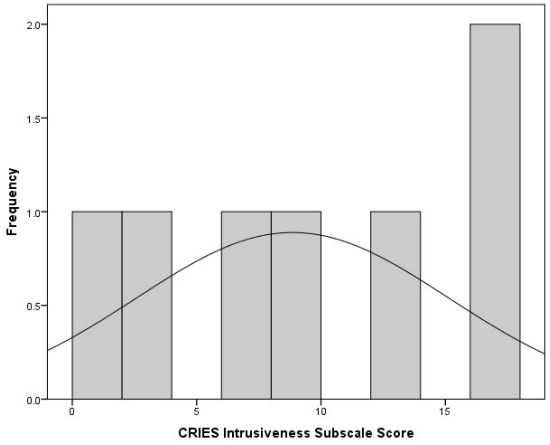


Figure FF.18. CRIES intrusiveness subscale scores for the control-IM group.



TMQQ Score

Figure FF.19. TMQQ scores for the PTSD-IM group.

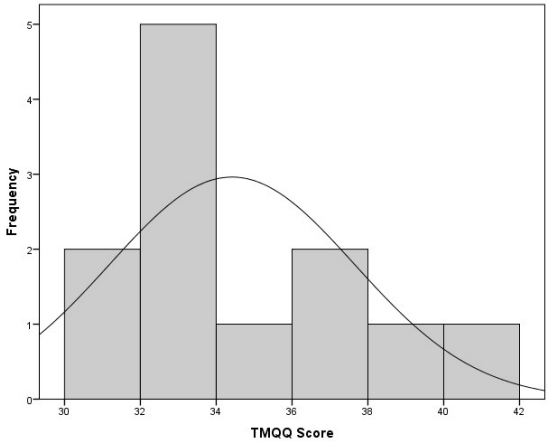


Figure FF.20. TMQQ scores for the depressed-IM group.

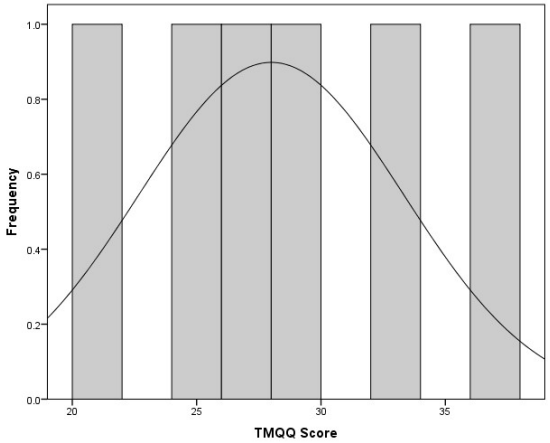
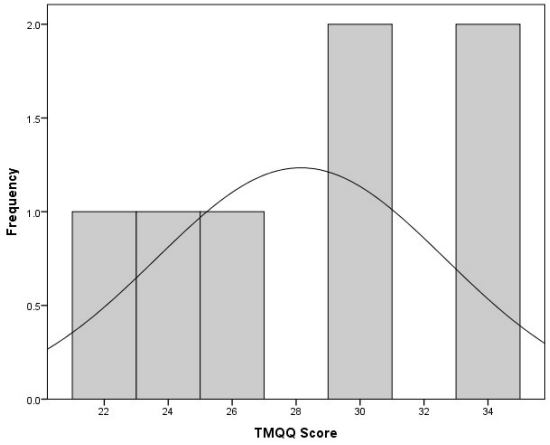


Figure FF.21. TMQQ scores for the control-IM group.



Associated Emotions: Total Emotions

Figure FF.22. Total associated emotions scores for the PTSD-IM group.

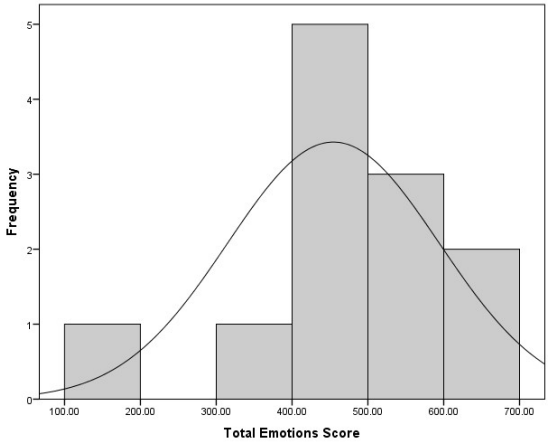


Figure FF.23. Total associated emotions scores for the depressed-IM group.

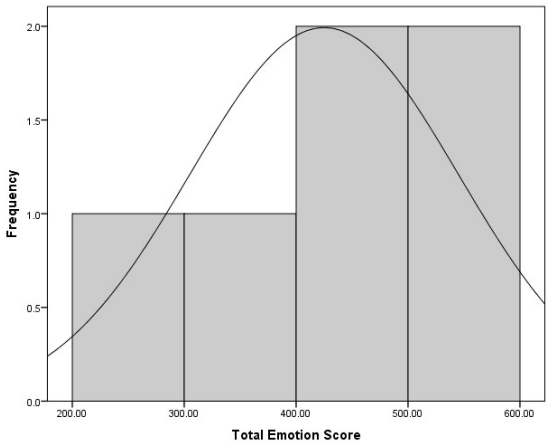
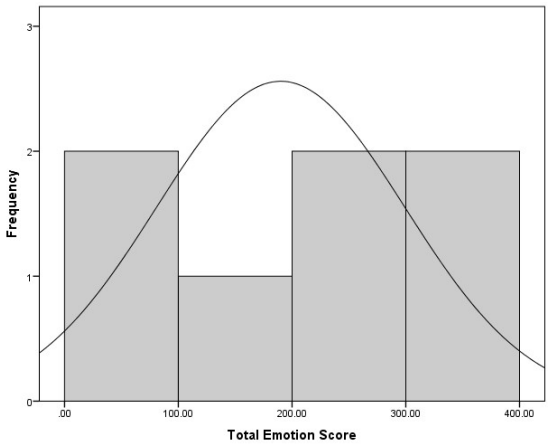


Figure FF.24. Total associated emotions scores for the control-IM group.



Associated Emotions: Anger

Figure FF.25. Anger scores for the PTSD-IM group.

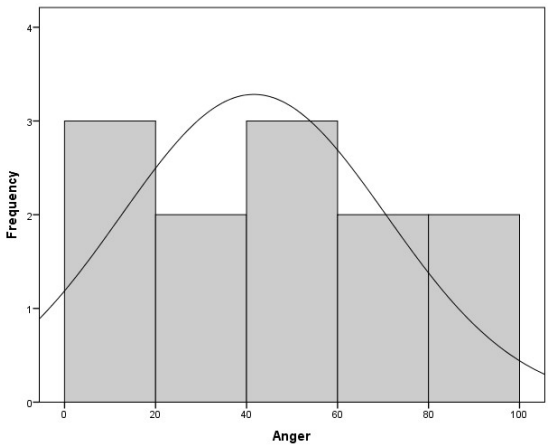


Figure FF.26. Anger scores for the depressed-IM group.

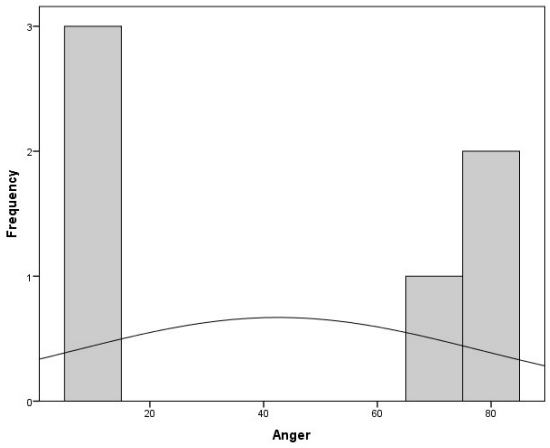
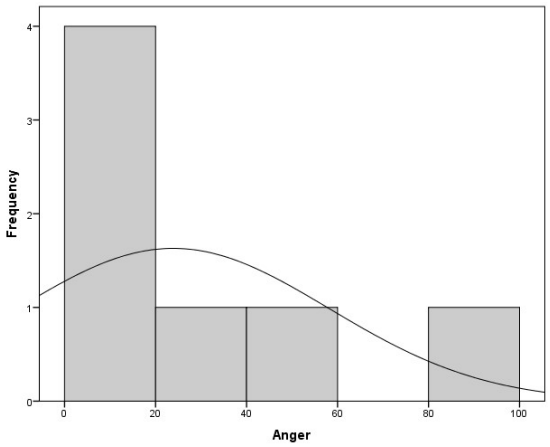


Figure FF.27. Anger scores for the control-IM group.



Associated Emotions: Sadness

Figure FF.28. Sadness scores for the PTSD-IM group.

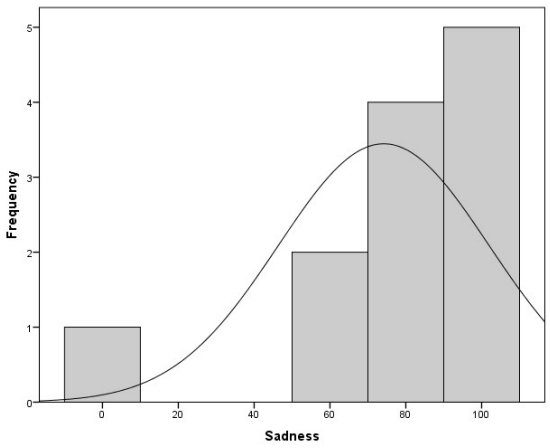


Figure FF.29. Sadness scores for the depressed-IM group.

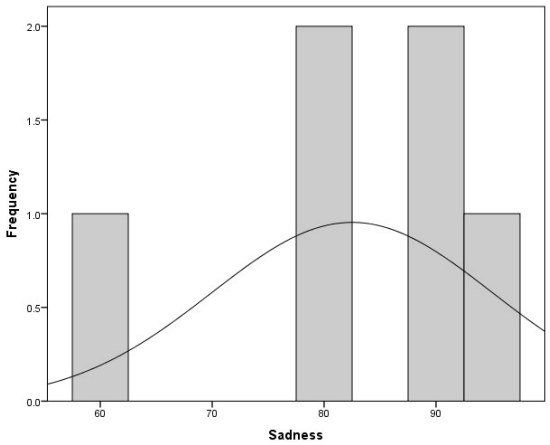
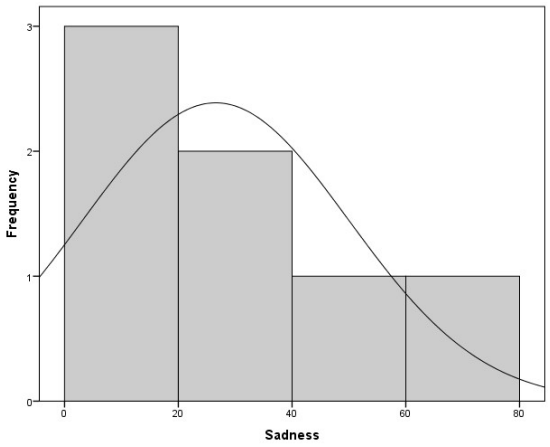


Figure FF.30. Sadness scores for the control-IM group.



Associated Emotions: Fear

Figure FF.31. Fear scores for the PTSD-IM group.

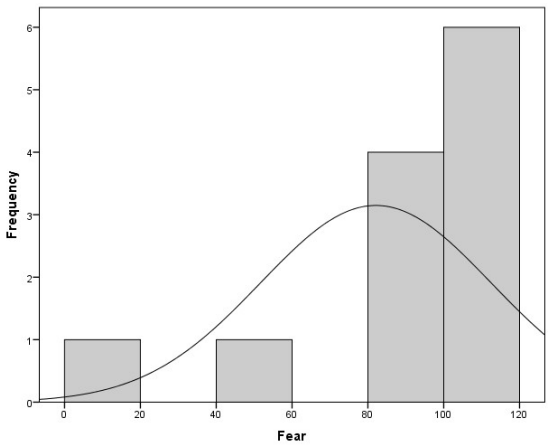


Figure FF.32. Fear scores for the depressed-IM group.

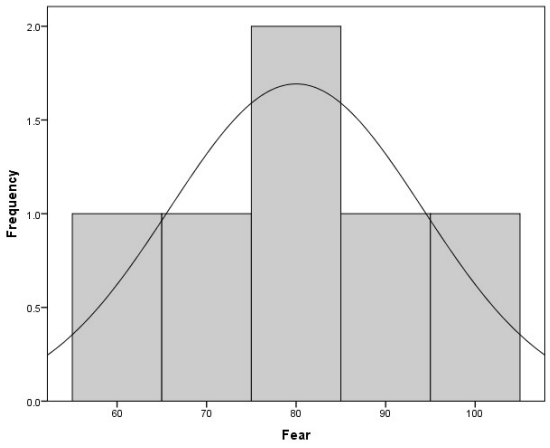
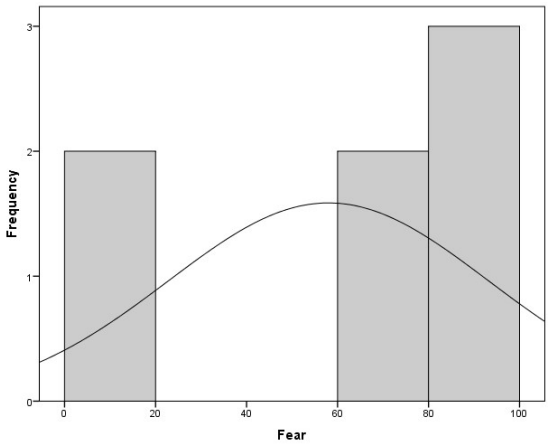


Figure FF.33. Fear scores for the control-IM group.



Associated Emotions: Guilt

Figure FF.34. Guilt scores for the PTSD-IM group.

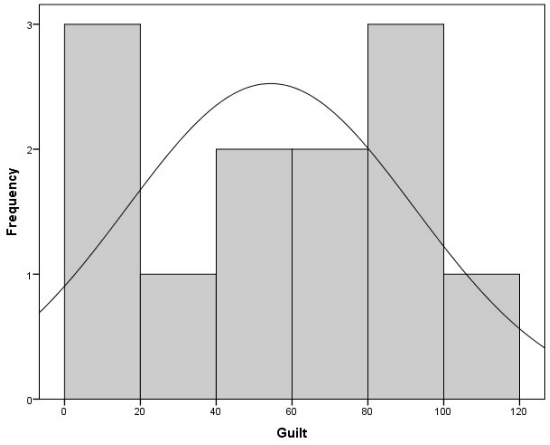


Figure FF.35. Guilt scores for the depressed-IM group.

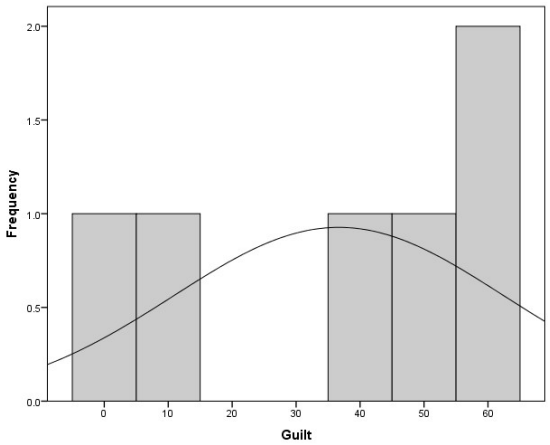
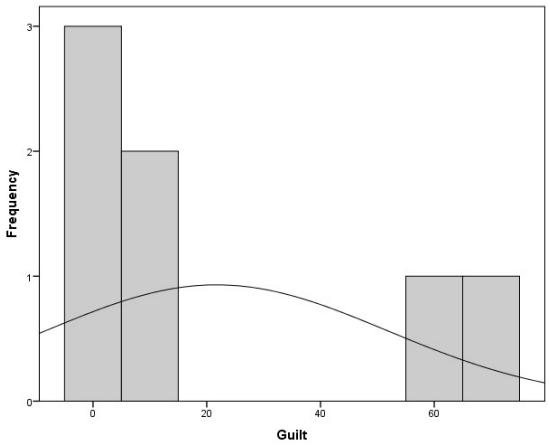


Figure FF.36. Guilt scores for the control-IM group.



Associated Emotions: Helplessness

Figure FF.37. Helplessness scores for the PTSD-IM group.

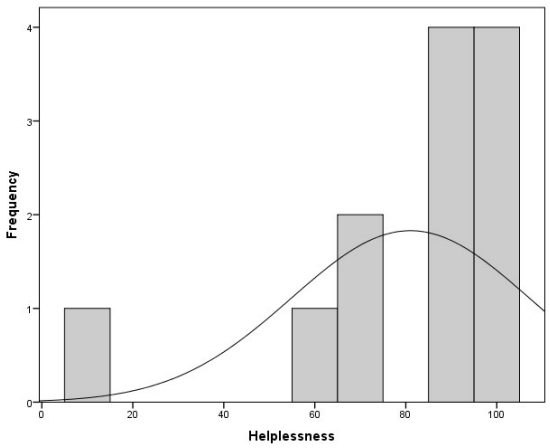


Figure FF.38. Helplessness scores for the depressed-IM group.

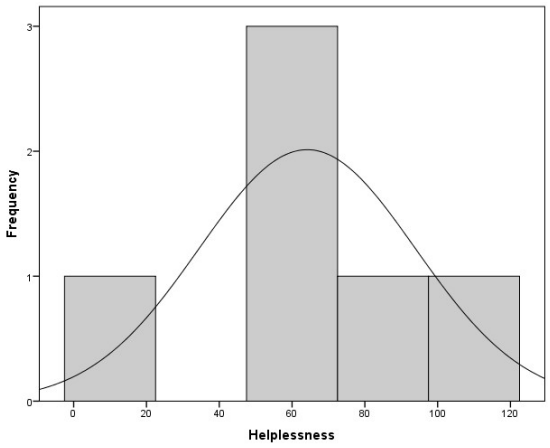
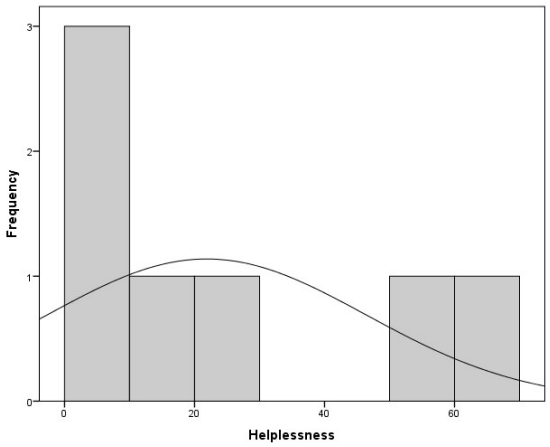


Figure FF.39. Helplessness scores for the control-IM group.



Associated Emotions: Shame

Figure FF.40. Shame scores for the PTSD-IM group.

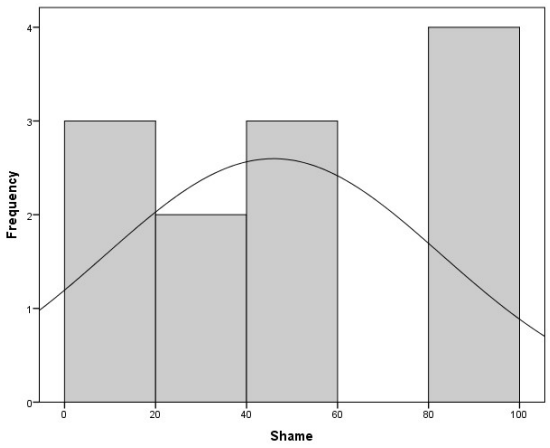


Figure FF.41. Shame scores for the depressed-IM group.

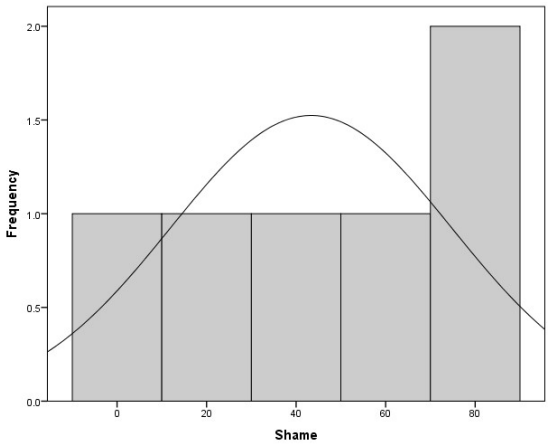
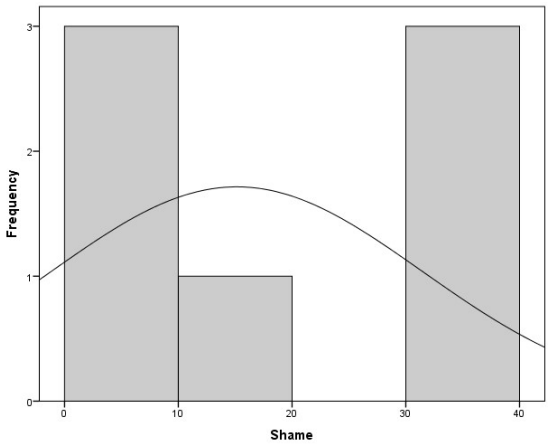


Figure FF.42. Shame scores for the control-IM group.



Associated Emotions: Anxiety

Figure FF.43. Anxiety scores for the PTSD-IM group.

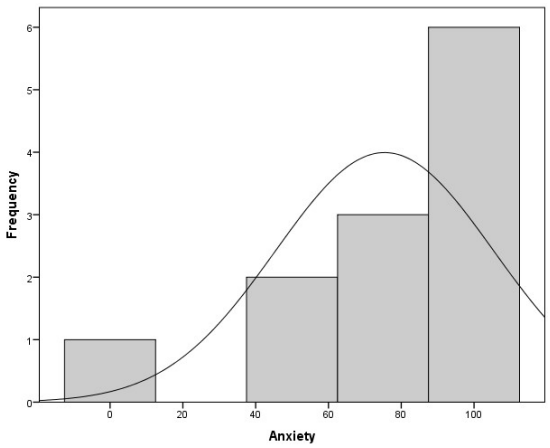


Figure FF.44. Anxiety scores for the depressed-IM group.

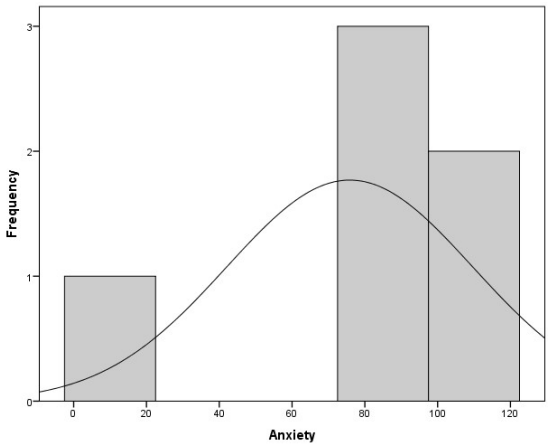
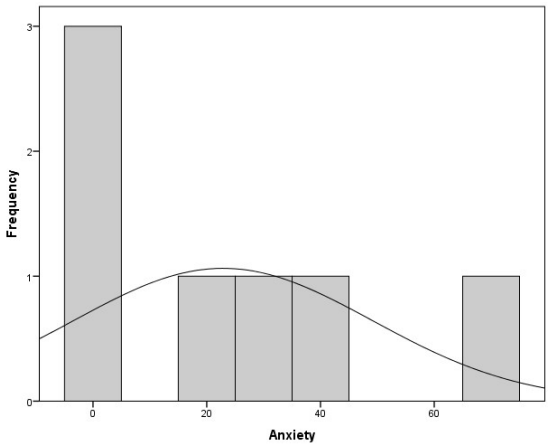


Figure FF.45. Anxiety scores for the control-IM group.



Distress

Figure FF.46. Distress ratings for the PTSD-IM group.

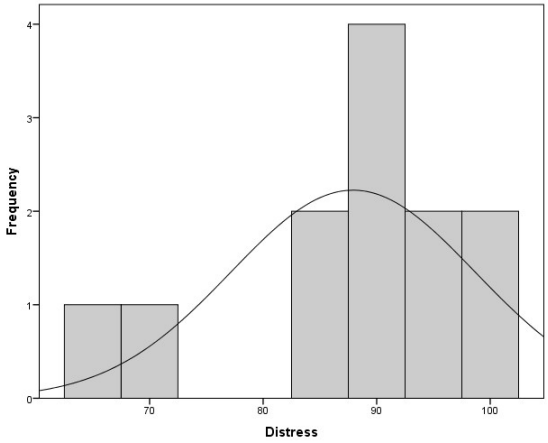


Figure FF.47. Distress ratings for the depressed-IM group.

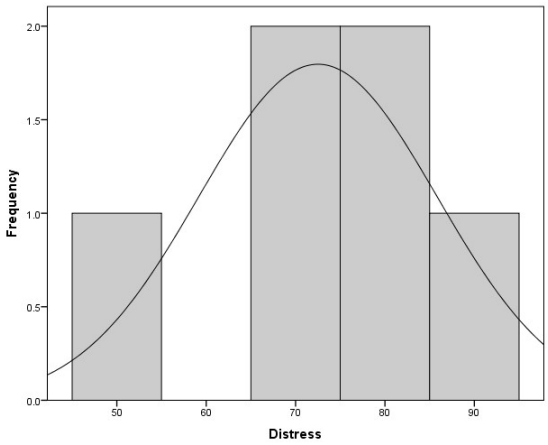
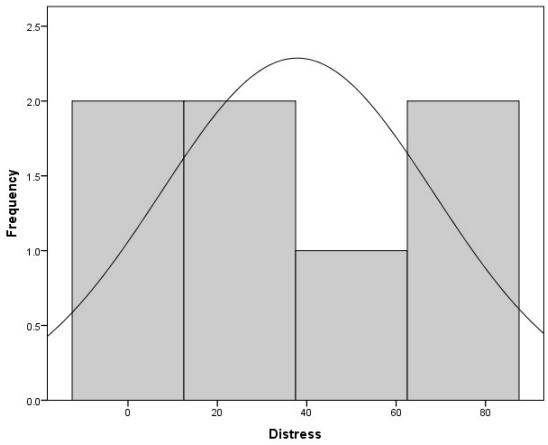


Figure FF.48. Distress ratings for the control-IM group.



Appraisals: Total Score

Figure FF.49. Total appraisals scores for the PTSD-IM group.

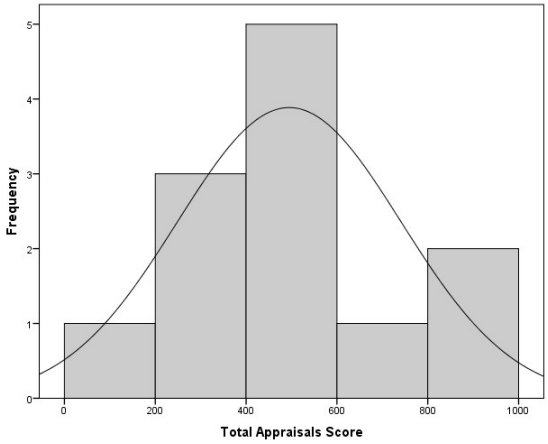


Figure FF.50. Total appraisals scores for the depressed-IM group.

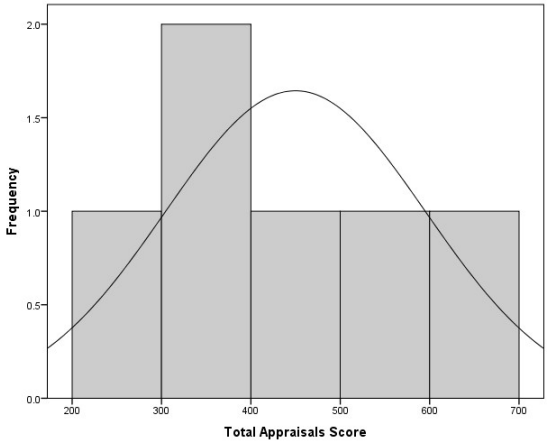
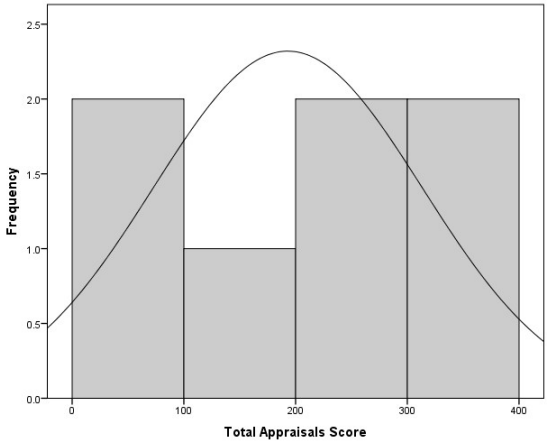


Figure FF.51. Total appraisals scores for the control-IM group.



Appraisals: Control

Figure FF.52. Control appraisal scores for the PTSD-IM-group.

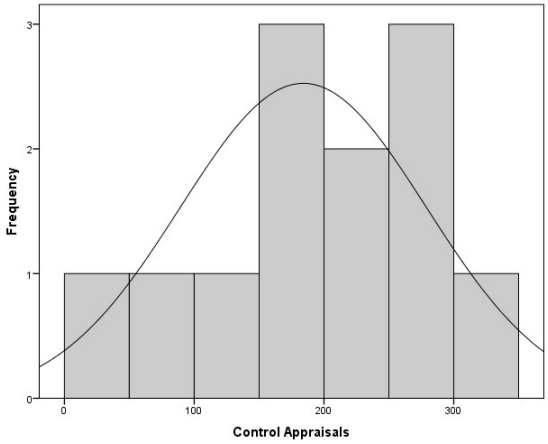


Figure FF.53. Control appraisal scores for the depressed-IM-group.

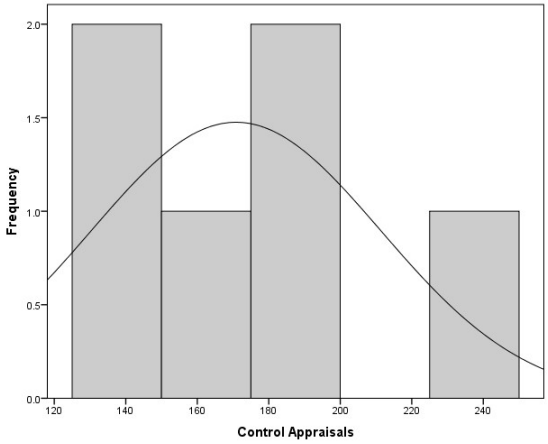
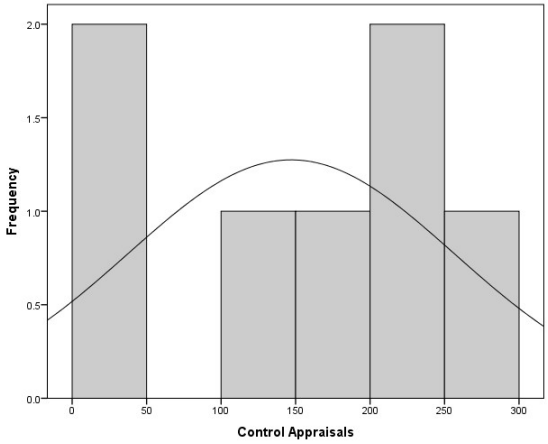


Figure FF.54. Control appraisal scores for the control-IM-group.



Appraisals: Psychological Abnormality

Figure FF.55. Scores for appraisals of psychological abnormality for the PTSD-IM-group.

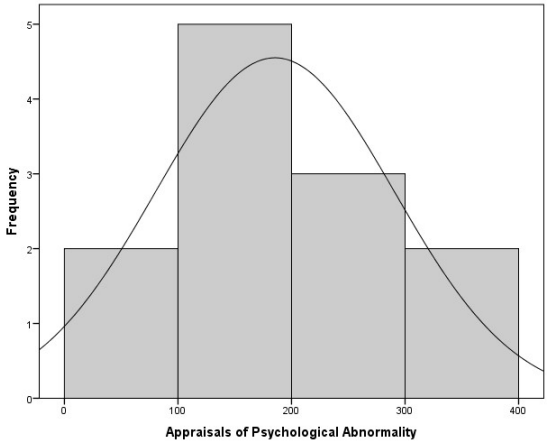


Figure FF.56. Scores for appraisals of psychological abnormality for the depressed-IM-group.

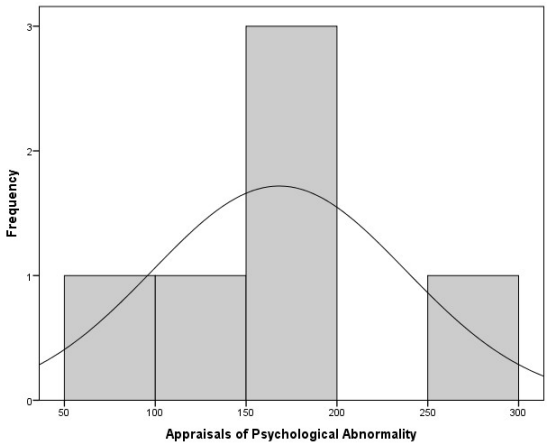
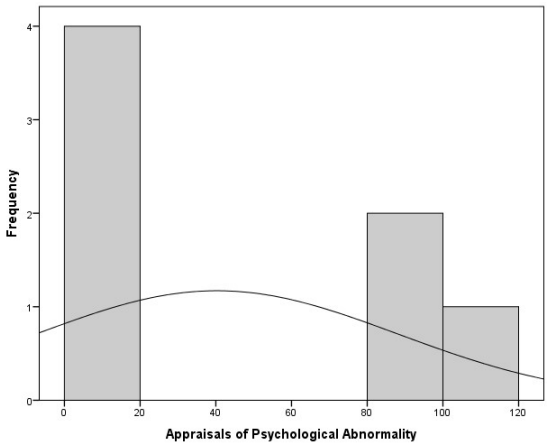


Figure FF.57. Scores for appraisals of psychological abnormality for the control-IM-group.



Appraisals: Negative Self-Evaluation

Figure FF.58. Scores for appraisals of negative self-evaluation for the PTSD-IM-group.

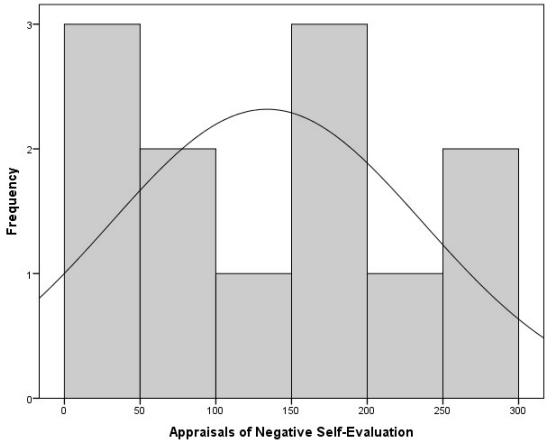


Figure FF.59. Scores for appraisals of negative self-evaluation for the depressed-IM-group.

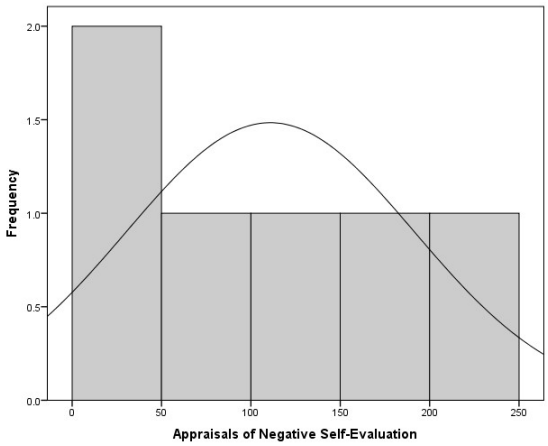
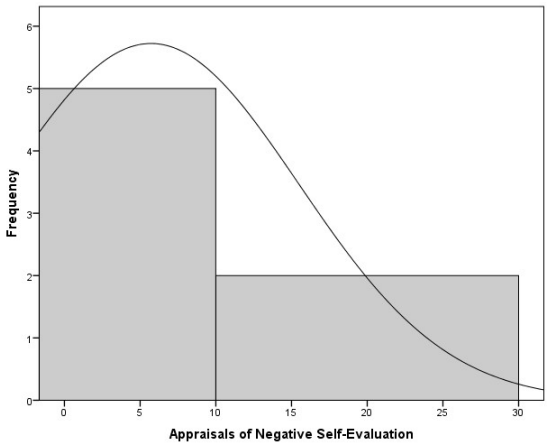


Figure FF.60. Scores for appraisals of negative self-evaluation for the control-IM-group.



Thought Control Strategies: Effectiveness of Rumination

Figure FF.61. Perceived effectiveness of rumination for the PTSD-IM-group.

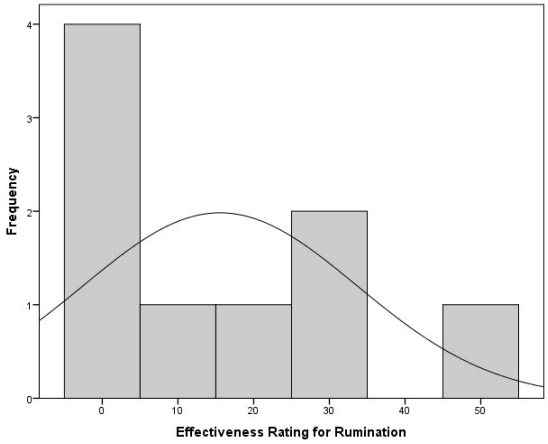


Figure FF.62. Perceived effectiveness of rumination for the depressed-IM-group.

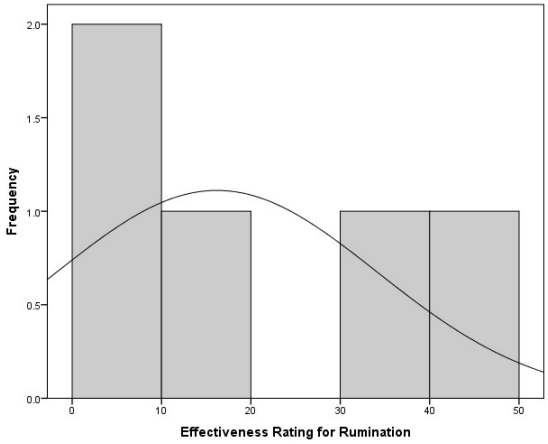
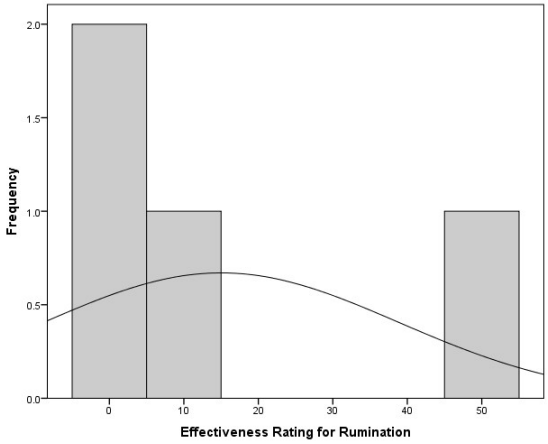


Figure FF.63. Perceived effectiveness of rumination for the control-IM-group.



Thought Control Strategies: Effectiveness of Suppression

Figure FF.64. Perceived effectiveness of suppression for the PTSD-IM-group

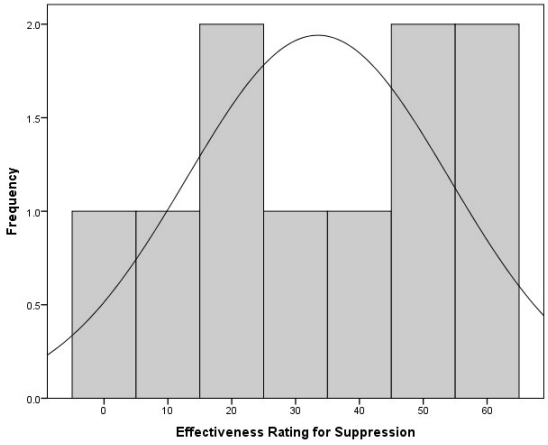


Figure FF.65. Perceived effectiveness of suppression for the depressed-IM-group

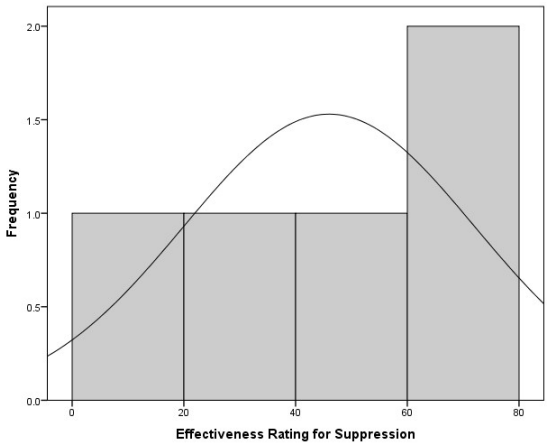
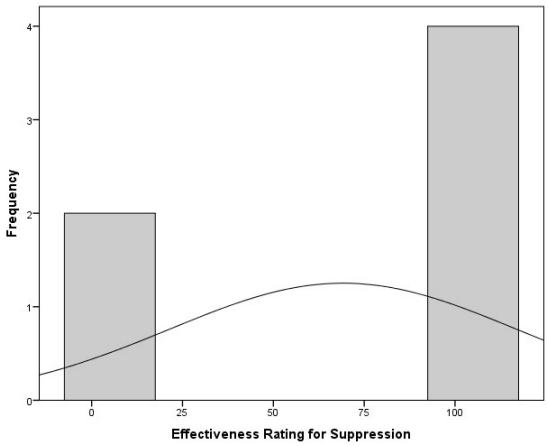


Figure FF.66. Perceived effectiveness of suppression for the control-IM-group



Thought Control Strategies: Effectiveness of Distraction

Figure FF.67. Perceived effectiveness of distraction for the PTSD-IM-group

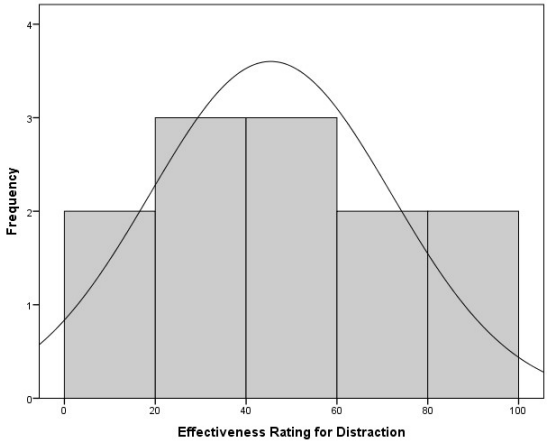


Figure FF.68. Perceived effectiveness of distraction for the depressed-IM-group

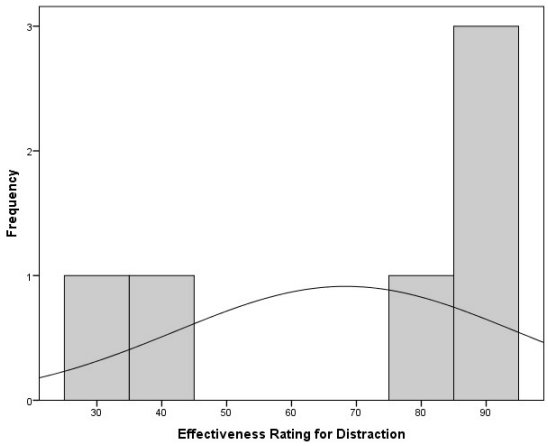
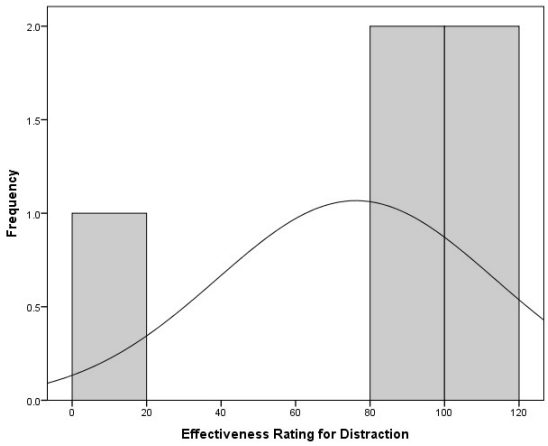


Figure FF.69. Perceived effectiveness of distraction for the control-IM-group



Thought Control Strategies: Effectiveness of Thought Replacement

Figure FF.70. Perceived effectiveness of thought replacement for the PTSD-IM-group

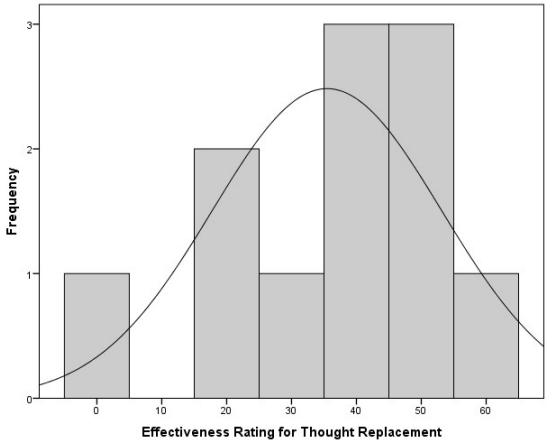


Figure FF.71. Perceived effectiveness of thought replacement for the depressed-IM-group

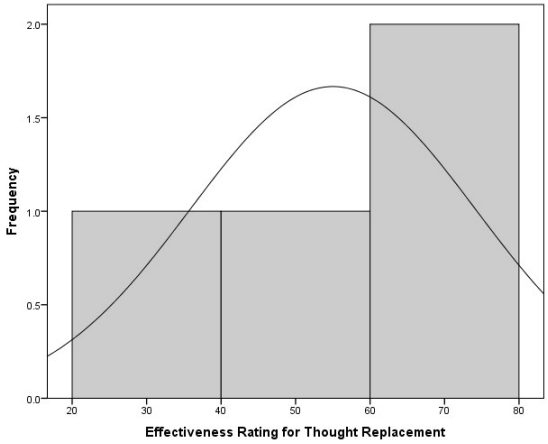


Figure FF.72. Perceived effectiveness of thought replacement for the control-IM-group