UNIVERSITY OF LIVERPOOL

Pathways to Unusual Sensory Perceptions

Christy Laganis

Supervised by:

Professor Rhiannon Corcoran

Professor William Sellwood

Advisors:

Professor John Read

Dr Eleanor Longden

Professor David Bernstein

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Christy

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Thesis Overview

This thesis considers the role of childhood adversity upon developing psychotic like experiences (PLEs). It contains two separate papers, a systematic review and a cross-sectional empirical paper. Both papers consider specific associations between types of childhood adversity experiences and PLEs in clinical and non-clinical populations.

Chapter 1 explores whether bullying was associated with hallucinations and/or paranoia in clinical and non-clinical populations. PLEs, including experiences of hallucinations and paranoia, are believed to exist upon a continuum (van Os, Linscott, Myin-Germeys, Delespaul, & Krabbendam, 2009). The impact of childhood adversity on PLEs has been examined extensively within the literature (Bendall, Jackson, Hulbert, & McGorry, 2008; Bendall, Jackson, & Hulbert, 2010; Matheson, Shepherd, Pinchbeck, Laurens, & Carr, 2013; Morgan & Fisher, 2007; Read, Os, Morrison, & Ross, 2005; Schafer & Fisher, 2011; Varese et al., 2012). However, the role of bullying is less commonly discussed. Furthermore, the underlying psychological mechanisms underpinning hallucinations and paranoia are hypthosised to differ, suggesting specific associations between bullying and these experiences need to be considered (Bentall et al., 2014).

The systematic review synthesises the findings from 10 quantitative studies. It concludes that bullying was associated with hallucinations and paranoia. Heterogeneity amongst studies makes it difficult to draw conclusions which are generalisable. Implications for further research and clinical practice are discussed.

Chapter 2 goes on to explore the underlying psychological mechanisms underpinning specific associations between different types of childhood adversity. The relationships between childhood adversity (emotional, physical and sexual abuse,

emotional and physical neglect, bullying and cyberbullying), adversity experienced as an adult (emotional, physical and sexual abuse), aspects of dissociation (depersonalisation, absorption and amnesia) and hallucination-proneness were explored. The role of depersonalisation and absorption in mediating the relationship between childhood adversity (emotional, physical, and sexual abuse) and hallucination-proneness was considered by using path analysis. Snowballing methods on social media and advertisements on the Hearing Voices Network (www.hearing-voices.org), Intervoice: The International Hearing Voices Network (www.intervoiceonline.org) and the University of Liverpool's announcement page for staff and students were used to recruit participants. In total, 420 participants with complete data were included in the data analysis. The findings suggested significant positive relationships between childhood adversity, adversity experienced as an adult, dissociative experiences and hallucination-proneness. Depersonalisation and absorption significantly mediated the relationships between childhood emotional and sexual abuse with hallucination-proneness, when controlling for adversity experienced as an adult. Childhood physical abuse was not directly related to hallucination-proneness and was not mediated by dissociative experiences. This paper concludes that there are specific associations between childhood emotional and sexual abuse with hallucination-proneness. Both depersonalisation and absorption appear to be important mechanisms underpinning these relationships. It is suggested that practitioners working with people experiencing hallucinations should consider and explicitly enquire about experiences of adversity and dissociation and apply relevant components to therapy.

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Chapter 1: Systematic Review

Bullying and its Specific Association with Hallucinations and/or Paranoia: A Systematic Review

Christy Laganis

Abstract

Bullying may be associated with clinical and sub-clinical symptoms of psychosis. The current study aimed to investigate whether bullying was specifically associated with hallucinations and/or paranoia in clinical and non-clinical samples. Searches were conducted in MEDLINE, PsycINFO, Scopus and Web of Science. The references of included papers were manually searched. Of 542 identified records, ten studies met the inclusion criteria. Findings suggested that bullying was associated with both hallucinations and paranoia. This was not consistent across studies and a number of methodological limitations were identified. The limited nature and heterogeneity amongst studies means that, at present, no definitive conclusions can be drawn.

Introduction

Several reviews and meta-analyses attempt to explore the nature and the magnitude of the association between childhood adversity and psychotic like experiences (PLEs), and disorders (Bendall, Jackson, Hulbert, & McGorry, 2008; Bendall, Jackson, & Hulbert, 2010; Matheson, Shepherd, Pinchbeck, Laurens, & Carr, 2013; Morgan & Fisher, 2007; Read, Os, Morrison, & Ross, 2005; Schafer & Fisher, 2011; Varese et al., 2012). The view that childhood adversity causes PLEs remains contestable due to the methodological issues associated with the research (Bendall et al., 2008; Morgan & Fisher, 2007). The most comprehensive meta-analysis to date concludes that childhood adversity substantially increases the risk of psychosis (OR= 2.78) and this remains significant when controlling for sociodemographic variables (Varese et al., 2012). These findings have been extended to schizotypy (a range of personality traits that places an individual at increased risk of developing psychosis; Velikonja, Fisher, Mason, & Johnson, 2015). Whilst existing research suggests that childhood adversity increases the risk of developing PLEs in clinical and non-clinical populations, it does not clarify which experiences of childhood adversity lead to what PLEs.

Most research to date has focused upon the role of childhood trauma (sexual, physical, and emotional abuse, and neglect) and PLEs, with the most attention paid to childhood sexual abuse (Bendall et al., 2008). Recently however, attention has focussed on other aspects of childhood adversity, which have not been accounted for in research on psychosis. In the United Kingdom, approximately half of young people report being bullied at some point, with approximately 145, 800 stating that this occurs on a daily basis (Ditch the Label, 2016). Bullying is associated with increased risk of suicidal ideation and behaviours (Brunstein Klomek et al., 2016; Holt et al.,

2015), the development of mental health difficulties and reduced general functioning (Sigurdson, Undheim, Wallander, Lydersen, & Sund, 2015). Considering the widespread problem of childhood bullying and its impact, it is plausible to suggest that bullying may be associated with PLEs.

The first meta-analysis of childhood adversity and psychosis found, based on six studies, that exposure to bullying is associated with an increased risk (OR= 2.39) of developing psychosis (Varese et al, 2012). This was almost identical to the OR for sexual abuse (2.38). Bebbington et al. (2004) found that this effect diminishes when controlling for exposure to other childhood adversities. A recent meta-analysis yielded a similar odds ratio for its impact upon the development of non-clinical psychotic symptoms (Van Dam et al., 2012). This association strengthens as the frequency, severity and duration of bullying increases (Lataster et al., 2006; Mackie, Castellanos-Ryan, & Conrod, 2011; Schreier et al., 2009). In an attempt to clarify the likelihood of causation, prospective studies suggest that, whilst the effect sizes vary amongst studies, bullying is associated with the subsequent development of PLEs (Cunningham, Hoy, & Shannon, 2015). These findings do not clarify whether the association between bullying and PLEs is due to a specific association, or as a result of dose-response relationships. Those who have experienced bullying may also be at increased risk of experiencing other adverse experiences and cumulatively these experiences may account for the development of PLEs.

Difficulties also arise in attempting to understand the scope and impact of bullying due to inconsistent definitions being employed. Researchers have recently attempted to operationalise bullying as “any unwanted aggressive behavior(s) by another youth or group of youths who are not siblings or current dating partners that involves an observed or perceived power imbalance and is repeated multiple times or

is highly likely to be repeated. Bullying may inflict harm or distress on the targeted youth including physical, psychological, social, or educational harm" (Gladden, Vivolo-Kantor, Hamburger, & Lumpkin, 2014, p. 7). Inconsistent definitions of bullying therefore cause difficulties in drawing definitive conclusions on the impact of bullying in developing PLEs as comparison amongst studies is difficult.

Hallucinations and paranoia often occur together, as well as with other psychotic symptoms, particularly in clinical populations (Nuevo, Van Os, Arango, Chatterji, & Ayuso-Mateos, 2013). However, hallucinations and paranoia also occur in isolation and are considered as transdiagnostic symptoms (Bentall, 2003; Daalman & Diederen, 2013; de Leede-Smith & Barkus, 2013). Specific associations between the types of symptoms and childhood adversities experienced have been observed (Sitko, Bentall, Shevlin, & Sellwood, 2014; Varese, Barkus, & Bentall, 2012; Velikonja et al., 2015). This highlights the value of exploring the specific association of bullying with both hallucinations and paranoia separately to help unearth the underlying psychological mechanisms which may be responsible for them.

Bentall et al. (2014) propose that childhood sexual abuse may be more implicated in the development of hallucinations, due to its impact upon source monitoring (capacity to discriminate between internal and external perceptions), and dissociation. Predisposition to paranoia is believed to occur as a result of childhood adversity and early insecure attachments that contribute to negative schemas about the self as vulnerable, and perceptions of others and the world as dangerous (Bentall et al., 2014; Freeman, 2007). Consistent with this, Wickham, Sitko and Bentall (2015) found that insecure attachment styles were specifically associated with paranoia in a clinical population and Sitko et al. (2014) found that insecure attachment styles mediated experiences of childhood neglect and paranoia in an USA population

sample. Due to the nature of bullying, it is likely to disrupt attachments with peers whereby they are perceived as threatening and the self is perceived as powerless and vulnerable. Psychological responses to sexual abuse may also induce insecure attachments in adulthood (Sitko et al., 2014). Bentall, Wickham, Shevlin, and Varese (2012) state that whilst associations between symptoms and the type of adversity may overlap, the potency of these associations vary.

As paranoia has been shown to be underpinned by experiences which cause attachment disruptions and create a negative view of the self and the world, it was hypothesised that paranoia would be associated with bullying, whereas the association between hallucinations and bullying was expected to be less potent and consistent. The aim of the present review was to systematically collate, and evaluate the evidence exploring the association between bullying with clinical and sub-clinical presentations of hallucinations, and/or paranoia to test these hypothesises. When reviewing the quality of the available literature, it was considered whether the analysis controlled for other symptoms of psychosis and types of adversity as they frequently co-occur and are risk factors for each other.

Method

Eligibility Criteria

Only reports published up until April 2016, with no start date restrictions, were included. Studies were included in this review if they met the following inclusion criteria: (a) an original research article in a peer reviewed journal; (b) full-text was available in English; (c) quantitative methodology; (d) childhood bullying was investigated; (e) hallucinations and/or paranoia in any group of individuals was measured and reported; and (f) the association between bullying and hallucinations, and/or paranoia was made explicit.

Studies were excluded if: (a) they were presented in a conference abstract or dissertation; (b) the full text was not available in English; (c) they were a literature review or a non-empirical paper; (d) there was no measure of bullying; or bullying was not analysed separately from an over-arching variable, e.g. childhood trauma; (e) bullying in adulthood and/or cyberbullying was only measured; and (f) there was no measure of hallucinations or paranoia; or they were not treated separately from an overall variable e.g. psychosis.

For the purposes of this review, adulthood is defined as aged 18 years and older. Hallucinations refer to perceptual experiences in the absence of external stimuli (Beck & Rector, 2003) and paranoia is defined as suspiciousness of threat to the self, ideas of reference and/or persecutory thoughts (Freeman et al., 2005). A working definition of bullying was employed as many studies fail to operationalise bullying. Bullying was defined by a perceived power imbalance by the victim in a face-to-face interaction amongst peers that was viewed as hostile and likely to be repeated. This caused the victim to experience distress.

The extent of the differences between face-to-face bullying and cyberbullying remain unknown (Dooley, Pyżalski, & Cross, 2009). Research has focussed upon the association between face-to-face bullying and symptoms of psychosis. Consequently studies that focussed upon cyberbullying were excluded. Qualitative studies were excluded as inferential statistics were required to objectively test the hypothesis posed.

Search Strategy

CL conducted the search in four databases: MEDLINE, PsycINFO, Scopus and Web of Science. The search in the Web of Science was restricted by field to the areas of psychiatry and psychology and the search in Scopus was restricted to social

sciences and humanities, and journals. The search in PsychINFO was also limited to academic journals. All searches were limited to English.

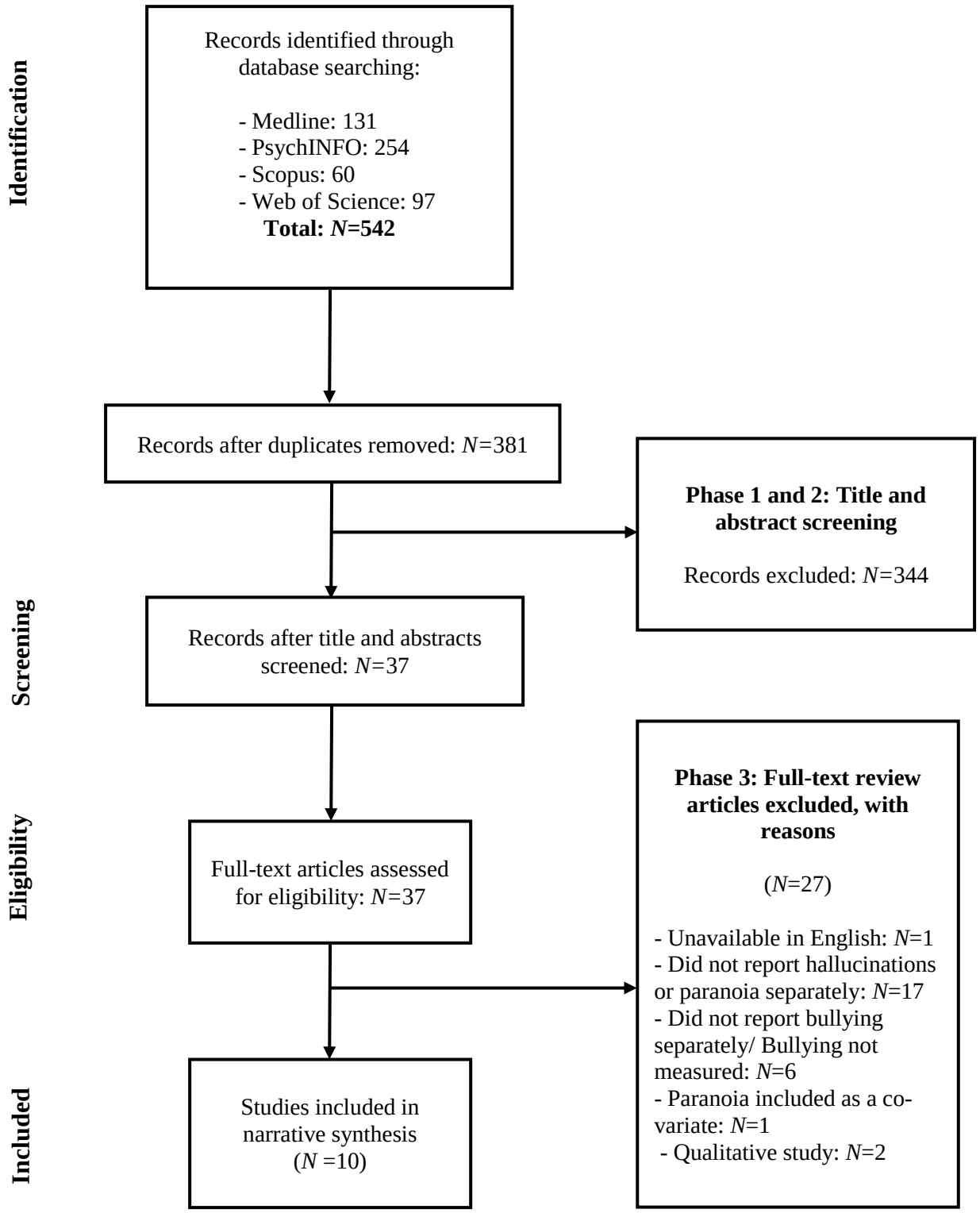
The following key word terms were used: *"bully*" OR, "bulli*"*, OR *"victimi*ation"*. Terms related to hallucinations and paranoia were also used: *"auditory hallucination*" OR, "hallucination*" OR, "hearing voice*" OR, "positive symptom*" OR, "paranoi*" OR, "delusion*"*, OR *"persecut*"*. The Boolean operator 'AND' was used to combine these groups. Searches within MEDLINE also employed Medical Subject Headings (MESH) and these were exploded for 'bullying' [psychology] and 'schizophrenia spectrum and other psychotic disorders'. Searches within PsycINFO also employed thesaurus terms and these were exploded for 'bullying' and 'psychosis and schizophrenia'.

Screening

Initially, searches generated 542 records representing 381 papers once duplicates were accounted for. Eligibility was assessed using a 3-stage procedure. Manuscript titles were first examined for relevance and abstracts were then screened for eligibility. The full texts of the remaining manuscripts were then read to check eligibility with the inclusion criteria. An adapted version of the Preferred Reporting Items for Systematic Reviews (PRISMA; Moher, Liberati, Tetzlaff, & Altman, 2009) depicts the review process (Figure 1).

Twenty-seven papers were deemed not to be eligible, leaving 10 papers to form the basis of this review. The references of these papers were hand searched by CL to identify further potential studies for inclusion. No further studies satisfying the inclusion criteria were identified.

Figure 1. Adapted Version of the PRISMA Diagram Showing the Process of the Systematic Review



Quality Assessment

Each study was quality assessed using an adapted version of the risk of bias tool (Appendix A). This was used in a review of self-harm in populations at risk of psychosis (Taylor, Hutton & Wood, 2015) and was previously adapted from the Agency for Healthcare Research and Quality (Williams, Plassman, Burke, Holsinger & Benjamin, 2010). Quality indicators consider the representativeness of the sample, the adequacy of the sample size, completeness of follow-up, measurement validity, and statistical conclusion validity. To improve the reliability, the lead author and another researcher (CL and SJ) rated each criterion independently. A scale of 'yes', 'no', 'partial', or 'unclear' was used. Brief reasons for ratings were noted. No attempt was made to assign a summary quality score as it is believed that this is not helpful and does not substantially influence the results (Williams et al., 2010). The researchers met to compare scoring and high levels of agreement were found (N = 115, 95.8%). Discrepancies were discussed until they were resolved.

Results

Description of Included Studies

Following the application of the inclusion criteria, 10 articles were included (Table 1). All were carried out in Western Europe within the past 13 years. Four explored the association of bullying with paranoia, one with hallucinations and five studies explored both phenomena. The time frames, in which experiences of paranoia and/ or hallucinations were considered, varied between studies. Ashford, Ashcroft and Maguire (2012) measured experiences of paranoia in the past month, whereas three studies considered experiences of paranoia and hallucinations within the past year (Bentall et al., 2012; Catone et al., 2015; Shevlin, McAnee, Bentall, & Murphy, 2015.

Valmaggia et al. (2015) also focussed upon state paranoia, an emotional response that was triggered by a virtual reality scenario, as opposed to trait paranoia, which is a more stable, consistent characteristic. Only three studies recruited participants from clinical populations. These participants had diagnoses of schizophrenia, social anxiety and those at risk of developing psychosis (Carvalho, da Motta, Pinto-Gouveia, & Peixoto., 2015; Lopes, 2013; Valmaggia et al., 2015).

Quality Assessment

Table 2 presents the results of the overall risk of bias quality assessment ratings. The most common methodological problems were related to the assessment of bullying, no matched control groups, justification of sample size and control of confounding variables in analyses. The measures used to assess experiences of bullying varied amongst studies. Whilst five studies focussed upon childhood experiences (Ashford et al., 2012; Bentall et al., 2012, Campbell & Morrison., 2007; Shakoor et al., 2015; Valmaggia et al., 2015), the remainder focussed upon lifetime experiences (Catone et al., 2015; Carvalho et al., 2015; Lopes., 2013; Morrison & Petersen., 2003; Shevlin et al., 2015). Valmaggia et al. (2015) expanded experiences of victimisation until the age of 18 years to denote childhood experiences, whereas the remainder focussed upon experiences up until the age of 16 years (Ashford et al., 2012; Bentall et al., 2012, Campbell & Morrison., 2007; Shakoor et al., 2015). Two studies explicitly focussed upon recent experiences of bullying amongst adolescents, although these varied in that Campbell and Morrison (2007) focussed upon experiences of bullying within the past academic term, whereas Shakoor et al. (2015) focussed upon experiences within the past academic year.

Definitions of bullying were generally not employed, with the exception of four studies (Campbell & Morrison, 2007; Carvalho et al., 2015; Lopes, 2013;

Valmaggia et al., 2015). The reliability and validity of measures were also questionable. Some studies employed single dichotomous questions to assess for the presence of victimisation and as such respondents may not select the answer which accurately portrayed their experience as differences between frequency, severity and duration of bullying were not considered. This may compromise construct validity and skew data (Bentall et al., 2012; Catone et al., 2015; Morrison & Petersen, 2003; Shevlin et al., 2015). This also makes comparison with the studies that employed continuum measures of bullying difficult.

Experiences were also determined by self-report measures and retrospective accounts of bullying. This is problematic as individuals prone to paranoia and hallucinations may be more vigilant for threat related material and more likely to recall information that is threat related. This may result in over-reporting experiences of bullying (Arseneault et al., 2011; Bentall & Kaney, 1995; de Leede-Smith & Barkus, 2013). However, memory biases have not been found amongst individuals with experiences of paranoia and hallucinations (Fisher et al., 2011; Taylor & John, 2004). This suggests that self-reports of bullying amongst people experiencing paranoia and hallucinations is as reliable as that expected of those who do not have these experiences.

No studies justified their sample size by providing a power calculation, and they frequently did not report the amount of missing data present or whether data assumptions were met for statistical analyses. Collectively, this makes it difficult to ascertain whether analyses were appropriate and may mean that studies were at risk of inflated Type II errors.

Five studies accounted for confounding variables (Ashford et al., 2012; Bentall et al., 2012; Catone et al., 2015; Shakoor et al., 2015; Shevlin et al., 2015).

Studies mainly adjusted for sociodemographic variables and only Bentall et al. (2012) controlled for co-occurring paranoia when measuring hallucinations and vice versa. Most studies failed to adjust for exposure to other adversities, symptoms of mental health difficulties and substance misuse. Dose-response relationships have been reported within the literature and those exposed to one type of adversity are at increased risk of exposure to others (Green et al., 2010; Varese et al., 2012). Symptoms also frequently co-occur alongside other symptoms and symptoms of anxiety and depression have previously been found to mediate the relationship between trauma and psychosis like symptoms (Fisher et al., 2012; Freeman & Fowler, 2009). The failure to control for these confounders means that the studies were at risk of inflated Type I errors, and caution should therefore be taken when interpreting the results.

Childhood Bullying

Hallucinations. Three studies considered childhood bullying and hallucinations (Bentall et al., 2012; Campbell & Morrison, 2007; Shakoor et al., 2015). Both, Campbell and Morrison (2007) and Shakoor et al. (2015) found that being bullied during childhood was related to experiences of hallucinations amongst adolescents (r = .29 and r = .18, respectively, p<.01). However, when predisposition to hallucinations was measured by an ambiguous stimuli, the relationship diminished to r = .09, ns (Campbell & Morrison, 2007). The bullied group also reported more experiences of hallucinations as measured by the LSHS-R (Launay & Slade, 1981) when compared to the non-bullied group (d = .56, p < .01), but once again this effect reduced when hallucinations were measured by the ambiguous stimuli (d = .26, p > .05; Campbell & Morrison, 2007).

Table 1

Characteristics of Included Studies

Study Number, Authors, Year & Country	Study Design	Sample Size and Participants	Sex (%)	Mean Age (Range) (Years)	Bullying Measure	Hallucinations/ Paranoia Measure
1. Ashford et al. (2012): United Kingdom	Cross-sectional	135 psychology undergraduate students	91.1 female; 8.9 male	19.8 (18-44)	Modified DIAS, with further modifications made by the authors.	Paranoia: GPTS
2. Bentall et al. (2012): United Kingdom[a]	Cross-sectional	7353 respondents from the 2007 British Adult Psychiatric Morbidity Survey	N.R.	N.R.	Question: "Looking at the card, could you tell me if you have ever suffered from any of these problems or events, at any time in your life?" and participants were presented with the card "Bullying". Participants were asked to select "more than 6 months ago", and "before the age of 16" alongside this.	Hallucinations: PSQ (Items 5 and 5a) Paranoia: PSQ (Items 3, 3a and 3b)

3. Campbell & Morrison (2007): United Kingdom	Cross-sectional	373 adolescents	56.3 female; 43.4 male	14.8 (14-16)	BVQ victimisation section	Hallucinations: LSHS-R auditory subscale and ambiguous stimuli. Paranoia: GPS
4. Carvalho et al. (2015): Portugal	Cross-sectional	64 members of the general population; 32 patients' relatives; 31 individuals diagnosed with paranoid schizophrenia (Azores islands); 30 individuals diagnosed with paranoid schizophrenia (Madeira islands); 30 individuals with paranoid schizophrenia in remission (Azores islands)	General population: 32.8 female; 67.2 male. Patients' relatives: 75.0 female; 25.0 male. Individuals diagnosed with paranoid schizophrenia (Azores islands): 35.5 female; 64.5 male. Individuals diagnosed with paranoid schizophrenia (Madeira islands): 100.0 female; 0 male. Individuals with paranoid schizophrenia in remission (Azores islands): 20.0 female; 80.0 male.	General population: 45.2 (N.R.). Patients' relatives: 55.6 (N.R.). Individuals diagnosed with paranoid schizophrenia (Azores islands): 41.5 (N.R.). Individuals diagnosed with paranoid schizophrenia (Madeira islands): 46.5 (N.R.). Individuals with paranoid schizophrenia in remission (Azores islands): 43.5 (N.R.).	BVQ (Portuguese version)	Paranoia: GPS (Portuguese version) and PC (Portuguese version)

5. Catone et al. (2015): United Kingdom[a]	Cross-sectional and Longitudinal	8580 and 7403 respondents from the 2000 and 2007 British Adult Psychiatric Morbidity Survey, respectively. T1= 2406 respondents from the 2000 British Adult Psychiatric Morbidity Survey	2000 Survey: 55.1 female; 44.9 male. 2007 Survey: 56.8 female; 43.2 male. T1= N.R.	2000 Survey: N.R. (16-74). 2007 Survey: N.R. (16-75+).	Participants were asked whether they had experienced any of the stressful events listed on a card: one of which was listed as "Bullying".	Hallucinations: PSQ (Items 5 and 5a) Paranoia: PSQ (Items 3, 3a and 3b)
6. Lopes (2013): Portugal	Cross-sectional	61 individuals with paranoid schizophrenia or social anxiety	34.4 female; 65.6 male	32.9 (N.R.)	Adapted version of BVQ victimisation section (Portuguese version)	Paranoia: Adapted PC (Portuguese version)
7. Morrison & Petersen (2003): United Kingdom	Cross-sectional	64 undergraduate students and warehouse operatives	87.5 female; 12.5 male	21.0 (18-59)	Trauma measure designed by the author	Hallucinations: LSHS-R
8. Shakoor et al. (2015): United Kingdom	Longitudinal	4826 twin pairs (36% MZ twin pairs)	55.0 female; 45.0 male	T0=11.6 (N.R.) T1=16.3 (N.R.)	MPVS	Hallucinations: SPEQ (9 items) Paranoia: SPEQ (15 items)
9. Shevlin et al. (2015): United Kingdom	Cross-sectional	3563 prisoners	24.5 female; 75.5 male	Modal age: 25-29 (N.R.)	Question, "Looking at the card, could you tell me if you have ever suffered from any of the problems or events shown on the card" and participants were	Hallucinations: Item from PSQ ("Did you at any time hear voices saying quite a few sentences when there was no one around that might

					presented with the card "Bullying".	account for it?") Paranoia: Item from PSQ ("Have you felt that a group of people was plotting to cause you serious harm?")
10. Valmaggia et al. (2015): United Kingdom	Cross-sectional	64 UHR participants; 43 HC participants	UHR: 40.6 female; 59.4 male. HC: 53.5 female; 46.5 male.	UHR: 22.6 (N.R.) HC: 24.0 (N.R.)	RBQ (primary and secondary school sections)	Paranoia: SSPS

Note. N.R.: Not reported; T0: Baseline; T1: Follow-up; MZ: Monozygotic twins; UHR: Ultra high risk for psychosis; HC: Healthy controls; Modified DIAS: Modified Direct and Indirect Aggression Scales (Owens, Shute, & Slee, 2000); GPTS: The Green et al. Paranoid Thought Scales (Green et al., 2008); PSQ: Psychosis Screening Questionnaire (Bebbington & Nayani, 1995); BVQ: The Bully/Victim Questionnaire (Olweus,1989; Portuguese version by Lopes & Pinto-Gouveia, 2005; Adapted Portuguese version by Lopes & Pinto-Gouveia, 2010, *in press*); LSHS-R: Revised Launay-Slade Hallucination Scale (Launay & Slade, 1981; Morrison, Wells, & Nothard, 2002); GPS: General Paranoia Scale (Fenigstein & Vanable, 1992; Portuguese version by Lopes, 2010); PC: The Paranoia Checklist (Freeman et al., 2005; Portuguese version by Lopes, 2010; Adapted Portuguese version by Lopes & Pinto-Gouveia, 2010, *in press*); MPVS: Multidimensional Peer Victimization Scale (Mynard & Joseph, 2000); SPEQ: Specific Psychotic Experiences Questionnaire (Ronald et al., 2014); RBQ: Retrospective Bullying Questionnaire (Schäfer et al., 2004); SSPS: State Social Paranoia Scale (Freeman et al., 2007).

[a] Both studies use data from the 2007 British Adult Psychiatric Morbidity Survey.

Table 2

Overview of Assessment of Study Methodological Quality

Authors	**Unbiased selection of cohort**	**Selection minimises baseline differences in demographic factors**	**Sample size calculation**	**Adequate description of the cohort**	**Validated method for assessing bullied status**	**Validated method for assessing hallucinations**	**Validated method for assessing paranoia**	**Outcome assessments blind to participants' exposure to bullying**	**Adequate follow-up**	**Missing data minimal**	**Analysis controls for confounders**	**Analytic methods appropriate**
Ashford et al. (2012)	Partial	N/A	No	Partial	Partial	N/A	Yes	N/A	N/A	Unclear	Partial	Partial
Bentall et al. (2012)	Yes	N/A	No	No	No	Partial	Partial	Unclear	N/A	Unclear	Partial	Yes
Campbell & Morrison (2007)	Partial	Partial	No	Partial	Partial	Partial	Yes	N/A	N/A	Unclear	No	Yes
Carvalho et al. (2015)	Partial	No	No	Yes	Partial	N/A	Yes	N/A	N/A	Unclear	No	Unclear
Catone et al. (2015)	Yes	N/A	No	Partial	No	Partial	Partial	Unclear	Yes	Unclear	Partial	Unclear
Lopes (2013)	Partial	No	No	Yes	No	N/A	Yes	Yes	N/A	Unclear	No	Unclear
Morrison & Petersen (2003)	No	Unclear	No	No	No	Yes	N/A	N/A	NA	Unclear	No	Yes
Shakoor et al. (2015)	Partial	N/A	No	No	Yes	Partial	Partial	N/A	Yes	Unclear	Partial	Yes
Shevlin et al. (2015)	Yes	N/A	No	Yes	No	Partial	Partial	No	N/A	Yes	Partial	Unclear
Valmaggia et al. (2015)	Partial	N/A	No	Partial	Yes	N/A	Yes	No	N/A	Unclear	No	Yes

Note. N/A: not applicable. *S*election minimises baseline differences in demographic factors only applies to studies with controlled/comparison groups. Sample size calculation, analysis controls for confounders, and analytic methods appropriate, only applies to studies with controlled/comparison groups and when studies test for predictors/correlates of paranoia/hallucinations. Outcome assessments blind to participants' exposure to bullying, only applies to studies that require participants to be interviewed. Adequate follow-up only applies to longitudinal studies

Non-linear relationships were found between the number of adverse events experienced and the likelihood of experiencing hallucinations (Bentall et al., 2012). Participants who had experienced three adverse events reported higher odds ratios (OR = 17.64, $p < .05$) than participants who had experienced four (OR = 13.68, $p < .05$; Bentall et al., 2012). This may suggest that it is the combination of the adverse events experienced during childhood that are important, rather than their cumulative effects. It is unclear whether experiences of bullying is part of a toxic combination, but when controlling for co-occurring paranoia and demographics, participants with experiences of childhood bullying were not considered at increased risk of hallucinations (OR = 1.56, $p > .05$; Bentall et al., 2012). Whilst not a significant independent predictor of auditory hallucinations (AH), experiences of bullying alongside post-trauma cognitions (about self $\beta = .21$ and the world $\beta = .15$, $p < .05$) significantly explained 16% of the variance of AH scores when it was controlled for (Campbell & Morrison, 2007). This suggests that negative beliefs about self and others were important in explaining the association between bullying and hallucinations.

Paranoia. Five studies considered childhood bullying and experiences of paranoia (Ashford et al., 2012; Bentall et al., 2012; Campbell & Morrison, 2007; Shakoor et al., 2015; Valmaggia et al., 2015). In three, childhood bullying was significantly related to experiences of paranoia, both during adolescence ($r = .24$ and $r = .26$; Campbell & Morrison, 2007; Shakoor et al., 2015) and adulthood (Ashford et al., 2012). As previously discussed small associations were also found with hallucinations. Shakoor et al's. (2015) findings suggest that the association between bullying and paranoia is modestly higher than the association between bullying and hallucinations, but Campbell & Morrison's (2007) findings suggest the opposite.

Ashford et al. (2012) found that the type of bullying experience related differently to the experience of paranoid thinking in adulthood. Indirect bullying (e.g. social exclusion), when compared with direct physical and verbal bullying, was most strongly related to ideas of social reference ($r = .44$, $p < .01$) and the least related to persecutory beliefs ($r = .33$, $p < .01$; Ashford et al., 2012). In contrast, direct physical bullying was the most strongly related to persecutory beliefs ($r = .43$, $p < .01$), and the least related to ideas of social reference ($r = .30$, $p < .01$; Ashford et al., 2012). Negative beliefs about self and others and depression were found to mediate the relationships between direct verbal and indirect bullying with paranoid thinking (Ashford et al., 2012). This suggests that negative affect and negative schemas mediate the relationship between bullying and paranoia. However, gender differences were not explored, which is a limitation, as males are known to experience more direct physical aggression than females (Card, Stucky, Sawalani, & Little, 2008).

In comparison to adolescents who had not been bullied, those who had, reported more experiences of paranoia ($d = .53$, $p < .01$; Campbell & Morrison, 2007). This effect size is similar to the effect size found for individuals who experienced bullying and hallucinations. Regardless of whether participants were at risk of psychosis or not, adults with experiences of childhood bullying were also more likely to experience state paranoia in response to a virtual reality scenario (Valmaggia et al., 2015). Victims and non-victims of prolonged bullying did not significantly differ on experiences of paranoia (Valmaggia et al., 2015). Bentall et al. (2012) found that childhood bullying did not significantly increase the risk of experiencing paranoia later in life, once controlling for demographic variables (OR = 1.32, $p > .05$). The odds of developing paranoia was modestly lower when compared to the odds of developing hallucinations, however both results were insignificant.

Experiences of bullying significantly explained 57% of the variance of paranoia alongside post-trauma cognitions (about self β = .31 and the world β = .27, p < .001) and positive metacognitive beliefs about paranoia (Campbell & Morrison, 2007). However, experience of bullying was not a significant independent predictor (Campbell & Morrison, 2007). This suggests that negative beliefs about self and the world, as well as beliefs endorsing paranoia as a survival strategy are important in explaining the association between bullying and paranoia. Similar to hallucinations, non-linear relationships were found between the number of adverse events experienced and the likelihood of experiencing paranoia (Bentall et al., 2012). In contrast with the findings of hallucinations, participants who had experienced four or more adverse events reported the highest odds ratios (OR = 16.46, p < .05; Bentall et al., 2012). However, participants who had experienced two adverse events reported higher odd ratios than those who experienced three, when controlling for co-occurring hallucinations and demographics (Bentall et al., 2012).

Lifetime bullying

Hallucinations. Three studies considered lifetime bullying and hallucinations (Catone et al., 2015; Morrison & Petersen, 2003; Shevlin et al., 2015). With Bonferroni corrections applied to control for multiple comparisons, participants with experiences of lifetime bullying were not deemed more predisposed to AH or visual hallucinations (Morrison & Petersen, 2003). Amongst prisoners, experiences of both sexual abuse and bullying were found to increase the likelihood of AHs only, when controlling for other risk and trauma variables (OR = 2.37 and OR = 1.72, respectively, p < .05; Shevlin et al., 2015). However, Shevlin et al. (2015) did not control for co-occurring symptoms of psychosis and mood variables. Similar risks for the likelihood of hallucinatory experiences in the context of lifetime bullying were

also found, when controlling for other risk and trauma variables, amongst respondents to the 2000 and 2007 British Adult Psychiatric Morbidity Surveys (OR = 1.89 and OR = 1.63, respectively, $p < .01$; Catone et al., 2015). Amongst a subsample of 2406 respondents in the 2000 survey, a further 68 participants who had not initially reported hallucinatory experiences, then reported them at 18-month follow-up (Catone et al., 2015). Thus, the risk of developing hallucinations increased by 2.84 times if participants had been bullied (Catone et al., 2015). However, this diminished and was no longer significant when controlling for other traumas (OR = 1.37, $p > .05$; Catone et al., 2015). In addition, bullying also did not significantly predict the maintenance of hallucinatory experiences at follow-up (Catone et al., 2015).

Paranoia. Four studies considered lifetime bullying and paranoia (Catone et al., 2015; Carvalho et al., 2015; Lopes, 2013; Shevlin et al., 2015). Whilst, Carvalho et al. (2015) found that total BVQ scores were significantly related to non-clinical and clinical measures of paranoia, the size of these relationships were limited ($r = 0.29$ and $r = 0.37$ respectively). Participants with psychotic disorders also reported similar experiences of victimisation and perpetration of bullying as non-clinical ones (Carvalho et al., 2015). Interestingly, when compared with participants with social anxiety, participants with paranoid schizophrenia reported significantly more experiences of bullying (Lopes, 2013). Independent of diagnosis, victims of bullying were also found to experience significantly more frequent ideas of reference and persecutory beliefs ($d = 1.00$), with greater conviction ($d = 1.04$) and associated distress ($d = 1.12$) than non-victims of bullying (Lopes, 2013).

Carvalho et al. (2015) support this because they found that cumulative experience of bullying predicted the frequency, conviction and distress of paranoia as opposed to the type of bullying endured (physical, verbal and indirect bullying;

Carvalho et al., 2015). Furthermore, whilst controlling for other risk and trauma variables, bullying was also found to increase the likelihood of paranoia in both the 2000 and 2007 British Adult Psychiatric Morbidity Surveys (OR = 2.04 and OR = 1.85, respectively, $p < .01$; Catone et al., 2015). This is slightly higher than the risks that were associated with the likelihood of developing hallucinations (Catone et al., 2015). Similar risks were also found amongst prisoners (OR = 1.99, $p < .05$) and once again this is modestly higher than the risks associated with hallucinations (Shevlin et al., 2015). Whilst violence experienced at home, and being a looked after child, also increased the likelihood of paranoia, sexual abuse did not (OR = 1.20, $p > .05$; Shevlin et al., 2015). However, sexual abuse, alongside bullying and being a looked after child, did increase the likelihood of experiencing co-occurring paranoia and hallucinations (Shevlin et al., 2015).

Amongst people who had not initially described experiences of paranoia in the 2000 survey, bullying victimisation increased the risk of developing paranoia at 18 month follow-up by 2.89 times (Catone et al., 2015). This was comparable to the odds of developing hallucination and as with hallucinations, this diminished and no longer remained significant when controlling for other traumas, and childhood sexual abuse (Catone et al., 2015). However, in contrast to hallucinations, bullying did significantly predict the maintenance of paranoia at follow-up (Catone et al., 2015).

Discussion

The aim of this review was to investigate the association of bullying with hallucinations and paranoia. Ten studies were identified for inclusion and only three studies utilised a clinical sample. This is surprisingly small, considering the abundance of reviews exploring childhood trauma and psychosis, and recent recommendations to consider symptoms of psychosis separately (Bentall et al., 2014).

The limited number of studies eligible for this review highlights the need for further research to investigate specific associations between bullying with hallucinations and paranoia, especially within clinical populations.

A number of studies suggested that bullying was associated with both hallucinations and paranoia (Bentall et al., 2014), and that people who experience hallucinations and/or paranoia had experienced more bullying than those who had not been bullied (Ashford et al., 2012; Campbell & Morrison, 2007; Carvalho et al., 2015; Catone et al., 2015; Lopes, 2013; Shakoor et al., 2015; Shevlin et al., 2015; Valmaggia et al., 2015). These findings remained significant when controlling for sociodemographic variables, other risk variables and trauma (Ashford et al., 2012; Catone et al., 2015; Shakoor et al., 2015; Shevlin et al., 2015). Non-significant associations between bullying and hallucinations were also reported (Campbell & Morrison, 2007; Catone et al., 2015; Morrison & Petersen, 2003). Whilst the majority of studies suggested a larger effect of the association between bullying and paranoia, these differences were modest and not consistent (Bentall et al., 2012; Campbell & Morrison, 2007; Catone et al., 2015; Shakoor et al., 2015; Shevlin et al., 2015). This refutes the hypothesis that bullying is more likely to be associated with paranoia. As results were not consistent across studies it is difficult to draw generalisable conclusions about specific associations between bullying with paranoia and hallucinations.

The expected association between bullying and paranoia was underpinned by the hypothesis that bullying is likely to be an attachment disrupting event. Consequently, this was expected to contribute to the development of negative beliefs about the self in conjunction with persecutory beliefs about others and the world (Freeman, 2007) and thus leading to paranoia. Findings do support that negative affect

and beliefs about self, others and the world have an explanatory role in the relationship between bullying and paranoia (Ashford et al., 2012; Campbell & Morrison, 2007). It therefore remains plausible that bullying is related to insecure attachments as individuals may become suspicious of others intentions and less trusting within relationships. Paranoia may therefore be perceived as a defence mechanism to avoid victimisation, regulate affect by protecting ones self-concept and enhance feelings of safety by attributing negative events to others, and increasing sensitivity to sources of threat (Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; MacBeth, Schwannauer, & Gumley, 2008). This suggests that paranoia is a defence strategy to maintain safety in the presence of perceived threats that are expected due to previous experiences of bullying.

As the findings highlighted that bullying was not specifically associated with paranoia, this mediation may extend to hallucinations. This, however, requires further empirical investigation. The indicated associations between hallucinations and bullying may also be because only one study controlled for co-occurring paranoia (Bentall et al., 2012). Hallucinations frequently co-occur with paranoia and the association between bullying and hallucinations may have occurred as consequence of the association between bullying and paranoia. Alternatively, these results may be due to problems with statistical power and the validity of measurements for hallucinations. Whilst the findings do suggest the association with bullying is not specific to paranoia, the limitations outlined above highlight that it is premature to make these conclusions as the findings may be accounted for by methodological limitations.

Summary

This is the first systematic review to assimilate the results from studies exploring the association between bullying with hallucinations and/or paranoia within clinical and non-clinical populations. Although the number of identified papers was limited, the field appears to be rapidly developing, with eight of these studies being published between 2012-2015. The heterogeneity amongst studies, including the diversity of populations, operationalisations of bullying, and the inconsistencies of the time-frame in which hallucinations and paranoia were explored prevented a statistical synthesis from being conducted. These limitations therefore pose challenges in concluding whether or not the association between hallucinations and bullying is less potent and consistent than the association with paranoia.

Adequate control groups were lacking and, cross-sectional designs were frequently employed. Consequently, it cannot be concluded that bullying leads to experiences of paranoia and/or hallucinations. Instead, this association may be due to bullies' ability to detect vulnerability within victims and they may subsequently select victims with mental health difficulties as they are more likely to tolerate victimisation (Sutton, Smith, & Swettenham, 1999; Turner, Finkelhor, & Ormrod, 2010). Therefore, causality cannot be established as it is plausible to suggest that the relationship is bidirectional, or individuals who experience hallucinations and/or paranoia, are prone to bullying.

Only four studies controlled for negative affect and/or exposure to other adversities (Ashford et al., 2012; Catone et al., 2015; Shakoor et al., 2015; Shevlin et al., 2015). The importance of negative affect has previously been discussed. Furthermore, amongst studies that explored it, other traumatic events and dose-response relationships were implicated with hallucinations and paranoia (Bentall et

al., 2012; Carvalho et al., 2015; Morrison & Petersen, 2003; Shevlin et al., 2015). As bullying frequently occurs in the context of other adversities, it may be that persistent exposure to adversity and its subsequent chronic activation of stress responses during childhood, cause structural brain changes and over-activity within the hypothalamic-adrenal-pituitary axis (Read, Perry, Moskowitz, & Connolly, 2001). This may contribute to heightened sensitivity towards stress and makes individuals prone to psychotic phenomena throughout their life (Read et al., 2001). Due to the collective inadequacy of studies to control for these confounders, it is unclear whether there is any benefit to paying attention to specific associations between bullying with paranoia and hallucinations. Instead, it may be more important to consider how cumulative experiences of adversity make individuals prone to PLEs.

Studies also did not consider the extent to which paranoid ideation occurred in the context of real threats of persecution. Therefore, the 'paranoia' identified may not be indicative of irrational fears. It is also unclear as to the extent to which the findings are generalisable to clinical populations as only three studies included clinical samples. Generalisability is also limited because the majority of studies did not employ a definition of bullying, nor did they consider the type of bullying, frequency, severity or duration. Studies exploring lifetime bullying also failed to distinguish between proximal and distal bullying. Consequently, it is premature to reach a conclusion regarding the association between bullying with hallucinations and/or paranoia.

Implications and Future Research

Further research exploring symptom specific associations with bullying is needed. In doing so, the methodological limitations of currently published findings should be addressed. Research should control for other experiences of adversity and

endeavour to consistently utilise measures of bullying which do not rely upon dichotomous responses and employ definitions. This should also include clinical populations, and bullying experienced as a child, and adult should clearly be differentiated. In doing so, this will enable the magnitude of the specific associations between bullying and paranoia to be compared with the associations between bullying and hallucinations and shed light upon whether there is value in enquiring about specific associations of adversity as opposed to the degree of adversity experienced. In the age of technology, it would be advantageous to consider whether associations extend to cyberbullying.

Whilst causality has not been established, the findings that experiences of bullying are associated with paranoia and hallucinations may help to inform early detection and intervention. This has been associated with improved outcomes for people with psychosis (ten Velden Hegelstad et al., 2012). Such strategies may be aimed at the micro-level or macro-level. Once bullying has been identified, young people could be provided with information and psychological support. Anti-bullying policies could help to reduce the incidence of bullying. This may help to decrease the likelihood of experiences of paranoia and hallucinations.

The findings also support the growing body of evidence that it is imperative to enquire about what has happened to people as opposed to believing that their experiences are a consequence of differences in biochemistry (Dillon, Johnstone, & Longden, 2012). Guidelines already exist which state that staff within mental health services should be trained and are expected to enquire about abuse (National Health Service, 2013). These findings suggest that staff should also be trained to enquire about experiences of bullying to facilitate disclosures and help service-users understand the emotional and psychological consequences of these experiences (e.g.

insecure attachments, negative views of the self and other). This can then be utilised to inform interventions to reduce the distress associated with paranoia and hallucinations.

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Chapter 2: Empirical Paper

Childhood Adversities and Hallucination-Proneness: The Mediating Role of Different Facets of Dissociation

For submission to the Journal of Child and Adolescent Trauma (Author Guidelines in Appendix B)

Abstract

Links between psychosis, dissociation and adversity have been identified previously. However, the level of specificity regarding these factors has been limited. Specific associations between childhood adversity (emotional, physical and sexual abuse) and hallucination-proneness were predicted to be mediated by two factors of dissociation (depersonalisation and absorption) in an opportunistic sample. Adversity as an adult was also controlled for. In total, 430 participants completed an online study measuring experiences of adversity in childhood and adulthood, dissociation and hallucination-proneness. Depersonalisation and absorption positively mediated the relationship between childhood emotional and sexual abuse and hallucination-proneness but childhood physical abuse did not appear to have a significant association with hallucination-proneness. Enquiring about experiences of childhood adversity and dissociation in people experiencing hallucinations may aid formulations. This can be used to inform subsequent interventions.

Keywords: Psychosis, hallucinations, trauma, childhood trauma, dissociation.

Introduction

Approximately 5-8% of the general population report psychotic-like experiences (PLEs; Van Os, Linscott, Myin-Germeys, Delespaul, & Krabbendam, 2009). These individuals represent a high-risk group for psychotic disorders (Hanssen, Bak, Bijl, Vollebergh, & Os, 2005; Welham et al., 2009). Psychosis and PLEs are therefore believed to operate on a continuum (Van Os et al., 2009). Childhood adversity has consistently been indicated as a risk factor for psychotic disorders and sub-clinical PLEs (Matheson, Shepherd, Pinchbeck, Laurens, & Carr, 2013; Read, Os, Morrison, & Ross, 2005; Varese et al., 2012; Velikonja, Fisher, Mason, & Johnson, 2015). Furthermore, revictimisation increases the likelihood that childhood sexual abuse is followed by psychosis (Bebbington et al., 2011). However, research is methodologically limited as it has utilised composite measures of childhood adversity and psychosis (Costello, 1992; Fisher et al., 2010). Critiques of this approach, state that further understanding of the symptom-specific associations underpinning the risks could help extrapolate who is at risk of developing PLEs and/or psychotic disorders and may help with the focus of interventions (Bentall et al., 2014). Therefore, understanding specific associations between types of childhood adversity and types of PLEs can inform strategies for early detection and intervention to improve recovery.

The traumagenic neurodevelopmental model proposes that sensitivity within the hypothalamic-adrenal-pituitary axis, abnormalities in neurotransmitter systems, and structural brain changes in response to chronic exposure to childhood adversity render individuals vulnerable to stress (Read, Perry, Moskowitz, & Connolly, 2001). This is believed to predispose individuals to PLEs and psychosis (Read et al., 2001).

Cognitive theories emphasise the role of negative schemata derived from traumatic experiences, and negative attributions of symptoms as culturally unacceptable, as the underlying mechanisms (Morrison, 2001; Morrison, Frame, & Larkin, 2003). These theories are complimentary to each other, and suggest that hyperarousal and dissociative disturbances confer a risk for psychosis and PLEs (Morrison et al., 2003; Read et al., 2001). This suggests that interventions which aim to reduce dissociation, hyperarousal and challenge the negative beliefs associated with adversity can help to reduce the risk of developing PLEs.

Dissociation is defined as a "disruption of the usually integrated functions of consciousness, memory, identity or perception of the environment" (American Psychiatric Association, 2000, p. 811). Dissociation has consistently been indicated in the mediation of childhood adversity and psychosis or PLEs (Cole, Newman-Taylor, & Kennedy, 2016; Evans, Reid, Preston, Palmier-Claus, & Sellwood, 2015; Perona-Garcelan et al., 2012a, 2014; Varese, Barkus, & Bentall, 2012). Bentall et al. (2014) propose due to its capacity to induce dissociation and its impact upon source monitoring (capacity to discriminate between internal and external perceptions), childhood sexual abuse may be more implicated in the development of hallucinations. However, dissociation also mediates the relationship between childhood neglect and emotional abuse on hallucination-proneness in both clinical and non-clinical participants (Varese et al., 2012). This suggests that childhood sexual abuse, childhood emotional abuse and childhood neglect are likely to induce dissociative experiences. Consequently, individuals who have experienced these adversities are more likely to experience hallucinations.

It has been argued that dissociation has distinct subtypes occurring for different reasons (Holmes et al., 2005). Detachment-type dissociation refers to an

altered state in consciousness whereby there is a lack of grounding to one's body (as in out-of-body experiences), sense of self (as in depersonalisation) and external world (as in derealisation; Holmes et al., 2005). Compartmentalisation-type dissociation refers to an inability to control actions or cognitive processes usually amenable to such control, and whilst principally still intact, may disrupt mnemonic functioning (Vogel, Braungardt, Grabe, Schneider, & Klauer, 2013). Exploration of the factor structure of the Dissociative Experience Scale-II (DES-II; Carlson & Putnam, 1993), a popular measure of dissociation, supports this view. It generally yields factors distinguishable as derealisation/depersonalisation (detachment) and amnesia (although limited, an example of compartmentalisation; Holmes et al., 2005). However, a third factor of absorption is also sometimes yielded from the DES-II, depending upon the sample under investigation. This refers to the tendency to become immersed in thoughts and experiences (Holmes et al., 2005). It is therefore important to consider whether the association between childhood adversity and PLEs is specific to detachment-type dissociation, compartmentalisation-type dissociation and/or absorption as this will have different implications for interventions.

Whilst studies have not routinely differentiated the type of dissociation investigated, evidence has accumulated to suggest that detachment-type dissociation, rather than compartmentalisation, is responsible for the association between childhood adversity and hallucinations in clinical and non-clinical samples (Humpston et al., 2016; Kilcommons & Morrison, 2005; Perona-Garcelan et al., 2008, 2012a, 2012b, 2013, 2014; Vogel et al., 2013). Dissociation as a result of trauma is believed to result in detachment from one's inner and outer reality (Allen, Coyne, & Console, 1997). This suggests that detachment-type dissociation impairs reality-testing and can lead to severe confusion, disorganisation and disorientation, and consequently renders the

individual prone to hallucinations (Allen et al., 1997). However, Cole et al. (2016) found that depersonalisation (detachment) did not mediate the relationship between childhood adversity and hallucination-proneness, whilst absorption did. This suggests that absorption mediates the relationship between childhood adversity and hallucinations.

Many studies have highlighted the role that absorption has in the relationship between childhood adversity and hallucinations (Humpston et al., 2016; Perona-Garcelan et al., 2013, 2014; Pilton, Varese, Berry & Bucci, 2015). However, several others suggest it does not (Kilcommons & Morrison, 2005; Perona-Garcelan et al., 2008, 2012a, 2012b). Allen et al. (1997) suggest the role of absorption is dependent upon its relationship with detachment, as to become absorbed in one facet of experience means to become detached from other aspects. The role of absorption is therefore unclear and it is unknown if it independently mediates the relationship between childhood adversity and hallucinations when detachment is controlled for. Collectively the evidence has led to some authors to conclude that psychosis is "traumatic in origin and dissociative in kind" (Moskowitz, Read, Farrelly, Rudegeair, & Williams, 2009, p. 322).

In summary, the role of detachment-type dissociation has clearly been observed in the relationship between childhood adversity and clinical and sub-clinical symptoms of hallucinations, whilst the role of absorption is less clear. The extent to which the association between different types of childhood adversity and hallucinations might be related to detachment-type dissociation also remains unclear. Furthermore, the literature does not consider the differences in the degree of dissociation between those who have and have not experienced adversity as an adult. This is important to consider as later abuse may compound the consequences of

earlier abuse and is potentially a confounder (Chiu et al., 2015). Thus, adulthood trauma may sustain or exacerbate the effect of childhood adversity on subsequent dissociation and hallucinations.

This study aims to examine how the factors from the DES-II relate to types of childhood adversity and hallucination-proneness in a clinical and non-clinical sample. The hypothesis was that childhood adversity would be related to dissociative processes and hallucination-proneness. A model was tested which hypothesised that childhood emotional, sexual and physical abuse would predict the occurrence of all the dissociative processes and hallucination proneness, whilst controlling for the co-variance with each other and adversity experienced as an adult. It was predicted that these relationships would be mediated by both depersonalisation and absorption.

Method

Participants

Eligibility to take part was based upon being; 18 years and older, ability to consent, proficient in English and no identified organic pathology (e.g. traumatic brain injury). Participants who did not meet the inclusion criteria were excluded. The final sample consisted of 430 participants but 10 participants had missing data and were removed from the analysis. This is arguably appropriate as the total loss of cases is below 5%. Consequently, the bias and loss of power as a result was minimal (Graham, 2009).

The mean age for the total sample was $M = 33.55$, $SD = 11.69$. Table 3 provides an overview of demographic information.

Table III

Summary of Demographic Information

Demographics		*N*	%
Sex	Male	72	17.1
	Female	348	82.9
Ethnicity	White	381	90.7
	Other	39	9.3
Marital status	Single	141	33.6
	Married	88	21.0
	Civil partnership	7	1.7
	In a relationship	164	39.0
	Divorced	16	3.8
	Other	4	1.0
Employment	Employed	209	49.8
	Unemployed	58	13.8
	Student	125	29.8
	Other	28	6.7
Educational attainment	Low education	25	6.0
	Mid education	129	30.7
	High education	266	63.3
Diagnosed with a mental health problem	Yes	189	45.0
	No	231	55.0
Currently in receipt of treatment	Yes	162	38.6
	No	258	61.4

Note. Employed refers to full-time/part-time/self-employment; Unemployed refers to out of work/voluntary work; Low education refers to no qualifications/GCSE's or their equivalents; Mid education refers to A- Levels/vocational qualifications or their equivalents; High education refers to graduate/post graduate qualifications.

Measures/Materials

Demographic information. (Appendix C)

Age, gender, ethnicity, marital status, educational attainment, employment status, personal history of mental health problems and whether or not participants

were currently involved with mental health services or receiving treatment for a mental health problem were recorded.

The childhood trauma questionnaire (CTQ; Bernstein & Fink, 1998).

The CTQ is a 28-item self-report measure which retrospectively assesses emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect. Respondents indicate the frequency of each item using a five-point Likert scale ("never" = 1 to "very often" = 5). The total of each scale is calculated and can range from 5-25. Three items assess denial of negative childhood experiences. Good internal consistency was found for all scales in the present study and ranged from from .87 for the physical abuse subscale to 0.97 for the sexual abuse subscale.

Participants were also asked an additional two questions to assess experiences of bullying: "I was harassed or bullied by peers in person" and cyberbullying during childhood: "I was harassed or bullied by peers though technology or communication devices".

Adversity experienced as an adult (designed by the authors). (Appendix D)

This was designed to measure the type and frequency of adversity experienced since the age of 16 years old. The measure consists of three items to assess experiences of emotional abuse: "I believe I have been emotionally abused", physical abuse: "I believe I have been physically abused" and sexual abuse: "I believe I have been sexually abused". Respondents indicate the frequency of each item using a five-point Likert scale ("never" = 1 to "very often" = 5).

The Dissociative Experiences Scale- 2nd version (DES-II; Carlson & Putnam, 1993). (Appendix E)

This is a 28-item self-report questionnaire measuring the frequency of dissociation. Participants indicate the frequency of the time they experience each item

by selecting a number between 0 and 100%. Three factors have been found in several studies with general population, student, and clinical samples (Holmes et al., 2005). These are depersonalisation/derealisation, absorption and dissociative amnesia. The DES-II has good test-retest reliability, internal reliability and acceptable convergent and predictive validity (Carlson & Putnam, 1993; van Ijzendoorn & Schuengel, 1996). Item 27 (Some people sometimes find that they hear voices inside their head that tell them to do things or comment on things that they are doing) was excluded from the analysis because it overlapped with hallucination-proneness. Excellent internal consistency was found in the present study for depersonalisation/derealisation (α = .93), absorption (α = .89) and dissociative amnesia (α = .91).

The revised Launay-Slade hallucination scale (LSHS-R; Bentall & Slade, 1985). (Appendix F)

The LSHS-R is a 12-item self-report measure of clinical as well as sub-clinical auditory and visual hallucinations. Respondents indicate the extent to which each item applies to them using a five-point Likert scale (1= "certainly does not apply'' to 5 = "certainly applies'') which provides a total of 0-48. Good internal consistency was found in the present sample (α = .89).

Procedure

Ethical approval was provided by the University of Liverpool (Appendix G). The study was advertised electronically on the Hearing Voices Network (www.hearing-voices.org), Intervoice: The International Hearing Voices Network (www.intervoiceonline.org) and the University of Liverpool's announcement page for staff and students with another research project (Appendix H). All questionnaires were completed online via Qualtrics (www.qualtrics.com). A snowballing method on Facebook and Twitter was also utilised. All potential participants were provided with

an information sheet (Appendix I) for the study before consent to participate was obtained (Appendix J). Participants were advised of the sensitive nature of the study and reminded that they could withdraw at any time, prior to submitting their data. At the end of the study participants were presented with a debrief sheet (Appendix K), which signposted them to support services to obtain further support if it was required. Participants were also provided with the opportunity to enter a prize draw to win 1 of 6 £25 Amazon vouchers.

Data Analysis

None of the measured variables were found to be normally distributed (skew and/or kurtosis *z* scores > 1.96). Logarithmic and square root transformations were unable to normalise every variable's distribution to within acceptable limits. Consequently, non-parametric tests were employed. Descriptive and correlational analyses were undertaken in SPSS v. 22 (IBM Corporation., Armonk, NY, USA) and subsequent path analysis in AMOS v. 22 (IBM Corporation., Armonk, NY, USA).

Several methods for completing mediation analysis exist (e.g. Baron & Kenny, 1986; Preacher & Hayes, 2008). Manifest variables were of primary concern within the models. Consequently, path analysis was selected over structural equation modelling, which requires large sample sizes due to the inclusion of latent variables (Wolf, Harrington, Clark, & Miller, 2013).

Bias corrected bootstrapping was employed. This estimates indirect point effects and 95% confidence intervals (BC 95% CIs). The literature suggested employing this with 10,000 resamples (Hayes & Scharkow, 2013; Mallinckrodt, Abraham, Wei & Russell, 2006). It does not depend on parametric assumptions and enables the inclusion of multiple mediators simultaneously (Fox, 2008; Preacher & Hayes, 2008). The Bollen-Stine (Bollen & Stine, 1992) bootstrap adjusted *p* value

was used to assess overall model fit based on the chi-square statistic. A Bollen-Stine *p*-value >.05 indicates a good fitting model. Model fit was also assessed by using the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). For a model to be regarded as an acceptable fit, RMSEA values of ≤.06 are recommended (Hu and Bentler, 1999) and a CFI value of >.95 suggests a good model. AMOS does not routinely provide separate indirect effects via a single mediator. These were computed using user-defined estimands (manually inputted syntax to compute the product of the regression weights for the variables under investigation).

Results

Descriptive Statistics and Correlations

In total 355 (84.5%) participants had experienced at least some type of childhood adversity and 199 (47.4%) participants had experienced physical, emotional and/or sexual abuse as an adult.[1] Table 4 shows the numbers and percentage of participants who experienced each type of childhood and adulthood adversity. In total 194 participants reported that they had experienced adversity both as a child and adult (46.2%). The correlations for the measures of different types of adversities, facets of dissociation and hallucination-proneness are represented in Table 5. This shows that aside from the relationship between experiences of cyberbullying with child physical abuse (r_s = .08, p = .10), child emotional neglect (r_s = .05, p = .34), adult emotional abuse (r_s = .08, p = .11) and adult physical abuse (r_s = .08, p =

[1] Participants were classified as experiencing childhood adversity if they met the low (to moderate) cut off score on any subscale on the Childhood Trauma Questionnaire (Bernstein & Fink, 1998) and/or they indicated that they had been bullied in any way by stating this was at least 'sometimes true'. Participants were classified as experiencing adversity as an adult if they indicated that it was at least 'sometimes true' that they had experienced physical, emotional or sexual abuse since the age of 16 years.

.10), all types of adversity were significantly positively correlated with each other and displayed significant positive correlations with dissociative experiences and hallucination-proneness. Furthermore, all of the factors of dissociation were significantly positively correlated with hallucination-proneness.

Table IV

Frequency of Adversity Experienced

Type of adversity experienced	Frequency (% of total sample)
Child emotional abuse	254 (60.5)
Child physical abuse	112 (26.7)
Child sexual abuse	162 (38.6)
Child emotional neglect	247 (58.8)
Child physical neglect	174 (41.4)
Childhood bullying	237 (56.4)
Childhood cyberbullying	43 (10.2)
Adult emotional abuse	182 (43.3)
Adult physical abuse	71 (16.9)
Adult sexual abuse	92 (21.9)

Note. $N = 420$.

Table V

Means, Standard Deviations, and Correlations for Adversity Experienced as a Child and Adult, Dissociation and Hallucination-Proneness

	M	*SD*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. CTQ total	47.29	20.26	-														
2. Emotional abuse	11.87	5.86	.91**	-													
3. Physical abuse	7.22	3.97	.65**	.58**	-												
4. Sexual abuse	8.70	6.33	.66**	.48**	.44**	-											
5. Emotional neglect	11.73	5.39	.87**	.77**	.48**	.41**	-										
6. Physical neglect	7.77	3.50	.78**	.65**	.42**	.45**	.69**	-									
7. Bullying	2.75	1.34	.42**	.46**	.27**	.26**	.38**	.32**	-								
8. Cyberbullying	1.37	.84	.12*	.15**	.08	.13**	.05	.11*	.34**	-							
9. DES-II total	21.17	18.80	.45**	.47**	.28**	.32**	.31**	.34**	.25**	.16**	-						
10. Depersonalisation	15.64	22.42	.46**	.47**	.26**	.32**	.34**	.38**	.25**	.19**	.80**	-					
11. Absorption	29.43	22.26	.38**	.41**	.26**	.29**	.26**	.28**	.21**	.17**	.94**	.68**	-				
12. Amnesia	11.88	17.89	.39**	.42**	.25**	.31**	.24**	.29**	.24**	.13**	.84**	.62**	.76**	-			
13. LSHS-R total	20.03	11.94	.42**	.45**	.25**	.34**	.32**	.29**	.27**	.14**	.64**	.61**	.61**	.50**	-		
14. Adult emotional abuse	2.36	1.39	.64**	.67**	.40**	.39**	.54*	.49**	.38**	.08	.41**	.45**	.39**	.32**	.45**	-	
15. Adult physical abuse	1.57	1.08	.46**	.43**	.44**	.35**	.35**	.39**	.28**	.08	.33**	.36**	.31**	.28**	.33**	.58**	-
16. Adult sexual abuse	1.72	1.27	.51**	.42**	.33**	.61**	.33**	.39**	.24**	.10*	.33**	.38**	.29**	.29**	.39**	.52**	.48**

N = 420. Correlations represent Spearman's r. * $p \leq .05$; ** $p \leq .01$

Path Analysis

Whilst simultaneously controlling for the effect upon each other, the DES-II subscales of depersonalisation and absorption were hypothesised to mediate the relationship between the types of adversity experienced as a child and hallucination-proneness. Adversity experienced as an adult was also controlled for.

The model fit indices suggest that the hypothesised model (Figure 2) adequately fits the data; χ^2 (1) = 3.21, p = .07; CFI = 1.00, RMSEA = .07. Path and associated maximum likelihood and bootstrap SEs/CIs are presented in Table 6.

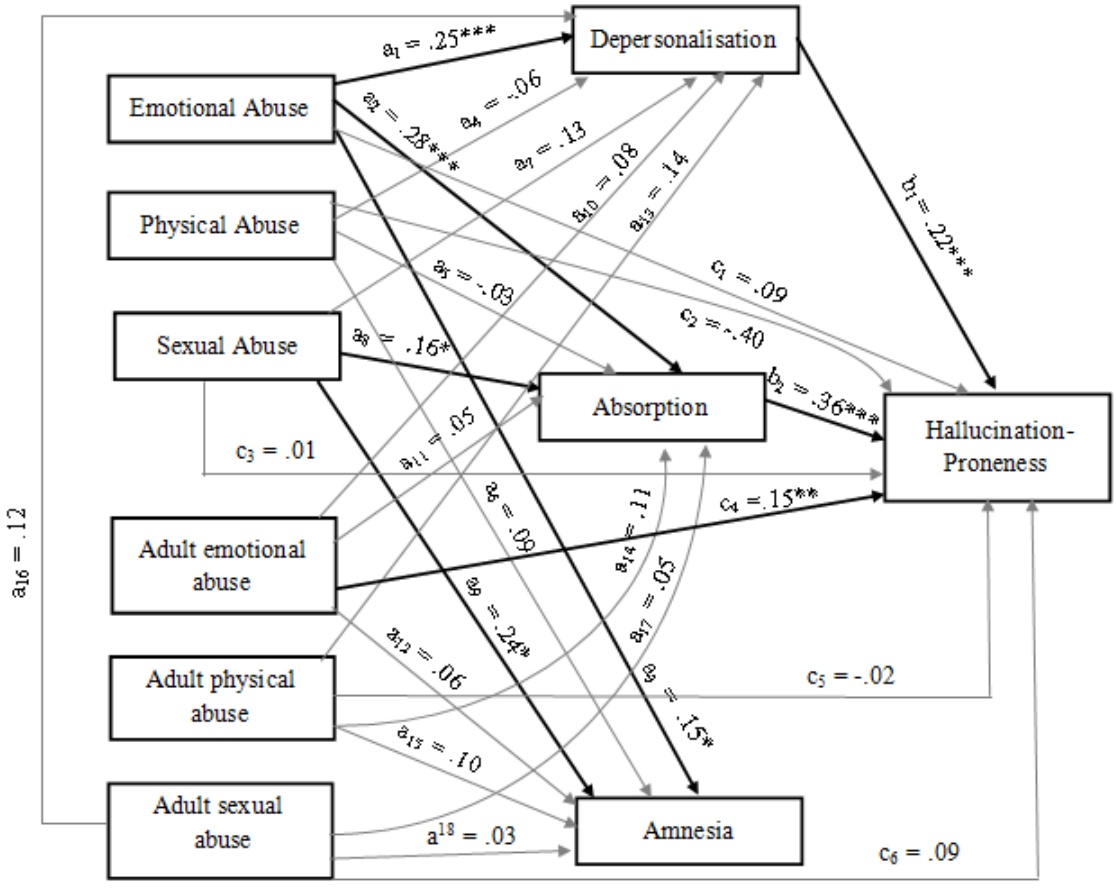

Figure 2. Graphical Representation of the Model. The hypothesised model explores the relationship between types of adversity experienced (childhood emotional, sexual and physical abuse and emotional, physical and sexual abuse experienced as an adult) and hallucination-proneness via the mediating variables of depersonalisation and absorption. For simplicity error terms have been omitted. All exogenous variables

were correlated with each other and error terms were correlated as appropriate i.e. all of the factors of dissociation error terms (depersonalisation, absorption and amnesia) were correlated with each other. Estimates shown are standardised betas (β). Significance levels were established via bootstrapped CIs (10,000 resamples). A bootstrapped Chi square test indicated an adequate model fit, $\chi 2$ (1) = 3.21, p = .07; CFI = 1.00, RMSEA = 0.07.

Table VI

Path Estimates for Model (figure 2)

Path	Estimate		SE of *b*		Bootstrap 95% CIs *b*		Boostrap 95% CIs β	
	b	β	ML	Bootstrap	Lower	Upper	Lower	Upper
Direct path estimates								
a_1	.96***	.25	.25	.28	.42	1.50	.11	.38
a_2	1.07***	.28	.26	.30	.50	1.67	.13	.43
a_3	.47*	.15	.20	.22	.05	.92	.02	.29
a_4	-.06	-.01	.33	.42	-.89	.75	-.15	.14
a_5	-.18	-.03	.34	.39	-.94	.57	-.16	.11
a_6	.41	.09	.27	.43	-.45	1.24	-.10	.29
a_7	.47	.13	.21	.27	-.05	1.01	-.01	.28
a_8	.55*	.16	.22	.25	.07	1.04	.02	.30
a_9	.67**	.24	.18	.24	.21	1.16	.07	.40
a_{10}	1.29	.08	1.01	1.08	-.88	3.38	-.05	.21
a_{11}	.77	.05	1.05	1.15	-1.58	2.92	-.10	.19
a_{12}	.78	.06	.83	.91	-.96	2.61	-.08	.20
a_{13}	2.94	.14	1.21	1.67	-.36	6.24	-.02	.30
a_{14}	2.35	.11	1.26	1.54	-.79	5.27	-.04	.26
a_{15}	1.68	.10	.99	1.50	-1.24	4.61	-.08	.28
a_{16}	2.10	.12	1.07	1.33	-.40	4.84	-.02	.27
a_{17}	.88	.05	1.11	1.34	-1.57	3.67	-.09	.20
a_{18}	.47	.03	.88	1.15	-1.67	2.88	-.13	.20
b_1	.12***	.22	.03	.03	.05	.18	.10	.34
b_2	.20***	.36	.03	.03	.14	.26	.25	.48
c_1	.18	.09	.12	.12	-.05	.41	-.02	.20
c_2	-.12	-.40	.15	.15	-.41	.17	-.13	.06
c_3	.019	.01	.10	.10	-.17	.22	-.09	.12
c_4	1.25**	.15	.46	.50	.27	2.24	.03	.26
c_5	-.26	-.02	.56	.63	-1.49	.99	-.14	.09
c_6	.88	.09	.49	.50	-.08	1.87	-.01	.20
Indirect path estimates								
a_1b_1	.11***	.06	-	.04	.04	.21	.02	.10

a_4b_1	-.01	-.00	-	.05	-.11	.10	-.03	.03
a_7b_1	.06*	.03	-	.04	-.00	.15	.00	.08
$a_{10}b_1$	.15	.02	-	.14	-.08	.48	-.01	.06
$a_{13}b_1$	.34*	.03	-	.22	-.00	.88	.00	.08
$a_{16}b_1$	.25	.03	-	.18	-.02	.72	-.00	.08
a_2b_2	.21***	.10	-	.07	.10	.36	.05	.17
a_5b_2	-.04	-.01	-	.08	-.19	.11	-.06	.04
a_8b_2	.11*	.06	-	.05	.02	.22	.01	.12
$a_{11}b_2$	.15	.02	-	.23	-.32	.59	-.04	.07
$a_{14}b_2$	.46	.04	-	.32	-.12	1.15	-.01	.10
$a_{17}b_2$	.17	.02	-	.27	-.30	.78	-.03	.08

N = 420. ML = maximum likelihood estimation. Probability values determined on bootstrapped CIs (10,000 resamples)
* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Direct relationships.

Childhood emotional abuse significantly predicted depersonalisation (βa_1 = .25, p = .001), absorption (βa_2 = .28, p < .001), amnesia (βa_3 = .15, p < .05) but not hallucinations (βc_1 = .09, p = .11). Absorption and amnesia were both significantly predicted by childhood sexual abuse (βa_8= .16, p < .05; βa_9 = .24, p < .01) but depersonalisation was not (βa_7 = .13, p = .08). Childhood physical abuse did not significantly predict any of the factors of dissociation (βa_4 = -.01, p = .90; βa_5 = -.03, p = .65; βa_6 = .09, p = .35). Hallucination-proneness was significantly predicted by depersonalisation (βb_1 = .22, p = .001), absorption (βb_2 = .36, p < .001) and adult emotional abuse (βc_4 = .15, p = .01) but not by childhood physical and sexual abuse (βc_2 = -.40, p = .43; βc_3 = .01, p = .82).

Indirect relationships.

Depersonalisation significantly mediated the relationship between childhood emotional abuse and hallucinations (βa_1b_1 = .06, p = .001), childhood sexual abuse and hallucinations (βa_7b_1 = .03, p = .05), and adult physical abuse and hallucinations ($\beta a_{13}b_1$ = .03, p = .05). Absorption significantly mediated the relationship between childhood emotional abuse and hallucinations (βa_1b_2 = .10, p < .001), and childhood

sexual abuse and hallucinations ($\beta a_7 b_2 = .06$, $p < .05$). This suggests that depersonalisation and absorption mediates the relationship between childhood emotional and sexual abuse with hallucinations.

Discussion

These findings show that experiences of adversity are associated with experiences of dissociation and hallucinations in this data set. This is consistent with previous research which has shown that childhood adversity is a risk for developing psychotic disorders and PLEs (Matheson et al., 2013; Read et al., 2005; Varese et al., 2012; Velikonja et al., 2015). In terms of specific adversities, all types of childhood adversity (emotional, physical, and sexual abuse, emotional and physical neglect, bullying and cyberbullying) were associated with hallucination-proneness. The strongest relationships were found for emotional ($r_s = .45$, $p < .001$) and sexual abuse ($r_s = .34$, $p < .001$). Whilst any experience of adversity may increase the likelihood of hallucination-proneness, individuals who have experienced childhood emotional and sexual abuse may be more prone to hallucinations.

The model indicated a good fit to the data when depersonalisation and absorption, rather than amnesia, were hypothesised as mediators between childhood sexual abuse and hallucination-proneness. This supports the hypothesis that there is a specific association between childhood sexual abuse and hallucinations because dissociative experiences are employed as a defence strategy in response to childhood sexual abuse (Bentall et al., 2014). However, Varese et al. (2012) found that dissociation mediated the relationship between both childhood sexual abuse and emotional abuse with hallucination-proneness. The present study's findings also suggest a specific association between childhood emotional abuse and hallucination-

proneness and show this was positively mediated by depersonalisation and absorption. This compliments findings that detachment-type dissociation, rather than compartmentalisation, is responsible for the association between childhood adversity and hallucinations (Humpston et al., 2016; Kilcommons & Morrison, 2005; Perona-Garcelan et al., 2008, 2012a, 2012b, 2013, 2014; Vogel et al., 2013). As a consequence of childhood sexual and emotional abuse, individuals may be more likely to experience dissociation which then renders them vulnerable to experience hallucinations. For example, individuals may detach from the experiences of childhood sexual and emotional abuse. Whilst this may be an adaptive strategy to help cope with these experiences at the time, in the long term, this may lead to a lack of connection to the self and others. Therefore, when traumatic memories do intrude into consciousness as a consequence of not being encoded, they may be experienced as a hallucination.

Childhood physical abuse was found not to be significantly directly or indirectly related to hallucinations. Therefore, individuals who experience childhood physical abuse, in the absence of childhood sexual and emotional abuse, do not appear to be more vulnerable to these dissociative experiences or hallucinations.

Allen et al. (1997) suggests that depersonalisation may be more relevant in clinical symptoms of hallucinations. This is supported by Cole et al. (2016) who found that the relationship between childhood adversity and hallucination-proneness was mediated by absorption, rather than depersonalisation in a non-clinical population. This suggests that the degree of depersonalisation or absorption experienced in response to childhood adversity determines the severity of hallucination-proneness. Both depersonalisation and absorption (independent to its association with depersonalisation) were found to be mediators in the current study.

However, this study included participants with both clinical and sub-clinical symptoms of hallucinations. It is therefore unclear whether both absorption and depersonalisation underpin the association between childhood emotional and sexual abuse with hallucination-proneness in both clinical and non-clinical populations. Consequently, future research would benefit from exploring whether the current findings are replicated in homogenous samples of clinical and non-clinical presentations of hallucinations.

High levels of adversity were observed (84.5% had experienced at least one type of childhood adversity). Whilst it is difficult to compare rates of childhood adversity amongst studies, the rates of adversity reported within this study appear to be higher than previous reports within the general population (Freeman & Fowler; Kessler et al., 2010) and amongst participants with a psychotic disorder studies (Bonoldi et al., 2013). In total there were 231 participants who were not diagnosed with a mental health problem in the current study. Amongst participants who were not diagnosed with a mental health problem, 75.8% had experienced at least one type of childhood adversity, whereas 95.2% of participants diagnosed with a mental health problem had. Thus, the difference in findings may be attributable to the combination of differences in assessment and criteria of childhood adversity, the population under investigation and the use of social network sites such as Twitter to advertise the study. Those with an interest in these experiences may be more likely to go on to advertise and complete the study. This should be considered when interpreting the findings.

Limitations and Future Directions

This study adds to the current body of research investigating the underlying mechanisms of PLEs. It expands upon previous research by mapping out the

relationship between specific types of adversity and hallucination-proneness, whilst simultaneously considering the contribution of dissociation resulting from adverse experiences in adulthood. As individuals who experience childhood adversity are prone to experience adversity as an adult, it was important to control for this. Failure to do so may have provided results which depicted dose-response associations as opposed to specific-associations between childhood adversity, dissociative experiences and hallucination-proneness.

Demographic variables and mental health diagnosis were not controlled for. The large prevalence of childhood adversity may be because individuals with these experiences are more motivated to complete studies of this nature. However, the large prevalence may have been as a consequence of utilising low threshold cut off scores on the CTQ to detect the frequency of adversity experienced. This was to increase the chances of detecting experiences of adversity. Whilst, the specificity of these scores (false identification) are reported as acceptable, the likelihood of false-positives are increased via their use (Bernstein & Fink, 1998). Furthermore, these estimates are based upon women in a non-clinical sample and therefore in the absence of further information, a degree of caution is warranted when interpreting these findings.

Furthermore, the sample largely consisted of white, educated females and may not be generalisable to males from other ethnic backgrounds. Future research would benefit from minimising bias and differences in baseline characteristics.

The cross-sectional nature of the study design means that it cannot be concluded that experiences of childhood sexual and emotional abuse preceded dissociative experiences and hallucinations. Therefore, causality cannot be inferred. A retrospective self-report measure of childhood adversity was utilised and whilst concerns have previously been expressed that individuals with PLEs are susceptible to

over report threat-related information, findings do not support this claim (Hardt & Rutter, 2004). Instead, retrospective self-report measures of adversity have been shown to be reliable and valid measures amongst individuals with PLEs (Fisher, Craig, & Fearon, 2011).

Variables previously found to mediate the relationship between childhood adversity and hallucinations were not included in the models e.g. negative affect (Bebbington et al., 2011; Bentall et al., 2014), metacognitive beliefs, self-concept clarity (Evans, Reid, Preston, Palmier-Claus, & Sellwood, 2015) and anxious attachment style (Sitko, Bentall, Shevlin, & Sellwood, 2014). Therefore, the results from this study may have occurred as a consequence of the association of dissociation with these variables e.g. childhood sexual and emotional abuse may have led to emotional dysregulation and in the absence of secure relationships to provide comfort and model effective coping, individuals may have employed dissociative defences to cope, which subsequently rendered them vulnerable to hallucinations. Future research should therefore attempt to control for these variables in order to provide confidence that dissociative experiences mediate associations, as opposed to being related to other variables which are mediators. Furthermore, further research is needed to establish the effects of specific dissociative processes upon other types of childhood adversity factors (e.g. childhood emotional and physical neglect, bullying) and PLEs.

Whilst the measures for bullying, cyberbullying and experiences of adult adversity appear to have face validity, they are single item measures, and may lack reliability and construct validity.

Clinical Implications

Although causation cannot be inferred from the study's findings, taken alongside previous research, they suggest that hallucinatory experiences are trauma

related. This lends support to current appeals for trauma-informed services in the United Kingdom (Sweeney, Clement, Filson, & Kennedy, 2016). This calls for a paradigm-shift in mental health services, whereby service-users' distress is not pathologised. Instead, it is viewed as an understandable reaction, to what has happened to them. The findings therefore add further weight to the guidance that clinicians should be trained to sensitively enquire and respond to disclosures of abuse (Read, Hammersley & Rudegeair, 2007). In doing so, meaning can be derived from experiences, which may help to facilitate connection to trauma related information and thus reduce detachment. Interventions that promote safety, containment and grounding can help to facilitate this process by reducing dissociation (Myrick, Chasson, Lanius, Leventhal, & Brand, 2015) and subsequently, distress associated with hallucinatory experiences.

Psychosocial rather than pharmacological interventions appear best placed to facilitate this. Investment in social interventions, aimed at preventing and identifying childhood adversity may also help to reduce the incidence of PLEs by offering early intervention and adaptive coping mechanisms to prevent the long term utilisation of dissociation as a coping mechanism in children that have had these experiences.

To conclude, this is the first study to explore the mediating effect of aspects of dissociation on the specific associations between psychotic experiences and forms of childhood adversity when controlling for adversity experienced as an adult. Specific associations between childhood emotional and sexual abuse and hallucination-proneness were found. Depersonalisation and absorption were mediators of this association. Future research would benefit from replicating these findings in homogenous samples of healthy and clinical participants, whilst also controlling for co-occurring PLEs.

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Chapter 3: APPENDICES

Appendix A: Quality Assessment Tool

Quality assessment tool adapted from Taylor, Hutton & Wood. (2015)

Quality of observational studies

General instructions: Grade each criterion as 'Yes,' 'No,' 'Partially,' or 'Unclear.' Factors to consider when making an assessment are listed under each criterion. Note that some criteria will only apply to specific types of study. For example, power calculations are relevant for studies aiming to compare experiences of paranoia and/or hallucinations between two groups, or studies that look at correlates of paranoia and/ or hallucinations within those who have experienced bullying. However, power calculations are not relevant in an uncontrolled study of a single group of participants who have experienced bullying where paranoia and/ or hallucinations data is only described (rather than featuring in any inferential statistics). Where a criterion only applies to a specific design, it is in italics.

1. **Unbiased selection of the cohort?**

   Factors that help reduce selection bias:

   Inclusion/exclusion criteria is:

   - Clearly described
   - Criteria for classifying experiences of bullying are clearly outlined or previous literature outlining these criteria is referred to.

   Recruitment strategy is:

   - Clearly described
   - Sample is representative of the population of interest: A definition of bullying is provided and samples are differentiated on this basis.

Samples that are not distinguished on the basis of a definition of bullying may not be representative of this group.

- When recruiting clinical samples, studies that randomly recruit from services or select a consecutive cohort of individuals will be less prone to bias than approaches to recruitment that rely on clinicians to select those to take part in the study.
- Studies where participants respond to advertisements and so self-select into the study run the risk of bias.

2. ***Selection minimizes baseline differences in demographic factors (For controlled/ comparison group studies only)?***

   Factors to consider:

   - Was selection of the comparison group appropriate? Consider whether these two sources are likely to differ on factors related to the outcome (besides bullying status). Note that in instances of bullying versus no bullying experiences, differences in presentations would be expected, but matching on key demographics (age, gender, ethnicity, education, etc.) would still be required to minimize bias.
   - Did the study investigators do other things to ensure that exposed/unexposed groups were comparable, e.g., by using stratification?

3. ***Sample size calculated (for controlled/comparison group studies and where studies test for predictors/correlates of paranoia/hallucinations)?***

   Factors to consider:

- Did the authors report conducting a power analysis or describe some other basis for determining the adequacy of study group sizes for the primary outcome(s) of interest to us?
- Did the eventual sample size deviate by ≤ 10% of the sample size suggested by the power calculation?

4. **Adequate description of the cohort?**

   Consider whether the cohort is well-characterized in terms of baseline demographics?

   - Consider key demographic information such as age, gender and ethnicity.
   - Information regarding education or socio-economic characteristics is also important.
   - Information regarding experiences of mental health difficulties and experiences of other trauma is relevant.

5. **Validated method for assessing bullying status?**

   Factors to consider:

   - Was the method used to ascertain bullying exposure clearly described? (Details should be sufficient to permit replication in new studies)
   - Was a valid and reliable measure used to ascertain bullying exposure? *(Self-report measures tend to have lower reliability and validity than clinical interview*, studies which measure bullying as a child and as an adult separately are more likely to be reliable and valid.
   - Note that measures that consist of single items of scales taken from larger measures are likely to lack content validity and reliability.

6. **Validated method for assessing paranoia and/or hallucinations?**

Factors to consider:

- Were primary outcomes assessed using valid and reliable measures? Note that measures that consist of single items of scales taken from larger measures are likely to lack content validity and reliability.
- Were these measures implemented consistently across all study participants?
- *When clinical samples are used was a valid and reliable measure used to ascertain diagnosis. Gold standard tools include Diagnostic and statistical manual interviews, which includes structured clinical interview for DSM disorders (SCID). When considering patients in ultra-high risk groups, gold standard tools include the Comprehensive Assessment of the At-Risk Mental State (CAARMS) and the Structured Interview of Prodromal Syndromes (SIPS).*

7. ***Outcome assessment blind to participants' exposure to bullying? (Only applicable when interviewers are used)***

    - Were the study investigators who assessed outcomes blind to the bullying status of participants? (Note that even in single-arm studies, a degree of blinding is possible, for example using external interviewers with no knowledge of participants' experiences of bullying).

8. ***Adequate follow-up period (longitudinal studies only)?***

    Factors to consider:

    - Minimum adequate follow-up period is 1-year for paranoia and/or hallucinations.
    - A justification of the follow-up period length is preferable.
    - Follow-up period should be the same for all groups

- If differences in follow-up time were adjusted for using statistical techniques, e.g., survival analysis then this is reasonable.

9. **Missing data**

Factors to consider:

- Did missing data from any group exceed 20%?
- In longitudinal studies, consider attrition over time as a form of missing data. Note that the criteria of < 20% missing data may be unrealistic over longer follow-up periods.
- If missing data is present and substantial, were steps taken to minimize bias (e.g., sensitivity analysis or imputation).

10. ***Analysis controls for confounding variables (controlled/comparison group studies and where studies test for predictors/correlates of paranoia and/or hallucinations)?***

Factors to consider for controlled studies:

- Does the study identify and control for important confounding variables and effect modifiers? Confounding variables are risk factors that are correlated with bullying status and outcome and may therefore bias the estimation of the effect of bullying status on outcome if unmeasured. These may include demographic and accompanying clinical diagnosis e.g. in controlled studies were participants in healthy control groups screened for the presence of psychotic disorders?
- Of relevance is whether or not the study controlled for hallucinations when paranoia is the outcome and controlled for paranoia when

hallucinations is the outcome. Also did the study control for participants' previous experiences of trauma.

Factors to consider for studies looking at predictors of paranoia and/or hallucinations within bullied groups:

- Did the study control for likely demographic and clinical confounders? For example, using multiple regression to adjust for demographic or clinical factors likely to be correlated with predictor and outcome?

11. ***Analytic methods appropriate (controlled/comparison studies and where studies test for predictors/correlates of paranoia and/or hallucinations)?***

Factors to consider:

- Was the kind of analysis done appropriate for the kind of outcome data (categorical, continuous, etc.)?
- Was the number of variables used in the analysis appropriate for the sample size? (The statistical techniques used must be appropriate to the data and take into account issues such as controlling for small sample size, clustering, rare outcomes, multiple comparison, and number of covariates for a given sample size)

Appendix B: Author Guidelines for Journal of Child and Adolescent Trauma

Only essential information is provided here, please see author guidelines for more detail. Available at http://www.springer.com/psychology/child+%26+school+psychology/journal/40653

Manuscript Style

The entire manuscript should adhere to APA 6th edition standards including: Times New Roman 12 pt. font, 1" all around page margins, with a page header at ½" and entire manuscript should be double spaced, left aligned with .5" first line indents. Quotations, references, figure-caption list, and tables must also adhere to APA 6th edition guidelines. With quotations of 40 or more words, DO NOT use quotation marks. Set off the quotation in Block style format indented ½". Number all pages consecutively with Arabic numerals, with the title page being page 1 and include a running head on all pages. The suggested running head should be less than 40 characters (including spaces) and should comprise the article title or an abbreviated version thereof.

A title page should be uploaded as the first page of the manuscript and should include only the title of the article. Do not include author's name or author's affiliation or other identifying names since the manuscripts undergo anonymous reviews. An abstract is to be provided, and should be no more than 150 words. Abstract should be flush left and left-aligned. A list of 4−8 key words is to be provided directly below the abstract. Key words should express the precise content of the manuscript, as they are used for indexing purposes.

List references alphabetically at the end of the paper and refer to them in the text by name and year in parentheses. Where there are six or more authors, only the first author's name is given in the text, followed by et al., unless there are more than two references with the same author surname and same year. In this case, list as many others as needed (usually no more than two or three) to indicate which reference you are referring to followed by et al.

Illustrations

- Illustrations (photographs, drawings, diagrams, and charts) are to be numbered in one consecutive series of Arabic numerals and cited in numerical order in the text. Photographs should be high-contrast and drawings should be dark, sharp, and clear. Artwork for each figure should be provided on a separate page. Each figure should have an accompanying caption. The captions for illustrations should be listed on a separate page.
- Tables should be numbered (with Roman numerals) and referred to by number in the text. Each table should be typed on a separate sheet of paper. Center the title above the table, and type explanatory footnotes (indicated by superscript lower−case letters) below the table.
- If there are tables and/or figures, they must be referred to in text (e.g., see Table 1). In addition, you should provide an indication of approximately where the table/figure should be placed within the manuscript. This indicator should be placed at a natural break in the text (e.g., between paragraphs or between sections) after the corresponding in-text citation of the table/figure.

Appendix C: Demographic Information

1. What is your gender?

☐Male
☐Female
☐Prefer not to say

2. What age are you?

_____

3. What is your ethnicity?

White
☐English/Welsh/Scottish/Northern Irish/British
☐Irish
☐Gypsy or Irish Traveller
☐Any other White background (please state) _____

Mixed/multiple ethnic groups
☐White and Black Caribbean
☐White and Black African
☐White and Asian
☐Any other Mixed/multiple ethnic background (please state) _____

Asian/Asian British
☐Indian
☐Pakistani
☐Bangladeshi
☐Chinese
☐Any other Asian background (please state) _____

Black/African/Caribbean/Black British
☐African
☐Caribbean
☐Any other Black /African/Caribbean background (please state) _____

Other ethnic group
☐Arab
☐Any other ethnic group, write in

☐Prefer not to say

4. What is your relationship status?

☐Single
☐In a relationship
☐Married
☐Civil partnership
☐Divorced
☐Other (please state) _____
☐Prefer not to say

5. What is your employment status?

☐Paid or self-employment
☐Voluntary employment
☐Unemployed
☐Student
☐Housewife/Husband
☐Retired
☐Other (please state) _____
☐Prefer not to say

6. Which of these categories best describes your total combined family income for the past 12 months?

This should include income (before taxes) from all sources, wages, rent from properties, social security, disability and/or veteran's benefits, unemployment benefits, workman's compensation, help from relatives (including child payments and alimony), and so on.

☐Less than £7,785
☐£7,786 - £10,635
☐£10,636 - £14,504
☐£14,505 - £20,394
☐More than £20,395

7. What is your highest educational qualification?

☐No formal qualifications
☐High school qualification
☐Professional/vocational diploma
☐A-levels (or equivalent)
☐University Bachelors degree
☐University Masters degree

☐PHD
☐Other (please state) _____
☐Prefer not to say

8. Have you been diagnosed with a mental health problem?

☐Yes
☐No
☐Prefer not to say

9. If yes what was your mental health diagnosis?

_____

☐Prefer not to say

10. Are you currently involved with mental health services or receiving treatment for a mental health problem?

☐Yes
☐No
☐Prefer not to say

Appendix D: Trauma measure (designed by the authors)

Since the age of 16	**Never True**	**Rarely True**	**Sometimes True**	**Often True**	**Very Often True**
I believe I have been emotionally abused.					
I believe I have been physically abused.					
I believe I have been sexually abused.					

Appendix E: The Dissociative Experiences Scale- 2nd version (DES-II; Carlson & Putnam, 1993)

Directions: This questionnaire consists of twenty-eight questions about experiences that you may have in your daily life. We are interested in how often you have these experiences. It is important, however, that your answers show how often these experiences happen to you when you are not under the influence of alcohol or drugs. To answer the questions, please determine to what degree the experience described in the question applies to you, and circle the number to show what percentage of the time you have the experience.

For example: 0% 10 20 30 40 50 60 70 80 90 10
(Never) (Always)

1. Some people have the experience of driving or riding in a car or bus or subway and suddenly realizing that they don't remember what has happened during all or part of the trip. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

2. Some people find that sometimes they are listening to someone talk and they suddenly realize that they did not hear part or all of what was said. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

3. Some people have the experience of finding themselves in a place and have no idea how they got there. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

4. Some people have the experience of finding themselves dressed in clothes that they don't remember putting on. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

5. Some people have the experience of finding new things among their belongings that they do not remember buying. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

6. Some people sometimes find that they are approached by people that they do not know, who call them by another name or insist that they have met them before. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

7. Some people sometimes have the experience of feeling as though they are standing next to themselves or watching themselves do something and they actually see themselves as if they were looking at another person. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

8. Some people are told that they sometimes do not recognize friends of family members. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

9. Some people find that they have no memory for some important events in their lives (for example, a wedding or graduation). Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

10. Some people have the experience of being accused of lying when they do not think that they have lied. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

11. Some people have the experience of looking in a mirror and not recognizing themselves. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

12. Some people have the experience of feeling that other people, objects, and the world around them are not real. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

13. Some people have the experience of feeling that their body does not seem to belong to them. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

14. Some people have the experience of sometimes remembering a past event so vividly that they feel as if they were reliving that event. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

15. Some people have the experience of not being sure whether things that they remember happening really did happen or whether they just dreamed them. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

16. Some people have the experience of being in a familiar place but finding it strange and unfamiliar. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

17. Some people find that when they are watching television or a movie they become so absorbed in the story that they are unaware of other events happening around them. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

18. Some people find that they become so involved in a fantasy or daydream that it feels as though it were really happening to them. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

19. Some people find that they sometimes are able to ignore pain. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

20. Some people find that they sometimes sit staring off into space, thinking of nothing, and are not aware of the passage of time. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

21. Some people sometimes find that when they are alone they talk out loud to themselves. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

22. Some people find that in one situation they may act so differently compared with another situation that they feel almost as if they were two different people. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

23. Some people sometimes find that in certain situations they are able to do things with amazing ease and spontaneity that would usually be difficult for them (for example, sports, work, social situations, etc.). Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

24. Some people sometimes find that they cannot remember whether they have done something or have just thought about doing that thing (for example, not knowing whether they have just mailed a letter or have just thought about mailing it). Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

25. Some people find evidence that they have done things that they do not remember doing. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

26. Some people sometimes find writings, drawings, or notes among their belongings that they must have done but cannot remember doing. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

27. Some people sometimes find that they hear voices inside their head that tell them to do things or comment on things that they are doing. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

28. Some people sometimes feel as if they are looking at the world through a fog, so that people and objects appear far away or unclear. Circle the number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

Appendix F: The Revised Launay-Slade Hallucination Scale (LSHS-R; Bentall & Slade, 1985)

1. **No matter how hard I try to concentrate, unrelated thoughts always creep into my mind**

□ Certainly applies
□ Possibly applies
□ Unsure
□ Possibly does not apply
□ Certainly does not apply

2. **In my daydreams I can hear the sound of a tune almost as clearly as I was listening to it**

□ Certainly applies
□ Possibly applies
□ Unsure
□ Possibly does not apply
□ Certainly does not apply

3. **Sometimes my thoughts seem as real as actual events in my life**

□ Certainly applies
□ Possibly applies
□ Unsure
□ Possibly does not apply
□ Certainly does not apply

4. **Sometimes a passing thought will seem so real that it frightens me**

□ Certainly applies
□ Possibly applies
□ Unsure
□ Possibly does not apply
□ Certainly does not apply

5. **The sounds I hear in my daydreams are usually clear and distinct**

□ Certainly applies

□ Possibly applies

□ Unsure

□ Possibly does not apply

□ Certainly does not apply

6. **The people in my daydreams seem to true to life that I sometimes think they are**

□ Certainly applies

□ Possibly applies

□ Unsure

□ Possibly does not apply

□ Certainly does not apply

7. **I often hear a voice speaking my thoughts aloud**

□ Certainly applies

□ Possibly applies

□ Unsure

□ Possibly does not apply

□ Certainly does not apply

8. **In the past I have had the experience of hearing a person's voice and then found that no one was there**

□ Certainly applies

□ Possibly applies

□ Unsure

□ Possibly does not apply

□ Certainly does not apply

9. **On occasions I have seen a person's face in front of me when no one was in fact there**

□ Certainly applies

□ Possibly applies

□ Unsure

□ Possibly does not apply

□ Certainly does not apply

10. I have heard the voice of the devil

□ Certainly applies

□ Possibly applies

□ Unsure

□ Possibly does not apply

□ Certainly does not apply

11. In the past I have heard the voice of God specking to me

□ Certainly applies

□ Possibly applies

□ Unsure

□ Possibly does not apply

□ Certainly does not apply

12. I have been troubled by hearing voices in my head

□ Certainly applies

□ Possibly applies

□ Unsure

□ Possibly does not apply

□ Certainly does not apply

Appendix G: Ethical Approval

From: "Brignal, Liz" <lizzyb@liverpool.ac.uk>
Date: Tuesday, 19 May 2015 15:20
To: "Corcoran, Rhiannon" <corcoran@liverpool.ac.uk>
Subject: IPHS-1415-LB-213-Childhood adversities and hallucination-proneness: The mediating role of different facets of dissociation. (Pathways to unusual sensory perceptions)

Dear Rhiannon

I am pleased to inform you that IPHS Research Ethics Committee has approved your application for ethical approval. Details and conditions of the approval can be found below. .

Ref: IPHS-1415-LB-213
PI / Supervisor: Rhiannon Corcoran
Title: Childhood adversities and hallucination-proneness: The mediating role of different facets of dissociation. (Pathways to unusual sensory perceptions)
First Reviewer: Judi Smith
Second Reviewer: Ian Donald
Date of Approval: 19/5/15

The application was APPROVED subject to the following conditions:

Conditions

1 All serious adverse events must be reported to the Sub-Committee within 24 hours of their occurrence, via the Research Governance Officer (ethics@liv.ac.uk).

2 This approval applies for the duration of the research. If it is proposed to extend the duration of the study as specified in the application form, IPHS REC should be notified as follows. If it is proposed to make an amendment to the research, you should notify IPHS REC by following the Notice of Amendment procedure outlined athttp://www.liv.ac.uk/researchethics/amendment%20procedure%209-08.doc.

3 If the named PI / Supervisor leaves the employment of the University during the course of this approval, the approval will lapse. Therefore please contact the Institute's Research Ethics Office atiphsrec@liverpool.ac.uk in order to notify them of a change in PI / Supervisor.

Best Wishes
Liz Brignal

Appendix H: Advertisement

Two studies seek participants' valuable experiences. Chance to win Amazon vouchers!

We are conducting research into unusual sensory experiences such as hearing voices which others cannot hear. Below you will find the details of two research studies; **one of these studies also requires people who do not have these experiences at all**. You have the option to complete one, both or neither of the studies by clicking on the links listed.

STUDY ONE: Self-compassion, mindfulness and distressing voices

The purpose of the study is to investigate ways people cope with the experience of hearing voices others cannot hear. It is hoped that the results will help in understanding how to provide more effective therapies for people who hear distressing voices.

Who can take part?
To take part you need to:

- Be over 18 years old
- Be able to read written instruction in English
- Have heard voices that others couldn't hear

What will I be asked to do?
You will be asked to complete a set of online questionnaires by selecting responses from a list, including questions about your experience of hearing voices and how you relate to yourself and others. It is up to you how much information you provide. It is anticipated that this will take between 20 and 30 minutes. If you choose to leave your contact details you will also be entered into a prize draw with a chance of winning one of six **£25 Amazon vouchers**.

Click on this link if you're interested to complete the survey or to find out more:

A further chance to win Amazon vouchers:

STUDY TWO: Pathways to unusual sensory perceptions

The purpose of the study is to investigate things which contribute to the likelihood of people experiencing unusual sensory perceptions, such as hearing voices which others cannot hear. **People who do not have these experiences are also encouraged to complete the survey.** It is hoped that the results will inform ways in which people with these experiences are supported.

Who can take part?
To take part you need to:

- Be 18 years and older
- Be able to read, write and understand English
- Be **without** a diagnosis of a neurological condition (e.g. epilepsy, Parkinson's) and/or dementia
- Have **no** significant head injury

What will I be asked to do?
You will be asked to complete a set of online questionnaires by selecting responses from a list, including questions about your experience of unusual sensory perceptions, feelings of being disconnected and your experiences of trauma in childhood and as an adult. It is up to you how much information you provide. It is anticipated that this will take no longer than 25 minutes. If you choose to leave your contact details you will also be entered into a prize draw with a chance of winning one of six **£25 Amazon vouchers**.

Click on this link if you're interested to complete the survey or to find out more

Appendix I: Participant Information Sheet

Participant Information Sheet

Pathways to unusual sensory perceptions

You are invited to take part in a research study. Before deciding whether to take part or not, it is important for you to understand why the research is being done and what it will involve. Please read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear, or if you would like more information. You do not have to accept this invitation and should only agree to take part if you want to.

What is the study for?

This research is about factors which contribute to people experiencing unusual sensory perceptions (sometimes referred to as 'hearing voices', 'seeing visions' or 'hallucinations'). Many people have these experiences at some point in their life. We want to understand more about what influences this. We will use this research to help us to understand the difficulties which are faced by victims of trauma and people who experience unusual sensory perceptions. By doing so, we aim to improve the care and support which is offered.

Who is doing the study and who has approved it?

The study is being carried out by a team from the University of Liverpool, Lancaster University and Mersey Care NHS Trust. It has been approved by the University of Liverpool's Research Ethics Committee.

Why have I been chosen to take part?

Experiences of unusual sensory perceptions range from **none at all** to **frequently**. You have been chosen to take part in this survey because we are aiming to hear from as wide a spectrum of people as possible, irrespective of whether they **do** or **do not** experience unusual sensory perceptions.

Am I eligible to take part?

We are inviting individuals aged 18 and over and who are able to read, write and understand English. Individuals with any neurological condition (e.g. epilepsy, Parkinson's), a significant head injury or a diagnosis of dementia are asked **not** to take part in the study.

Do I have to take part in the study?

No. It is up to you to decide whether or not to take part. If you decide to take part we will ask you to indicate that you have provided consent by ticking a box. However, you are free to stop completing the questionnaire at anytime. A decision to stop taking part or a decision not to take part will not affect you in any way.

What will taking part involve?

If you would like to participate, we will first ask you to complete an online consent form which asks if you have read and understood this information. We will then ask if you are happy to participate. A questionnaire will then be provided. The questionnaire should take no longer than approximately 25 minutes. You are free to take a break at anytime, however, it is important to leave your computer switched on, so you don't lose the answers you have entered. The questionnaire will not have any identifying information attached to it.

Once you have completed the questionnaire, you will have finished the study. There will be no further questionnaires or any other kind of follow up in the future. At the end of the study, you will be given the option to provide your e-mail address so that you can be entered into a prize draw to win one of six £25 Amazon vouchers. Once the study closes, the draw will take place and you will be informed by email if you have won a prize. If you would like to receive a copy of the final report you will be asked to provide your email address. If you do provide an email address, either for a chance to win the vouchers and/or to receive a copy of the final report, then this information will be kept separately from your questionnaire answers. Your email address will be deleted once the winners of the prize draw have been selected and/or you have been mailed with a final copy of the report.

Will there be benefits of taking part?

There are no specific benefits from taking part, besides the chance to win an Amazon voucher should you choose to enter the prize draw. However, we hope that this research may improve the care and support for victims of trauma and people who experience unusual sensory perceptions in the future.

What are the possible disadvantages of taking part?

The questionnaires will take time to complete (no more than 25 minutes). Questions about experiences of trauma, such as physical and sexual abuse, experienced as a child and adult will be asked. This may be upsetting to you. However, you are free to leave the study at any time should you become upset. We will provide you with information to help you access additional support from organisations such as Mind or the Hearing Voice Network. Furthermore, if any of the questions raise concerns you are advised to contact your GP for support, and/or discuss them with someone you trust.

What will happen if I want to stop taking part?

You have the right to stop answering the questionnaire at any point, without needing to give any explanation. Should you wish to do this, simply close the internet browser window containing the questionnaires. If you do this, your questionnaire will be withdrawn from the study and permanently deleted. Unfortunately, once you have completed the study, it will not be possible to ask for your data to be removed, as we will have no way of identifying which sets of answers are yours.

What if I am unhappy or there is a problem?

If you wish to complain or have any concerns about any aspect of the way you have been treated during this study, you can approach Christy Laganis (claganis@liv.ac.uk). Alternatively, you can contact the Research Governance Officer (0151 794 8290 or ethics@liv.ac.uk). When contacting the Research Governance Officer, please provide details of the name or description of the study (so that it can be identified), the researcher(s) involved, and the details of the complaint you wish to make.

Will my taking part in this study be kept confidential?

Yes it will. All responses will be anonymised, which means that no one will know your identity or which responses are yours. Any information which identifies you (for example, your contact details, should you wish to be entered into the prize draw) will be stored separately from questionnaire data. Your responses will only be viewed by the researchers involved in the study. All information collected for this research project will be kept safely and securely on a University of Liverpool password-protected computer for 5 years in line with the British Psychological Society's Guidelines.

What will happen to the results of this study?

The results will form part of a Doctorate thesis in Clinical Psychology. They may also be written up for publication in academic journals and presented at research conferences. If you wish, we will be happy to send you a summary of what we have found at the end of the study (approximately July 2016). A summary of the anonymised results will also be posted on the Hearing Voices Network website.

Who can I contact for further information?

Christy Laganis (Trainee Clinical Psychologist) T: 0151 794 5102; E-mail: claganis@liverpool.ac.uk
Professor Rhiannon Corcoran (Professor of psychology) T: 0151 795 5365;
E-mail: Rhiannon.Corcoran@liverpool.ac.uk
Professor William Sellwood (Clinical Psychologist) T: 01524 593998 E-mail: b.sellwood@lancaster.ac.uk

Thank you for taking the time to read this. You should keep this information sheet for future reference

Christy Laganis, Trainee Clinical Psychologist, Mersey Care NHS Trust
Professor Rhiannon Corcoran, Professor of psychology, University of Liverpool
Professor William Sellwood, Programme Director, Lancaster University

Appendix J: Participant Consent Form

Pathways to unusual sensory perceptions
Christy Laganis, Professor Rhiannon Corcoran and Professor William Sellwood

	Please tick box
1. I confirm that I have read and have understood the information sheet dated 10/06/2015 for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2. I understand that participation is voluntary and that I am free to withdraw at any time up until the submission of my data without my rights being affected. In addition, should I not wish to answer any particular question or questions, I am free to decline.	☐
3. I understand that in order to protect my identity, any personally identifiable information will be removed once I have submitted my data and I understand that this will mean that I will no longer be able to withdraw my data once I have submitted it.	☐
4. I understand that should I choose to leave my email address for the prize draw and/ or to receive the final copy of the report, it will be kept separate from the rest of my data on a secure password protected computer and will be deleted once the winners of the prize draw have been selected and/ or once the final copy of the report has been sent.	☐
5. I confirm that I am eligible to take part in the study.	☐
6. I agree to take part in the above study.	☐

Appendix K: Debrief Sheet

Thank You for your help!

We appreciate the time you have given to contribute to this study.

If you wish to be entered into the prize draw for the chance to win Amazon Vouchers, please enter your email address into the box below (if you do not wish to be entered into the draw, please leave the box blank).

The draw will take place once the study has closed, and you will be informed whether you have been successful or not via the email address above.

If you wish to receive a copy of the final report, please enter your email address into the box below (if you do not wish to, please leave the box blank).

Your email address will be kept separate from your questionnaire answers and will only be used to select a winner of the prize draw and/or to e-mail you with the final copy of the report. It will be deleted once the winners of the prize draw have been selected and/or you have been mailed with a final copy of the report.

We hope that there has been nothing upsetting about taking part. However, we would like to remind you that should if any of the questions raise concerns you are advised to contact your GP for support, and/or discuss them with someone you trust.

You can also gain support by contacting an independent support organisation such as:

The Samaritans: 08457 90 90 90 or www.samaritans.org
The Hearing Voice Network: www.hearing-voices.org
Mind: 0300 123 33 93 or www.mind.org.uk
Victim Support: 0845 30 30 90 or www.victimsupport.org.uk
Rape Crisis England and Wales: 0808 802 9999 or www.rapecrisis.org.uk
National Domestic Violence Helpline: 0808 2000 247 or
www.nationaldomesticviolencehelpline.org.uk

Contact details of the lead researcher:
Christy Laganis
Trainee Clinical Psychologist
Doctorate of Clinical Psychology Programme
University of Liverpool
Email: claganis@liverpool.ac.uk